1996 Inventory of Toxic Air Emissions

Part II: Mobile Sources

February 2000

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Pennsylvania Department of Environmental Protection, Air Quality Control
Wisconsin Department of Natural Resources, Bureau of Air Management

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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
DVMT	Daily Vehicle Miles Traveled
EET	Emission Estimating Techniques
EIIP	Emission Inventory Improvement Program
EIS	Emission Inventory System
ESP	Electrostatic Precipitator
FAEED	FAA Aircraft Engine Emission Database
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
HDGV	Heavy-Duty Gasoline Vehicles
HDDV	Heavy-Duty Diesel Vehicles
IDEM	Indiana Department of Environmental Management
IEPA	Illinois Environmental Protection Agency
IJC	International Joint Commission
IMS	Information Management System
INDOT	Indiana Department of Transportation
LDDV	Light-Duty Diesel Vehicles
LDDT	Light-Duty Diesel Trucks
LDGV	Light-Duty Gasoline Vehicles
LDGT1	Light-Duty Gasoline Trucks
LDGT2	Light-Duty Gasoline Trucks
MACT	Maximum Achievable Control Technology
MC	Motorcycles
MCEI	Minnesota Criteria Pollutant Emission Inventory
MDEQ	Michigan Department of Environmental Quality
MOBILE5	U.S. EPA's Vehicle Emissions Model
MPCA	Minnesota Pollution Control Agency
MSDS	Material Safety Data Sheet
NATA	National Air Toxics Assessment
n.e.c.	Not Elsewhere Classified
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NEVES	Non-road Engine and Vehicle Emission Study
NO_x	Nitrogen Oxides
NTI	National Toxic Inventory
NYDEC	New York Department of Environmental Conservation
OEPA	Ohio Environmental Protection Agency
OMS	Office of Mobile Standards
PAH	Polycyclic Aromatic Hydrocarbons

PART5	U.S. EPA's Highway Vehicle Particulate Emission Factor Model
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
RFG	Reformulated Gasoline
SAMS	SIP Air Pollutant Inventory Management System
SCC	Source Classification Code
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SSD	Source Summary Database
STEPS	State Environmental Programs Systems
TANKS	Storage Tank Emissions Software
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 Air Toxic Emissions Inventory Project conducted a regional emissions inventory of toxic air contaminants which are significant contributors to the environmental degradation of the Great Lakes and its urban areas.

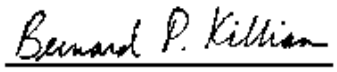
The Inventory Project is an important step in meeting the goals of the 1986 Great Lakes Toxic Substances Control Agreement (signed by the Great Lakes governors and Premier of Ontario), and sections 112(c)(6), 112(k) and 112(m) of the 1990 U.S. Clean Air Act Amendments.

This project is a partnership between 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 toxic contaminants. This is the second compilation of a region wide inventory of toxic air pollutants. The initial inventory, published in October 1998, used 1993 data to focus on 49 pollutants of concern for point and area sources. This second regional inventory for 1996 was expanded to 82 pollutants to accommodate for the addition of mobile sources. Part I of the 1996 regional inventory (Point and Area Sources) was published in December 1999. Emissions from mobile sources are included in this Part II of the report.

The air toxic emission estimates contained in this report represent the best single compilation of such estimates, however, this inventory project has also identified the limitations which still exist in making such estimates. Results should therefore be viewed as an initial step for use by policy-makers, modelers and others involved in air quality management. These data can support regulatory decisions if used in conjunction with other sources of quality assured data.

The Great Lakes Commission, together with the eight Great Lakes states and the province of Ontario is now compiling inventories for 1997 and 1998, and eventually, 1999 data. Through this continuing effort, a mechanism has been established to support sound regulatory decisions.

Great Lakes Regional Air Directors



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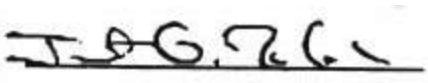

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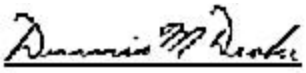

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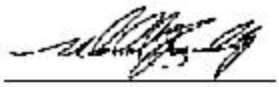

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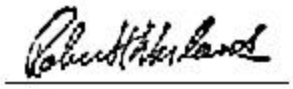

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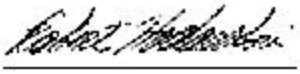

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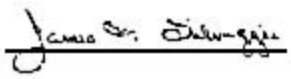

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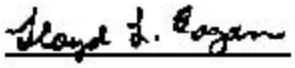

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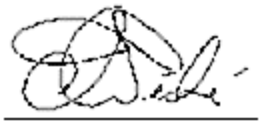

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The Great Lakes Regional Air Toxic Emissions Inventory has been a challenging endeavor for all involved. As an unprecedented effort to compile a regional inventory of toxic air emissions, a multitude of complex issues had to be resolved to ensure that the priorities of all Great Lakes jurisdictions - federal, state, and provincial - were adequately addressed.

This unique effort has benefited from the leadership of Orlando Cabrera-Rivera, chair of the Steering Committee for the Great Lakes Regional Air Toxic Emissions Inventory Project, Julie Wagemakers, project manager, Great Lakes Commission, and Buzz Asselmeier and Chun Yi Wu for administering the quality assurance and quality control checks on the inventory data. Ms. Wu conducted the Scope Study that looked at expanding the Great Lakes regional inventory to include mobile source emissions. The results of this study served as the basis for developing the mobile sources module in RAPIDS. Emission inventory specialists from the Great Lakes states, U.S. EPA and the province of Ontario worked together closely, making the project a team effort.

This report was written, compiled, and reviewed by all of the above project participants in addition to their staff. Editorial, report compilation and technical assistance was provided by Great Lakes Commission staff member Derek Moy. Project administration and oversight was provided by Dr. Michael J. Donahue, Commission executive director, and Julie Wagemakers, program manager, Communications and Information Management. Contractual support for software development was provided by Windsor Technologies, Inc.

Executive Summary

Introduction and Inventory Objective

This report (Part II: Mobile Sources), a product of the Great Lakes Regional Air Toxic Emissions Inventory Project, presents a multijurisdictional inventory of mobile sources emissions of 82 toxic air contaminants that have the potential to impact environmental quality in the Great Lakes basin. Part I of this report, Point and Area Sources, was published in December 1999.

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).

This inventory report presents a compilation of the best available data for calendar year 1996 emissions from mobile sources. Point and area source emission summaries in relation to mobile source emissions are also included. Information 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)*. RAPIDS includes the capability of estimating emissions from 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.

Part II of the inventory effort focused on the identification of mobile source categories that contribute to the total emissions of toxic contaminants listed in Table 1-1. Examples of mobile sources include: cars, trucks, trains, recreation vehicles, airplanes, marine vessels, farm equipment, construction equipment and other non-road engines such as lawnmowers and snowblowers.

Emission estimates for the 82 toxic compounds are presented in the first half of this report, with state reports and methodologies detailed in the appendices.

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. 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, analysis and assessing the benefits of implementing control technologies and other emission reduction programs.

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:

- Assigns responsibilities and procedures to the states, Great Lakes Commission, U.S. EPA Great Lakes National Program Office (GLNPO);
- Outlines procedures to identify and locate emission sources of target compounds;
- Guides selection of specific emission estimation techniques;
- Instructs states on compiling and updating the regional repository at GLNPO;
- Outlines quality assurance/quality control procedures for emission data and estimates; and
- Identifies and explains the full suite of automated tools available for developing the regional inventory.

Because the inventory was a multi-state, regional effort, a high level of coordination and communication was necessary to ensure consistency among the states and province of Ontario in terms of data management, methodology, calculation methods and other issues. During the course of inventory development, the Great Lakes Regional Air Toxic Emissions Inventory Technical Steering Committee communicated via daily e-mail exchanges, weekly or biweekly conference calls, and bimonthly in-person meetings. In addition, the Steering Committee developed an Internet group mailing service, airtoxics@great-lakes.net, which facilitated 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. A complete archive of all airtoxics listserve messages, including minutes for all conference calls and in-person meetings can be found on the Great Lakes Information Network (GLIN) (http://www.great-lakes.net). The committee also oversaw contractor development of the inventory software and resolved outstanding issues and inconsistencies among the eight states and Ontario. The Steering Committee is composed of representatives from each of the air management programs from the eight Great Lakes states as well as Ontario and observers from U.S. EPA. A complete list of members with contact information can be found in Appendix K**.**

The Steering Committee worked closely with the project software development contractor, Windsor Technologies, Inc., to develop and test RAPIDS. Following on the success of the 1993 inventory, RAPIDS was enhanced to include a mobile source module to estimate emissions from on-road and non-road mobile sources; the addition of growth factor algorithms to project emissions; controlled emission factor functionality; development of mobile sources emission factors for the Great Lakes region; and improved 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 is available for public use from the Commission's website at http://www.glc.org/air/rapids/rapids.html. Requests for data can be forwarded to the point of contact listed on the webpage.

Finally, a Quality Assurance/Quality Control (QA/QC) Committee reviewed the inventory report, established QA/QC criteria for use by all states and the province of Ontario, and ensured the report provides an accurate and useful summary of toxic air emissions at the regional level.

Next steps

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 Great Lakes jurisdictions 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 1990 Clean Air Act Amendments.

The Great Lakes Regional Air Toxic Emissions Inventory Project 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 mobile sources. Point and area source emissions were compiled and presented in Part I of the Great Lakes Commission's 1996 Inventory of Toxic Air Emissions, published December 1999.

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 1988 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 regional 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 with plans to develop a 1999 inventory the following year. 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)			
Pollutant Name	Cas No.	Pollutant Name	Cas No.
Acetaldehyde	75-07-0	Methyl chloroform (1,1,1-Trichloroethane)	71-55-6
Acrolein	107-02-8	Methylene chloride (Dichloromethane)	75-09-2
Acrylamide	79-06-1	Methylene diphenyl diisocyanate (MDI)	101-68-8
Acrylonitrile	107-13-1	Parathion	56-38-2
Atrazine	1912-24-9	Pentachloronitrobenzene (quintobenzene)	82-68-8
Benzene (including benzene from gasoline)	71-43-2	Pentachlorophenol	87-86-5
1,3-Butadiene	106-99-0	Phenol	108-95-2
Carbon tetrachloride	56-23-5	Phosgene	75-44-5
Chlordane	57-74-9	Styrene	100-42-5
Chloroform	67-66-3	2,3,7,8 -tetrachlorodibenzo -furan (TCDF)	51207-31-9
Coke oven emissions	8007-45-2	2,3,7,8 -tetrachlorodibenzo -p-dioxin (TCDD)	1746-01-6
Di-n-butyl phthalate	84-74-2	Tetrachloroethylene (Perchloroethylene)	127-18-4
Di-n-octyl phthalate	117-84-0	Toluene	108-88-3
Dichloroethyl ether (bis(2-chloroethyl) ether)	111-44-4	2,4-Toluene diisocyanate	26471-62-5
Diethylhexyl phthalate (Bis(2-ethylhexyl)phthalate) (DEHP)	117-81-7	Total polychlorinated biphenyls (PCBs)	1336-36-3
Ethylbenzene	100-41-4	Total polychlorinated dibenzodioxins (PCDDs)	
Ethylene dibromide (Dibromoethane)	106-93-4	Total polychlorinated dibenzofurans (PCDFs)	
Ethylene dichloride (1,2-Dichloroethane)	107-06-2	Trichloroethylene	79-01-6
Ethylene oxide	75-21-8	2,4,5-Trichlorophenol	95-95-4
Formaldehyde	50-00-0	2,4,6-Trichlorophenol	88-06-2
Glycol ethers		Trifluralin	1582-09-8
Heptachlor	76-44-8	Vinyl chloride	
Hexachlorobenzene	118-74-1	Xylenes (Meta)	1330-20-7
Hexachlorobutadiene	87-68-3	Xylenes (Ortho)	1330-20-7
Hexachloroethane	67-72-1	Xylenes (Para)	1330-20-7
Hydrazine	302-01-2	Xylenes (Iso)	1330-20-7
Methoxychlor	72-43-5		

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

16 PAHs (POM)			
Pollutant Name	**Cas No.**	**Pollutant Name**	**Cas No.**
Acenaphthene	83-32-9	Chrysene	218-01-9
Acenaphthylene	208-96-8	Dibenz(a,h)anthracene	53-70-3
Anthracene)	120-12-7	Fluoranthene	206-44-0
Benz(a)anthracene	56-55-3	Fluorene	86-73-7
Benzo(a)pyrene	50-32-8	Indeno(1,2,3-cd)pyrene	193-39-5
Benzo(b)fluoranthene	205-99-2	Naphthalene	91-20-3
Benzo(ghi)perylene	191-24-2	Phenanthrene	85-01-8
Benzo(k)fluoranthene	207-08-9	Pyrene	129-00-0
Metal Compounds			
Pollutant Name	**Cas No.**	**Pollutant Name**	**Cas No.**
Antimony	7440-36-0	Copper	7440-50-8
Arsenic	7440-38-2	Lead	7439-92-1
Beryllium	7440-41-7	Alkylated lead	
Cadmium	7440-43-9	Maganese	7439-96-5
Chromium	7440-47-3	Mercury	7439-97-6
Chromium (6)	18540-29-9	Nickel	7440-02-0
Cobalt	7440-48-4		

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 toxic emissions inventory and strengthen its ability to support sound regulatory decisions at all levels of government.

2. Methodology

Emissions from mobile sources were calculated as part of the Great Lakes Regional Air Toxic Emissions Inventory Project. The inventory process focused on evaluating, and estimating emissions from on-road and non-road mobile sources that release one or more of the 82 toxic air pollutants of concern. Figure 2-1 presents the mobile source categories inventoried for this project. For additional discussion on the project's methodology, see The 1996 Great Lakes Regional Air Toxic Emissions Inventory report (Part I, Point and Area Sources) and the Air Toxic Emissions Inventory Protocol for the Great Lakes States.

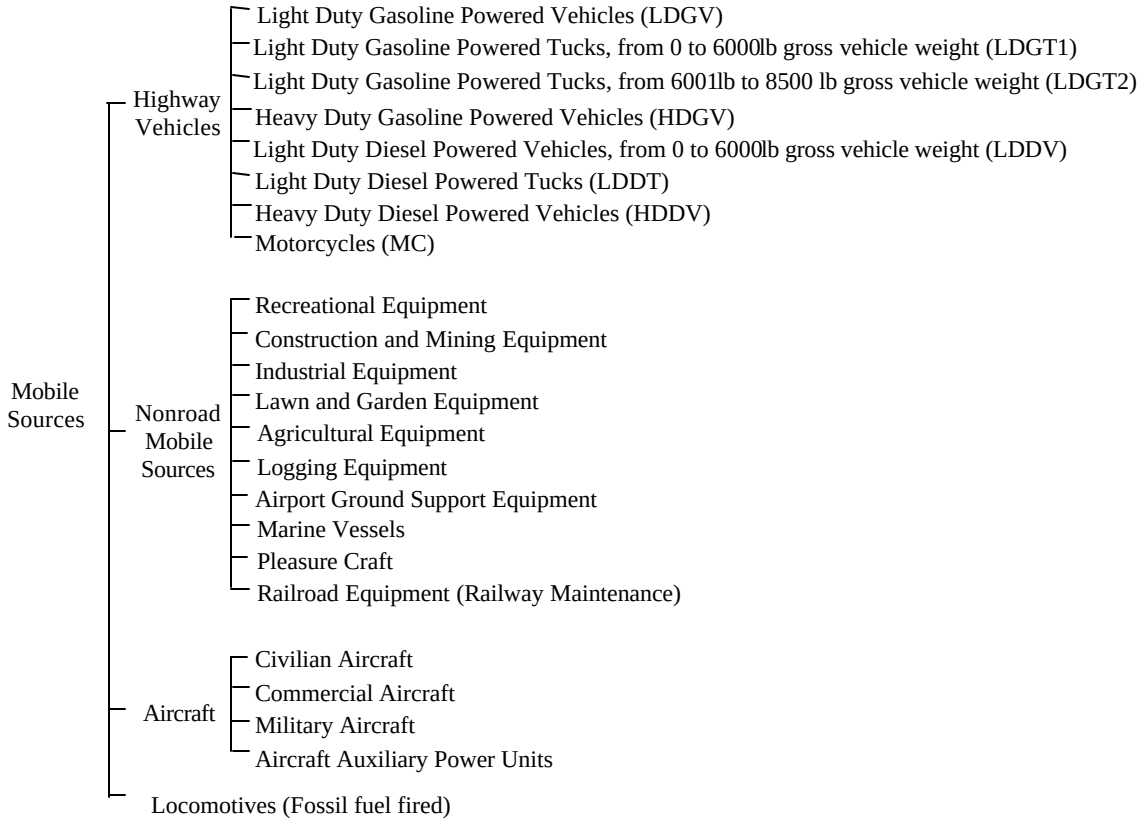


Figure 2-1. Mobile sources included in the toxic air emissions inventory.

It should be noted that given variances in data availability and staffing resources from one jurisdiction to the next, coverage of above source categories might vary among jurisdictions.

Rather than comparing emissions state by state (or province), 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. For state/provincial specific information on the inventory compilation process, please see the state/provincial portion of the report (Appendices A through I).

Emission Estimation and Inventory Software: RAPIDS

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

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 consisted of: the implementation of on-road mobile source emissions estimates capabilities using MOBILE5 and PART5 outputs, the non-road emissions estimation using NEVES data, aircraft emissions estimates using FAEED, mobile source growth algorithms to project emissions, and the incorporation of FIRE 6.0 emission factors. Additional emission factors and speciation profiles for mobile sources were obtained from the documentation for the 1996 Base Year National Toxic Inventory for Onroad Sources, the Documentation for 1996 Base Year National Toxic Inventory for Nonroad Sources, and U.S. EPA's Non-Road model. For pollutants not included in section 112(b) of the 1990 Clean Air Act Amendments, regional toxic speciation profiles for on-road gasoline and diesel exhaust and evaporative hydrocarbon were derived. These factors were developed using U.S. Department of Transportation data, oxygenated and reformulated fuels data from the National Renewable Energy Laboratory (NREL), and SPECIATE v.1.5 gasoline speciation profiles 1313 and 1305.

The mobile source module in RAPIDS includes import functions ("intelligent imports") that facilitated the input of user supplied data for emission estimation of on-road and non-road sources. There are three import methods for on-road sources, four for non-road and three for aircraft. Each of these "intelligent imports" functions checks the validity of the input data files through the use of valid values tables. Invalid entries are written to the exception log, and not incorporated into any RAPIDS tables. The user must review the exception log, and make the necessary corrections to the data. One or more of these data input methods was used by each of the states/province in estimating emissions from mobile sources.

ON-ROAD SOURCES

Method I - user supplies the following data files:

1. Speeds -- the vehicle speeds by vehicle type (e.g. light duty gasoline vehicles [consistent with MOBILE5a (OMS, 1998b) and PART5 (OMS, 1998c) vehicle classifications]), area type (i.e. urban or rural roadway), and facility type (e.g. minor arterial);
2. Activity -- the vehicle miles traveled (VMT) by vehicle type, area type, facility type, and season (e.g. ozone, winter);
3. VMT profile -- the VMT profile by vehicle type, area type, facility type, and season (*optional input file* which must be supplied if county-wide VMT are supplied in the activity data file);
4. Seasonal adjustment factors -- the seasonal adjustment factors (SAF) by vehicle type, area type, facility type, and season;
5. MOBILE emissions factors -- MOBILE-derived emissions factors by vehicle type, speed, and pollutant (e.g. hydrocarbon, carbon monoxide [consistent with MOBILE pollutants]); and

6. PART emissions factors -- PART derived emissions factors by vehicle type and pollutant (e.g. PM_{10}, exhausted sulfate [consistent with PART pollutants]).

Based on the contents of the user-supplied data files, RAPIDS will estimate on-road mobile source air toxic emissions.

Method II - the user supplies primary, on-road mobile source emissions estimates (e.g. TOG, PM_{10}); RAPIDS uses the state-computed on-road primary emissions estimates to compute air toxic emissions estimates from on-road mobile sources.

Method III - the user supplies estimates of on-road mobile source air toxic emissions estimates. RAPIDS stores these toxic emissions estimates after quality assurance checks have been successfully performed.

NON-ROAD SOURCES

Method I - user supplies the following data file:
Activity -- the SCC-specific activity data by season; and/or seasonal adjustment factors -- the seasonal adjustment factors (SAF) by SCC.

Based on the contents of the user-supplied data files, RAPIDS estimates non-road mobile source air toxic emissions. Of note, the use of the user-supplied activity data file is flexible enough to accommodate both surrogate activity data (e.g. population for actual number of non-road equipment) and actual activity data (e.g. equipment counts).

In using this method, the user must verify that the RAPIDS emissions factors have units that are consistent with the units of the activity data for the corresponding non-road source.

Method II – the RAPIDS user supplies no data. RAPIDS estimates non-road mobile source air toxic emissions based entirely on default data. The default data have been derived from available EPA sources, most notably EPA's Non-road Engine and Vehicle Emission Study (NEVES; EPA, 1991 and EEA, 1992). The RAPIDS user has the discretion to substitute the default non-road mobile source information with data that the user feels is better suited to estimate non-road mobile source emissions. Further, by using components of Method I and Method II, the RAPIDS user has additional flexibility in controlling how non-road mobile source emissions estimates are computed.

Method III - user supplies estimates of the primary pollutants (e.g. TOG, PM_{10}) for the non-road mobile sources. These data are stored in RAPIDS after quality assurance checks have been successfully performed. RAPIDS then uses the state-computed non-road primary emissions estimates to compute air toxic emissions estimates from non-road mobile sources.

Method IV – user supplies actual non-road mobile source air toxic emissions estimates. RAPIDS stores the data after quality assurance checks have been successfully performed.

AIRCRAFT

Method I - the user supplies the following data:

1. Landing/takeoff (LTO) counts -- the counts of landing/takeoff cycles by aircraft or aircraft/engine type on a county or airport level;
2. Time-in-Mode (TIM) data -- optional time-in-mode data for a specific county or airport location and aircraft types. This information will be used preferentially over the default values provided by the Federal Aviation Administration Aircraft Engine Emissions Database (FAEED; OMS, 1998a);

The following files, which were obtained from the FAEED system, are resident in the RAPIDS database:

1. Default aircraft/engine combinations -- LTO counts are sometimes collected by aircraft type rather than by aircraft and engine combination. This table contains the default engine type to use for each aircraft type;
2. Engine description -- Descriptive information about each engine type and aircraft combination, including the number of engines on each aircraft type, the category of the aircraft (e.g. jumbo jet, military transport) and the SCC, which is based on the aircraft category, applicable to the emissions;
3. Emission factors -- Emission factors for NO_X, TOG, CO, and SO_X, based on the engine type and operating mode (i.e. idle, takeoff, approach, climb out); and
4. Default TIM values -- Average time in mode values for each aircraft category.

Utilities are available to allow the user to upload new versions of the FAEED, or to add new aircraft and engine types. Based on the contents of these data files, RAPIDS estimates air toxic emissions from aircraft.

Method II - user supplies primary (TOG, NO_X, CO, PM and SO_X), aircraft emissions estimates. These data are stored in RAPIDS after quality assurance checks have been successfully performed. RAPIDS then uses the state-computed aircraft primary emissions estimates to compute air toxic emissions estimates.

Method III - user supplies actual air toxic emissions estimates for aircraft. RAPIDS stores the data after quality assurance checks have been successfully performed.

For detailed information on RAPIDS' mobile source features, please see RAPIDS Mobile Source Enhancements at the Great Lakes Commission's site (http://www.glc.org/air/rapids/rapids.html).

3. Results

Overall Emissions from Mobile Sources

The 1996 emissions were estimated for 82 target compounds, however, data were only available to obtain emissions from mobile sources for 37 air toxins, including 13 polycyclic aromatic hydrocarbons (PAHs), 14 non-metal compounds and 10 metal compounds. The highest emissions were estimated for toluene at 280.66 million pounds, while the lowest emissions for Anthracene at 124.46 pounds. Among the 37 pollutants, on-road mobile sources contribute more that 50% emissions for two PAHs and almost all non-metal compounds (excluding PAHs) and metal compounds, except phenol and nickel. Non-road vehicles and equipment are the primary sources with more than 50% contributions for nickel and nine out of 13 PAHs. Aircraft dominates phenol emissions and account for about 23% of emissions for phenanthrene and acrolein while its contribution to emissions of other pollutants are insignificant. There are no emissions estimated from aircraft for metal compounds. Locomotives contribute very little to overall emissions. Also, information was not adequate to obtain PAH emissions for locomotives. Table 3-1 shows total mobile source emissions and percentage of contributions from each of the four categories.

Emissions from On-road Mobile Sources

The results shown in Table 3-1 suggest that on-road mobile sources are the most significant contributors to overall mobile source emissions. A close look was taken at the eight subcategories of highway vehicles. Two subcategories for Light Duty Gasoline Powered Trucks, LDGT1 and LDGT2, were combined as LDGT. Table 3-2 presents the emission distributions from the seven subcategories.

The LDGV are the dominant subcategory for on-road mobile source emissions. They contribute more than 86.6% of emissions for thirteen PAHs, more than 50% of emissions for 10 non-metal compounds (excluding PAHs) and eight metal compounds. The LDGT are the second significant contributor to the on-road mobile source emissions with contributions from 10.7% to 36.8% for two PAHs, 12 non-metal compounds, and ten metal compounds. The HDDV are listed as the third significant contributor, contributing about 9.2 to 32.7% of emissions to three non-metal compounds, and eight metal compounds. The HDDV also are responsible for 58.4, 45.2, and 32.7% of lead, mercury, and formaldehyde emissions, respectively. The contributions from other subcategories are insignificant. PAH missions were estimated at negligible levels for the LDDV and LDDT.

Emissions from All Sources

The point and area source emissions were analyzed in Part I of this report, released in December 1999. This section discusses the big picture of emissions in the Great Lakes region, including emissions from point, area, and mobile sources.

The 1996 emissions were obtained for 77 air toxins out of 82 target compounds: 16 PAHs, 49 non-metal compounds and 12 metal compounds. Table 3-3 shows pollutant names; total estimated emissions; and percentage of contributions from point, area, and mobile sources. Among the 77 pollutants, 76 pollutants are emitted from point sources, 62 pollutants from area sources and 37 from mobile source. Area sources contribute more than almost two thirds of total emissions for 15 PAHs, 7 non-metal compounds, and one metal compound. Point sources are responsible for more than two thirds of total emissions for one PAH, 27 non-metal compounds and ten metal compounds, while mobile sources account for almost more than two thirds emissions for seven non-metal compounds: acetaldehyde, acrolein, 1,3-butadiene, ethylbenzene, m-xylenes, o-xylenes, and p-xylenes. Mobile sources are also the primary emission sources for benzene, formaldehyde, toluene, and xylenes (isomers and mixture), with contributions from 51.4 to 63.2%.

The highest emissions were estimated for toluene at 545.82 million pounds, while the lowest emissions were recorded for 2,4,5-trichlorophenol at about 0.02 pounds. Detailed emission distributions by standard industrial classification (SIC) codes and source classification codes (SCC) are shown in the pie charts and tables followed.

It should be noted that this project has demonstrated that both area and mobile 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.

Table 3-1: 1996 mobile source emissions in the Great Lakes region.

Pollutant Name	Cas No.	Mobile Total (lb)	On-road (%)	Non-road (%)	Aircraft (%)	Locom* (%)
PAHs						
Anthracene	120127	124.46	21.22	71.07	7.71	0.00
Benz(a)anthracene	56553	1,739.95	25.59	73.56	0.85	0.00
Benzo(ghi)perylene	191242	3,513.14	27.89	71.78	0.33	0.00
Benzo(a)pyrene	50328	1,172.74	34.89	64.33	0.78	0.00
Benzo(b)fluoranthene	205992	1,251.00	47.24	52.54	0.22	0.00
Benzo(k)fluoranthene	207089	1,121.71	36.80	62.93	0.27	0.00
Chrysene	218019	1,994.98	51.20	48.51	0.30	0.00
Dibenz(a,h)anthracene	53703	195.44	34.74	64.94	0.31	0.00
Fluoranthene	206440	1,300.93	32.90	64.39	2.71	0.00
Indeno(1,2,3-cd)pyrene	193395	224.47	42.50	57.23	0.28	0.00
Naphthalene	91203	2,665,168.63	96.77	0.00	3.23	0.00
Phenanthrene	85018	649.22	30.04	46.21	23.74	0.00
Pyrene	129000	1,102.17	48.44	48.78	2.78	0.00
Non-Metal Compounds (Excluding PAHs)						
Acetaldehyde	75070	25,181,524.90	56.32	37.04	5.13	1.51
Acrolein	67641	2,758,659.45	66.51	10.21	22.61	0.67
Benzene	71432	80,056,493.16	76.14	23.06	0.80	0.00
Butadiene,13	106990	25,609,616.28	78.35	19.63	2.02	0.00
Ethylbenzene	100414	44,927,258.91	73.58	26.21	0.19	0.02
Formaldehyde	50000	66,888,782.78	58.87	33.19	6.26	1.68
Phenol	108952	58,148.32	0.00	0.00	100.00	0.00
Styrene	100425	9,886,305.26	93.31	5.40	1.18	0.11
Toluene	108883	280,664,730.84	81.73	18.12	0.15	0.01
Xylenes,Iso	1330207	170,320,891.63	71.43	28.45	0.10	0.02
Xylenes,M	108383	22,459,394.30	96.19	3.81	0.00	0.00
Xylenes,O	95476	38,722,799.32	97.34	2.57	0.09	0.00
Xylenes,P	106423	34,824,087.12	97.29	2.71	0.00	0.00
Metal Compounds						
Antimony	7440360	23,901.67	100.00	0.00	0.00	0.00
Arsenic	7440382	45,356.02	99.22	0.64	0.00	0.14
Cadmium	7440439	11,965.05	100.00	0.00	0.00	0.00
Chromium	7440473	30,370.01	82.88	16.86	0.00	0.26
Cobalt	7440484	323.54	100.00	0.00	0.00	0.00
Copper	7440508	284,863.10	99.13	0.51	0.00	0.36
Lead	7439921	78,456.28	85.68	8.29	0.00	6.03
Manganese	7439965	84,150.24	92.93	5.56	0.00	1.51
Mercury	7439976	4,406.84	78.38	20.54	0.00	1.07
Nickel	7440020	82,665.08	12.03	87.81	0.00	0.15

* Locom = Locomotives

Table 3-2: 1996 On-road mobile source emissions in the Great Lakes region by subcategory.

Pollutant Name	Cas No.	On-road Total (lb)	LDGV (%)	LDGT (%)	HDGV (%)	LDDV (%)	LDDT (%)	HDDV (%)	MC (%)
PAHs									
Anthracene	120127	26.41	88.53	3.36	0.59	0.00	0.00	7.52	0.01
Benz(a)anthracene	56553	445.31	95.85	2.65	0.49	0.00	0.00	1.00	0.01
Benzo(ghi)perylene	191242	979.87	96.69	2.66	0.44	0.00	0.00	0.20	0.01
Benzo(a)pyrene	50328	409.20	97.00	2.28	0.32	0.00	0.00	0.39	0.00
Benzo(b)fluoranthene	205992	590.92	97.17	2.02	0.20	0.00	0.00	0.61	0.00
Benzo(k)fluoranthene	207089	412.84	96.61	2.28	0.30	0.00	0.00	0.81	0.00
Chrysene	218019	1,021.35	86.63	10.70	1.45	0.00	0.00	1.20	0.02
Dibenz(a,h)anthracene	53703	67.90	97.19	2.44	0.36	0.00	0.00	0.00	0.01
Fluoranthene	206440	427.96	93.55	2.34	0.34	0.00	0.00	3.77	0.00
Indeno(1,2,3-cd)pyrene	193395	95.40	97.71	2.07	0.21	0.00	0.00	0.00	0.00
Naphthalene	91203	2,579,193.20	59.21	36.82	3.25	0.00	0.00	0.00	0.73
Phenanthrene	85018	195.04	89.87	2.09	0.27	0.00	0.00	7.76	0.00
Pyrene	129000	533.87	92.66	1.90	0.18	0.00	0.00	5.25	0.00
Non-Metal Compounds (Excluding PAHs)									
Acetaldehyde	75070	14,182,562.96	40.31	24.49	2.66	0.53	0.52	30.92	0.56
Acrolein	67641	1,834,873.91	49.96	28.20	1.51	0.28	0.37	19.14	0.54
Benzene	71432	60,958,753.14	59.57	34.88	4.40	0.06	0.01	0.29	0.79
1,3-Butadiene	106990	20,064,192.62	61.61	35.04	1.81	0.05	0.02	0.51	0.96
Ethylbenzene	100414	33,057,625.98	61.76	34.22	2.70	0.01	0.01	0.61	0.69
Formaldehyde	50000	39,378,025.24	38.64	23.69	3.26	0.59	0.55	32.65	0.62
Styrene	100425	9,224,461.31	58.41	32.67	5.37	0.03	0.04	2.28	1.19
Toluene	108883	229,379,238.25	62.18	34.64	2.32	0.00	0.00	0.14	0.72
Xylenes,Iso	1330207	121,664,396.65	61.45	34.95	2.55	0.01	0.01	0.39	0.65
Xylenes,M	108383	21,602,580.94	56.36	35.02	7.78	0.00	0.00	0.00	0.84
Xylenes,O	95476	37,691,766.02	62.92	33.69	2.74	0.00	0.00	0.00	0.64
Xylenes,P	106423	33,879,247.29	65.19	32.70	1.58	0.00	0.00	0.00	0.53
Metal Compounds									
Antimony	7440360	23,901.67	59.99	26.52	2.51	0.65	0.20	9.23	0.90
Arsenic	7440382	45,001.84	59.85	26.52	2.52	0.71	0.24	9.27	0.89
Cadmium	7440439	11,965.05	59.92	26.59	2.54	0.65	0.21	9.21	0.89
Chromium	7440473	25,171.19	55.66	23.62	2.81	0.61	0.27	16.30	0.73
Cobalt	7440484	323.54	59.62	26.62	2.62	0.65	0.21	9.39	0.90
Copper	7440508	282,373.64	59.80	26.60	2.82	0.53	0.19	9.29	0.78
Lead	7439921	67,224.67	18.02	15.72	6.76	0.57	0.35	58.35	0.24
Manganese	7439965	78,204.91	58.07	25.90	2.81	0.65	0.22	11.49	0.86
Mercury	7439976	3,454.22	34.68	16.14	2.28	0.74	0.35	45.24	0.57
Nickel	7440020	9,948.58	54.36	22.50	3.27	0.54	0.26	18.46	0.61

Table 3-3: 1996 air toxics emissions from the Great Lakes region.

Pollutant Name	Cas No.	Total (lb)	Point (%)	Area (%)	Mobile (%)
PAHs					
Acenaphthene	83329	245,853.29	16.71	83.29	0.00
Acenaphthylene	208968	2,634,823.24	7.70	92.30	0.00
Anthracene	120127	311,470.73	15.01	84.95	0.04
Benz(a)anthracene	56553	714,360.48	7.13	92.62	0.24
Benzo(ghi)perylene	191242	135,332.33	15.37	82.04	2.60
Benzo(a)pyrene	50328	219,272.25	35.00	64.47	0.53
Benzo(b)fluoranthene	205992	189,004.57	31.64	67.70	0.66
Benzo(k)fluoranthene	207089	59,550.95	0.02	98.10	1.88
Chrysene	218019	2,503,085.76	87.52	12.40	0.08
Dibenz(a,h)anthracene	53703	73,729.34	11.10	88.63	0.27
Fluoranthene	206440	510,171.11	25.26	74.49	0.25
Fluorene	86737	592,492.51	22.83	77.17	0.00
Indeno(1,2,3-cd)pyrene	193395	188,282.54	11.87	88.01	0.12
Naphthalene	91203	16,437,654.50	7.42	76.37	16.21
Phenanthrene	85018	6,445,075.33	7.41	92.58	0.01
Pyrene	129000	491,822.26	30.00	69.78	0.22
Non-Metal Compounds (Excluding PAHs)					
Acetaldehyde	75070	27,101,699.13	5.80	1.29	92.91
Acrolein	67641	3,225,825.28	4.29	10.19	85.52
Acrylamide	107028	1,280.42	100.00	0.00	0.00
Acrylonitrile	107131	2,342,705.57	97.47	2.53	0.00
Atrazine	1912249	9,540,401.15	0.00	100.00	0.00
Benzene	71432	144,736,836.21	4.16	40.53	55.31
1,3-Butadiene	106990	32,388,658.47	1.36	19.57	79.07
Carbon tetrachloride	56235	138,212.06	67.97	32.03	0.00
Chlordane	57749	0.94	100.00	0.00	0.00
Chloroform	67663	1,561,844.76	91.35	8.65	0.00
Coke oven emissions		1,926,830.47	100.00	0.00	0.00
Dichloroethyl ether(bis(2-chloroethyl) ether)	111444	923.15	100.00	0.00	0.00
Diethylhexyl phthalate (DEHP)	117817	44,639.50	100.00	0.00	0.00
Di-n-butyl phthalate	84742	5,362,721.10	0.69	99.31	0.00
Di-n-octyl phthalate	117840	8,047.87	100.00	0.00	0.00
Ethylbenzene	100414	64,519,934.95	7.92	22.45	69.63
Ethylene dibromide (Dibromoethane)	106934	5,634,134.56	99.38	0.62	0.00
Ethylene dichloride(1,2-Dichloroethane)	107062	186,326.90	88.72	11.28	0.00
Ethylene oxide	75218	4,833,488.99	4.59	95.41	0.00
Formaldehyde	50000	105,770,535.79	34.57	2.19	63.24
Glycol ethers		10,386,902.31	67.16	32.84	0.00
Hexachlorobenzene	118741	9.94	87.91	12.09	0.00
Hexachlorobutadiene	87683	8.00	100.00	0.00	0.00
Hexachloroethane	67721	876.00	100.00	0.00	0.00
Hydrazine	302012	479.84	100.00	0.00	0.00
Methyl chloroform(1,1,1-Trichloroethane)	71556	61,471,598.26	3.29	96.71	0.00

Table 3-3: 1996 air toxics emissions from the Great Lakes region (continued).

Pollutant Name	Cas No.	Total (lb)	Point (%)	Area (%)	Mobile (%)
Methylene chloride (Dichloromethane)	74873	32,466,722.32	53.20	46.80	0.00
Methylene diphenyl diisocyanate (MDI)	101688	44,345.27	100.00	0.00	0.00
Pentachlorophenol	87865	20,886.33	100.00	0.00	0.00
Phenol	108952	4,747,760.83	98.35	0.43	1.22
Phosgene	75445	194.76	100.00	0.00	0.00
Styrene	100425	28,771,679.07	38.75	26.89	34.36
2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)	1746016	0.32	94.89	3.37	0.00
2,3,7,8-tetrachlorodibenzo-furan (TCDF)	51207319	32.64	98.02	1.98	0.00
Tetrachloroethylene (Perchloroethylene)	127184	73,669,513.07	5.77	94.23	0.00
Toluene	108883	545,821,725.75	9.88	38.70	51.42
2,4-Toluene diisocyanate	584849	10,919.81	59.08	40.92	0.00
Total polychlorinated biphenyls (PCBs)	1336363	35.39	99.76	0.24	0.00
Total polychlorinated dibenzodioxins (PCDDs)		36.11	88.50	11.50	0.00
Total polychlorinated dibenzofurans (PCDFs)		45.37	49.51	50.49	0.00
Trichloroethylene	79016	51,271,198.52	32.01	67.99	0.00
2,4,5-Trichlorophenol	95954	0.02	100.00	0.00	0.00
2,4,6-Trichlorophenol	188062	12,784.14	100.00	0.00	0.00
Trifluralin	1582098	662,346.08	0.95	99.05	0.00
Vinyl chloride	75014	884,242.02	83.36	16.64	0.00
Xylenes (isomers and mixture)	1330207	311,317,244.44	12.27	33.02	54.71
m-Xylenes	108383	23,270,303.00	0.31	3.18	96.52
o-Xylenes	95476	58,704,829.34	0.39	33.65	65.96
p-Xylenes	106423	35,310,692.68	0.01	1.37	98.62
Metal Compounds					
Antimony	7440360	83,502.86	71.38	0.00	28.62
Arsenic	7440382	211,047.65	78.03	0.48	21.49
Beryllium	7440417	16,178.61	97.33	2.67	0.00
Cadmium	7440439	517,761.12	43.06	54.63	2.31
Chromium	7440473	986,078.18	91.45	5.47	3.08
Chromium (6)	18540299	27,805.15	77.14	22.86	0.00
Cobalt	7440484	180,886.08	18.97	80.85	0.18
Copper	7440508	1,105,819.54	73.82	0.42	25.76
Lead	7439921	890,764.49	90.49	0.70	8.81
Manganese	7439965	3,335,800.14	96.85	0.63	2.52
Mercury	7439976	220,251.64	94.91	3.09	2.00
Nickel	7440020	693,258.26	80.32	7.75	11.92

Table 3-4: 1996 mobile source emissions in the Great Lakes region summarized by SCC/AMS codes. (Those less than 5% of the total were grouped as "Other")

Material code	SCC/AMS	Description	IL	IN	MI	MN	NY	OH	PA	WI	ON	Emissions (lbs)	Percentage (%)
Acetaldehyde	Other		x	x		x	x	x	x	x	x	23,695,650.00	94
Acetaldehyde	2270005015	Farm Equipment: Agricultural Tractors	x	x		x	x	x	x	x		1,485,874.90	6
Acrolein	Other		x	x		x	x	x	x	x	x	1,990,710.39	75
Acrolein	2275020000	Commercial Aircraft: Total: All Types	x	x		x	x	x		x	x	506,864.11	19
Acrolein	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total	x	x		x	x	x			x	145,555.20	5
Anthracene	Other					x	x	x		x	x	54.80	44
Anthracene	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	32.34	26
Anthracene	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total				x					x	19.54	16
Anthracene	2275020000	Commercial Aircraft: Total: All Types				x	x	x		x	x	8.99	7
Anthracene	2260001010	Recreational Vehicles: Motorcycles: Off-Road								x		8.79	7
Antimony	Other		x	x								15,609.52	65
Antimony	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total	x	x								2,644.80	11
Antimony	2201001290	Light Duty Gasoline Vehicles (LDGV): Minor Arterial: Urban Total	x	x								2,138.61	9
Antimony	2201001230	Light Duty Gasoline Vehicles (LDGV): Interstate: Urban Total	x	x								1,979.45	8
Antimony	2201001170	Light Duty Gasoline Vehicles (LDGV): Major Collector: Rural Total	x	x								1,529.28	6
Arsenic	Other		x	x		x	x	x		x	x	29,797.45	66
Arsenic	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total	x	x								4,968.89	11
Arsenic	2201001290	Light Duty Gasoline Vehicles (LDGV): Minor Arterial: Urban Total	x	x								4,013.41	9
Arsenic	2201001230	Light Duty Gasoline Vehicles (LDGV): Interstate: Urban Total	x	x								3,713.31	8
Arsenic	2201001170	Light Duty Gasoline Vehicles (LDGV): Major Collector: Rural Total	x	x								2,862.97	6
Benz(a)anthracene	Other					x	x	x		x	x	808.35	46
Benz(a)anthracene	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	468.03	27
Benz(a)anthracene	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total				x					x	336.43	19
Benz(a)anthracene	2260001010	Recreational Vehicles: Motorcycles: Off-Road								x		127.14	7

Table 3-4: 1996 mobile source emissions in the Great Lakes region summarized by SCC/AMS codes. (Those less than 5% of the total were grouped as “Other”) (Continued)

Material Code	SCC/AMS	Description	IL	IN	MI	MN	NY	OH	PA	WI	ON	Emissions (lbs)	Percentage (%)
Benz(ghi)perylene	Other					x	x	x		x	x	1,508.75	43
Benz(ghi)perylene	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	922.11	26
Benz(ghi)perylene	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total				x					x	831.79	24
Benz(ghi)perylene	2260001010	Recreational Vehicles: Motorcycles: Off-Road								x		250.49	7
Benzene	Other		x	x		x	x	x	x	x	x	64,733,643.20	81
Benzene	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	4,549,746.05	6
Benzene	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total	x	x		x	x	x	x			5,182,732.24	6
Benzene	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total	x	x		x	x	x			x	5,590,371.67	7
Benzo(a)pyre	Other					x	x	x		x	x	468.84	40
Benzo(a)pyre	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total				x					x	353.08	30
Benzo(a)pyre	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	275.87	24
Benzo(a)pyre	2260001010	Recreational Vehicles: Motorcycles: Off-Road				x				x		74.94	6
Benzo(b)fluoranthene	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total				x					x	512.65	41
Benzo(b)fluoranthene	Other					x	x	x		x	x	432.71	35
Benzo(b)fluoranthene	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	240.35	19
Benzo(b)fluoranthene	2260001010	Recreational Vehicles: Motorcycles: Off-Road								x		65.29	5
Benzo(k)fluoranthene	Other					x	x	x		x	x	439.76	39
Benzo(k)fluoranthene	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total				x					x	353.71	32
Benzo(k)fluoranthene	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	258.12	23
Benzo(k)fluoranthene	2260001010	Recreational Vehicles: Motorcycles: Off-Road								x		70.12	6
BUTADIENE,13	Other		x	x		x	x	x	x	x	x	20,385,222.50	80
BUTADIENE,13	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total	x	x		x	x	x	x			2,075,062.69	8
BUTADIENE,13	2201001290	Light Duty Gasoline Vehicles (LDGV): Minor Arterial: Urban Total	x	x		x	x	x				1,687,826.60	7
BUTADIENE,13	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total	x	x		x	x	x			x	1,461,504.49	6

Table 3-4: 1996 mobile source emissions in the Great Lakes region summarized by SCC/AMS codes. (Those less than 5% of the total were grouped as “Other”) (Continued)

Material Code	SCC/AMS	Description	IL	IN	MI	MN	NY	OH	PA	WI	ON	Emissions (lbs)	Percentage (%)
CADMIUM	Other		x	x								7,820.04	65
CADMIUM	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total	x	x								1,323.44	11
CADMIUM	2201001290	Light Duty Gasoline Vehicles (LDGV): Minor Arterial: Urban Total	x	x								1,070.01	9
CADMIUM	2201001230	Light Duty Gasoline Vehicles (LDGV): Interstate: Urban Total	x	x								988.52	8
CADMIUM	2201001170	Light Duty Gasoline Vehicles (LDGV): Major Collector: Rural Total	x	x								763.04	6
CHROMIUM	Other		x	x		x	x	x	x	x	x	24,127.95	79
CHROMIUM	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total	x	x		x	x	x	x			2,385.71	8
CHROMIUM	2201001290	Light Duty Gasoline Vehicles (LDGV): Minor Arterial: Urban Total	x	x		x	x	x				1,956.02	6
CHROMIUM	2201001230	Light Duty Gasoline Vehicles (LDGV): Interstate: Urban Total	x	x		x	x	x	x			1,900.33	6
CHRYSENE	Other					x	x	x		x	x	1,276.55	64
CHRYSENE	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total				x					x	364.55	18
CHRYSENE	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	353.88	18
COBALT	Other		x	x								212.12	66
COBALT	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total	x	x								35.79	11
COBALT	2201001290	Light Duty Gasoline Vehicles (LDGV): Minor Arterial: Urban Total	x	x								29.05	9
COBALT	2201001230	Light Duty Gasoline Vehicles (LDGV): Interstate: Urban Total	x	x								26.13	8
COBALT	2201001170	Light Duty Gasoline Vehicles (LDGV): Major Collector: Rural Total	x	x								20.44	6
COPPER	Other sources		x	x		x	x	x	x	x	x	165,663.81	58
COPPER	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total	x	x		x	x	x	x			29,379.49	10
COPPER	2201001230	Light Duty Gasoline Vehicles (LDGV): Interstate: Urban Total	x	x		x	x	x	x			21,274.07	7
COPPER	2201001000	Light Duty Gasoline Vehicles (LDGV): Total: All Road Types								x		20,309.90	7
COPPER	2201001170	Light Duty Gasoline Vehicles (LDGV): Major Collector: Rural Total	x	x		x	x	x	x			17,031.52	6
COPPER	2201001290	Light Duty Gasoline Vehicles (LDGV): Minor Arterial: Urban Total	x	x		x	x	x				16,368.15	6
COPPER	2201001130	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Rural Total	x	x		x	x	x	x			14,836.16	5

Table 3-4: 1996 mobile source emissions in the Great Lakes region summarized by SCC/AMS codes. (Those less than 5% of the total were grouped as "Other") (Continued)

Material Code	SCC/AMS	Description	IL	IN	MI	MN	NY	OH	PA	WI	ON	Emissions (lbs)	Percentage (%)
DIBENZ(A,H)ANTHRACENE	Other					x	x	x		x	x	70.13	36
DIBENZ(A,H)ANTHRACENE	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total				x					x	58.37	30
DIBENZ(A,H)ANTHRACENE	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	52.64	27
DIBENZ(A,H)ANTHRACENE	2260001010	Recreational Vehicles: Motorcycles: Off-Road								x		14.30	7
ETHYLBENZENE	Other		x	x		x	x	x	x	x	x	33,884,012.60	75
ETHYLBENZENE	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	4,358,809.21	10
ETHYLBENZENE	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total	x	x		x	x	x			x	3,818,809.39	8
ETHYLBENZENE	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total	x	x		x	x	x	x			2,865,627.71	6
FLUORANTHENE	Other					x	x	x		x	x	557.61	43
FLUORANTHENE	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total				x					x	353.79	27
FLUORANTHENE	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	306.31	24
FLUORANTHENE	2260001010	Recreational Vehicles: Motorcycles: Off-Road								x		83.21	6
FORMALDEHYDE	Other		x	x		x	x	x	x	x	x	59,700,624.54	89
FORMALDEHYDE	2270005015	Farm Equipment: Agricultural Tractors	x	x		x	x	x	x	x		3,836,670.10	6
FORMALDEHYDE	2275020000	Commercial Aircraft: Total: All Types	x	x		x	x	x		x	x	3,351,488.14	5
INDENO(1,2,3-CD)PYRENE	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total				x					x	83.09	37
INDENO(1,2,3-CD)PYRENE	Other					x	x	x		x	x	73.64	33
INDENO(1,2,3-CD)PYRENE	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	53.27	24
INDENO(1,2,3-CD)PYRENE	2260001010	Recreational Vehicles: Motorcycles: Off-Road								x		14.47	6
LEAD	Other sources		x	x		x	x		x	x	x	57,608.67	73
LEAD	2230070110	Heavy Duty Diesel Vehicles (HDDV): Interstate: Rural Total	x	x		x	x		x			8,626.02	11
LEAD	2230070230	Heavy Duty Diesel Vehicles (HDDV): Interstate: Urban Total	x	x		x	x		x			8,205.17	10
LEAD	2230070270	Heavy Duty Diesel Vehicles (HDDV): Other Principal Arterial: Urban Total	x	x		x	x		x			4,016.42	5
MANGANESE	Other		x	x		x	x	x	x	x	x	58,031.07	69
MANGANESE	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total	x	x		x	x	x	x			8,336.08	10
MANGANESE	2201001290	Light Duty Gasoline Vehicles (LDGV): Minor Arterial: Urban Total	x	x		x	x	x				6,712.91	8
MANGANESE	2201001230	Light Duty Gasoline Vehicles (LDGV): Interstate: Urban Total	x	x		x	x	x	x			6,265.84	7
MANGANESE	2201001170	Light Duty Gasoline Vehicles (LDGV): Major Collector: Rural Total	x	x		x	x	x	x			4,804.35	6

Table 3-4: 1996 mobile source emissions in the Great Lakes region summarized by SCC/AMS codes. (Those less than 5% of the total were grouped as "Other") (Continued)

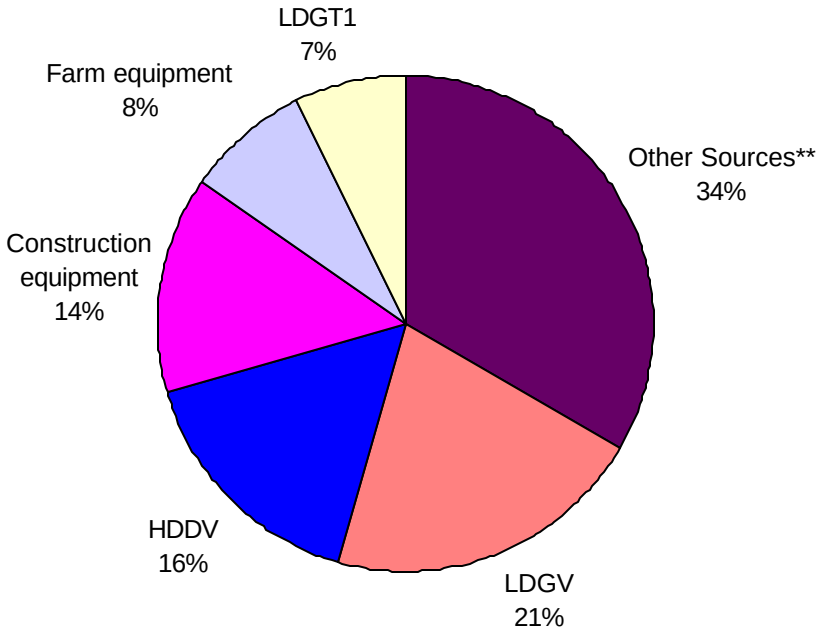
Material Code	SCC/AMS	Description	IL	IN	MI	MN	NY	OH	PA	WI	ON	Emissions (lbs)	Percentage (%)
MERCURY	Other		x	x		x	x	x		x		3,459.68	79
MERCURY	2230070230	Heavy Duty Diesel Vehicles (HDDV): Interstate: Rural Total	x	x		x	x		x			356.97	8
MERCURY	2230070110	Heavy Duty Diesel Vehicles (HDDV): Interstate: Urban Total	x	x		x	x		x			354.21	8
MERCURY	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total	x	x		x	x	x	x			235.97	5
	Other		x	x		x	x	x	x	x	x	1,898,716.27	72
NAPHTHALENE	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total				x	x	x			x	260,314.10	10
NAPHTHALENE	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total				x	x	x	x			220,246.37	8
NAPHTHALENE	2201001310	Light Duty Gasoline Vehicles (LDGV): Collector: Urban Total				x	x	x	x			145,596.99	5
NAPHTHALENE	2201001000	Light Duty Gasoline Vehicles (LDGV): Total: All Road Types								x		140,294.90	5
NICKEL	2280003000	Residual: Total, All Vessel Types									x	69,967.20	85
NICKEL	Other		x	x		x	x	x	x	x	x	12,697.89	15
PHENANTHRENE	Other					x	x	x		x	x	234.62	36
PHENANTHRENE	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total				x					x	155.62	23
PHENANTHRENE	2275020000	Commercial Aircraft: Total: All Types				x	x	x		x	x	149.27	23
PHENANTHRENE	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	109.71	17
PHENOL	2275020000	Commercial Aircraft: Total: All Types	x	x		x	x	x		x		41,673.33	72
PHENOL	2275050000	General Aviation: Total	x	x		x	x	x		x		5,876.85	10
PHENOL	2275001000	Military Aircraft: Total	x	x			x	x		x		5,613.80	10
PHENOL	2275060000	Air Taxi: Total	x	x		x	x					4,516.42	8
PHENOL	2275070000	Aircraft Auxiliary Power Units: Total					x				x	467.91	1
PYRENE	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total									x	441.92	40
PYRENE	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	196.59	18
PYRENE	Other sources					x	x	x		x	x	463.67	4
STYRENE	Other		x	x		x	x	x	x	x	x	7,479,881.24	76
STYRENE	2201001000	Light Duty Gasoline Vehicles (LDGV): Total: All Road Types								x		921,818.95	9
STYRENE	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total				x	x	x			x	820,187.50	8
STYRENE	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total				x	x	x	x			664,417.58	7

Table 3-4: 1996 mobile source emissions in the Great Lakes region summarized by SCC/AMS codes. (Those less than 5% of the total were grouped as “Other”) (Continued)

Material Code	SCC/AMS	Description	IL	IN	MI	MN	NY	OH	PA	WI	ON	Emissions (lbs)	Percentage (%)
TOLUENE	Other		x	x		x	X	x	x	x	x	201,220,598.54	72
TOLUENE	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total	x	x		x	x	x			x	26,155,118.31	9
TOLUENE	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total	x	x		x	x	x	x			20,186,800.27	7
TOLUENE	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	17,798,556.18	6
TOLUENE	2201001290	Light Duty Gasoline Vehicles (LDGV): Minor Arterial: Urban Total	x	x		x	x	x				15,303,657.54	5
XYLENE,M	Other			x		x	x		x	x		12,265,994.15	55
XYLENE,M	2201001000	Light Duty Gasoline Vehicles (LDGV): Total: All Road Types								x		3,649,481.19	16
XYLENE,M	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total				x			x			1,725,563.56	8
XYLENE,M	2201020000	Light Duty Gasoline Trucks 1 (LDGT1): Total: All Road Types								x		1,257,191.52	6
XYLENE,M	2201001310	Light Duty Gasoline Vehicles (LDGV): Collector: Urban Total				x			x			1,219,753.13	5
XYLENE,M	2201001130	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Rural Total				x			x			1,183,321.54	5
XYLENE,M	2201001170	Light Duty Gasoline Vehicles (LDGV): Major Collector: Rural Total				x			x			1,158,089.20	5
XYLENE,O	Other			x		x	x	x	x	x	x	24,253,204.08	63
XYLENE,O	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total		x		x	x	x			x	4,750,708.30	12
XYLENE,O	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total		x		x	x	x	x			3,314,073.53	9
XYLENE,O	2201001290	Light Duty Gasoline Vehicles (LDGV): Minor Arterial: Urban Total		x		x	x	x				2,457,396.65	6
XYLENE,O	2201001330	Light Duty Gasoline Vehicles (LDGV): Local: Urban Total		x		x	x	x				1,990,315.93	5
XYLENE,O	2201001000	Light Duty Gasoline Vehicles (LDGV): Total: All Road Types								x		1,957,100.83	5
XYLENE,P	Other			x			x	x			x	20,796,382.10	60
XYLENE,P	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total		x			x	x			x	5,631,044.28	16
XYLENE,P	2201001270	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total		x			x	x				3,193,600.37	9
XYLENE,P	2201001290	Light Duty Gasoline Vehicles (LDGV): Minor Arterial: Urban Total		x			x	x				2,867,076.30	8
XYLENE,P	2201001330	Light Duty Gasoline Vehicles (LDGV): Local: Urban Total		x			x	x				2,335,984.07	7
XYLENES ISO	Other		x			x	x	x	x	x	x	125,919,958.35	74
XYLENES ISO	2260001020	Recreational Vehicles: Snowmobiles				x	x	x		x	x	19,547,214.70	11
XYLENES ISO	2201001250	Light Duty Gasoline Vehicles (LDGV): Other Freeways and Expressways: Urban Total	x			x	x	x			x	14,681,030.00	9
XYLENES ISO	2201001290	Light Duty Gasoline Vehicles (LDGV): Other Principal Arterial: Urban Total	x			x	x	x	x			10,172,835.17	6

Figure 3-1:

ACETALDEHYDE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



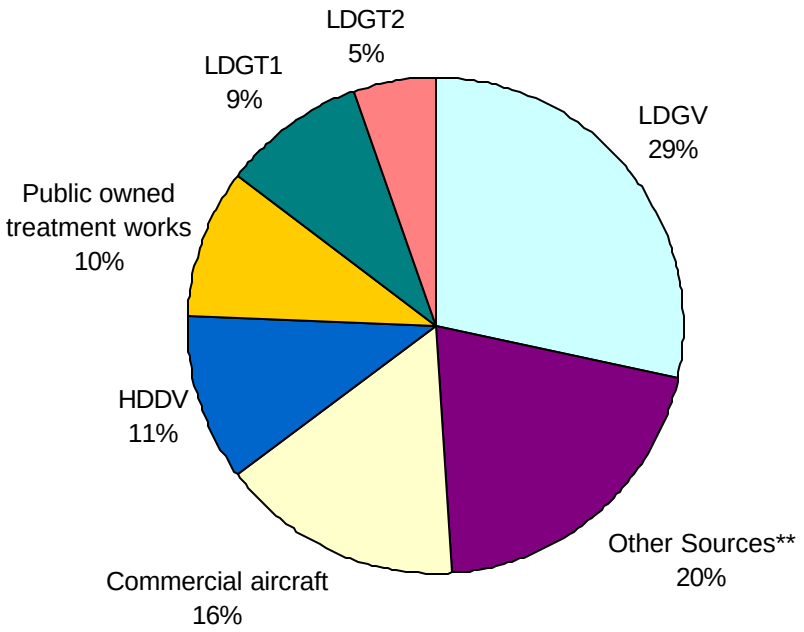
SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Other Sources**	9,023,003.96	X	X	X	X	X	X	X	X	X
-------	LDGV	5,716,590.39	X	X		X	X	X	X	X	X
-------	HDDV	4,385,933.15	X	X	X	X	X	X	X		X
-------	Construction equipment	3,868,745.45	X	X		X	X	X	X		X
-------	Farm equipment	2,127,994.82	X	X		X	X	X	X		X
-------	LDGT1	1,979,431.36	X	X		X	X	X		X	X

Total Estimated Emissions: 27,101,699.13 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 3-2:

ACROLEIN
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	LDGV	916,759.16	X	X		X	X	X	X	X	X
-------	Other Sources**	659,998.69	X	X	X	X	X	X	X	X	X
-------	Commercial aircraft	506,864.11	X	X		X		X	X		X
-------	HDDV	351,273.43				X	X	X	X		X
-------	Public owned treatment works	318,987.36	X							X	X
-------	LDGT1	300,254.77	X	X		X	X	X		X	X
-------	LDGT2	171,687.75	X	X		X	X	X		X	X

Total Estimated Emissions: 3,225,825.28 lbs.

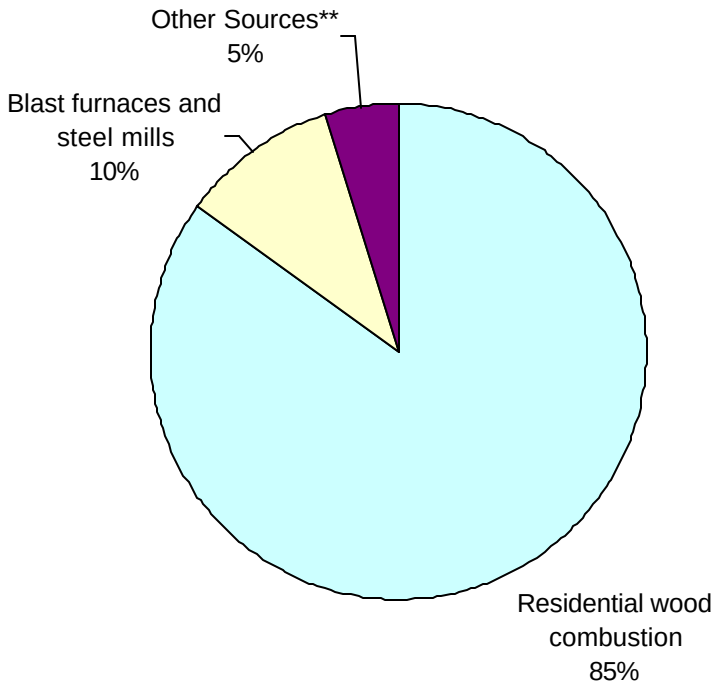
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-3:

ANTHRACENE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Residential wood combustion	264,590.61	X	X	X	X		X	X		X
3312	Blast furnaces and steel mills	32,227.88	X	X					X		
-------	Other Sources**	14,652.24	X	X	X	X	X	X	X		

Total Estimated Emissions: 311,470.73 lbs.

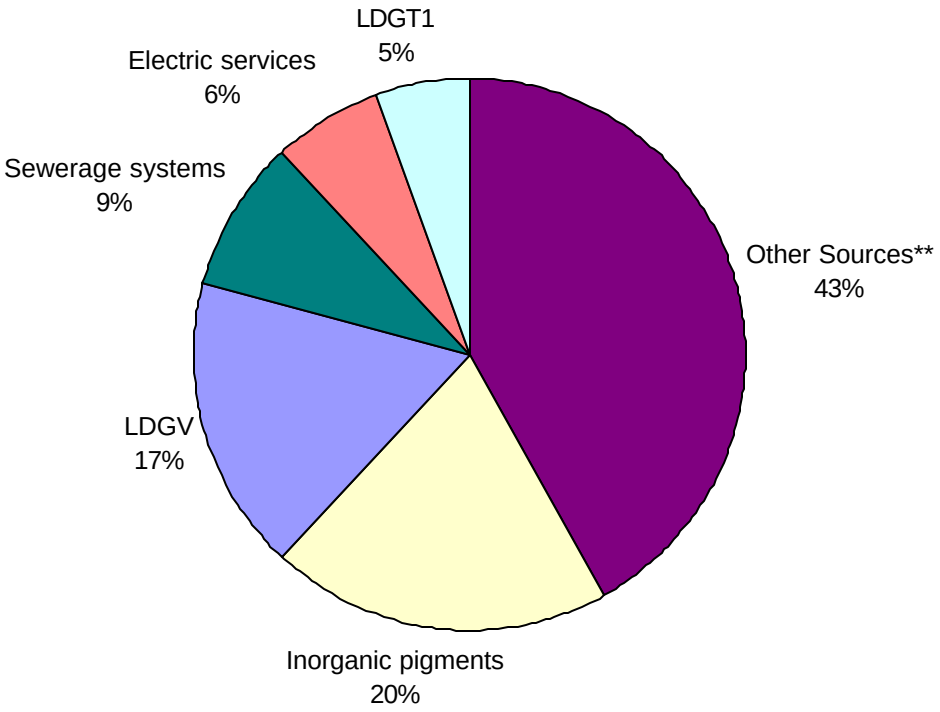
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-4:

ANTIMONY
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Other Sources**	35,122.65	X	X	X	X	X	X	X	X	X
2816	Inorganic pigments	16,718.00						X			X
-------	LDGV	14,339.52	X	X							
4952	Sewerage systems	7,403.12	X		X	X	X		X		
4911	Electric services	5,375.04	X	X	X	X	X		X	X	
-------	LDGT1	4,544.53	X	X							

Total Estimated Emissions: 83,502.86 lbs.

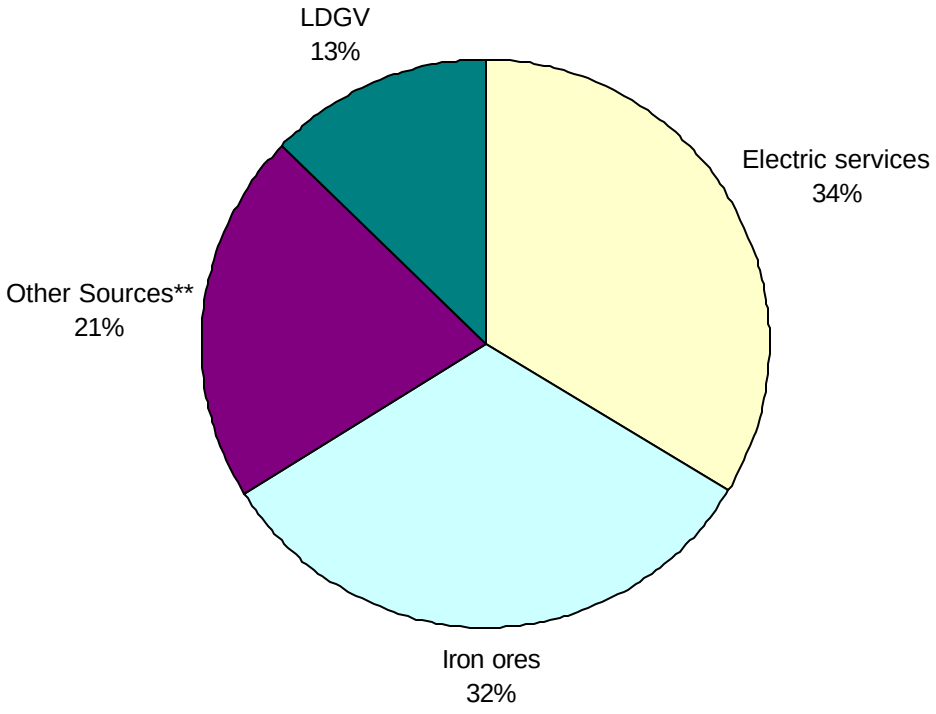
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-5:

ARSENIC
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
4911	Electric services	70,889.06	X	X	X	X	X		X	X	X
1011	Iron ores	68,367.33			X	X			X		
-------	Other Sources**	44,857.93	X	X	X	X	X	X	X	X	X
-------	LDGV	26,933.32	X	X							

Total Estimated Emissions: 211,047.65 lbs.

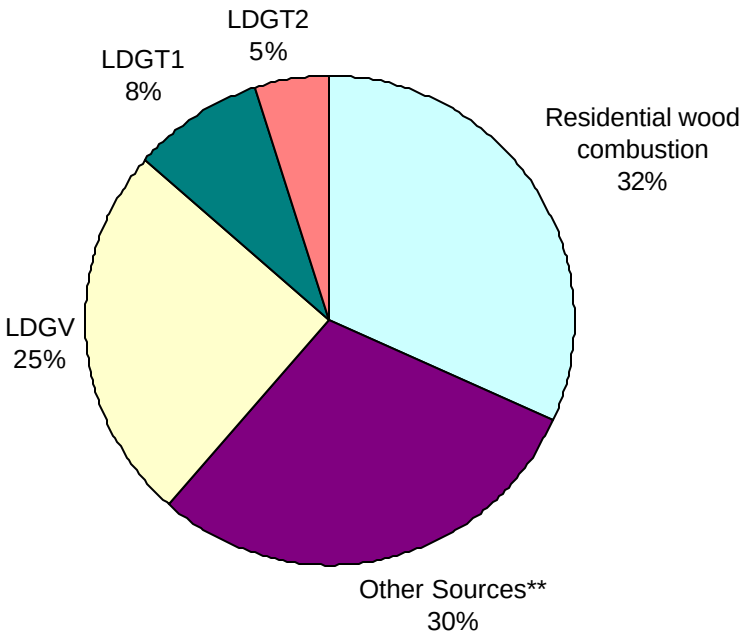
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-6:

BENZENE
1996 Estimated Emissions* by Source Category for Point, Area and Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Residential wood combustion	45,839,856.93	X	X	X	X		X	X		X
-------	Other Sources**	42,976,490.17	X	X	X	X	X	X	X	X	X
-------	LDGV	36,314,529.88	X	X	X	X	X	X	X	X	X
-------	LDGT1	12,276,948.74	X	X		X	X	X		X	X
-------	LDGT2	7,329,010.49	X	X		X	X	X		X	X

Total Estimated Emissions: 144,713,326.21 lbs.

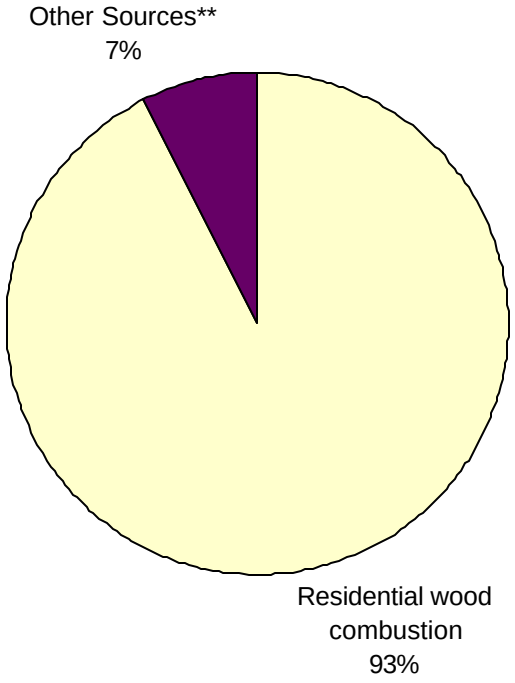
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-7:

BENZ(A)ANTHRACENE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Residential wood combustion	661,215.70	X	X	X	X		X	X		X
-------	Other Sources**	53,144.78	X	X	X	X	X		X		X

Total Estimated Emissions: 714,360.48 lbs.

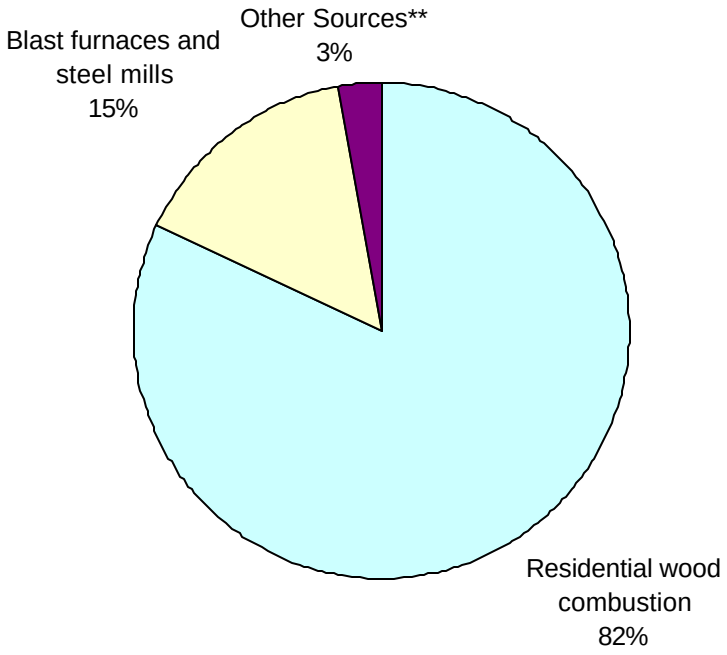
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-8:

BENZO(GHI)PERYLENE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Residential wood combustion	111,024.52	X	X	X	X		X	X		X
3312	Blast furnaces and steel mills	20,495.07	X	X					X		
-------	Other Sources**	3,812.74	X	X	X	X	X		X		

Total Estimated Emissions: 135,332.33 lbs.

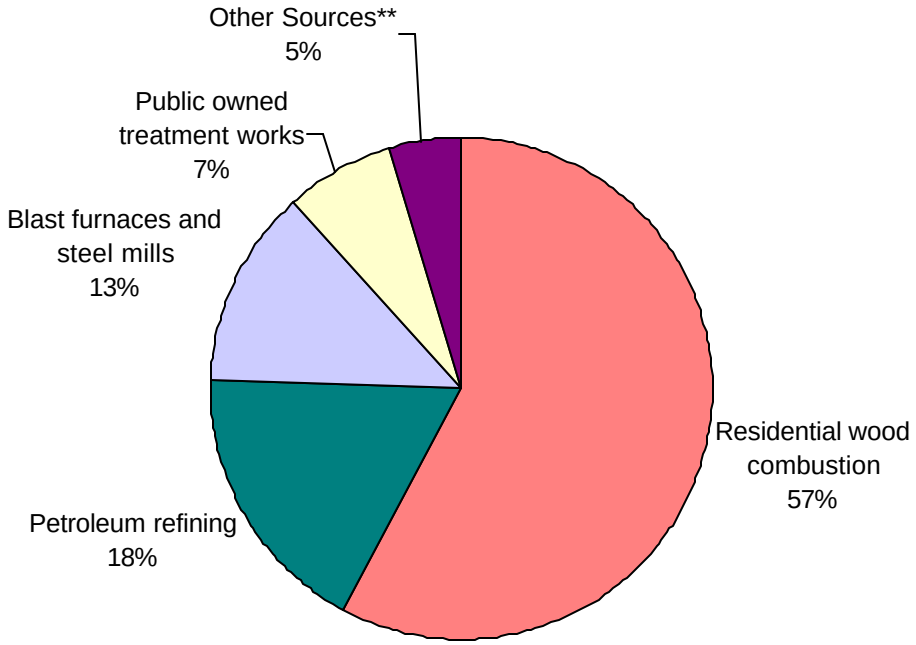
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-9:

BENZO(A)PYRENE
1996 Estimated Emissions* by Source Category for Point, Area Mobile Sources



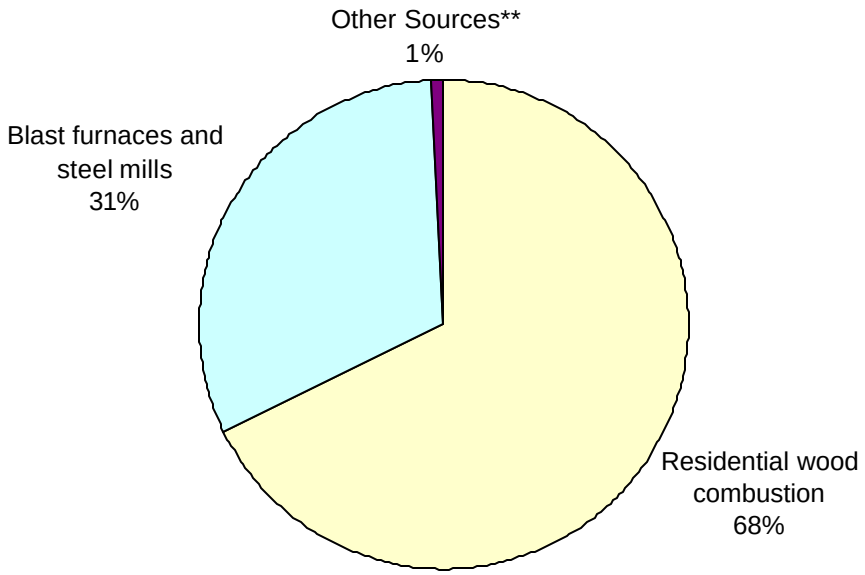
SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Residential wood combustion	126,625.57	X	X	X	X		X	X		X
2911	Petroleum refining	39,272.37	X	X	X	X	X		X		
3312	Blast furnaces and steel mills	28,054.35	X	X	X				X		
-------	Public owned treatment works	14,734.96									X
-------	Other Sources**	10,585.00	X	X	X	X	X		X		X

Total Estimated Emissions: 219,272.25 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 3-10:

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



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Residential wood combustion	127,953.70	X	X	X	X		X	X		X
3312	Blast furnaces and steel mills	59,321.22							X		
-------	Other Sources**	1,729.73	X	X	X	X	X		X		X

Total Estimated Emissions: 189,004.66 lbs.

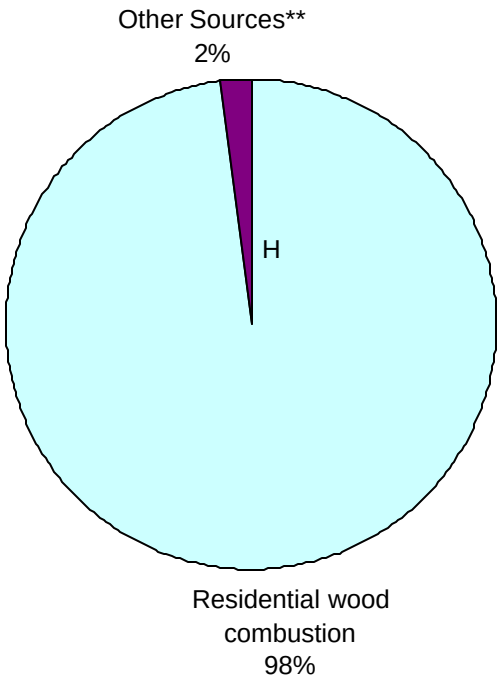
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-11:

BENZO(K)FLUORANTHENE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



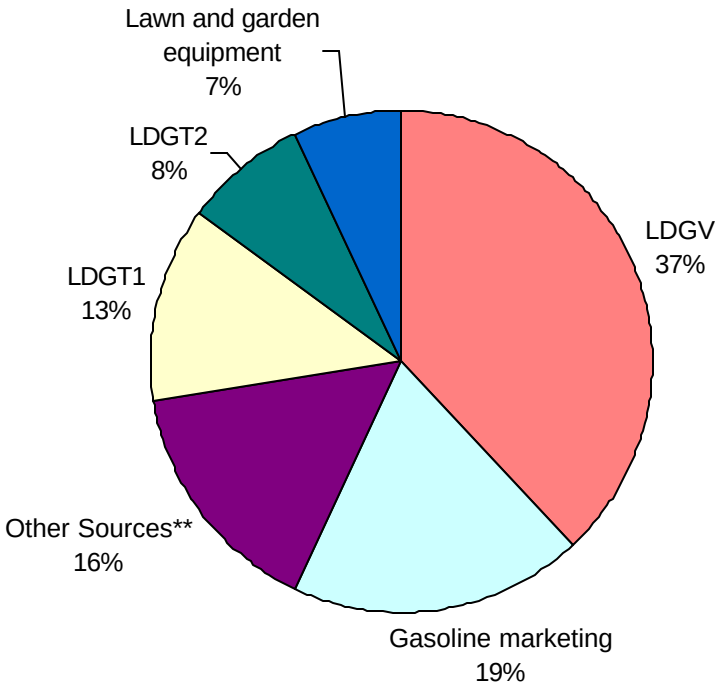
SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Residential wood combustion	58,418.44	X	X	X	X		X	X		X
-------	Other Sources**	1,132.42	X	X		X	X		X		

Total Estimated Emissions: 59,550.86 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 3-12:

BUTADIENE,13
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



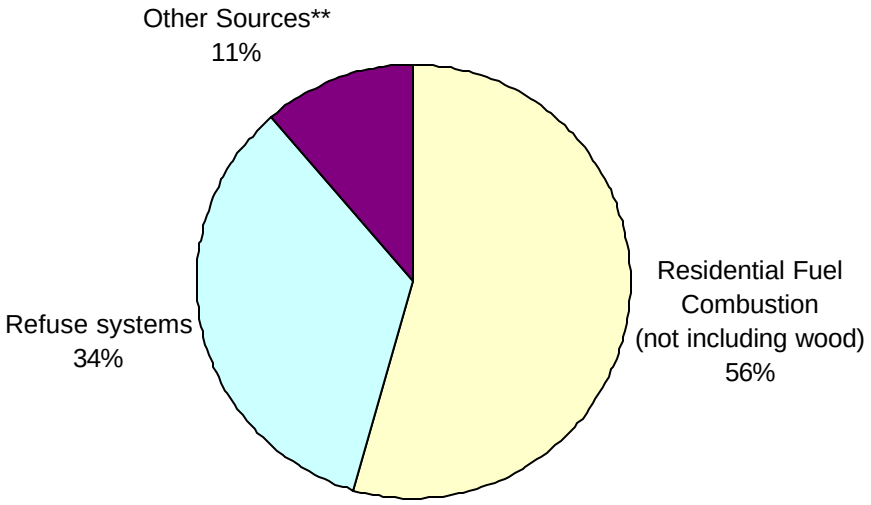
SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	LDGV	12,361,279.22	X	X		X	X	X	X	X	X
-------	Gasoline marketing	6,065,974.65			X	X					X
-------	Other Sources**	5,089,943.50	X	X	X	X	X	X	X	X	X
-------	LDGT1	4,055,798.87	X	X		X	X	X		X	X
-------	LDGT2	2,529,140.99	X	X		X	X	X		X	X
-------	Lawn and garden equipment	2,286,521.25	X	X		X	X	X	X		X

Total Estimated Emissions: 32,388,658.47 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 3-13:

CADMIUM
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Residential Fuel Combustion (not wood)	281,568.32	X	X		X			X		X
4953	Refuse systems	177,941.42	X	X	X	X	X			X	
-------	Other Sources**	58,251.37	X	X	X	X	X	X	X	X	X

Total Estimated Emissions: 517,761.12 lbs.

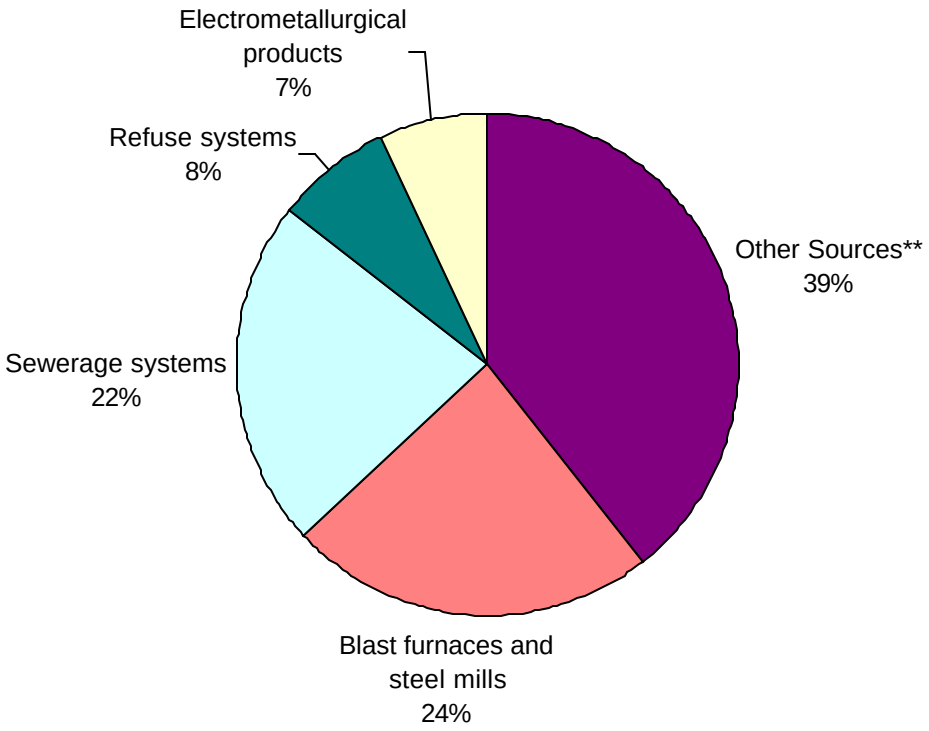
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-15:

CHROMIUM
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Other Sources**	388,472.61	X	X	X	X	X	X	X	X	X
3312	Blast furnaces and steel mills	232,817.54	X	X	X	X	X	X		X	X
4952	Sewerage systems	221,454.43	X		X	X	X		X	X	X
4953	Refuse systems	75,332.00	X	X	X	X	X			X	
3313	Electrometallurgical products	68,001.60						X	X		

Total Estimated Emissions: 986,078.18 lbs.

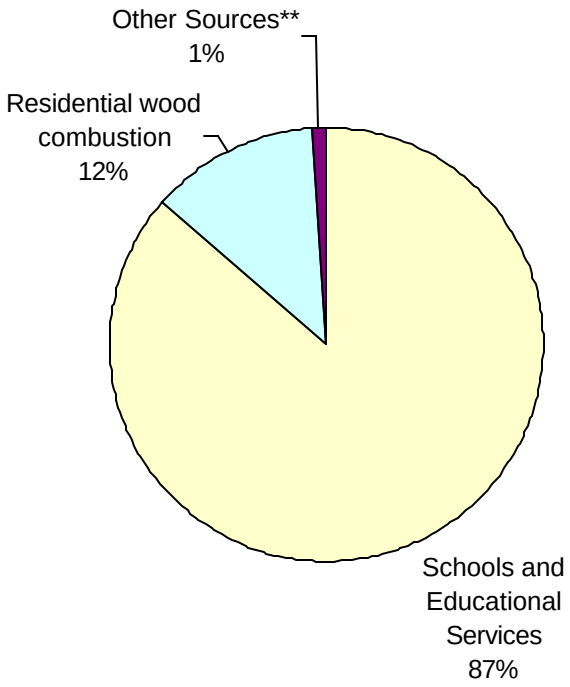
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-15:

CHRYSENE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
8299	Schools and Educational Services	2,165,301.60								X	
-------	Residential wood combustion	310,436.77	X	X	X	X		X	X		X
-------	Other Sources**	27,347.39	X	X	X	X	X		X		X

Total Estimated Emissions: 2,503,085.76 lbs.

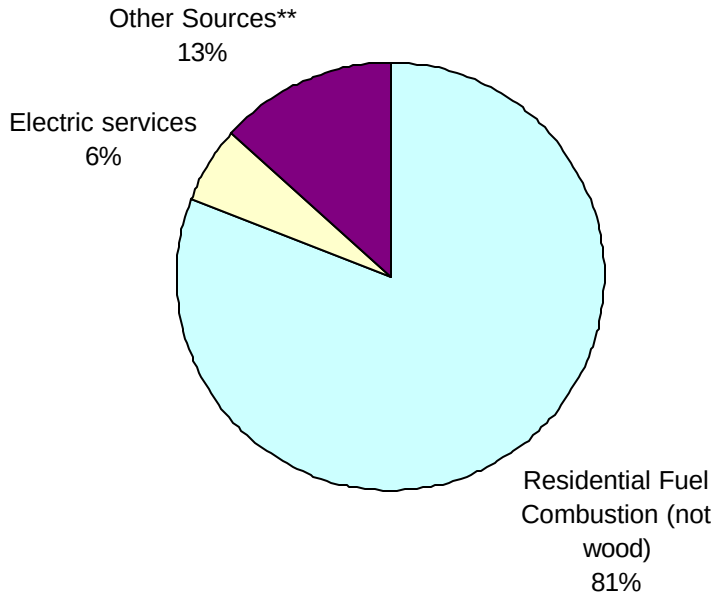
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-16:

COBALT
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Residential Fuel Combustion (not wood)	146,249.71		X		X			X		X
4911	Electric services	10,638.89	X	X	X	X	X		X		X
-------	Other Sources**	23,997.47	X	X	X	X	X	X	X		X

Total Estimated Emissions: 180,886.08 lbs.

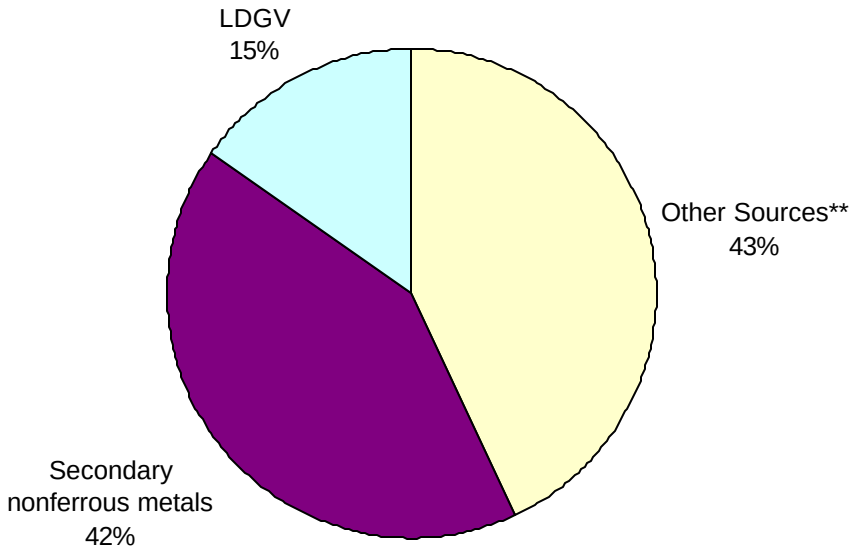
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-17:

COPPER
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Other Sources**	475,071.53	X	X	X	X	X	X	X	X	X
3341	Secondary nonferrous metals	461,886.06	X	X		X	X	X		X	X
-------	LDGV	168,861.95	X	X		X	X	X	X	X	X

Total Estimated Emissions: 1,105,819.54 lbs.

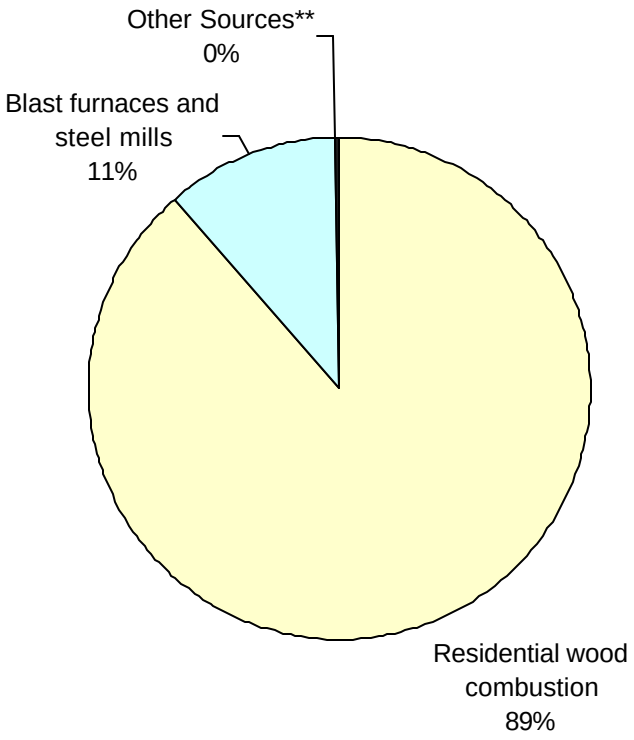
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-18:

DIBENZAHAN
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Residential wood combustion	65,348.56	X	X	X	X		X	X		X
3312	Blast furnaces and steel mills	8,169.44	X						X		
-------	Other Sources**	211.34	X	X	X	X	X		X		

Total Estimated Emissions: 73,729.34 lbs.

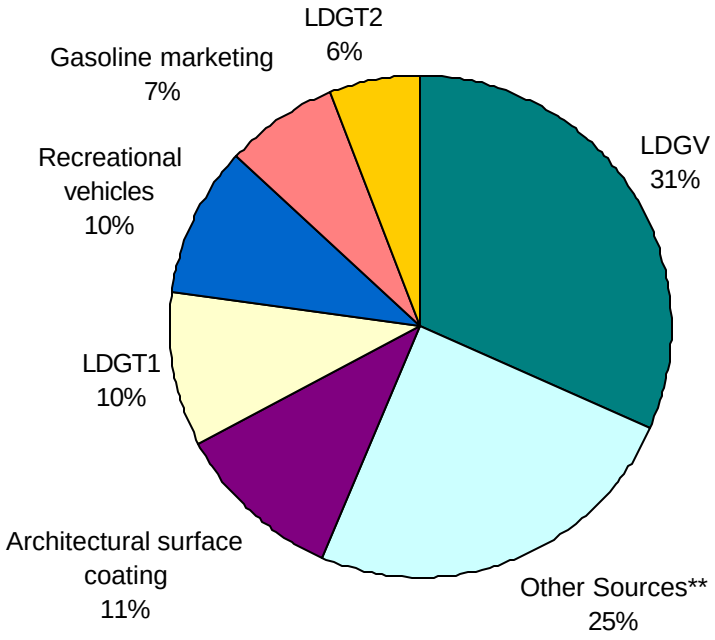
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-19:

ETHYLBENZENE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	LDGV	20,414,955.40	X	X		X	X	X	X	X	X
-------	Other Sources**	16,003,386.25	X	X	X	X	X	X	X	X	X
-------	Architectural surface coating	6,938,684.35	X	X	X	X	X	X	X	X	X
-------	LDGT1	6,463,623.42	X	X		X	X	X		X	X
-------	Recreational vehicles	6,214,316.33	X	X		X	X	X	X		X
-------	Gasoline marketing	4,810,030.13	X	X	X	X			X	X	X
-------	LDGT2	3,674,939.07	X	X		X	X	X		X	X

Total Estimated Emissions: 64,519,934.95 lbs.

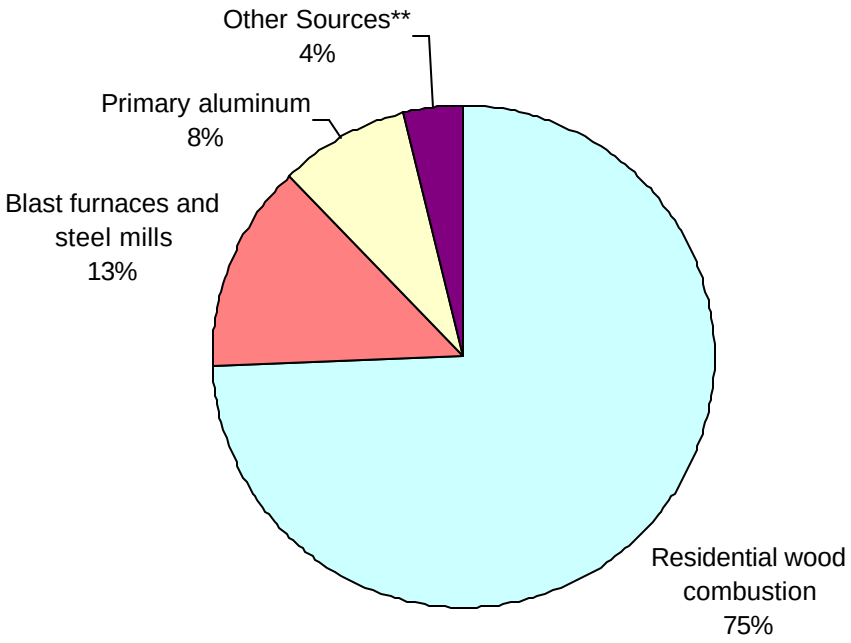
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-20:

FLUORANTHENE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Residential wood combustion	379,983.92	X	X	X	X		X	X		X
3312	Blast furnaces and steel mills	68,044.95	X	X					X	X	
3334	Primary aluminum	42,155.03		X			X				
-------	Other Sources**	19,987.21	X	X	X	X	X		X	X	X

Total Estimated Emissions: 510,171.11 lbs.

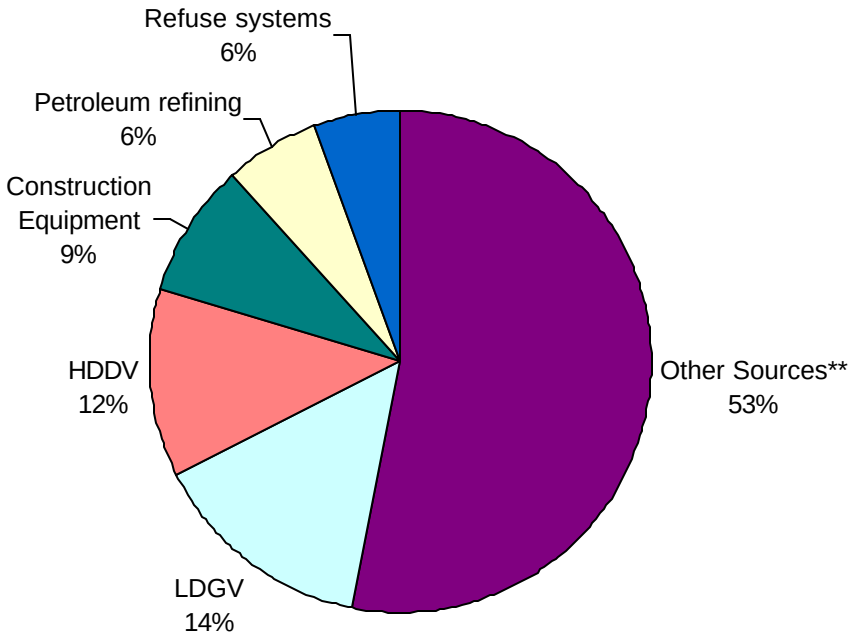
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-21:

FORMALDEHYDE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Other Sources**	56,160,105.34	X	X	X	X	X	X	X	X	X
-------	LDGV	15,214,642.79	X	X		X	X	X	X	X	X
-------	HDDV	12,858,248.16	X	X		X	X	X	X	X	X
-------	Construction Equipment	9,196,776.96	X	X	X	X	X			X	X
2911	Petroleum refining	6,342,952.17	X	X		X	X			X	X
4953	Refuse systems	5,997,810.38	X	X	X	X	X			X	

Total Estimated Emissions: 105,770,535.79 lbs.

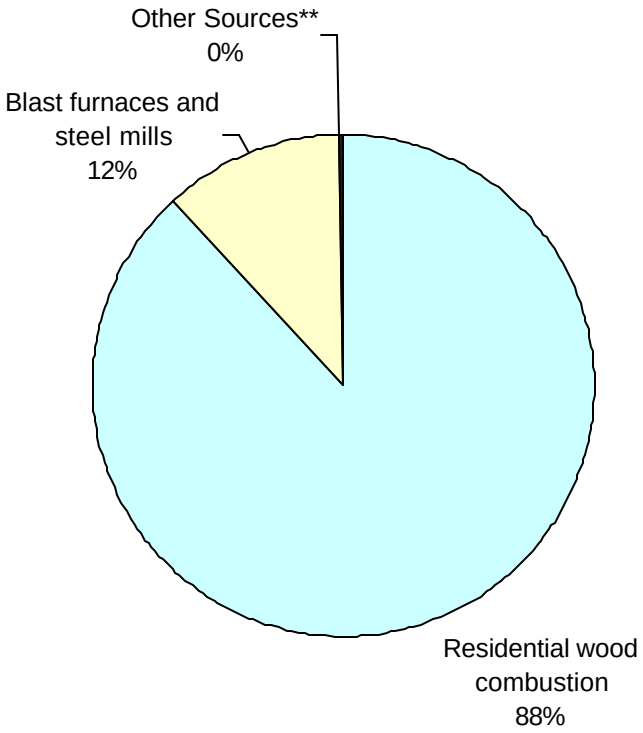
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-22:

INDENO(1,2,3-CD)PYRENE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Residential wood combustion	165,706.02	X	X	X	X		X	X		X
3312	Blast furnaces and steel mills	21,924.24	X	X					X		
-------	Other Sources**	652.28	X	X	X	X	X		X	X	X

Total Estimated Emissions: 188,282.54 lbs.

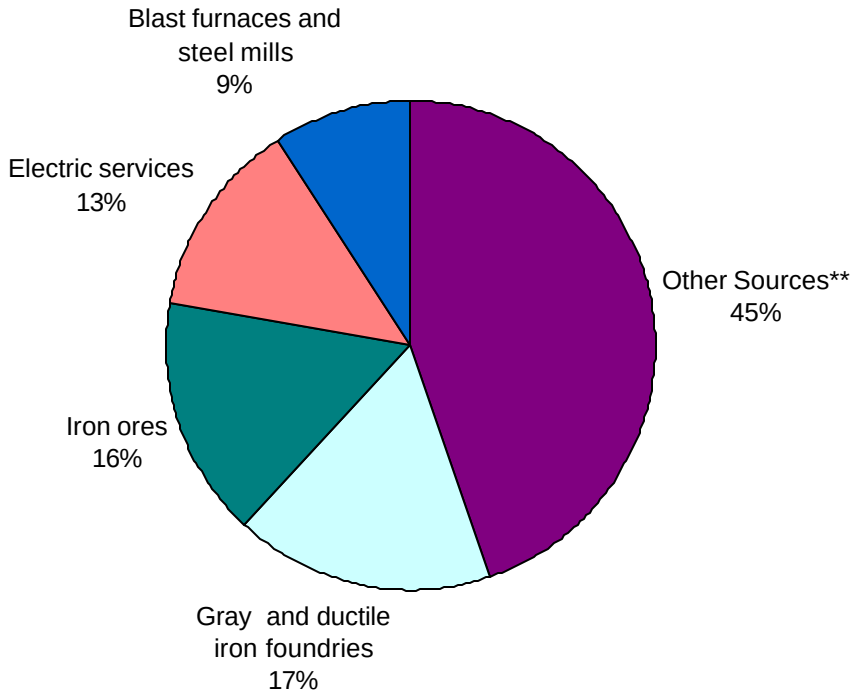
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-23:

LEAD
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Other Sources**	399,604.12	X	X	X	X	X	X	X	X	X
3321	Gray and ductile iron foundries	152,167.76	X	X	X	X		X			X
1011	Iron ores	140,249.73			X	X			X		
4911	Electric services	117,813.18	X	X	X	X	X		X		X
3312	Blast furnaces and steel mills	80,929.68	X	X	X	X	X	X			X

Total Estimated Emissions: 890,764.49 lbss.

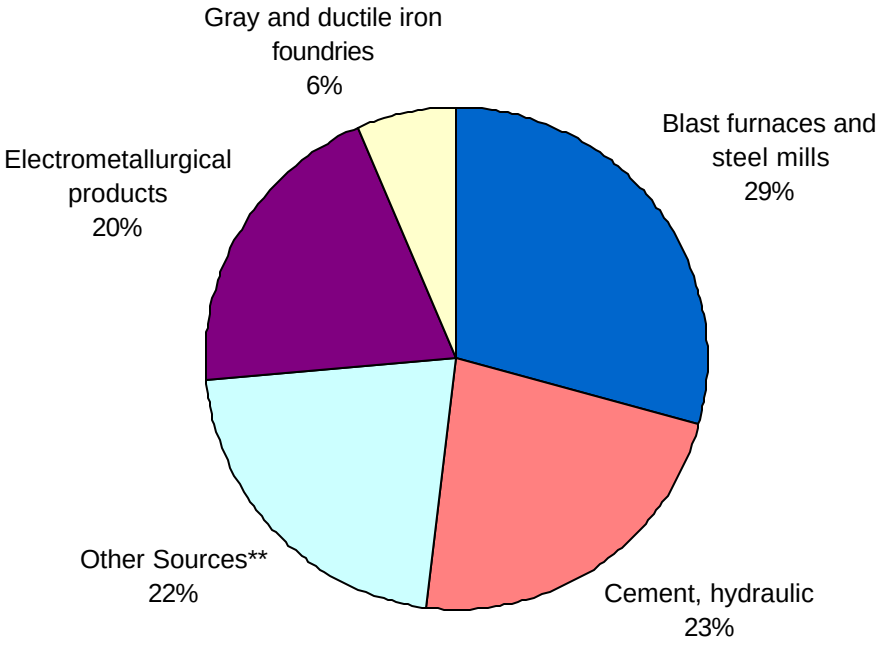
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-24:

MANGANESE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3312	Blast furnaces and steel mills	976,500.90	X	X	X	X	X	X	X	X	X
3241	Cement, hydraulic	752,891.65	X	X	X		X			X	
-------	Other Sources**	723,513.72	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

Total Estimated Emissions: 3,335,800.14 lbs.

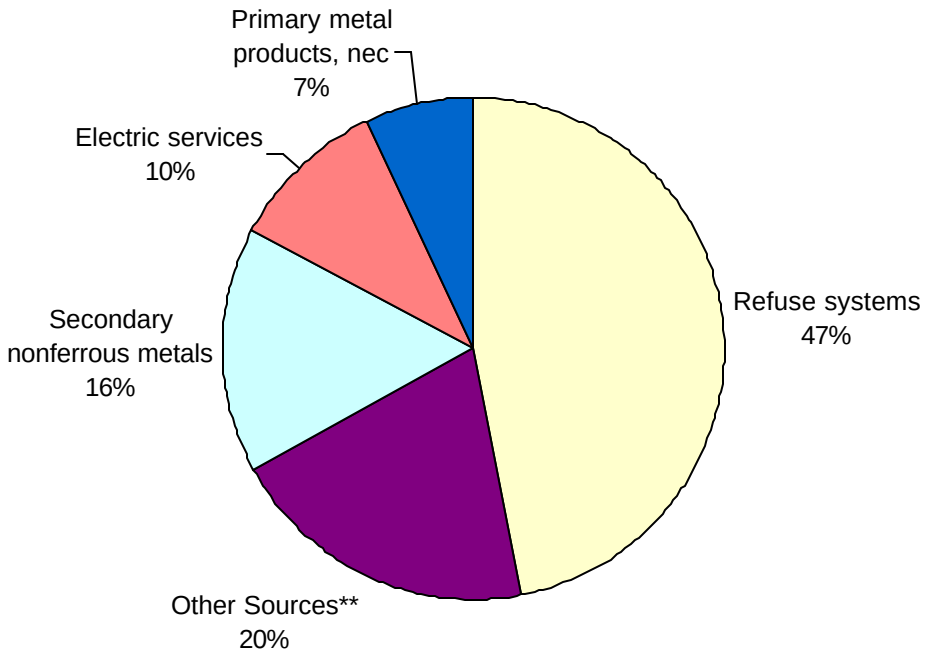
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-25:

MERCURY
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



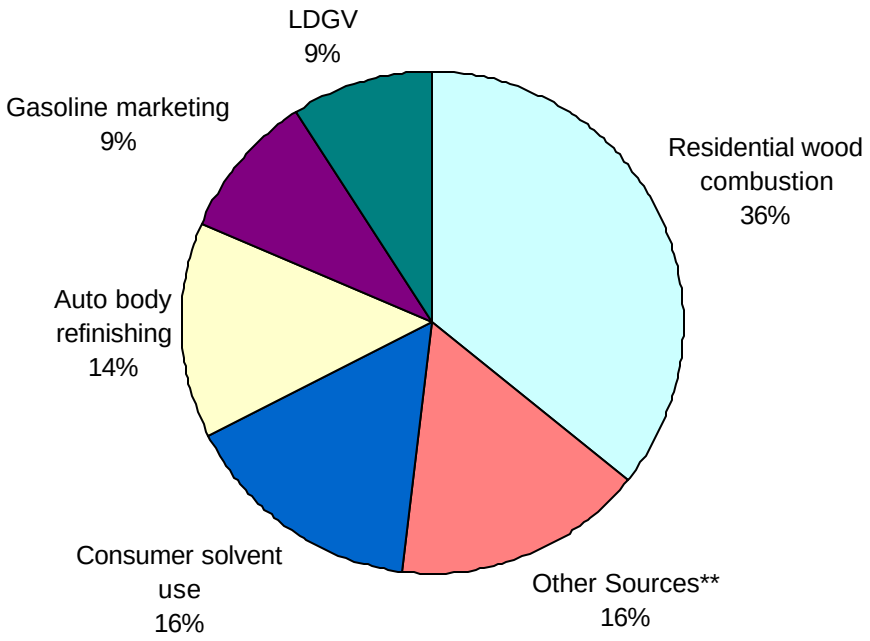
SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
4953	Refuse systems	103,328.76	X	X	X	X	X		X	X	
-------	Other Sources**	44,056.40	X	X	X	X	X	X	X	X	X
3341	Secondary nonferrous metals	34,692.04	X	X		X				X	X
4911	Electric services	22,776.81	X	X	X	X	X		X	X	X
3399	Primary metal products, nec	15,397.64	X							X	

Total Estimated Emissions: 220,251.64 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 3-26:

NAPHTHALENE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Residential wood combustion	5,871,027.19	X	X	X	X		X	X		X
-------	Other Sources**	2,676,503.44	X	X	X	X	X	X	X	X	X
-------	Consumer solvent use	2,554,555.31	X	X	X	X	X				X
-------	Auto body refinishing	2,253,594.15	X	X	X	X	X	X		X	X
-------	Gasoline marketing	1,554,947.09	X		X	X			X	X	X
-------	LDGV	1,527,027.31				X	X	X	X	X	X

Total Estimated Emissions: 16,437,654.50 lbs.

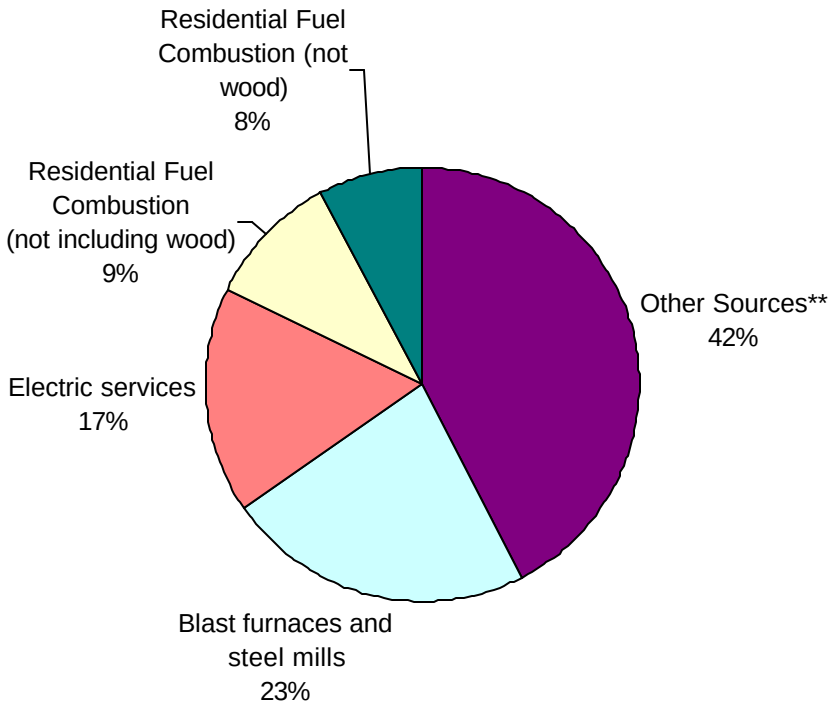
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-27:

NICKEL
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



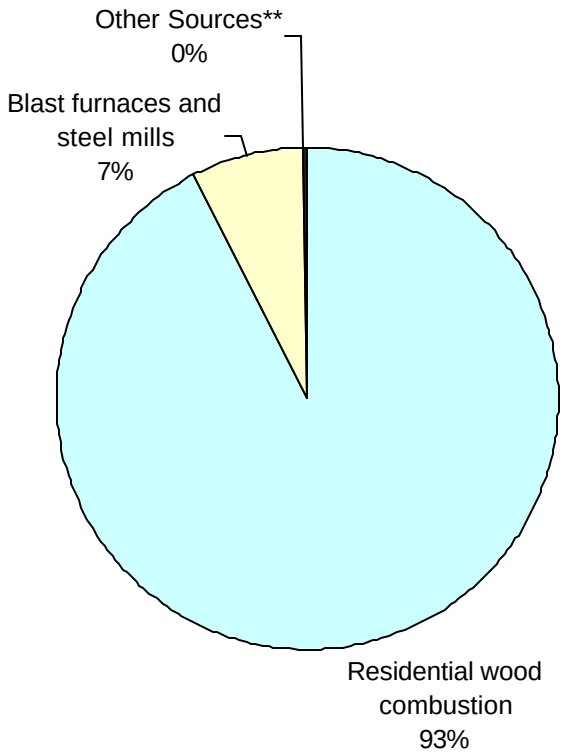
SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Other Sources**	293,826.01	X	X	X	X	X	X	X	X	X
3312	Blast furnaces and steel mills	159,155.32	X	X	X	X	X	X		X	X
4911	Electric services	116,721.05	X	X	X	X	X		X	X	X
-------	Commercial Marine	69,967.20							X		
-------	Residential Fuel Combustion (not wood)	53,588.68	X	X		X			X		X

Total Estimated Emissions: 693,258.26 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 3-28:

PHENANTHRENE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Residential wood combustion	5,967,145.20	X	X	X	X		X	X		X
3312	Blast furnaces and steel mills	459,767.27	X	X					X		
-------	Other Sources**	18,162.86	X	X	X	X	X	X	X	X	

Total Estimated Emissions: 6,445,075.33 lbs.

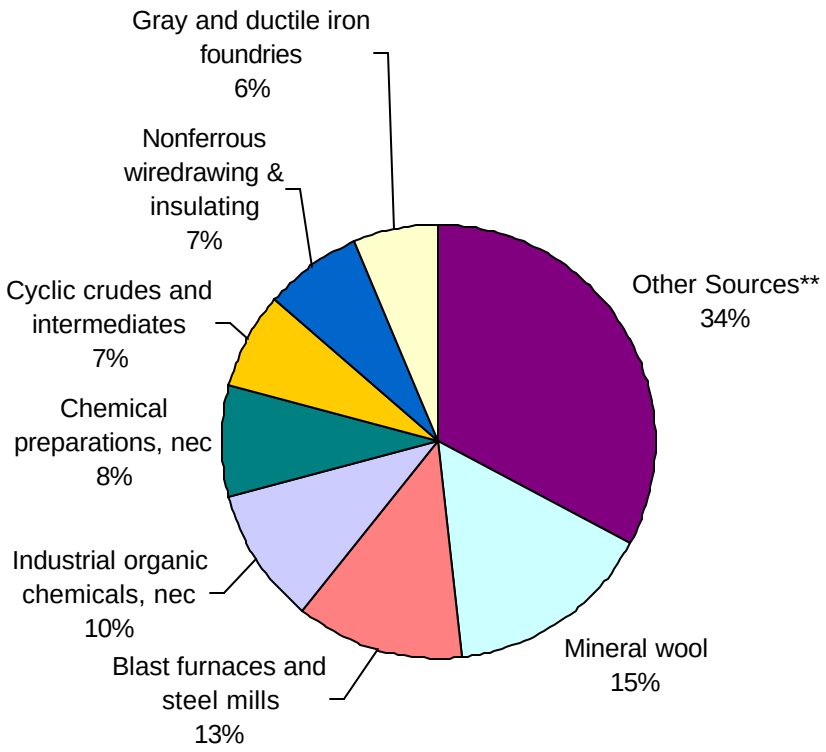
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-29:

PHENOL
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



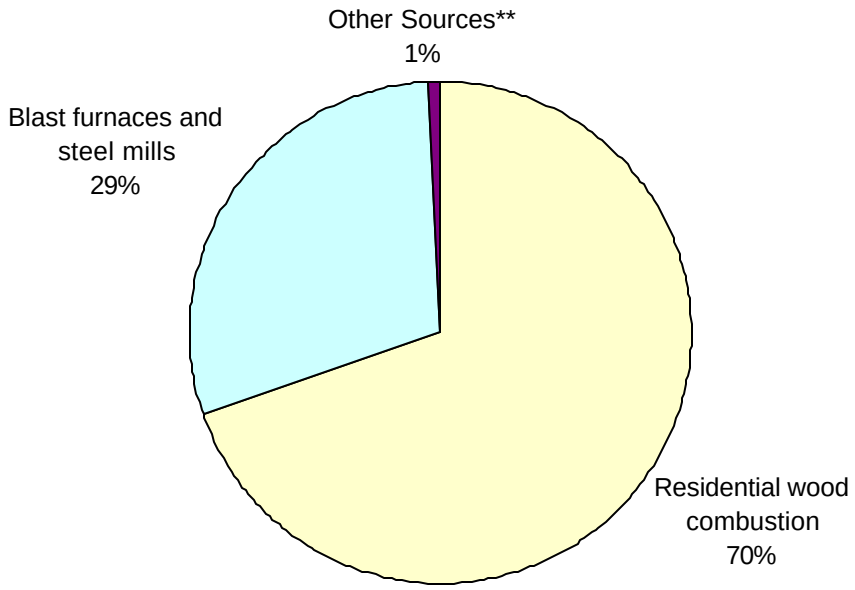
SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Other Sources**	1,560,434.39	X	X	X	X	X	X	X	X	X
3296	Mineral wool	730,988.06		X	X		X	X			
3312	Blast furnaces and steel mills	602,499.30		X			X	X	X		
2869	Industrial organic chemicals, nec	472,777.41	X	X	X		X	X	X		X
2899	Chemical preparations, nec	389,838.54	X		X				X		
2865	Cyclic crudes and intermediates	348,095.00						X			
3357	Nonferrous wiredrawing & insulating	336,487.57	X	X					X		
3321	Gray and ductile iron foundries	306,640.56	X	X	X	X		X		X	X

Total Estimated Emissions: 4,747,760.83 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 3-30:

PYRENE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Residential wood combustion	343,173.69	X	X	X	X		X	X		X
3312	Blast furnaces and steel mills	144,959.85	X	X					X		
-------	Other Sources**	3,688.72	X	X	X	X	X		X		

Total Estimated Emissions: 491,822.26 lbs.

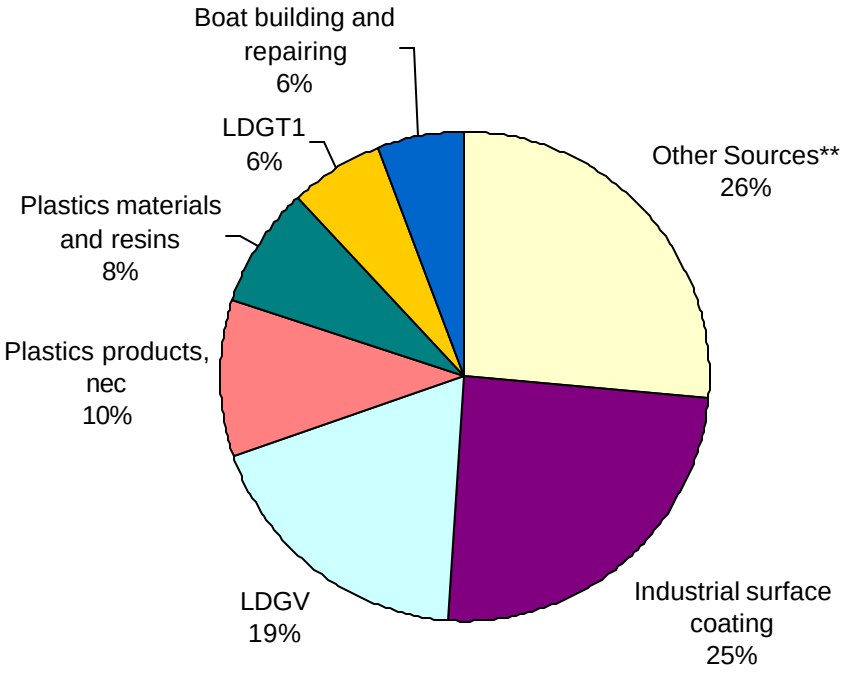
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-31:

STYRENE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



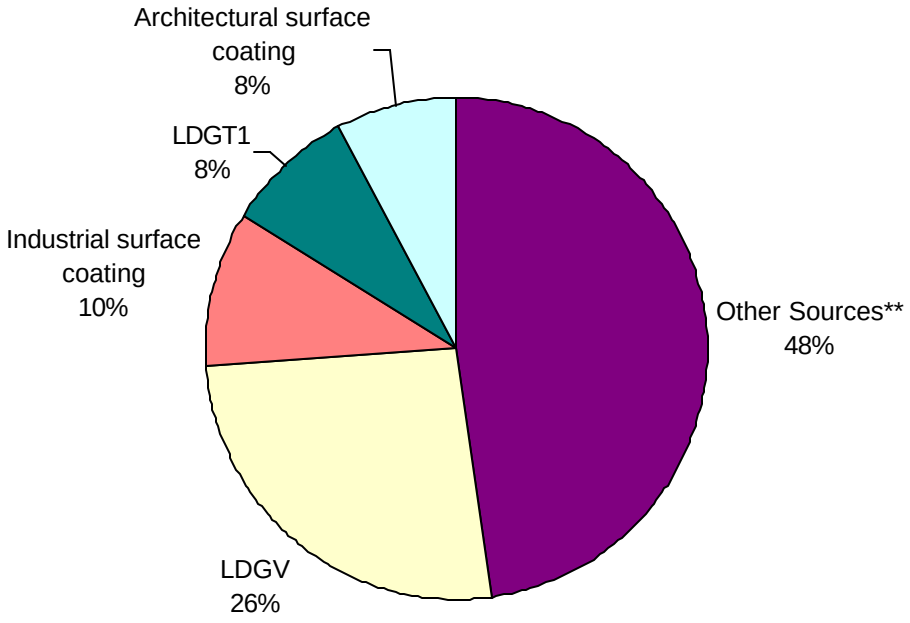
SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Other Sources**	7,577,772.74	X	X	X	X	X	X	X	X	X
-------	Industrial surface coating	7,112,743.41								X	
-------	LDGV	5,388,428.37				X	X	X	X	X	X
3089	Plastics products, nec	2,966,341.84	X	X	X	X		X	X	X	X
2821	Plastics materials and resins	2,316,316.31	X	X	X	X	X	X	X	X	X
-------	LDGT1	1,758,680.52				X	X	X		X	X
3732	Boat building and repairing	1,651,395.89	X	X	X	X					X

Total Estimated Emissions: 28,771,679.07 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 3-32:

TOLUENE
1996 Estimated Emissions* by Source Category for Point, Area & Mobile Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Other Sources**	261,424,401.31	X	X	X	X	X	X	X	X	X
-------	LDGV	142,633,753.80	X	X		X	X	X	X	X	X
-------	Industrial surface coating	54,103,261.14	X	X	X	X				X	X
-------	LDGT1	45,561,296.62	X	X		X	X	X		X	X
-------	Architectural surface coating	42,099,012.88	X	X	X	X	X	X	X	X	X

Total Estimated Emissions: 545,821,725.75 lbs.

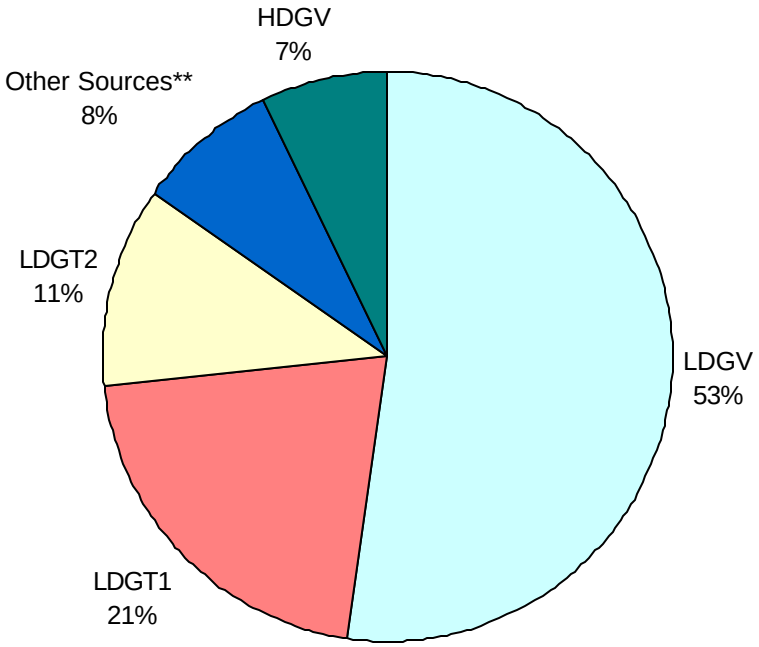
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-33:

XYLENES(META)
1996 Estimated Emissions* by Source Category for Point and Area Sources



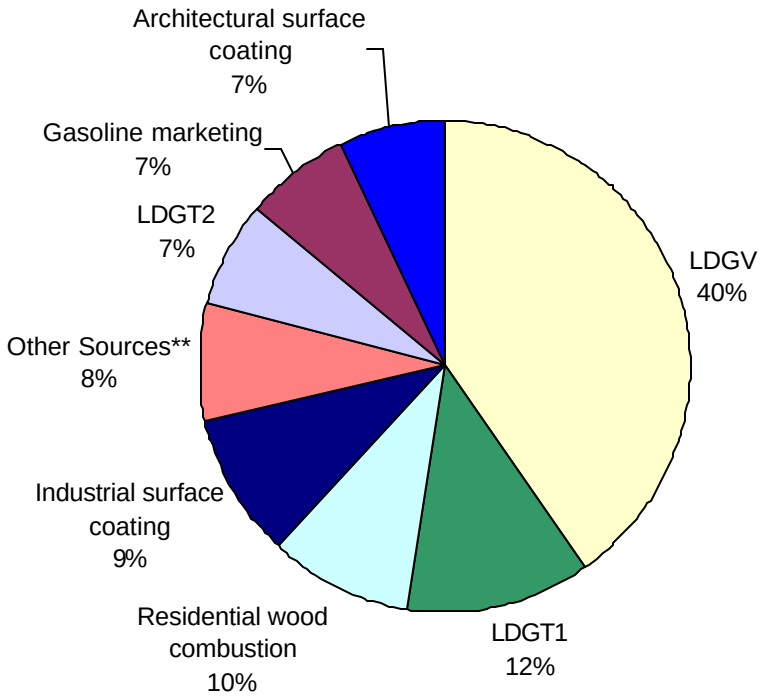
SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	LDGV	12,174,626.71				X				X	X
-------	LDGT1	4,916,897.05				X				X	X
-------	LDGT2	2,648,693.42				X				X	X
-------	Other Sources**	1,849,853.93		X	X	X	X	X	X	X	X
-------	HDGV	1,680,231.90		X		X	X			X	X

Total Estimated Emissions: 23,270,303.00 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 3-34:

XYLENES(ORTHO)
1996 Estimated Emissions* by Source Category for Point and Area Sources



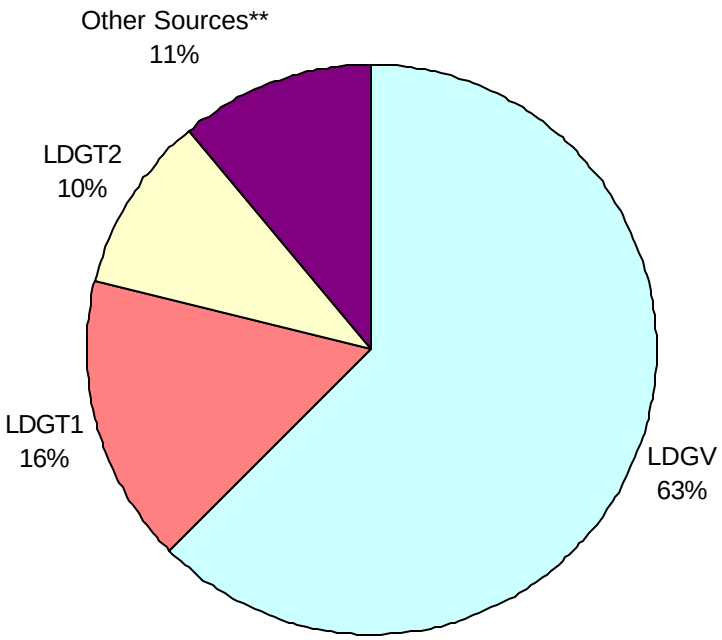
SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	LDGV	23,715,960.22		X		X	X	X	X	X	X
	LDGT1	7,092,472.37		X		X	X	X		X	X
-------	Residential wood combustion	5,610,026.07		X	X	X		X	X		X
-------	Industrial surface coating	5,427,070.30		X	X	X				X	X
-------	Other Sources**	4,576,706.47		X	X	X	X	X	X	X	X
-------	LDGT2	4,156,770.87		X		X	X	X		X	X
-------	Gasoline marketing	4,090,117.72		X	X	X		X	X		X
-------	Architectural surface coating	4,035,705.32							X	X	

Total Estimated Emissions: 58,704,829.34 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 3-35:

XYLENES(PARA)
1996 Estimated Emissions* by Source Category for Point and Area Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	LDGV	22,087,386.24		X	X	X					X
-------	LDGT1	5,762,628.94				X			X		X
-------	LDGT2	3,575,752.92		X		X					X
-------	Other Sources**	3,884,924.59		X	X	X	X		X		

Total Estimated Emissions: 35,310,692.68 lbs.

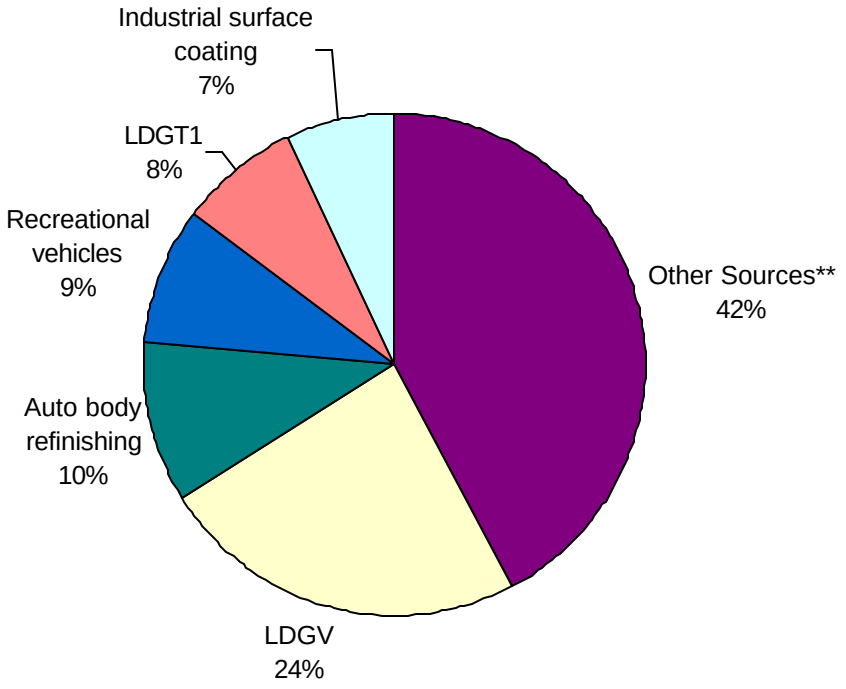
* Each jurisdiction estimated emissions for those sources for which they had data available.

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

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

Figure 3-36:

XYLENES(ISO)
1996 Estimated Emissions* by Source Category for Point and Area Sources



SIC	DESCRIPTION	EMISSIONS (lbs)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Other Sources**	131,108,634.20	X	X	X	X	X	X	X	X	X
-------	LDGV	74,758,077.66	X			X	X	X	X	X	X
-------	Auto body refinishing	31,905,350.80	X	X	X	X	X	X		X	X
-------	Recreational vehicles	27,345,212.35	X			X	X	X	X		X
-------	LDGT1	24,430,722.83	X			X	X	X		X	X
-------	Industrial surface coating	21,769,246.60	X	X	X	X				X	X

Total Estimated Emissions: 311,317,244.44 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.

4. Conclusion

The mobile source inventory was made possible by the cooperation of the eight states and province of Ontario, the United States Environmental Protection Agency and the Great Lakes Commission. Mobile source emissions represent a significant portion of the overall inventory of air toxic emissions. By understanding all sources of air toxic emissions, the Great Lakes states, province of Ontario and the United States Environmental Protection Agency can effectively develop strategies to evaluate control technology and reduce airborne deposition of persistent toxic chemicals in the Great Lakes watershed.

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 assessment of atmospheric deposition to the Great Lakes under the efforts of the United States Environmental Protection Agency's Great Waters Program.

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 used by the 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 Lakes, as input to air deposition modeling, and support the development of remedial action and other management plans.

To accomplish the estimation of the mobile source contribution to the toxic air emissions inventory, the Steering Committee of the Inventory Project directed the development of the mobile source emissions estimation module into RAPIDS. This module allows the air regulatory agencies to calculate on-road mobile emissions in RAPIDS directly from the raw input data (emission factors for Total Organic Gases and Particulate Matter, vehicle miles or kilometers traveled, vehicle type, road class, speed, etc.). This module also permits the calculation of toxic emissions from the outputs of the base mobile source emission estimation models (MOBILE5, PART5). The RAPIDS mobile module also allows for calculation of non-road toxic emissions through the input of raw data or to use the output of other non-road emission estimation techniques (NONROAD model) to calculate specific air toxic emissions. As the agencies had differing abilities and needs in the development of the final inventory, this flexibility was critical to the success of the project.

However, this flexibility also has the potential to create inconsistencies in the data. For example, different emissions estimation methodologies could lead to vastly different emissions estimates between states. This is especially true for the non-road portion of the inventory which does not have an established protocol. To calculate the non-road inventory, the agencies used either the NONROAD model or U.S. EPA studies as the base methodology to estimate emissions. Both of these methodologies are acceptable, but can lead to widely different results. In addition, several agencies were unable to gather the raw data to calculate certain portions of the non-road inventory (locomotives, aircraft and commercial marine vessels). Therefore in future inventories, the air regulatory agencies need to work together to minimize these inconsistencies. This would, at a minimum, include the review and update of the protocol, training (especially for mobile source inventory personnel) and the continued development of RAPIDS software.

While the States and Ontario are committed to compiling annual inventories to assess and analyze the contribution of toxic air emissions to the Great Lakes and other water bodies, these inventories can also serve a number of other very important purposes as well.

This inventory will assist the United States Environmental Protection Agency in assessing the impact of hazardous air pollutants (HAPs). U.S. EPA has prepared a National Toxic Inventory (NTI), in order to perform a risk-based assessment associated with the exposure to HAPs. This assessment, known as the National Air Toxics Assessment (NATA), can be enhanced by the use of State specific inventories. The Great Lakes Regional Air Toxic Inventory can provide better spatial and temporal resolution of emissions through the use of more representative activity data such as local traffic counts and county level data for non-road sources. The list of contaminants for the Great Lakes air toxic inventory would need to be expanded to include the full list of 188 HAPs as delineated in Section 112(b) of the Clean Air Act to support the NTI and NATA activities. In addition, the mobile source inventory module could be used as a national model for preparing state-specific mobile source air toxic inventories.

The Great Lakes emissions inventory can also be used to assist the states and Ontario in completing their other air emissions inventory needs. States with ozone nonattainment areas are required to complete comprehensive periodic (every 3 years) inventories for those areas. Some states have expanded this effort to include the entire state. Much of the mobile source information collected is directly transferable to the inventory project, as well as other efforts.

The data collected from this inventory can also be used to assist in other ongoing assessments. The U.S. EPA is currently developing a national database that will contain a state's comprehensive emission inventory that will provide other entities with access to the state's inventory to perform these assessments. If a state does not provide its own inventory, the U.S. EPA will estimate emissions for that state or portion therein. It is preferable for a state to complete this on its own to provide a more accurate picture of its own air emissions. Ontario would benefit similarly and is encouraged to do the same as the Great Lakes states.

The Great Lakes states and Ontario have developed protocols to provide consistencies within the emissions inventory process. These have had limited success because of the difference in available resources and the lack of an overarching authority requiring a complete inventory. A

comprehensive federal emissions reporting rule that consolidates all emissions inventory requirements could provide consistency for the States and Ontario.

In summary, the Great Lakes states and the province of Ontario have successfully implemented a system, the Great Lakes Regional Air Toxic Emissions Inventory, to compile and analyze air toxic emissions from mobile sources for the Great Lakes region. Beyond the periodic air toxic inventory work that the States and Ontario will be compiling as part of the assessment of airborne toxic emissions in the Great Lakes region, this system can be used for a variety of other purposes. These include:

1. The NTI and NATA;
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 unprecedented regional study of air pollutant emissions and as such is an example of the cooperation that is possible nationally and internationally. It can be used as a model for states, provinces and countries compiling air emissions inventories of regional interest, including the NTI, the National Emissions Trends Inventory and other regional assessments of various air toxic pollutants.

RAPIDS is available free of charge at http://www.glc.org/air/rapids/rapids.html. Requests for state/provincial data should be directed to the Great Lakes Commission at http://www.glc.org.

5. References

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- "Document for the 1996 Base Year National Toxics Inventory for Non-road Vehicle and Equipment Mobile Sources"(Prepared by Eastern Research Group, Inc., Morrisville, NC. July 26, 1999; ftp://ftp.epa.gov/pub/EmisInventory/nti_96/mustread/mobiledocumentation/NONR
- "Document for the 1996 Base Year National Toxics Inventory for On-road Vehicle Mobile Sources"(Prepared by Eastern Research Group, Inc., Morrisville, NC. July 26, 1999; ftp://ftp.epa.gov/pub/EmisInventory/nti_96/mustread/mobiledocumentation/ONR
- "Use of RAPIDS to Develop a Regional Air Toxic Inventory." Michael Donahue, Julie Wagemakers, and Derek Moy of the Great Lakes Commission; Orlando Cabrera-Rivera of the Wisconsin Department of Natural Resources; Chun Yi Wu of the Minnesota Pollution Control Agency; David Asselmeier of the Illinois EPA; Gary Baker of the Michigan DEQ; Rob McDonough of the New York Department of Environmental Conservation; Jon Bates of the Indiana Department of Environmental Management; Peter Wong of the Ontario Ministry of Energy and the Environment; Suzanne King of the US EPA and Robert Emigh, Mark Young, and Suzanne Strasser of Windsor Technologies, Inc. Paper presented at the Emission Inventory: Regional Strategies for the Future, U.S. EPA/Air Waste Management Association Specialty Conference, Raleigh, North Carolina, October 26-28, 1999.

6. Appendices

Appendix A: Illinois Toxic Emissions Inventory

CALCULATION METHODS

Aircraft

The number of operations (landings and takeoffs) for each airport were obtained from Illinois' 1996 ozone inventory. For O'Hare and Midway airports, data had been previously obtained from Landrum & Brown via the Chicago Department of Aviation (March 1998) on the design day flights from those airports. This data included operations for specific aircraft types and engine types.

For O'Hare and Midway, emissions were calculated by using emission factors from the FAA Engine Emission Database (FAEED) version 2.1 specific to the engine type being inventoried. Default time-in-modes (TIM) were used. Since the daily count of flights was given, this value was multiplied by 366 to obtain the annual number of flights. For airports other than O'Hare and Midway, emissions were calculated by using "average" emission factors from AP-42. Once VOC emissions were calculated, they were converted to TOG and speciated to obtain the pollutants of interest.

Off-road Mobile Sources

Off-road mobile sources were calculated using USEPA's NONROAD model with the default parameters. Output from the model was for the pollutant TOG which was then speciated to obtain the pollutants of interest.

On-road Mobile Sources

Annual VMT by road type for each county was obtained from the Illinois Department of Transportation. Using conversion factors, these values were converted to monthly VMT values and then apportioned to vehicle types.

Next, USEPA's MOBILE 5b model was run for each county for each month of 1996 to obtain emission factors of TOG. The inputs into the model included average speed for the road type, monthly maximum and average temperatures from the National Weather Service, fleet mix and appropriate inspection and maintenance values (if appropriate). If a county did not have a National Weather Service site which recorded temperature, the nearest site to that county was used. Emission factors output from the MOBILE model were then multiplied by VMT to obtain TOG emissions. These emissions were then speciated to obtain the pollutants of interest.

Particulate matter emissions from on-road mobile sources were calculated using USEPA's PART5 model. The inputs into the model included average speed for the road type, fleet mix, particle size, average vehicle weight, number of wheels and number of precipitation days. The number of precipitation days was obtained from the National Weather Service. Emission factors output from the

PART5 model were then multiplied by VMT to obtain particulate emissions. These emissions were then speciated to obtain the pollutants of interest.

INFORMATION

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Table A-1: Illinois emissions by county in pounds/year

	Adams	Alexander	Bond	Boone	Brown
Acetaldehyde	20,251.18	3,911.43	9,980.32	14,519.82	2,797.70
Acrolein	1,500.29	311.99	631.91	1,233.82	141.69
Antimony	71.28	17.08	39.58	65.90	8.14
Arsenic	133.85	32.08	74.33	123.75	15.29
Benzene	37,729.03	7,631.20	13,710.65	25,565.09	3,376.74
Butadiene,13	39,623.60	7,894.29	14,186.67	26,691.83	3,406.49
Cadmium	35.64	8.54	19.79	32.95	4.07
Chromium	62.38	15.32	38.45	61.00	7.07
Cobalt	0.96	0.23	0.53	0.89	0.11
Copper	457.65	109.95	256.85	425.50	52.24
Ethylbenzene	20,872.45	4,322.23	7,663.64	14,088.30	1,865.61
Formaldehyde	58,061.80	11,192.13	28,905.56	41,857.26	8,124.63
Lead	32.99	10.86	48.34	56.71	3.37
Manganese	223.92	54.04	128.16	210.37	25.52
Mercury	10.19	2.55	6.74	10.37	1.15
Naphthalene	21.67	7.65	31.87	71.40	5.10
Nickel	19.38	4.80	12.41	19.35	2.19
Phenol	9.35	3.30	13.75	30.80	2.20
Styrene	15.72	5.55	23.12	51.80	3.70
Toluene	152,249.94	33,801.68	58,551.59	103,694.38	13,946.99
Xylenes,Iso	104,249.99	20,849.29	37,359.49	69,964.87	9,131.47

	Bureau	Calhoun	Carroll	Cass	Champaign
Acetaldehyde	21,450.02	24,761.61	8,370.36	6,338.36	54,000.50
Acrolein	1,036.26	228.49	507.51	292.83	4,522.36
Antimony	72.66	5.70	23.64	16.26	227.49
Arsenic	136.44	10.71	44.40	30.54	427.18
Benzene	27,896.96	5,702.39	13,183.66	7,943.30	93,424.25
Butadiene,13	29,015.30	6,397.95	13,929.73	7,778.43	98,891.17
Cadmium	36.33	2.85	11.82	8.13	113.74
Chromium	69.32	4.93	20.62	14.12	211.73
Cobalt	0.98	0.07	0.32	0.22	3.09
Copper	470.59	36.60	151.75	104.34	1,469.56
Ethylbenzene	15,474.07	3,173.66	7,288.78	4,357.42	51,847.47
Formaldehyde	62,038.23	6,997.68	24,081.46	18,407.72	155,530.89
Lead	78.80	2.18	10.38	6.65	204.90
Manganese	234.00	17.87	74.20	50.98	727.32
Mercury	12.02	0.79	3.36	2.29	36.12
Naphthalene			2.55	3.82	252.09
Nickel	22.23	1.52	6.39	4.37	67.32
Phenol			1.10	1.65	108.74
Styrene			1.85	2.77	182.89
Toluene	113,766.83	22,534.55	52,733.00	32,259.51	385,388.94
Xylenes,Iso	76,860.69	16,282.54	36,584.18	21,280.18	257,216.13

Table A-1: Illinois emissions by county in pounds/year (continued)

	Christian	Clark	Clay	Clinton	Coles
Acetaldehyde	14,715.94	12,556.25	7,421.44	12,819.04	17,271.24
Acrolein	784.78	607.52	360.46	854.77	1,229.18
Antimony	47.78	47.66	22.17	54.29	77.35
Arsenic	89.72	89.51	41.63	101.95	145.25
Benzene	20,655.22	16,058.89	10,155.51	23,076.30	29,423.88
Butadiene,13	20,711.57	16,309.27	9,672.06	23,933.55	30,068.61
Cadmium	23.89	23.83	11.08	27.14	38.67
Chromium	41.46	46.42	19.20	48.82	70.51
Cobalt	0.64	0.64	0.30	0.73	1.05
Copper	306.51	309.39	142.20	349.51	498.64
Ethylbenzene	11,466.84	8,996.72	5,640.03	12,985.98	16,412.87
Formaldehyde	42,575.85	36,360.21	21,532.32	36,722.39	49,748.03
Lead	19.32	59.10	8.69	35.43	58.02
Manganese	149.73	154.46	69.44	171.86	245.82
Mercury	6.73	8.15	3.11	8.13	11.86
Naphthalene	11.47	6.37	3.82		39.52
Nickel	12.83	14.99	5.94	15.32	22.25
Phenol	4.95	2.75	1.65		17.05
Styrene	8.32	4.62	2.77		28.67
Toluene	86,483.92	68,876.46	43,635.22	99,173.54	124,750.16
Xylenes,Iso	55,842.83	43,647.50	26,835.96	63,384.55	79,986.81

	Cook	Crawford	Cumberland	DeKalb	DeWitt
Acetaldehyde	1,034,816.78	7,694.39	10,253.96	26,708.53	8,864.14
Acrolein	176,013.85	448.64	461.04	1,936.07	456.92
Antimony	4,721.04	24.52	40.50	97.12	30.44
Arsenic	8,865.21	46.04	76.05	182.38	57.16
Benzene	2,290,643.00	10,512.66	12,751.11	45,695.02	12,530.35
Butadiene,13	2,446,821.38	9,896.92	12,909.30	47,897.58	12,793.92
Cadmium	2,360.52	12.26	20.25	48.56	15.22
Chromium	4,284.86	21.2	40.35	86.43	27.44
Cobalt	64.16	0.33	0.55	1.31	0.41
Copper	30,419.92	157.24	263.52	624.59	196.02
Ethylbenzene	1,244,879.22	5,828.48	7,232.21	25,197.55	6,978.94
Formaldehyde	2,994,728.74	22,385.77	29,684.54	76,836.40	25,600.97
Lead	3,388.68	9.38	57.41	56.30	20.38
Manganese	14,983.21	76.77	132.15	306.54	96.43
Mercury	719.01	3.43	7.19	14.29	4.58
Naphthalene	22,888.03	24.22		57.37	
Nickel	1,348.43	6.55	13.13	27.02	8.62
Phenol	9,682.17	10.45		24.75	
Styrene	15,723.58	17.57		41.62	
Toluene	9,174,092.79	45,745.18	56,972.25	183,296.50	52,368.45
Xylenes,Iso	6,199,210.59	27,459.11	34,600.61	125,921.37	34,210.53

Table A-1: Illinois emissions by county in pounds/year (continued)

	Douglas	DuPage	Edgar	Edwards	Effingham
Acetaldehyde	12,034.90	212,848.82	10,549.58	3,414.12	20,456.65
Acrolein	546.64	21,264.51	387.07	144.01	1,169.14
Antimony	39.50	1,085.21	25.05	10.74	88.17
Arsenic	74.17	2,037.82	47.04	20.16	165.57
Benzene	14,249.04	520,785.62	10,723.24	4,159.97	31,256.75
Butadiene,13	14,043.55	554,650.58	10,417.35	4,032.38	31,894.40
Cadmium	19.75	542.60	12.52	5.37	44.08
Chromium	37.51	982.40	21.75	9.36	84.59
Cobalt	0.53	14.74	0.34	0.14	1.19
Copper	255.71	6,990.74	160.72	68.94	571.40
Ethylbenzene	7,919.33	292,074.43	5,879.44	2,338.11	17,533.76
Formaldehyde	34,972.42	603,311.66	30,737.17	9,902.51	58,985.95
Lead	41.44	758.73	10.23	4.72	99.27
Manganese	127.03	3,441.56	78.52	33.71	284.43
Mercury	6.48	164.56	3.53	1.52	14.72
Naphthalene	11.47	370.80	3.82		7.65
Nickel	12.01	308.81	6.73	2.90	27.18
Phenol	4.95	159.87	1.65		3.30
Styrene	8.32	268.14	2.77		5.55
Toluene	60,528.06	2,192,303.09	43,598.10	18,402.96	134,224.84
Xylenes,Iso	38,182.61	1,445,478.69	28,641.28	11,079.85	85,164.89

	Fayette	Ford	Franklin	Fulton	Gallatin
Acetaldehyde	16,136.02	10,267.89	12,862.67	12,372.47	4,749.99
Acrolein	896.21	370.84	1,026.41	769.70	180.14
Antimony	60.29	23.20	67.87	47.86	10.83
Arsenic	113.22	43.56	127.46	89.88	20.34
Benzene	21,735.90	9,483.67	26,551.26	20,579.76	5,160.57
Butadiene,13	22,428.91	9,261.53	27,897.93	21,411.55	5,044.04
Cadmium	30.14	11.60	33.93	23.93	5.41
Chromium	58.23	21.28	63.45	41.65	9.42
Cobalt	0.81	0.31	0.92	0.65	0.14
Copper	391.01	149.65	438.68	307.16	69.53
Ethylbenzene	12,152.05	5,174.92	15,100.39	11,534.25	2,864.77
Formaldehyde	46,686.09	29,973.02	36,651.94	35,532.07	13,809.92
Lead	70.99	18.47	63.36	20.25	4.53
Manganese	194.89	73.86	217.29	150.13	33.98
Mercury	10.18	3.59	10.86	6.77	1.53
Naphthalene	24.22	10.20	7.65	1.27	
Nickel	18.75	6.73	20.20	12.90	2.91
Phenol	10.45	4.40	3.30	0.55	
Styrene	17.57	7.40	5.55	0.92	
Toluene	92,253.19	37,991.70	117,781.30	87,092.41	21,794.30
Xylenes,Iso	59,389.36	25,343.91	73,207.59	56,627.84	13,817.78

Table A-1: Illinois emissions by county in pounds/year (continued)

	Greene	Grundy	Hamilton	Hancock	Hardin
Acetaldehyde	7,873.22	20,646.62	5,130.53	12,453.06	935.89
Acrolein	335.45	1,400.59	170.70	617.29	93.93
Antimony	17.99	81.61	12.44	31.69	6.24
Arsenic	33.78	153.26	23.36	59.50	11.72
Benzene	9,250.64	31,798.98	5,089.85	16,166.22	2,589.69
Butadiene,13	9,392.83	33,886.31	4,779.68	16,442.54	2,630.27
Cadmium	8.99	40.80	6.22	15.84	3.12
Chromium	15.68	81.50	10.84	27.60	5.46
Cobalt	0.24	1.10	0.16	0.43	0.08
Copper	115.46	531.19	79.86	203.36	40.08
Ethylbenzene	5,106.52	17,633.12	2,830.81	8,897.49	1,500.96
Formaldehyde	22,836.73	59,506.85	14,951.32	36,072.29	2,631.91
Lead	7.85	117.00	5.39	13.60	2.93
Manganese	56.45	266.46	39.04	99.41	19.61
Mercury	2.55	14.54	1.76	4.49	0.89
Naphthalene		48.45		7.65	
Nickel	4.86	26.51	3.36	8.55	1.69
Phenol		20.90		3.30	
Styrene		35.15		5.55	
Toluene	37,555.30	129,194.51	22,052.37	65,097.14	12,405.10
Xylenes,Iso	25,220.27	88,183.08	13,384.17	44,053.86	7,018.22

	Henderson	Henry	Iroquois	Jackson	Jasper
Acetaldehyde	6,074.40	25,818.35	25,809.34	11,634.30	7,642.82
Acrolein	304.30	1,629.26	1,006.08	1,463.46	264.51
Antimony	17.07	97.33	72.90	63.28	18.77
Arsenic	32.07	182.77	136.89	118.83	35.26
Benzene	8,190.42	39,242.19	27,753.79	25,540.28	7,927.22
Butadiene,13	8,520.65	41,551.57	28,170.38	26,228.82	7,406.47
Cadmium	8.53	48.66	36.45	31.64	9.38
Chromium	14.91	92.45	69.44	54.69	16.36
Cobalt	0.23	1.32	0.99	0.86	0.25
Copper	109.62	630.08	472.07	405.79	120.51
Ethylbenzene	4,538.30	21,748.79	15,317.82	14,340.09	4,366.03
Formaldehyde	17,545.61	74,430.96	74,993.43	33,451.54	22,277.79
Lead	7.61	102.32	78.22	23.87	8.14
Manganese	53.61	313.04	234.67	198.10	58.92
Mercury	2.43	15.99	12.03	8.85	2.66
Naphthalene		36.97		134.48	
Nickel	4.62	29.60	22.26	16.90	5.07
Phenol		15.95		57.87	
Styrene		26.82		96.47	
Toluene	33,261.42	159,057.56	112,624.87	113,369.50	33,303.14
Xylenes,Iso	22,573.03	108,702.71	75,654.42	68,628.42	20,821.82

Table A-1: Illinois emissions by county in pounds/year (continued)

	Jefferson	Jersey	JoDaviess	Johnson	Kane
Acetaldehyde	17,965.48	6,326.93	8,288.08	6,268.71	97,737.15
Acrolein	1,275.57	419.01	609.68	429.94	7,917.16
Antimony	93.21	26.89	33.40	32.31	367.30
Arsenic	175.03	50.49	62.72	60.68	689.72
Benzene	32,627.37	11,215.56	15,752.87	11,450.59	186,968.10
Butadiene,13	34,453.71	11,732.34	16,790.59	12,038.41	195,703.86
Cadmium	46.60	13.44	16.70	16.15	183.65
Chromium	89.86	23.35	29.02	31.96	331.07
Cobalt	1.26	0.36	0.45	0.43	4.99
Copper	604.35	172.52	214.32	210.09	2,365.08
Ethylbenzene	18,431.42	6,303.90	8,737.55	6,560.73	103,513.94
Formaldehyde	51,443.69	18,124.79	23,696.14	17,920.47	280,163.93
Lead	108.45	11.00	13.84	43.95	245.51
Manganese	301.12	84.29	104.73	105.20	1,163.40
Mercury	15.69	3.79	4.71	5.67	55.29
Naphthalene	11.47		2.55		237.63
Nickel	28.93	7.23	8.99	10.37	103.89
Phenol	4.95		1.10		102.62
Styrene	8.32		1.85		169.01
Toluene	141,131.79	47,783.28	63,440.42	51,962.86	761,557.19
Xylenes,Iso	90,227.55	30,935.11	43,880.39	31,582.49	514,617.54

	Kankakee	Kendall	Knox	Lake	LaSalle
Acetaldehyde	26,695.16	14,074.17	19,792.26	175,597.86	42,039.41
Acrolein	2,190.02	1,079.54	1,423.04	20,587.93	3,050.84
Antimony	121.68	63.82	79.42	736.37	174.51
Arsenic	228.49	119.84	149.14	1382.77	327.70
Benzene	49,828.12	28,801.70	34,836.41	5,015,130.28	72,556.30
Butadiene,13	52,202.68	30,227.24	36,899.58	557,611.43	77,007.10
Cadmium	60.84	31.91	39.71	368.18	87.25
Chromium	109.04	55.85	73.08	654.39	161.82
Cobalt	1.65	0.86	1.07	10.00	2.37
Copper	783.06	409.75	512.46	4,734.90	1,126.91
Ethylbenzene	27,744.91	16,122.98	19,342.27	278,978.37	40,406.38
Formaldehyde	76,628.67	40,116.47	56,814.98	491,795.46	120,742.67
Lead	76.49	29.44	64.93	418.64	152.46
Manganese	384.82	200.46	253.08	2,323.05	557.33
Mercury	18.12	9.13	12.37	108.17	27.54
Naphthalene	82.87		26.77	171.83	76.50
Nickel	34.19	17.32	23.14	204.27	51.38
Phenol	35.75		11.55	74.09	33.00
Styrene	60.12		19.42	123.51	55.50
Toluene	207,647.87	120,761.91	141,944.12	1,994,487.75	299,085.37
Xylenes,Iso	136,928.87	79,602.63	96,545.24	1,424,166.76	201,017.44

Table A-1: Illinois emissions by county in pounds/year (continued)

	Lawrence	Lee	Livingston	Logan	McDonough
Acetaldehyde	6,999.67	21,709.46	27,235.72	20,136.20	11,539.72
Acrolein	741.88	1,338.65	1,113.37	1,015.86	720.50
Antimony	24.02	75.48	82.32	76.13	37.24
Arsenic	45.10	141.74	154.58	142.95	69.93
Benzene	9,412.04	30,084.82	30,351.44	26,532.02	16,082.43
Butadiene,13	9,270.11	31,731.03	30,332.82	27,462.28	16,246.33
Cadmium	12.01	37.74	41.16	38.06	18.62
Chromium	20.82	71.60	77.51	73.73	32.24
Cobalt	0.32	1.02	1.11	1.03	0.50
Copper	154.07	488.58	532.43	493.84	238.87
Ethylbenzene	5,123.12	16,543.60	16,706.13	14,844.22	8,860.42
Formaldehyde	20,548.27	62,818.31	79,164.56	58,234.11	33,459.57
Lead	9.59	78.59	81.18	91.23	14.47
Manganese	75.26	242.68	264.09	246.28	116.64
Mercury	3.37	12.37	13.33	12.91	5.22
Naphthalene	104.55	52.27	7.65	8.92	35.70
Nickel	6.44	22.91	24.74	23.77	9.97
Phenol	45.10	22.55	3.3	3.85	15.40
Styrene	75.85	37.92	5.55	6.47	25.90
Toluene	39,961.73	119,459.83	123,219.81	112,117.15	66,064.19
Xylenes,Iso	24,397.99	83,043.48	82,102.88	72,778.02	43,426.08

	McHenry	McLean	Macon	Macoupin	Madison
Acetaldehyde	56,744.27	57,750.37	31,208.27	16,684.56	71,789.57
Acrolein	5,630.35	4,601.39	3,822.86	969.29	7,782.36
Antimony	247.63	226.30	140.00	65.68	379.07
Arsenic	465.00	424.95	262.89	123.34	711.85
Benzene	135,668.62	93,097.62	64,405.33	25,972.05	169,471.42
Butadiene,13	146,287.54	98,538.47	66,542.67	26,719.53	180,925.17
Cadmium	123.81	113.15	70.00	32.84	189.53
Chromium	218.62	211.54	123.30	59.73	351.32
Cobalt	3.36	3.07	1.90	0.89	5.15
Copper	1,591.24	1,462.52	899.41	423.32	2,447.79
Ethylbenzene	75,358.97	51,507.22	35,616.86	14,593.75	94,943.43
Formaldehyde	160,884.22	166,621.57	89,944.28	48,036.95	204,054.99
Lead	129.44	211.07	71.04	48.09	329.22
Manganese	779.75	724.43	440.59	208.59	1,210.32
Mercury	35.96	36.20	20.24	10.03	59.82
Naphthalene	103.27	278.70	373.91	3.82	340.35
Nickel	68.06	67.37	38.41	18.82	111.33
Phenol	44.55	118.27	160.42	1.65	147.03
Styrene	74.92	193.43	257.46	2.77	237.46
Toluene	548,055.35	380,440.60	271,385.06	111,617.74	715,783.53
Xylenes,Iso	379,178.41	256,173.75	173,583.54	71,048.02	469,042.60

Table A-1: Illinois emissions by county in pounds/year (continued)

	Marion	Marshall	Mason	Massac	Menard
Acetaldehyde	15,251.11	8,428.17	8,938.97	5,522.41	5,285.37
Acrolein	1,148.18	529.93	388.03	384.83	201.84
Antimony	69.54	27.04	17.70	28.66	13.96
Arsenic	130.58	50.78	33.24	53.83	26.21
Benzene	26,240.78	11,610.89	10,497.77	9,772.42	5,745.87
Butadiene,13	26,397.83	12,032.67	10,724.64	9,933.66	5,651.76
Cadmium	34.77	13.52	8.85	14.33	6.98
Chromium	64.51	25.27	15.38	27.01	12.17
Cobalt	0.94	0.36	0.24	0.38	0.18
Copper	449.08	174.77	113.58	185.42	89.61
Ethylbenzene	14,736.57	6,419.81	5,766.31	5,574.72	3,186.48
Formaldehyde	43,987.90	24,413.35	25,929.34	15,856.32	15,361.27
Lead	60.98	25.16	7.34	28.42	6.07
Manganese	222.12	86.56	55.50	91.98	43.81
Mercury	10.98	4.32	2.50	4.64	1.98
Naphthalene	52.27	25.50	1.27	7.65	
Nickel	20.48	8.04	4.76	8.62	3.77
Phenol	22.55	11.00	0.55	3.30	
Styrene	37.92	18.50	0.92	5.55	
Toluene	115,286.46	47,642.19	41,754.87	44,654.54	24,102.18
Xylenes,Iso	70,600.55	31,716.67	28,707.24	26,477.23	15,431.55

	Mercer	Monroe	Montgomery	Morgan	Moultrie
Acetaldehyde	9,177.94	9,952.43	19,000.96	14,058.72	6,671.05
Acrolein	420.01	734.77	1,035.29	874.36	323.17
Antimony	20.62	40.99	72.16	50.85	21.63
Arsenic	38.72	76.98	135.51	95.49	40.62
Benzene	11,257.51	19,323.81	25,972.43	21,876.30	9,053.58
Butadiene,13	11,620.09	20,405.32	26,743.73	22,518.36	9,048.90
Cadmium	10.31	20.49	36.08	25.42	10.81
Chromium	17.91	37.01	69.14	46.14	18.88
Cobalt	0.28	0.55	0.98	0.69	0.29
Copper	132.30	264.01	467.58	327.67	138.86
Ethylbenzene	6,184.28	10,885.54	14,530.65	12,165.78	5,053.48
Formaldehyde	26,588.78	28,403.28	54,942.69	40,548.51	19,299.01
Lead	8.47	27.93	80.59	36.41	9.62
Manganese	64.64	129.90	232.70	161.39	67.91
Mercury	2.91	6.19	12.02	7.73	3.07
Naphthalene	1.27	1.53	20.40	17.85	
Nickel	5.54	11.61	22.21	14.53	5.85
Phenol	0.55	0.66	8.80	7.70	
Styrene	0.92	1.11	14.80	12.95	
Toluene	44,535.03	82,601.68	110,377.62	91,079.71	38,546.70
Xylenes,Iso	30,932.97	53,508.40	70,965.27	59,798.59	24,470.29

Table A-1: Illinois emissions by county in pounds/year (continued)

	Ogle	Peoria	Perry	Piatt	Pike
Acetaldehyde	21,855.81	51,528.46	9,301.42	11,023.42	12,089.16
Acrolein	1,424.91	6,933.32	425.85	460.05	619.63
Antimony	88.00	231.29	27.53	33.04	37.21
Arsenic	165.26	434.31	51.69	62.04	69.87
Benzene	36,297.00	114,740.46	11,395.80	12,056.35	16,078.86
Butadiene,13	38,354.64	122,429.02	10,942.14	12,039.92	16,648.40
Cadmium	44.00	115.64	13.76	16.52	18.60
Chromium	81.36	205.48	23.99	31.89	34.04
Cobalt	1.19	3.14	0.37	0.44	0.50
Copper	568.12	1,487.11	176.67	214.26	239.95
Ethylbenzene	20,123.33	62,943.57	6,358.57	6,712.55	8,939.06
Formaldehyde	62,814.26	148,007.59	27,003.85	32,046.84	34,955.26
Lead	74.97	131.35	11.97	38.75	28.86
Manganese	280.82	729.65	86.38	106.78	118.37
Mercury	13.82	33.94	3.90	5.57	5.74
Naphthalene	14.02	661.22	8.92	7.65	6.37
Nickel	25.80	64.22	7.44	10.27	10.75
Phenol	6.05	282.04	3.85	3.30	2.75
Styrene	10.17	456.04	6.47	5.55	4.62
Toluene	146,886.60	461,610.77	49,657.63	51,119.42	66,447.04
Xylenes,Iso	100,625.17	314,382.69	30,171.89	32,515.81	44,139.13

	Pope	Pulaski	Putnam	Randolph	Richland
Acetaldehyde	1,370.58	4,388.78	3,031.91	9,756.31	7,091.86
Acrolein	97.96	214.49	190.34	704.55	400.03
Antimony	6.51	17.48	9.40	39.21	22.93
Arsenic	12.22	32.82	17.66	73.64	43.06
Benzene	2,714.96	5,931.43	5,103.17	17,712.95	10,445.27
Butadiene,13	2,743.04	6,005.74	5,329.54	18,044.37	10,078.70
Cadmium	3.25	8.74	4.70	19.60	11.46
Chromium	5.69	16.89	8.24	34.11	19.83
Cobalt	0.08	0.23	0.12	0.53	0.31
Copper	41.81	113.37	60.39	251.64	147.08
Ethylbenzene	1,554.50	3,367.74	2,823.41	9,910.36	5,796.01
Formaldehyde	3,914.26	12,678.00	8,711.25	28,030.36	20,556.83
Lead	3.01	20.67	4.42	16.56	8.75
Manganese	20.45	56.51	29.55	122.99	71.81
Mercury	0.93	2.95	1.34	5.55	3.21
Naphthalene				15.30	10.20
Nickel	1.76	5.44	2.56	10.57	6.13
Phenol				6.60	4.40
Styrene				11.10	7.40
Toluene	12,529.97	26,591.50	20,574.82	75,765.67	44,657.17
Xylenes,Iso	7,351.45	16,094.45	14,090.89	48,140.51	27,708.22

Table A-1: Illinois emissions by county in pounds/year (continued)

	Rock Island	St. Clair	Saline	Sangamon	Schuyler
Acetaldehyde	37,900.80	65,436.57	6,487.32	59,656.07	4,533.12
Acrolein	5,213.18	8,982.03	494.37	7,406.89	204.14
Antimony	183.46	362.82	34.94	271.07	14.40
Arsenic	344.50	681.33	65.61	509.01	27.04
Benzene	87,325.19	155,628.30	13,143.06	116,495.65	5,679.95
Butadiene,13	94,032.53	164,001.13	13,421.73	124,725.15	5,715.98
Cadmium	91.73	181.41	17.47	135.53	7.20
Chromium	163.01	331.75	30.41	247.37	12.55
Cobalt	2.49	4.93	0.47	3.68	0.19
Copper	1,179.63	2,339.65	224.22	1,747.56	92.43
Ethylbenzene	48,137.09	87,450.15	7,495.14	64,509.41	3,157.62
Formaldehyde	108,558.14	186,992.87	18,517.58	171,865.56	13,130.92
Lead	104.39	279.59	14.84	205.47	6.31
Manganese	578.80	1,153.91	109.59	861.71	45.19
Mercury	26.93	55.97	4.94	41.64	2.04
Naphthalene	478.95	807.70	3.82	763.18	
Nickel	50.96	104.61	9.42	78.10	3.89
Phenol	203.26	349.29	1.65	326.94	
Styrene	329.62	558.30	2.77	525.37	
Toluene	354,923.83	682,715.67	59,666.29	486,118.81	23,756.04
Xylenes,Iso	240,411.22	423,491.35	35,747.52	318,571.91	15,408.86

	Scott	Shelby	Stark	Stephenson	Tazewell
Acetaldehyde	4,049.45	12,874.77	4,826.38	14,701.62	33,842.24
Acrolein	181.28	620.78	150.95	1,011.21	2,897.02
Antimony	13.38	35.00	10.07	58.29	168.36
Arsenic	25.13	65.73	18.92	109.46	316.15
Benzene	4,974.37	15,501.92	4,373.20	25,665.74	73,889.70
Butadiene,13	5,076.10	15,418.16	4,226.74	26,209.78	79,433.31
Cadmium	6.69	17.50	5.03	29.14	84.18
Chromium	12.47	31.03	8.74	50.39	151.38
Cobalt	0.18	0.47	0.13	0.79	2.28
Copper	86.47	225.02	64.66	373.83	1,083.80
Ethylbenzene	2,779.72	8,583.28	2,384.47	14,108.07	41,384.20
Formaldehyde	11,728.57	37,397.58	14,081.66	42,327.95	96,165.10
Lead	12.23	19.38	4.08	22.12	109.78
Manganese	42.81	110.36	31.58	182.51	532.94
Mercury	2.13	5.12	1.42	8.15	25.22
Naphthalene		17.85		19.12	15.30
Nickel	3.96	9.68	2.70	15.58	47.52
Phenol		7.70		8.25	6.60
Styrene		12.95		13.87	11.10
Toluene	21,035.89	64,838.26	17,425.08	102,901.74	306,833.05
Xylenes,Iso	13,572.69	41,685.93	11,676.71	70,008.49	206,387.33

Table A-1: Illinois emissions by county in pounds/year (continued)

	Union	Vermilion	Wabash	Warren	Washington
Acetaldehyde	5,794.07	27,201.21	4,213.52	9,705.78	13,769.87
Acrolein	385.90	1,866.45	227.48	466.87	574.38
Antimony	30.47	114.82	14.29	31.25	49.52
Arsenic	57.22	215.60	26.83	58.69	92.99
Benzene	10,665.04	48,263.01	6,404.71	12,392.06	16,201.61
Butadiene,13	10,805.40	50,296.83	6,369.70	12,371.11	16,082.83
Cadmium	15.23	57.41	7.14	15.62	24.76
Chromium	28.17	103.12	12.34	27.06	48.31
Cobalt	0.41	1.56	0.19	0.42	0.67
Copper	196.73	739.04	91.63	200.48	321.50
Ethylbenzene	6,094.55	26,925.73	3,596.90	6,867.12	9,135.62
Formaldehyde	16,593.33	78,057.42	12,159.05	28,136.20	39,947.66
Lead	25.96	73.96	5.37	12.21	62.10
Manganese	97.24	363.33	44.73	97.90	160.56
Mercury	4.78	17.17	1.99	4.38	8.49
Naphthalene		17.85		6.37	
Nickel	8.93	32.35	3.81	8.37	15.61
Phenol		7.70		2.75	
Styrene		12.95		4.62	
Toluene	48,844.97	201,262.74	27,921.96	51,653.81	71,658.29
Xylenes,Iso	28,921.69	132,833.78	17,257.71	33,448.51	43,599.11

	Wayne	White	Whiteside	Will	Williamson
Acetaldehyde	11,200.87	8,865.85	21,053.60	113,388.41	16,098.94
Acrolein	474.59	474.19	1,450.92	9,714.55	1,886.24
Antimony	34.93	32.18	76.65	518.78	98.08
Arsenic	65.60	60.42	143.94	974.16	184.18
Benzene	13,131.20	12,396.02	34,684.19	235,881.87	38,707.14
Butadiene,13	12,587.29	12,295.49	35,996.75	252,621.55	41,321.04
Cadmium	17.46	16.09	38.32	259.39	49.04
Chromium	32.28	29.14	69.28	478.51	89.68
Cobalt	0.47	0.43	1.04	7.05	1.33
Copper	225.51	207.30	493.70	3348.22	632.48
Ethylbenzene	7,319.31	7,000.02	19,149.39	131,793.37	21,807.35
Formaldehyde	32,571.91	25,646.16	60,676.44	323,111.56	45,784.48
Lead	29.63	22.63	52.81	432.55	75.71
Manganese	111.45	102.07	243.00	1,654.11	311.98
Mercury	5.48	4.88	11.58	81.20	15.12
Naphthalene	6.37	8.92	42.07	176.20	105.24
Nickel	10.23	9.17	21.79	151.44	28.33
Phenol	2.75	3.85	18.15	76.01	44.97
Styrene	4.62	6.47	30.52	127.83	74.31
Toluene	56,983.72	55,379.41	140,502.79	976,666.18	167,547.52
Xylenes,Iso	34,773.19	33,258.99	95,128.65	656,744.83	106,800.74

Table A-1: Illinois emissions by county in pounds/year (continued)

	Winnebago	Woodford	**State Total**
Acetaldehyde	66,878.19	16,543.40	**3,266,260.04**
Acrolein	8,618.05	904.79	**366,038.17**
Antimony	322.97	61.03	**14,084.41**
Arsenic	606.48	114.60	**26,447.70**
Benzene	171,752.78	24,155.65	**6,603,688.81**
Butadiene,13	185,998.33	25,334.29	**7,009,678.49**
Cadmium	161.48	30.51	**7,042.20**
Chromium	284.37	57.93	**12,804.80**
Cobalt	4.38	0.82	**191.41**
Copper	2,074.79	395.06	**90,767.18**
Ethylbenzene	94,758.27	13,480.89	**3,646,614.92**
Formaldehyde	189,957.30	47,677.04	**9,386,981.76**
Lead	163.23	63.88	**10,284.46**
Manganese	1,016.32	196.26	**44,722.26**
Mercury	46.66	10.01	**2,150.98**
Naphthalene	509.46		**29,840.39**
Nickel	88.58	18.54	**4,033.49**
Phenol	216.90		**12,667.28**
Styrene	352.35		**20,612.15**
Toluene	685,851.94	100,226.05	**27,047,256.40**
Xylenes,Iso	477,969.59	66,765.27	**18,108,624.83**

Appendix B: Indiana Toxic Emissions Inventory

BACKGROUND

The Indiana Department of Environmental Management, Office of Air Management, has developed a statewide inventory of the 82 target air toxic compounds for the Great Lakes Air Toxic Emissions Inventory Project for calendar year 1996. The inventory covers point, area and mobile sources. The point and area source portion of the inventory was previously released under a separate report. This report documents the mobile source inventory methodology and results.

MOBILE SOURCES

Indiana's mobile source inventory includes estimates for onroad mobile sources and nonroad mobile sources. The onroad mobile source category includes estimates for vehicles which are typically driven on the road, such as cars, trucks, and motorcycles. The nonroad mobile source category includes estimates for equipment that are not typically driven on the road, such as trains, boats, lawn and garden equipment, aircraft and construction equipment.

ONROAD MOBILE SOURCES

DATA SOURCES

Onroad mobile source air toxic estimates were made using U.S.EPA's Mobile 5b and Part 5 models, activity data supplied by the Indiana Department of Transportation (INDOT), and speciation profiles from RAPIDS. Onroad mobile source vehicles included in the inventory are shown below:

Vehicle Types

Heavy Duty Diesel Vehicles (HDDV)
Heavy Duty Gas Vehicles (HDGV)
Light Duty Diesel Trucks (LDDT)
Light Duty Diesel Vehicles (LDDV)
Light Duty Gas Trucks (LDGT1, LDGT2)
Light Duty Gas Vehicles (LDGV)
Motorcycles (MC)

MOBILE 5B

Mobile 5b is the mobile source model used to develop emission factors for volatile organic compounds, and other criteria pollutants (except lead and particulate matter) for on road vehicles. The model takes into account the effect of temperatures, vehicle fleet mix, average speeds, reid vapor pressure of gasoline, and the effects of state Inspection and Maintenance (I/M) programs to develop area specific emission factors. The mobile 5b emission factors are then multiplied by activity data and toxic pollutant

speciation profiles to estimate emissions. Interested persons can find this model and supporting documentation at U.S.EPA's Office of Mobile Sources (OMS) website[1].

Temperature Data

Temperature data were obtained electronically from Purdue University's website[2]. One set of monthly average high and low temperatures was used for the state.

Fuel Specifications, Model Year Registration Distribution Rates And Speeds Inputs

Fuel specifications, speeds for each vehicle and road type, and model year registration distribution rates used were obtained from U.S.EPA's mobile source inventories developed as part of the regional ozone control program (October 1998).

Fleet Mixes and I/M programs

National default fleet mix information included in the Mobile 5b model was used. Three different mobile 5b scenarios were run in order to accommodate areas with fuel requirements and I/M programs. These scenarios are:

1. Counties with a vehicle Inspection and Maintenance program and federal Reformulated Gasoline (RFG) requirements (Lake and Porter Counties),
2. Counties with a vehicle Inspection and Maintenance program and summertime fuel RVP requirements (Clark and Floyd Counties), and
3. Counties with no I/M or fuel requirements (rest of the state).

PART 5

The part 5 model provides PM and lead emission factors for exhaust emissions, brake and tire wear, and road dust. The Part 5 model provided an emission factor for lead with a value of zero for on road gasoline powered vehicles. Lead estimates were included for diesel exhaust emissions. The part 5 model and supporting documentation can also be obtained from the OMS website[1].

ACTIVITY DATA

Average daily vehicles miles traveled (DVMT) by vehicle type and road type were obtained from INDOT[3]. Road types include:

Road Types

Collector: Urban Total
Major Collector: Rural Total
Interstate: Rural Total
Interstate: Urban Total
Local: Rural Total
Local: Urban Total
Minor Arterial: Rural Total
Minor Arterial: Urban Total
Minor Collector: Rural Total

Other Freeways And Expressways: Urban Total
Other Principal Arterial: Rural Total
Other Principal Arterial: Urban Total

Monthly correction factors were applied since vehicle activity varies from month to month. Monthly correction factors used were 0.8 for January and February, 0.9 for March and December, 1 for April, May, September, October, and November, and 1.1 for June, July and August.

IDEM is currently working with the Northwest Regional Planning Commission to refine the activity data used in the Northwest Indiana mobile source inventory for transportation conformity purposes. The results of this effort were not available at the time this inventory was developed and are therefore not reflected in the annual estimates provided for Lake and Porter Counties.

CALCULATION METHOD

Monthly volatile organic compound (VOC) emissions were estimated outside of RAPIDS using the adjusted DVMT and monthly VOC emission factors obtained from Mobile 5b. Monthly VOC totals (by vehicle and road type by county) were then summed to obtain an annual total VOC estimate. VOC estimates were converted to Total Organic Gases (TOG) using conversion factors obtained from RAPIDS. PM emission estimates were made by multiplying the PM emission factor from the Part 5 model times the DVMT times 366 days per year for 1996. Speciation profiles taken from RAPIDS in March 1999 were used to estimate air toxic emissions.

Onroad Speciation Profiles

Code	Vehicle Category	Emission Type	Material Speciated
1101	LDGV	EXHAUST/EVAPORATIVE	TOG
1101	LDGT	EXHAUST/EVAPORATIVE	TOG
1101	MC	EXHAUST/EVAPORATIVE	TOG
1186	HDGV	EXHAUST/EVAPORATIVE	TOG
1201	LDDT	EXHAUST	TOG
1201	LDDV	EXHAUST	TOG
1201	HDDV	EXHAUST	TOG
31203	LDGV	EXHAUST	PM
31203	LDGT	EXHAUST	PM
31203	HDGV	EXHAUST	PM
31203	MC	EXHAUST	PM
32104	LDDV	EXHAUST	PM
32206	HDDV	EXHAUST	PM
32206	LDDT	EXHAUST	PM
34004	ALL VEHICLES	BRAKE WEAR	PM
41130	ALL VEHICLES	ROAD DUST	PM

For onroad sources the following air toxics were inventoried: acetaldehyde, acrolein, antimony, arsenic, benzene, Butadiene,13, cadmium, chromium, cobalt, copper, ethylbenzene, formaldehyde, lead, manganese, mercury, nickel, toluene, m-xylene, o-xylene, p-xylene.

NONROAD MOBILE SOURCES

DATA SOURCES

The primary data source used for making the nonroad estimates was U.S.EPA's nonroad model, issued June 1998, and revised July and October 1998. U.S.EPA's nonroad model and supporting documentation can also be downloaded from the OMS website[1]. The nonroad model provides emission estimates for VOC, particulate matter and other criteria pollutants by SCC in each county. Non road equipment types included in U.S.EPA's nonroad model and included in this inventory are shown below:

Equipment Types From U.S.EPA's Nonroad Model

Construction Equipment
Farm Equipment
Industrial Equipment
Lawn & Garden Equipment
Light Commercial Equipment
Logging Equipment
Recreational Boats
Recreational Vehicles
Service Equipment

Equipment Types Not Included in U.S.EPA's Nonroad Model

Aircraft
Commercial Marine Vessels
Railroads

VOC emissions were converted to TOG, and then speciation profiles from RAPIDS were applied. Speciation profiles obtained from RAPIDS as of March 1999 were used for non road mobile source HAP estimates.

Nonroad Mobile Speciation Profiles

Code	Category	Fuel	Material Speciated
1098	Air Taxi	Gas	TOG
1098	Aircraft	Gas	TOG
1201	Commercial Marine Vessels	Diesel	TOG
0001	Commercial Marine Vessels	Residual	TOG
1186	Construction Equipment	Gas	TOG
1201	Construction Equipment	Diesel	TOG
31203	Construction Equipment	Gas	PM
32104	Construction Equipment	Diesel	PM
1186	Farm Equipment	Gas	TOG

1201	Farm Equipment	Diesel	TOG
31203	Farm Equipment	Gas	PM
32104	Farm Equipment	Diesel	PM
1099	General Aviation	Gas	TOG
1101	Industrial Equipment	Gas	TOG
1186	Industrial Equipment	Gas	TOG
1201	Industrial Equipment	Diesel	TOG
31203	Industrial Equipment	Gas	PM
31230	Industrial Equipment	Gas	PM
32104	Industrial Equipment	Diesel	PM
1101	Lawn & Garden Equipment	Gas	TOG
31203	Lawn & Garden Equipment	Gas	PM
31230	Lawn & Garden Equipment	Gas	PM
1101	Light Commercial Equipment	Gas	TOG
1201	Light Commercial Equipment	Diesel	TOG
31203	Light Commercial Equipment	Gas	PM
32104	Light Commercial Equipment	Diesel	PM
1186	Logging Equipment	Gas	TOG
1201	Logging Equipment	Diesel	TOG
31203	Logging Equipment	Gas	PM
32104	Logging Equipment	Diesel	PM
1097	Military Aircraft	Gas	TOG
1201	Railroads	Diesel	TOG
32104	Railroads	Diesel	PM
32202	Railroads	Diesel	PM
1101	Recreational Boats	Gas	TOG
1201	Recreational Boats	Diesel	TOG
31102	Recreational Boats	Gas	PM
31203	Recreational Boats	Gas	PM
32104	Recreational Boats	Diesel	PM
32202	Recreational Boats	Diesel	PM
1101	Recreational Vehicles	Gas	TOG
1201	Recreational Vehicles	Diesel	TOG
31203	Recreational Vehicles	Gas	PM
31230	Recreational Vehicles	Gas	PM
32104	Recreational Vehicles	Diesel	PM
1186	Service Equipment	Gas	TOG
1201	Service Equipment	Diesel	TOG
31203	Service Equipment	Gas	PM
32104	Service Equipment	Diesel	PM

For nonroad source estimates obtained using the U.S.EPA nonroad model the following air toxics were inventoried: acetaldehyde, acrolein, arsenic, benzene, Butadiene,13, chromium, copper, ethylbenzene, formaldehyde, lead, manganese, mercury, naphthalene, nickel, phenol, styrene, toluene, m-xylene, o-xylene, and p-xylene.

For categories not included in U.S.EPA's nonroad model, the remainder of this document explains how those categories were inventoried.

RAILROADS

The SCC used for railroads is 2285002005. Air toxics inventoried include acetaldehyde, arsenic, chromium, copper, formaldehyde, lead, manganese, mercury and nickel. The activity is gallons of diesel fuel consumed. Railroad activity for 1996 was estimated from data developed for the 1990 ozone inventory. The 1990 railroad activity was based on measured county miles of tracks, traffic density, and a fuel consumption index for class 1 railroads. A growth factor of 1.05 was developed using the estimated change in the total nationwide miles of railroad travel between 1990-1996 obtained from the 1997 Statistical Abstract of United States[4]. It was assumed the national change in the total miles of railroad travel was representative of the change in railroad miles for Indiana. It was also assumed that Class II and Class III railroads changed at the same rate as the Class I railroads.

The VOC and particulate emission factors used for this category were obtained from the U.S. EPA Office of Mobile Sources[1] in a fact sheet released in December, 1997. The emission factors used are:

EMISSION FACTORS

Pollutant	lb/1000 gals
PM	17.53
VOC	34.17

VOC emissions were then converted to TOG using conversion factors from RAPIDS. Air toxics were estimated using speciation profiles from RAPIDS.

SAMPLE CALCULATION

Adams County

905,873 gallons * 34.17 lbs VOC/1000 gallons * 1 lb TOG/lb VOC * 0.0291 lbs acetaldehyde/lb TOG = 901 lbs acetaldehyde

COMMERCIAL MARINE VESSELS

The SCCs for this category are 2280002000, for diesel fuel usage, and 2280003000, for residual fuel usage. The air toxics inventoried include acetaldehyde and formaldehyde.

This category consists of the emissions that result from waterborne commercial activities. It does not include estimates for recreational boating activities which are included in U.S.EPA's Nonroad Model. This category includes ports in Lake and Porter Counties along Lake Michigan in Northwest Indiana. The ports included are the Indiana Harbor in Lake County, and Burns Harbor in Porter County. No air emission estimates were made for the ports or commercial marine vessel activities along the Ohio River.

The 1996 Waterborne Commerce of the United States: Waterways and Harbors on the Great Lakes[5] was used to estimate the level of activity. The activity is the number of reported vessels entering and leaving these ports and the draft size of those vessels. The methodology followed was from U.S.EPA's Procedures for Emission Inventory Preparation, Volume IV (July 1989)[6]. Following this methodology there are two activities that must be estimated to account for commercial marine vessel emissions, underway and dockside emissions. Underway emissions are emissions that result in combustion of fuel while moving. Dockside emissions result from ships sitting at rest along the dock, but with the engines idling.

UNDERWAY EMISSIONS

The underway emissions calculation uses average fuel consumption rates for vessels of different drafts, emission factors based upon draft, and the area of Lake Michigan that is under Indiana's jurisdiction. The surface area (228 square miles) of Lake Michigan in Indiana is multiplied by 0.275 to determine the average hours of travel (62.7 hours).

Using this estimate of time in travel an estimate of the fuel consumed can be made using the average rate of consumption per the vessel's draft. Then by applying the appropriate emission factor and toxic speciation profile emissions were calculated. The table below shows the average fuel consumption rates and emission factors for vessels of various drafts.

UNDERWAY FUEL CONSUMPTION RATES AND
EMISSIONS FACTORS FOR COMMERCIAL MARINE VESSELS

Vessel Draft	**Diesel Consumption Rates**	**Emission Factors (lb/1000 gallon)**
	Gallon/hour	**VOC**
$6 and >12	10	44.5
$12 and >18	44	16.8
$18	128	50.0

SAMPLE CALCULATION

Lake County underway emissions calculation for vessels with a thirty-one foot draft

62.7 hours * 14 vessels * 128 gallons/hour * 50 lbs VOC/1000 gallons * 1.95 lb TOG/lb VOC * 0.0291 lbs acetaldehyde/lb TOG = 319 lbs acetaldehyde

DOCKSIDE EMISSIONS

To calculate dockside emissions it was assumed that all foreign vessels use residual fuel and all domestic vessels use diesel fuel, that vessels spend three days at dock, and that residual fuel is consumed at a rate of 660 gallons per day and diesel fuel at a rate of 1,900 gallons per day. To estimate the amount of fuel consumed, data on the number of foreign and domestic vessels from the 1996 Waterborne Commerce[5] were used.

DOCKSIDE FUEL CONSUMPTION RATES AND EMISSIONS FACTORS FOR COMMERCIAL MARINE VESSELS

Vessel Draft	Consumption Rates	Emission Factors (lb/1000 gallon)
	Gallon/day	VOC
Foreign (residual fuel)	660	59.0
Domestic (diesel fuel)	1,900	3.2

SAMPLE CALCULATION

Lake County dockside residual emissions

68 vessels * 3 days * 660 gallons/day * 59 lbs VOC/1000 gallons * 1.72 lb TOG/lb VOC * 0.42 lbs formaldehyde/lb TOG = 5738 lbs formaldehyde

Air toxic emissions were calculated using speciation profiles obtained from RAPIDS. Underway estimates were totaled and combined with the dockside estimates by fuel type and entered as a county total into RAPIDS.

AIRCRAFT

Aircraft emissions were estimated from operations data obtained from the Indiana Department of Transportation Aeronautics Division[7]. INDOT maintains operations information for four general types of aircraft (commercial, air taxi, general aviation and military) at its website. Each operation represents either a landing or a takeoff, so the county total number of operations were divided by two to match the emission factors. If a county has multiple airports, the operations at each airport were combined for a county total number of operations.

Due to the lack of aircraft and engine specific data at Indiana airports, composite emission factors for a combined landing and takeoff operation (LTO) were developed from the Federal Aviation Administration FAA Aircraft Engine and Emission Database (FAAED)[8] using data from table S_lto.dbf. The factors used are shown below:

SCC/AMS CODE	AIRCRAFT	LB VOC/LTO
2275001000	Military	27.10
2275020000	Commercial	7.16
2275060000	Air taxi	1.23
2275050000	General aviation	0.39

VOC were converted to TOG and air toxics were estimated using speciation profiles from RAPIDS. Air toxics inventoried include acetaldehyde, acrolein, benzene, Butadiene,13, ethylbenzene, formaldehyde, naphthalene, phenol, styrene, toluene, and o-xylene.

SAMPLE CALCULATION

Adams County Commercial Aircraft Estimate

471 operations/year * 1 LTO/2 operations * 7.16 lbs VOC/LTO * 1.18 lbs TOG/lb VOC * 0.047 lbs acetaldehyde/lb TOG = 93 lbs acetaldehyde/year

RESULTS

The attached table provides mobile source emission totals by county.

REFERENCES

1. United States Environmental Protection Agency, Office of Mobile Sources, Emissions Estimation/Modeling Software & Databases, December, 1998 available at http://www.epa.gov/oms/
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3. Indiana Department of Transportation, Planning Section, electronic data file of daily vehicle miles traveled by County by functional class, December, 1998.
4. 1997 Statistical Abstract of the United States, Bureau of Census, Department of Commerce, http://www.census.gov/prod/www/abs/cc07stab.html
5. 1996 Waterborne Commerce of the United States: Waterways and Harbors on the Great Lakes, United States Army Corps of Engineers, Navigation Data Center, Waterborne Commerce Statistics Center, July, 1998 available at http://www.wrsc.usace.army.mil/ndc/wcsc.html
6. United States Environmental Protection Agency, Procedures for Emission Inventory Preparation, Volume IV Mobile Sources, EPA-450/4-81-026(d), July 1989.
7. Indiana Department of Transportation, Intermodal Transportation Division, Aeronautics Section, December, 1998 available at http://www.state.in.us/dot/intermodal/aero.htm
8. FAA Aircraft Engine Emission Database (FAAED) and Users Guide, Version 2.0, December 1998, available at http://www.epa.gov/oms/nonrdmd1.htm

INFORMATION

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Table B-1: Indiana Mobile Source emissions by county in pounds/year (continued)

	Adams	Allen	Bartholomew	Benton	Blackford	Boone	Brown	Carroll	Cass	Clark	Clay
Acetaldehyde	13399.08	139363.8	40305.17	11848.08	5916.07	34543.58	5035.2	11431.5	18012.96	44747.79	16426.52
Acrolein	962.82	16610.3	6811.3	477.59	472.21	3189.61	527.15	933.18	1560.24	7000.45	1391.37
Antimony	42.89	468.24	112.73	25.33	20.23	123.57	19.92	36.87	59.33	179.41	58.74
Arsenic	81.7	894.91	216.83	49.29	42.22	244.74	40.63	73.58	115.36	336.68	110.28
Benzene	24263.82	296989.2	67742.54	12680.07	12820.27	59484.47	12996.14	20480.81	36194.17	81284.34	30460.72
Butadiene,13	25527	310738	69922	13397.9	13266.5	62836.4	14758.02	21832.7	37913	83846	32113.5
Cadmium	22.19	234.32	55.56	12.17	10.62	62.01	10.83	18.18	28.55	89.92	29.44
Chromium	40.73	449.12	110.07	25.63	21.09	130.2	20.4	37.29	57.22	172.4	57.37
Cobalt	0.59	6.29	1.51	0.35	0.31	1.75	0.29	0.5	0.8	2.45	0.79
Copper	280.75	3098.65	738.68	172.86	139.42	826.96	137.8	248.59	387.7	1164.21	390.7
Ethylbenzene	12697.39	153863.5	34147.65	6573.56	6637.61	30551.67	6953.44	10570.64	18961.12	40798.11	15861.37
Formaldehyde	37896.94	391318.9	116259.4	34354.55	16597.87	99050.87	14113.04	32761.72	51219.61	129391.8	46552.46
Lead	71.62	613.6	185.03	69.99	27.22	222.77	23.47	61.38	89.56	219.36	97.44
Manganese	142.82	1597.85	372.84	99.95	73.11	413.31	70.69	124.08	196.48	586.91	201.5
Mercury	2.8	21.55	7.59	2.47	1.02	8.02	1.04	2.36	3.22	9.18	3.12
Naphthalene	14	1427	1117			245		40.05	54	1035	63.5
Nickel	13.97	149.12	36.75	9.44	6.49	42.3	6.75	12.58	18.52	54.76	19.07
Phenol	5.5	607	478			104		17.03	23	436.4	27.3
Styrene	9	977	764			169		27.04	38	710.5	44.5
Toluene	82476.04	996402	219199.8	42922.86	43064.72	199158.2	45977.77	69156.27	122872	263300.5	103108.7
Xylene,M	2798.82	36299.4	9375.55	1207.98	1547.18	5628.27	522.54	1686.62	4585.27	9864.35	3380.52
Xylene,O	25037.42	302605.6	66617.97	13035.06	13073.28	60476.39	13954.84	20992.48	37306.43	80000.55	31309.39
Xylene,P	38836	466651	101187	20413.2	20212.7	94588.6	22487.03	33077.7	57516	122795	48626.8

Table B-1: Indiana Mobile Source emissions by county in pounds/year (continued)

	Clinton	Crawford	Daviess	Dearborn	Decatur	Dekalb	Delaware	Dubois	Elkhart	Fayette	Floyd
Acetaldehyde	19619.71	7400.35	12777.13	18700.18	17043.46	24345.8	55728.17	22739.43	83110.09	9437.34	22706.35
Acrolein	1486.62	501.88	834.29	1370.71	1248.83	1809.54	8127.48	1655.59	9566.4	1003.81	1860.6
Antimony	67.68	29.91	34.83	76.01	63.39	74.77	226.79	66.15	247.12	32.71	108.41
Arsenic	136.38	54.87	65.39	147.33	120.09	144.74	428.71	130.93	476.15	64.57	207.42
Benzene	36424.03	13379.88	21869.02	35311.7	29717.02	39096.3	134078.5	43854.97	165635.7	21983.6	50466.15
Butadiene,13	38342	14113.73	23419.4	38191.5	31378.9	40855	141259	41995	164957	22665	52062
Cadmium	35.88	14.83	18.43	41.19	30.74	36.7	112.02	32.36	122.06	16.01	52.88
Chromium	69.65	29.51	33.79	77.12	62.95	75.47	209.59	65.5	237.23	30.88	104.65
Cobalt	1	0.42	0.49	0.98	0.79	1.01	3.08	0.89	3.43	0.44	1.49
Copper	465.09	194.92	234.53	514.74	417.86	500.1	1465.66	434.84	1651.45	215.14	703.99
Ethylbenzene	18885.52	6909.17	11655.38	18306.88	15388.55	20223.44	68677.54	22179.82	84118.2	11385.38	26290.96
Formaldehyde	55566.49	21126.65	36324.98	53286.55	48646.36	69891.1	155864.2	64493.02	234631.1	26113.1	63708.94
Lead	116.23	53.35	66.53	124.41	107.63	151.25	218.76	118.28	368.71	38.49	132.96
Manganese	237	99.46	127.16	264.06	212.7	273.23	727.63	225.65	868.53	109.78	352.45
Mercury	4.34	1.93	2.33	4.19	3.62	5.58	9.11	4.36	13.62	1.51	5.03
Naphthalene	32			2.5	33.3	91	796	41	948	50	
Nickel	23.85	10.5	11.56	24.65	20.9	27.28	67.82	21.26	80.34	9.59	34.14
Phenol	14			0.7	15.1	39	337	18.5	401	22.5	
Styrene	23			1.4	24.2	64	546	29	653	35	
Toluene	123043.6	45134.65	75753.63	120383.8	100349	131313.7	446769.9	141391.7	539075.2	73597.32	170088.8
Xylene,M	3743.43	1221.79	2552.92	2220.51	2896.52	4442.4	13438.52	8273.07	26626.7	2931.31	6742.15
Xylene,O	37361.72	13702.51	22998.3	36548.01	30470.77	39875.25	135683.8	42941.53	163743.3	22355.46	51640.69
Xylene,P	58283	21508.04	35693.7	58189.8	47653	61810	211422	63803	246807	34295	79335

Table B-1: Indiana Mobile Source emissions by county in pounds/year (continued)

	Fountain	Franklin	Fulton	Gibson	Grant	Greene	Hamilton	Hancock	Harrison	Hendricks	Henry
Acetaldehyde	11412.03	9450.43	12109.81	19466.75	32986.59	18473.88	81201.98	39912.3	15161.07	45050.65	27003.06
Acrolein	699.17	722.15	1196.25	1379.85	3489.68	1286.55	8969.26	5741.62	1188.89	3377.71	2037.83
Antimony	35.1	34.55	37.06	67.63	116.97	57.22	241.23	142.64	67.31	141.66	105.39
Arsenic	66.74	68.11	71.84	131.69	225.32	109.71	465.6	270.52	128.02	278.81	203.56
Benzene	17693.12	18532.12	22265.92	35337.25	72427.17	31131.62	139447.2	71229.85	31415.44	73016.2	51040.77
Butadiene,13	18703.4	20110.2	23691.7	38609.5	75565	33320.3	144561	74952.6	33238.5	75788.3	54188.7
Cadmium	18.79	18.89	19.07	33.79	58.36	29.8	119.22	69.95	35.16	71.17	52.19
Chromium	35.38	35.37	35.35	67.16	112.67	53.73	240.15	138.62	66.17	144.49	103.17
Cobalt	0.53	0.45	0.56	0.98	1.69	0.79	3.2	2.07	0.88	1.89	1.4
Copper	234.64	242.5	250.78	450.88	784.03	392.71	1569.72	926.73	444.45	950.31	698.8
Ethylbenzene	9206.28	9614.07	11622.36	18804.62	37717.52	16069.56	71457	35530.95	16159.8	37661.95	26523.22
Formaldehyde	32766.87	26912.27	34609.25	55300.64	92165.8	52707.99	231850.1	115108.5	43084.28	128074.9	76413.02
Lead	76.08	53.78	60.96	114.1	153.91	91.64	436.94	210.76	96.92	276.16	176.37
Manganese	119.4	124.4	128.48	229.51	398.19	225.48	790.23	467.74	225.36	492.48	357.42
Mercury	2.69	2.06	2.11	4.19	5.63	3.36	16.14	7.63	3.1	10.02	6.51
Naphthalene	8.5	2	91		205	24.5	984	792		173	27
Nickel	11.97	11.7	11.93	23.09	38.36	19.89	77.53	46.29	20.68	49.4	36.63
Phenol	4.3	0.5	38.5		88	11.2	419	337		73	11.4
Styrene	6.5	1	62		140	17.4	676	544		119	18.5
Toluene	60034.23	63276.33	75540.72	123026.9	244159.9	105379.4	461840.1	231659	105794	244265.1	173187.9
Xylene,M	1796.92	1097.32	2399.52	3054.85	9195.17	2283.72	17562.3	5773.46	2563.24	8670.2	4761.27
Xylene,O	18232.6	19207.22	22945.67	37346.53	74152.13	31991.39	140280.7	70375.78	32111.12	74168.29	52580.43
Xylene,P	28458.7	30638.3	35668	58837.8	114179	50650.5	215555	110414.9	50643.7	114656.5	82447

Table B-1: Indiana Mobile Source emissions by county in pounds/year (continued)

	Huntington	Jackson	Jasper	Jay	Jefferson	Jennings	Johnson	Knox	Kosciusko	Lagrange	Lake
Acetaldehyde	23014.84	25830.1	22875.54	11373.18	12920.49	11073.74	41105.03	20924.18	31040.71	19954.56	176730.4
Acrolein	2066.07	2187.04	1552.2	1236.49	1918.1	1618.97	4344.93	1445.92	3459.1	1641.51	16803.6
Antimony	83.1	97.32	80.85	37.88	42.55	41.49	122.85	70.08	109.81	77.87	662.46
Arsenic	157.32	179.91	156.62	75.03	80.93	77.21	238.32	137.78	206.35	151.44	1254.04
Benzene	43346.95	46810.18	37020.73	21740.03	26815.12	21779.32	73310.5	37542.13	69426.38	43052.85	330102
Butadiene,13	45437	48897	39429.2	22675.1	28465.9	22959.5	76875	40476.4	73737	46026	336334
Cadmium	43.12	48.25	41.52	19.67	22.23	19.99	62.68	35.25	54.89	40.29	328.46
Chromium	82.97	95.4	83.45	36.79	40.12	38.01	127.39	67.23	102.55	80.28	632.81
Cobalt	1.09	1.24	1.2	0.51	0.62	0.54	1.77	1.03	1.47	1.07	8.33
Copper	550.6	627.32	541.1	249.15	287.45	260.09	815.63	472.15	713.62	517.32	4337.16
Ethylbenzene	22524.22	24300.23	19326.22	11103.34	13734.66	11131.56	38197.19	19866.8	35709.83	22388.52	171862.9
Formaldehyde	65525.42	73326.62	65572.7	32455.09	36706.47	31573.46	116938.8	59460.31	87855.99	56570.43	524260.9
Lead	136.44	168.29	162.98	53.82	51.68	45.3	232.49	115.26	144.28	126.41	831.38
Manganese	283.09	318.24	273.45	123.31	146.95	132.65	419.62	242.4	363.89	260.83	2202.63
Mercury	5.47	6.49	5.72	2.12	2.04	1.88	8.52	3.95	5.62	4.74	33.28
Naphthalene	114.5	115	38.4	111.1	235	208	414		215		1239
Nickel	26.86	31.22	29.86	12.24	13.76	11.84	43.34	23.25	32.87	25.16	208.75
Phenol	49.3	49	17.2	48.05	101	89.4	175		91		523
Styrene	79.4	79	27.3	76.05	161	141.5	285		147		849
Toluene	146157.3	157564.8	126060.7	72104.35	89292.44	72199.33	246879	129677.4	233338	146577.5	1103295
Xylene,M	5082.05	5599.28	3592.03	2310.23	2646.52	2345.22	9531.7	3649.03	6001.48	3592.95	53105
Xylene,O	44379.03	47852.54	38270.42	21901.16	27123.5	21930.01	74979.12	39367.82	70848.64	44496.32	335078.3
Xylene,P	68684	73961	59902.5	34018	42252	33997.8	115160	61673.7	111335	70139	506563

Table B-1: Indiana Mobile Source emissions by county in pounds/year (continued)

	Laporte	Lawrence	Madison	Marion	Marshall	Martin	Miami	Monroe	Montgomery	Morgan	Newton
Acetaldehyde	60888.52	16901.22	55708.74	376862.9	26195.24	4604.28	17918.15	36877.51	22558.74	26207.73	12049.39
Acrolein	5232.8	1825.84	5914.59	51563.4	2292.07	332.96	1084.07	4868.57	2069.72	2113.42	789.93
Antimony	205.16	62.68	206.48	1410.35	98.45	18.46	56.04	135.11	80.9	103.66	32.5
Arsenic	396.54	120.99	398.65	2680.11	190.89	33.72	106.74	257.34	156.73	202.18	62
Benzene	110722.7	37184.52	128940.7	846408.1	50472.43	8213.81	28213.59	84717.04	42775.33	55221.5	15717.28
Butadiene,13	116577	39986	135375	885682	54411	9280.9	30369.6	90152	44613	59141.5	17145.3
Cadmium	101.18	29.32	105.53	707	50.34	8.56	28.39	68.53	42.2	51.7	15.53
Chromium	204.48	59.53	196.06	1347.24	94.15	17.22	55.6	124.64	79.61	104.18	31.49
Cobalt	2.72	0.83	2.84	18.01	1.36	0.25	0.78	1.79	1.1	1.36	0.42
Copper	1372.64	413.92	1377.18	9198.93	660.97	119.86	375.76	880.82	532.15	689.7	217.77
Ethylbenzene	57925.65	19501.96	67332.54	441958.5	26337.12	4411.06	14943.93	44006.29	21944.31	29221.24	8286.16
Formaldehyde	171601.7	47736.95	154615.4	1052623	74540.05	13129.09	51103.81	103336.3	64155.99	73411.01	34852.98
Lead	341.45	80.56	249.82	1601.79	138.96	28.97	107.59	153.59	126.53	147	73.56
Manganese	732.14	217.84	704.55	4604.62	345.01	61.52	197.71	443.82	269.71	352.67	117.57
Mercury	12.72	3.06	9.93	63.05	4.68	1.08	3.74	5.79	4.39	5.45	2.55
Naphthalene	275	104	280	5152	90			426	122.5		46
Nickel	70.29	20.58	67.32	434.15	32.15	6.36	18.84	38.9	25.72	34.04	12.19
Phenol	116	44	120	2173	38			182	52.2		19.5
Styrene	189	72	192	3528	62			292	85.4		32.5
Toluene	375645.2	127192.6	436661.1	2851237	172368.5	29113.23	97465.85	286235.2	142710.1	190358.7	54183.32
Xylene,M	13339.83	3584.63	15554.72	116425.1	4173.64	452.62	2849.3	8817.04	4558.43	5869.12	1326.48
Xylene,O	114073	38616.8	132590.9	865997.2	52334.62	8841.64	29592.35	86921.93	43333.22	57794.25	16453.21
Xylene,P	176326	60441	204941	1324830	82484	14140.2	46269.8	135332	67386	90123.8	25910.5

Table B-1: Indiana Mobile Source emissions by county in pounds/year (continued)

	Noble	Ohio	Orange	Owen	Parke	Perry	Pike	Porter	Posey	Pulaski	Putnam
Acetaldehyde	24558.44	1647.46	6841.54	7594.78	8588.91	8278.98	7867.98	80100.46	17961.07	9971.21	24508.78
Acrolein	1821.18	141.31	873.45	527.44	723.94	787.75	539	5960.59	1168.79	700.81	2493.29
Antimony	73.82	7.59	26.95	29.05	34.84	32.71	26.89	244.86	57.67	29.64	85.15
Arsenic	147.08	13.03	49.91	54.15	68.07	61.33	53.55	476.99	111.33	55.06	164.29
Benzene	40604.07	3675.45	14170.62	13447.12	18968.22	18323.7	13893.2	118205.7	30892.47	16108.26	40219.33
Butadiene,13	42544	3907.8	15352.6	14749.2	20305.1	19370.5	15082.94	121808	32805.6	17340.3	42808.5
Cadmium	36.46	3.51	13.58	12.96	16.5	16.05	13.3	122.28	29.54	12.96	44.95
Chromium	70.99	6.41	24.69	28.09	33.95	31.28	28.16	247.23	58.17	28.97	87.76
Cobalt	1.05	0.1	0.38	0.37	0.47	0.47	0.34	3.39	0.76	0.4	1.11
Copper	522.98	45.56	174.68	189.37	226.87	217.5	185.84	1673.76	384.87	182.85	570.66
Ethylbenzene	20792.92	1894.86	7352.21	7158.8	9912.59	9588.93	7143.71	61195.15	16152.52	8493.12	20784.22
Formaldehyde	70373.32	4666.46	19635.64	21686.75	24360.92	23261.3	22487.97	272379.8	51124.54	28634.66	70362.61
Lead	128.54	8.5	34.71	42.38	45.1	47.08	40.92	440.28	107.94	54.27	152.72
Manganese	288.47	22.84	87.61	100.97	113.89	107.45	102.04	904.32	200.08	94.55	294.47
Mercury	4.51	0.33	1.38	1.63	1.61	1.91	1.65	16.38	3.97	1.99	6.12
Naphthalene	78		85			26.05		417		22	249
Nickel	26.79	2.2	8.19	10	11.12	10.69	9.08	85.94	18.88	9.2	28.7
Phenol	33.5		36.4			10.53		177		9	106
Styrene	54		58.5			17.05		286		16	171
Toluene	135639.7	12421.87	48059.52	46890.32	64811.12	62326.78	47144.01	395053.2	105317	55378.4	135223.3
Xylene,M	3847.07	293.25	1141.52	1103.12	1671.32	2053.7	620.78	16240.7	3085.27	1573.67	4014.13
Xylene,O	41185.53	3771.69	14597.65	14236.15	19676.87	18933.17	14310.09	119970.4	31974.93	16813.66	41073.02
Xylene,P	64447	5950.4	22986.9	22471.3	30943.2	29394.5	22983.06	183610	49991.9	26314.5	64035.8

Table B-1: Indiana Mobile Source emissions by county in pounds/year (continued)

	Randolph	Ripley	Rush	Scott	Shelby	Spencer	St. Joseph	Starke	Steuben	Sullivan	Switzerland
Acetaldehyde	16202.68	12086.22	10905.81	10124.51	26448.02	22492.53	100572.1	10994.84	26198.32	15053.92	2598.04
Acrolein	1181.36	908.99	709.06	842.17	2482.95	956.26	13402.4	1391.38	2447.35	1140.06	269.21
Antimony	48.06	45.98	35.36	42.6	87.37	49.92	316.89	33.63	91.81	40.53	12.04
Arsenic	93.12	89.25	68.44	83.78	169.44	100.42	614.18	65.66	177.11	81.47	22.93
Benzene	26412.52	23733.82	18834.72	21843.32	45908.5	25779.5	212646.9	17896.62	49574.75	20305.11	6560.99
Butadiene,13	28129.8	25468	19848.3	23386.5	47601	26770.4	221126	19413.3	52758	22397.1	7005.7
Cadmium	23.95	24.45	18.03	22.19	43.65	25.53	159.36	18.07	46.17	20.6	5.91
Chromium	46.67	45.54	34.91	42.86	87.97	55.22	303.37	31.75	95.19	41.49	10.75
Cobalt	0.69	0.64	0.47	0.59	1.24	0.65	4.5	0.49	1.33	0.55	0.17
Copper	324.98	317.16	228.53	285.19	576.06	337.87	2089.7	226.3	615.63	290.61	78.85
Ethylbenzene	13613.49	12335.18	9879.88	11492.74	23864.64	13332.63	109693.4	9122.26	25701.3	10578.15	3420.63
Formaldehyde	46342.07	34409.79	31011.86	28596.53	75428.67	65141.21	281569.3	31934.15	74361.25	43578.59	7324.14
Lead	86.57	71.91	60.16	65.96	158.4	157.68	408.15	52	165.7	84.57	11.45
Manganese	173.84	160.07	113.43	140.89	288.86	180.02	1065.77	117.44	320.64	161.6	38.86
Mercury	3.18	2.79	2.18	2.43	5.93	5.33	14.48	1.91	5.81	2.92	0.5
Naphthalene	47			2	203		1424	182	145.3	89	6
Nickel	16.37	16.83	11.09	14.54	29.34	18.64	96.84	11.71	31.75	15.19	3.43
Phenol	20			1	87		601	76.5	62.2	37.4	2.5
Styrene	32			2	140		975	125	100.2	61.5	4
Toluene	89101.24	80868.33	64209.23	74972.54	153971.1	86648	708452.6	59738.32	167627.7	69588.72	22340.47
Xylene,M	2142.92	1837.12	2180.62	2147.03	6304.7	2965.4	27690.9	1198.62	4670.87	1149.11	593
Xylene,O	27055.01	24551.7	19499.11	22763.57	46765.85	26304.57	215185.5	18145.78	50894.73	21131.74	6782.22
Xylene,P	42641	38810	30239.4	35623.8	71566	40788.6	330101	28713.4	79692	33700.2	10654.1

Table B-1: Indiana Mobile Source emissions by county in pounds/year (continued)

	Tippecanoe	Tipton	Union	Vanderburgh	Vermillion	Vigo	Wabash	Warren	Warrick	Washington	Wayne
Acetaldehyde	64699.4	10965.37	3829.55	66215.51	11188.27	53652.85	17704.47	8526.48	20139.23	10295.03	37630.37
Acrolein	9541.6	753.9	277.19	9230.2	960.41	9830.26	2109.14	502.84	1649.02	1150.58	3982.76
Antimony	194.8	41.34	12.61	204.6	42.05	161.88	58.54	24.93	78.35	39.61	160.76
Arsenic	373.86	79.83	22.74	391.18	78.3	309.67	109.77	47.96	149.9	76.54	314.74
Benzene	116610.9	19139.62	7012.42	145164.5	20572.75	107409.2	37640.72	13002.48	41450.58	22780.52	88976.05
Butadiene,13	120516	21090.5	7780.5	150718	22565.3	112654	39529	14078.66	44081.7	23450.6	94086
Cadmium	96.14	20.5	6.25	104.02	20.71	82.21	29.37	12.92	37.2	18.82	83.81
Chromium	191.85	40.4	11.58	193.52	42.48	154.69	53.73	23.15	78.29	37.56	156.96
Cobalt	2.48	0.61	0.18	2.78	0.57	2.08	0.78	0.35	1.01	0.55	2.29
Copper	1281.12	278.67	80.18	1352.24	279.57	1080.76	384.49	165.56	517.37	258.01	1077.39
Ethylbenzene	59161.3	10028.96	3725.73	75151.38	10876.93	54639.63	19440.1	6784.21	21767.61	11711.66	45992.52
Formaldehyde	184398.6	31307.84	10918.93	184931.8	31848.26	152429.1	50293	24495.4	56871.82	29016.85	105102.1
Lead	295.16	63.93	20.81	253.83	66.62	178.97	74.33	47.93	120.48	44.5	190.99
Manganese	645.8	141.69	42.01	693.17	143.96	549.79	197.25	87.16	263.48	127.26	539.77
Mercury	11.26	2.28	0.69	9.82	2.59	7.31	2.9	1.77	4.26	1.85	7.47
Naphthalene	1352			995	41	1503	181.5		19	80.6	161
Nickel	59.92	13.64	3.95	65.1	14.37	50.87	18.86	8.34	25.19	12.6	49.54
Phenol	572			420	18	643	77.3		8	34.3	69
Styrene	929			682	28	1030	125.4		13	55.4	112
Toluene	381253.5	66132.03	24498.47	484507.9	71271.39	352560.7	126149.5	44562.9	141777.5	75722.63	300052.8
Xylene,M	15187	999.52	441.53	20020.5	1618.06	13121.39	4239.83	919.35	4416.09	2918.52	8484.07
Xylene,O	115834.5	20076.29	7436.98	147169.1	21644.83	107126.6	38307.32	13526.44	43047.25	22992.39	91099.53
Xylene,P	177150	32139.7	11850.8	224890	34186.5	164439	59368	21458	67079	35342.9	142601

Table B-1: Indiana Mobile Source emissions by county in pounds/year (continued)

	Wells	White	Whitley	**State Total**
Acetaldehyde	13140.58	23465.51	15592.92	**2829029.6**
Acrolein	1011.99	1825.31	1221.1	**304979.67**
Antimony	40.72	68.94	62.14	**9817.24**
Arsenic	78.96	134.71	120.9	**18853.27**
Benzene	24106.92	37121.13	32026.66	**5561591.2**
Butadiene,13	24986.7	40012	34225.8	**5825424.6**
Cadmium	20.29	35.56	30.86	**4922.84**
Chromium	40.36	73.53	59.9	**9558.57**
Cobalt	0.58	0.89	0.85	**132.09**
Copper	271.4	464.36	411.18	**64947.32**
Ethylbenzene	12427.18	19444.41	16759.92	**2881313.6**
Formaldehyde	37449.23	67388.11	43975.51	**8111795.1**
Lead	64.96	143.53	85.76	**14255.57**
Manganese	142.62	245.36	207.89	**33238.74**
Mercury	2.41	5.74	3.04	**535.29**
Naphthalene	30	102.4		**25085.7**
Nickel	13.26	24.03	19.03	**3169.99**
Phenol	13	43.2		**10644.41**
Styrene	21	71.3		**17219.54**
Toluene	80679.63	126945.9	109479.7	**18671350**
Xylene,M	2805.62	3382.33	2966.07	**666121.43**
Xylene,O	24499.61	38548.62	33233.43	**5670337.9**
Xylene,P	37935	60481	52153	**8756413.2**

Appendix C: Michigan Toxic Emissions Inventory

Michigan's portion of the mobile sources toxic inventory was unavailable at time of publication.

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Appendix D: Minnesota Toxic Emissions Inventory

BACKGROUND

The Minnesota portion of the Great Lakes regional air toxics emission inventory for mobile sources includes four subcategories: on-road sources, non-road sources, aircraft, and locomotives. Although an emission factor method is preferred to estimate air toxics emissions, the information was only available for some air toxics emitted from on-road sources. In most cases, the air toxics emissions were estimated by using a speciation method which speciates total organic gases (TOG), particulate matter (PM), and/or particulate matter smaller than 10 microns (PM10) to individual air toxics. The TOG, PM, and/or PM10 emission factors were obtained from respective information sources for the four mobile source subcategories. The emission factors and speciation profiles for air toxics were directly from the 1996 National Toxics Inventory (NTI) with a supplement of speciation factors from EPA SPECIATE 1.5 for the pollutants not included in the NTI[1]. The following sections discussed the detailed data collection and emission estimation for each subcategory.

ON-ROAD SOURCES

Estimating emissions for on-road mobile sources was an important part of Minnesota's 1996 statewide air toxics emission inventory. The Minnesota Pollution Control Agency (MPCA) estimated emissions from on-road vehicles in several steps, using modeled emission factors, activity factors, and speciation profiles.

U.S. EPA's Mobile5b[2] and Part5[3] models produced total organic gases (TOG) and particulate matter (PM10) emission factors, respectively, for 87 counties in Minnesota. The TOG factors included exhaust (tailpipe) and engine evaporative factors. Refueling losses from vehicles were covered in a separate area source category. Exhaust PM10 emission factors were obtained along with PM10 factors for brake and tire wear.

The on-road fleet in each county was broken down into eight vehicle types:

Light Duty Gasoline Vehicles (LDGV)
Light Duty Gasoline Trucks; gross vehicle weight rating 0-6000 lbs. (LDGT1)
Light Duty Gasoline Trucks; gross vehicle weight rating 6001-8500 lbs. (LDGT2)
Heavy Duty Gasoline Vehicles (HDGV)
Light Duty Diesel Vehicles (LDDV)
Light Duty Diesel Trucks (LDDT)
Heavy Duty Diesel Vehicles (HDDV)
Motorcycles (MC)

Each of the emission factors were combined with the appropriate activity factor, vehicle miles traveled (VMT), to obtain TOG and PM10 emissions.

The source of the VMT data and the specific inputs to the US EPA models will be discussed further.

Mobile5b Emission Factors For TOG

U.S. EPA's Mobile5b model uses many factors to create TOG emission factors for on-road vehicles, including ambient temperature, gasoline type, and inspection/maintenance program effects. The model also accounted for the use of ethanol in fuel in Minnesota. To account for some of these factors, the MPCA calculated TOG emission factors for four different areas of the state:

1. Twin Cities Metropolitan Area: Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington counties. Some vehicles in the metro area were required to participate in an inspection/maintenance (I/M) program in 1996.
2. Northeast Minnesota
3. Northwest Minnesota
4. Central Minnesota

The latter three areas did not have an I/M program, but TOG emission factors were calculated separately to account for variations in ambient temperature. In addition, separate emission factors were calculated for each season to account for seasonal temperature changes on emissions. Average temperatures were calculated for the four seasonal divisions: March to May, June to August, September to November, and December to February. Since the inventory was for the calendar year 1996, the 'winter division' was not continuous so January, February, and December 1996 were calculated individually.

MPCA calculated TOG emission factors for seven speed classes that represent 12 roadway functional classes.

Functional Class	**Speed (MPH)**
Rural Interstate	60
Rural Principal Arterial	45
Rural Minor Arterial	40
Rural Major Collector	40
Rural Minor Collector	40
Rural Local	20
Urban Interstate	50
Urban Freeway	50
Urban Principal Arterial	33
Urban Minor Arterial	30

Urban Collector	30
Urban Local	20

The factors were specific to vehicle type, season, geographic area, and roadway type. The emission factors were combined with county and functional class specific VMT activity data to obtain TOG estimates for all 87 counties in Minnesota.

Part5 Emission Factors For PM10

U.S. EPA's Part5 model produces VMT-based PM10 emission factors but with fewer inputs than the Mobile5b model for TOG. For example, PM10 emissions are not as sensitive to temperature as TOG. MPCA calculated PM10, brake wear, and tire wear emission factors for each county in Minnesota.

Vehicle Miles Traveled Activity Data

The Minnesota Department of Transportation (Mn/DOT) provided VMT data from its Traffic Information System (TIS). Mn/DOT provided the VMT data broken down by functional class for each county in Minnesota. MPCA estimated VMT for each vehicle type using the Mobile5b model's default fleet breakdown.

TOXICS EMISSION ESTIMATION

MPCA used RAPIDS to speciate toxic air pollutants from TOG and PM10 emissions. To improve accuracy, TOG emissions were separated into exhaust emissions (EXHC) and evaporative emissions (EVHC). As previously stated, the evaporative emissions did not include evaporative emissions from refueling. Similarly, PM10 emissions were broken down into exhaust particulate (EXPM), brake wear (BW10), and tire wear (TW10) emissions.

For some pollutants and vehicle types, VMT-based emission factors for air toxics were available. For example, benzene, Butadiene,13, formaldehyde, and acetaldyhyde emissions were calculated using emission factors rather than TOG speciation for all vehicle types. Chromium, manganese, and nickel emission factors were also available, but only for three vehicle types: LDGV, LDGT1, and LDGT2. Toxics emissions were speciated for other vehicle types.

NON-ROAD SOURCES

MPCA estimated air toxics emissions from off road sources using the RAPIDS emission estimator. The estimator used RAPIDS default equipment population data and emission factors to calculate EXHC and PM10 emissions. Air toxics emissions were then speciated from those emission estimates. "Equipment population" refers to the quantity of equipment in operation in a certain county. Snowmobiles, lawn mowers, and construction equipment are examples of specific types of equipment.

There was one exception to the methodology. MPCA calculated emissions from aircraft auxiliary power units using specific information. State specific information of aircraft APU operations from 1990 was used to estimate 1996 operations using aircraft LTOs as a growth factor[4]. Hydrocarbon (HC) and

PM10 emission factors based on the amount of fuel used were used[5]. HC emissions were converted to TOG using appropriate conversion factors. Air toxics were speciated from those emissions data from EPA's NTI and SPECIATE database[6].

AIRCRAFT

MPCA estimated air toxics emissions from three types of aircraft: commercial, air taxis, and general aviation. Insufficient information was available to estimate emissions for military aircraft. TOG emissions were estimated using emission factors based on default time-in-mode (TIM)[7] and state-specific landing and takeoff operations (LTO) data. The U.S. Department of Transportation provided detailed LTO information. Air toxics emissions were speciated from the TOG emissions.

LOCOMOTIVES

Locomotive emissions were calculated using fuel use-based emission factors for volatile organic compounds (VOC) and PM10[8]. Individual railway companies with operations in Minnesota provided information on fuel use for their line and yard haul operations. Line haul operations emitted 0.0211 pounds of hydrocarbons (HC) per gallon of fuel used and 0.0116 lb/gal of PM10. Yard haul operations emitted 0.0506 lb/gal and 0.0138 lb/gal of HC and PM10, respectively. HC emissions were converted to VOC using appropriate conversion factors. Fuel use was apportioned to the counties in which the railways operated. The VOC and PM10 emissions were speciated to obtain air toxics emissions from locomotives.

REFERENCES

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8. *Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources*; U.S. Environmental Protection Agency: Research Triangle Park, NC, 1992; EPA-450/4-81-026d, pp 200-215.

INFORMATION

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Table D-1: Minnesota Mobile Source emissions by county in pounds/year

	Aitkin	Anoka	Becker	Beltrami	Benton	Big Stone	Blue Earth
Acetaldehyde	20,914.21	99,725.72	15,363.98	13,547.94	14,657.88	30,956.40	16,562.41
Acrolein	999.16	6,552.40	1,265.35	1,241.60	1,165.31	783.13	1,698.52
Anthracene	0.18	0.36	0.11	0.10	0.12	0.29	0.11
Arsenic	0.02	0.19	0.03	0.03	0.03	0.01	0.05
Benz(a)anthracene	2.43	3.62	1.43	1.24	1.42	4.22	1.29
Benz(ghi)perylene	4.87	7.86	2.93	2.53	2.91	8.34	2.71
Benzene	62,161.63	391,143.27	63,383.15	58,968.75	68,212.24	62,592.59	89,093.09
Benzo(a)pyrene	1.52	2.96	0.96	0.84	0.97	2.51	0.95
Benzo(b)fluoranthene	1.47	4.10	1.06	0.94	1.09	2.23	1.18
Benzo(k)fluoranthene	1.45	3.11	0.95	0.83	0.96	2.36	0.97
Butadiene,13	7,896.89	40,012.69	7,868.26	7,339.04	8,445.97	8,262.24	10,933.39
Chromium	12.34	24.64	7.92	6.93	7.92	20.28	7.88
Chrysene	4.94	34.02	5.57	5.23	6.06	4.08	8.20
Copper	148.84	1,496.62	215.23	205.81	238.30	42.47	345.84
Dibenz(a,h)anthracene	0.24	0.50	0.15	0.14	0.16	0.39	0.16
Ethylbenzene	25,952.32	116,214.71	24,593.32	23,115.92	24,780.86	32,821.90	30,962.09
Fluoranthene	1.74	3.87	1.15	1.02	1.17	2.81	1.19
Formaldehyde	48,571.18	179,287.20	39,622.93	35,402.20	38,005.06	65,120.07	46,145.32
Indeno(1,2,3-cd)pyrene	0.25	0.65	0.18	0.16	0.18	0.39	0.19
Lead	39.39	338.50	56.15	51.92	52.99	9.43	83.70
Manganese	14.07	11.17	7.33	6.16	7.02	26.01	5.44
Mercury	3.31	6.54	2.29	1.97	2.00	5.04	2.25
Naphthalene	1,763.76	18,092.48	2,898.50	2,866.14	2,978.21	556.07	4,387.04
Nickel	8.51	19.53	5.76	5.06	5.74	13.46	6.00
Phenanthrene	0.69	2.03	0.51	0.47	0.52	1.02	0.58
Phenol				5.50			0.08
Pyrene	1.34	4.74	1.06	0.96	1.11	1.87	1.28
Styrene	8,406.47	99,369.60	9,719.18	9,489.70	12,990.11	3,884.49	18,801.67
Toluene	134,618.61	779,626.56	149,857.79	143,431.68	151,605.23	140,733.39	201,117.59
Xylene,M	23,152.77	235,578.64	38,329.04	37,895.30	39,105.44	7,304.26	57,612.50
Xylene,O	12,820.73	135,602.66	20,472.01	20,234.52	21,626.01	4,032.14	31,838.23
Xylenes,Iso	103,276.04	444,666.87	96,971.35	91,036.19	97,059.97	132,877.70	120,351.64

Table D-1: Minnesota Mobile Source emissions by county in pounds/year (continued)

	Brown	Carlton	Carver	Cass	Chippewa	Chisago	Clay
Acetaldehyde	11,864.68	16,644.95	26,731.33	17,509.37	18,337.88	31,213.25	17,238.95
Acrolein	789.16	1,391.95	1,582.12	1,308.33	818.25	1,731.22	1,845.73
Anthracene	0.10	0.12	0.12	0.14	0.16	0.15	0.12
Arsenic	0.02	0.04	0.04	0.03	0.02	0.05	0.05
Benz(a)anthracene	1.27	1.52	1.36	1.73	2.19	1.75	1.35
Benz(ghi)perylene	2.58	3.12	2.84	3.53	4.37	3.63	2.84
Benzene	44,405.04	75,707.18	97,360.40	70,897.60	48,927.34	110,573.63	92,619.28
Benzo(a)pyrene	0.83	1.04	0.99	1.15	1.35	1.24	1.00
Benzo(b)fluoranthene	0.86	1.18	1.22	1.24	1.28	2.51	1.23
Benzo(k)fluoranthene	0.80	1.04	1.01	1.13	1.28	0.47	1.01
Butadiene,13	5,559.83	9,363.63	10,167.30	8,824.06	6,264.37	11,641.71	11,367.96
Chromium	6.73	8.57	8.17	9.43	10.96	10.20	8.25
Chrysene	3.77	6.75	8.29	6.17	3.75	9.33	8.51
Copper	134.10	268.62	347.13	232.51	100.61	382.65	358.58
Dibenz(a,h)anthracene	0.13	0.17	0.16	0.18	0.21	0.20	0.16
Ethylbenzene	18,043.04	27,901.51	30,577.28	27,254.57	21,986.59	35,670.54	33,922.63
Fluoranthene	0.97	1.26	1.24	1.37	1.54	1.53	1.25
Formaldehyde	29,018.82	43,728.70	48,896.66	44,312.41	41,730.97	57,431.16	47,933.51
Indeno(1,2,3-cd)pyrene	0.14	0.19	0.20	0.21	0.22	0.24	0.20
Lead	31.77	66.12	77.70	57.98	29.14	85.36	86.38
Manganese	6.94	7.43	5.81	9.07	12.94	7.98	5.74
Mercury	1.76	2.39	2.10	2.59	2.98	2.59	2.33
Naphthalene	1,787.00	3,453.80	4,184.79	3,033.31	1,275.75	4,751.82	4,898.30
Nickel	4.75	6.28	6.14	6.77	7.50	7.56	6.27
Phenanthrene	0.40	0.57	0.59	0.59	0.59	0.71	0.60
Phenol							
Pyrene	0.82	1.21	1.32	1.23	1.14	1.56	1.34
Styrene	7,870.91	14,047.81	23,496.51	10,264.51	6,182.48	18,957.29	15,497.18
Toluene	103,606.35	172,593.86	195,016.35	162,934.37	110,161.31	226,833.10	223,071.76
Xylene,M	23,473.77	45,440.22	54,460.53	40,108.22	16,752.56	62,531.38	64,813.72
Xylene,O	12,955.91	24,887.86	31,426.13	21,431.79	9,256.18	34,212.37	34,512.00
Xylenes,Iso	71,153.93	109,328.86	117,830.47	107,694.00	87,773.97	139,523.03	133,028.74

Table D-1: Minnesota Mobile Source emissions by county in pounds/year (continued)

	Clearwater	Cook	Cottonwood	Crow Wing	Dakota	Dodge	Douglas
Acetaldehyde	25,347.19	50,505.87	18,014.60	18,358.78	123,894.98	15,765.52	16,063.63
Acrolein	843.25	1,271.11	712.67	1,811.37	7,731.91	718.51	1,353.27
Anthracene	0.23	0.48	0.16	0.13	0.44	0.14	0.13
Arsenic	0.01	0.01	0.01	0.05	0.24	0.01	0.03
Benz(a)anthracene	3.27	6.87	2.23	1.47	4.47	1.90	1.53
Benz(ghi)perylene	6.48	13.58	4.43	3.08	9.70	3.79	3.15
Benzene	55,512.01	103,087.14	45,224.08	97,885.82	486,441.10	46,388.38	76,062.28
Benzo(a)pyrene	1.97	4.09	1.36	1.07	3.66	1.18	1.05
Benzo(b)fluoranthene	1.78	3.64	1.27	1.32	5.08	1.13	1.19
Benzo(k)fluoranthene	1.85	3.85	1.29	1.09	3.85	1.12	1.05
Butadiene,13	7,245.01	13,593.56	5,825.64	12,021.01	49,749.13	5,907.04	9,409.73
Chromium	15.92	33.04	11.02	8.88	30.49	9.55	8.62
Chrysene	3.86	6.76	3.36	8.98	42.31	3.65	6.78
Copper	66.65	74.76	80.65	376.64	1,863.18	106.04	268.58
Dibenz(a,h)anthracene	0.30	0.63	0.21	0.18	0.62	0.18	0.17
Ethylbenzene	27,805.35	53,241.68	20,899.03	33,624.65	136,873.09	19,941.07	28,694.54
Fluoranthene	2.21	4.57	1.54	1.34	4.79	1.35	1.27
Formaldehyde	54,994.13	106,424.07	40,232.10	50,796.53	222,692.58	36,127.16	41,893.09
Indeno(1,2,3-cd)pyrene	0.31	0.64	0.22	0.21	0.80	0.20	0.20
Lead	21.03	16.68	22.81	89.98	421.12	25.62	59.71
Manganese	19.94	42.31	13.31	6.31	13.66	11.02	7.52
Mercury	4.19	8.22	2.92	2.48	8.07	2.46	2.18
Naphthalene	900.85	903.56	1,010.63	4,690.97	21,313.02	1,308.73	3,565.96
Nickel	10.69	21.95	7.48	6.72	24.19	6.54	6.27
Phenanthrene	0.82	1.67	0.59	0.64	2.52	0.53	0.57
Phenol				0.10			
Pyrene	1.52	3.05	1.11	1.43	5.88	1.02	1.22
Styrene	4,103.50	5,274.51	5,088.18	20,209.13	119,191.11	6,201.02	14,568.15
Toluene	126,904.61	228,514.62	101,157.76	217,118.72	917,861.95	102,676.94	177,838.00
Xylene,M	11,913.34	11,961.09	13,271.75	61,596.03	277,322.31	17,184.26	46,905.37
Xylene,O	6,361.06	6,354.98	7,335.18	34,060.38	160,145.83	9,503.28	25,718.40
Xylenes,Iso	112,149.92	215,781.25	83,705.73	130,791.09	523,201.43	79,464.67	112,473.33

Table D-1: Minnesota Mobile Source emissions by county in pounds/year (continued)

	Faribault	Fillmore	Freeborn	Goodhue	Grant	Hennepin	Houston
Acetaldehyde	16,498.04	13,692.80	16,760.65	17,479.90	32,482.39	510,806.84	13,894.79
Acrolein	904.40	774.30	1,517.16	1,641.36	946.77	69,055.64	701.29
Anthracene	0.14	0.12	0.12	0.13	0.30	2.59	0.12
Arsenic	0.02	0.02	0.04	0.05	0.01	0.82	0.01
Benz(a)anthracene	1.86	1.56	1.48	1.46	4.31	16.75	1.66
Benz(ghi)perylene	3.73	3.14	3.06	3.06	8.53	34.10	3.32
Benzene	53,069.73	48,018.33	81,163.50	92,743.78	69,678.06	1,711,224.09	43,953.72
Benzo(a)pyrene	1.17	0.99	1.04	1.06	2.58	13.45	1.04
Benzo(b)fluoranthene	1.16	1.00	1.20	1.28	2.32	17.60	1.01
Benzo(k)fluoranthene	1.13	0.96	1.04	1.07	2.43	13.40	0.99
Butadiene,13	6,703.40	6,044.29	10,012.06	11,401.04	9,129.82	207,106.77	5,572.47
Chromium	9.55	8.08	8.53	8.71	20.86	102.86	8.41
Chrysene	4.33	3.98	7.32	8.47	4.74	145.34	3.53
Copper	140.27	133.75	296.58	352.25	70.76	6,376.20	108.75
Dibenz(a,h)anthracene	0.18	0.16	0.17	0.17	0.40	2.18	0.16
Ethylbenzene	22,195.50	19,550.31	30,137.59	31,627.77	35,266.85	467,540.01	18,935.48
Fluoranthene	1.36	1.16	1.26	1.31	2.89	20.26	1.19
Formaldehyde	39,070.30	32,583.79	44,740.37	47,849.38	69,487.75	1,047,596.86	32,177.21
Indeno(1,2,3-cd)pyrene	0.20	0.17	0.20	0.21	0.41	2.79	0.17
Lead	36.10	29.73	70.82	80.45	17.82	1,431.89	24.16
Manganese	10.54	8.72	6.98	6.45	26.38	44.86	9.50
Mercury	2.57	2.03	2.33	2.29	5.27	26.93	2.10
Naphthalene	1,805.21	1,703.40	3,934.22	4,317.63	916.29	72,481.65	1,430.86
Nickel	6.64	5.62	6.30	6.52	13.93	81.74	5.78
Phenanthrene	0.55	0.47	0.58	0.62	1.07	26.11	0.47
Phenol						5,294.08	
Pyrene	1.08	0.94	1.26	1.37	1.96	23.53	0.93
Styrene	7,818.31	7,667.24	15,626.06	18,676.07	5,260.28	409,638.79	6,562.82
Toluene	120,516.82	108,158.99	190,143.19	202,588.82	156,857.15	3,131,880.35	100,875.84
Xylene,M	23,745.00	22,370.72	51,785.02	56,688.45	12,050.73	935,348.18	18,792.36
Xylene,O	13,019.62	12,360.25	28,298.61	31,361.44	6,612.45	544,170.76	10,380.57
Xylenes,Iso	88,085.43	77,407.14	117,938.55	123,170.33	142,378.52	1,784,574.18	75,252.34

Table D-1: Minnesota Mobile Source emissions by county in pounds/year (continued)

	Hubbard	Isanti	Itasca	Jackson	Kanabec	Kandiyohi	Kittson
Acetaldehyde	17,567.61	19,059.81	15,134.42	21,246.59	18,114.89	15,094.97	34,886.97
Acrolein	896.20	980.12	1,498.31	980.68	730.04	1,376.94	1,005.50
Anthracene	0.15	0.11	0.11	0.19	0.16	0.11	0.32
Arsenic	0.02	0.03	0.04	0.02	0.01	0.04	0.01
Benz(a)anthracene	2.07	1.40	1.28	2.54	2.26	1.30	4.61
Benz(ghi)perylene	4.16	2.84	2.66	5.06	4.51	2.69	9.10
Benzene	56,864.66	57,156.52	74,514.10	60,670.02	50,330.15	73,036.25	68,870.37
Benzo(a)pyrene	1.30	0.92	0.91	1.57	1.39	0.91	2.74
Benzo(b)fluoranthene	1.28	0.97	1.07	1.50	1.32	1.07	2.44
Benzo(k)fluoranthene	1.25	0.90	0.91	1.50	1.33	0.92	2.58
Butadiene,13	7,197.37	6,244.65	9,179.64	7,735.59	6,445.36	9,004.79	9,084.28
Chromium	10.58	7.54	7.51	12.75	11.27	7.54	22.19
Chrysene	4.60	4.63	6.75	4.74	3.85	6.60	4.51
Copper	144.79	171.04	276.92	135.47	102.34	268.99	49.77
Dibenz(a,h)anthracene	0.20	0.15	0.15	0.24	0.22	0.15	0.42
Ethylbenzene	23,889.04	20,638.80	28,058.41	26,691.74	22,312.14	26,217.67	36,293.48
Fluoranthene	1.50	1.09	1.12	1.80	1.58	1.12	3.07
Formaldehyde	40,922.92	36,841.42	40,881.39	48,687.39	40,653.77	40,538.52	74,373.64
Indeno(1,2,3-cd)pyrene	0.22	0.16	0.18	0.26	0.23	0.18	0.43
Lead	32.27	44.30	67.73	35.02	22.79	65.97	19.34
Manganese	11.83	7.45	5.92	14.81	13.34	6.07	28.40
Mercury	2.65	2.12	2.12	3.36	2.81	2.13	5.82
Naphthalene	1,868.19	2,149.25	3,803.85	1,739.86	1,261.30	3,416.01	687.93
Nickel	7.29	5.39	5.60	8.74	7.65	5.60	14.81
Phenanthrene	0.60	0.46	0.52	0.70	0.61	0.52	1.12
Phenol							
Pyrene	1.18	0.96	1.13	1.36	1.17	1.12	2.04
Styrene	6,689.31	9,589.24	12,430.75	7,816.70	6,140.38	14,770.17	3,950.21
Toluene	128,739.60	120,274.21	179,971.23	137,281.69	111,322.48	164,990.73	156,879.03
Xylene,M	24,700.26	28,218.88	50,306.22	22,885.41	16,560.25	44,859.58	9,098.78
Xylene,O	13,203.88	15,610.57	26,855.65	12,548.28	9,161.73	24,793.33	4,855.11
Xylenes,Iso	95,283.07	81,170.25	110,189.72	106,462.92	89,196.73	102,279.99	146,878.32

Table D-1: Minnesota Mobile Source emissions by county in pounds/year (continued)

	Koochiching	Lac Qui Parle	Lake	Lake of the Woods	Le Sueur	Lincoln	Lyon
Acetaldehyde	14,989.13	23,834.77	23,245.20	46,625.39	14,042.75	28,668.16	13,965.51
Acrolein	728.48	804.55	1,012.95	1,072.18	907.66	773.52	953.57
Anthracene	0.13	0.22	0.20	0.45	0.11	0.27	0.11
Arsenic	0.01	0.01	0.02	0.00	0.02	0.01	0.03
Benz(a)anthracene	1.82	3.06	2.72	6.44	1.48	3.87	1.41
Benz(ghi)perylene	3.64	6.06	5.41	12.70	2.98	7.64	2.86
Benzene	44,075.08	52,929.69	55,444.17	89,070.53	51,204.78	58,537.95	50,710.34
Benzo(a)pyrene	1.13	1.84	1.66	3.81	0.96	2.30	0.92
Benzo(b)fluoranthene	1.08	1.67	1.55	3.36	0.99	2.05	0.96
Benzo(k)fluoranthene	1.08	1.74	1.57	3.58	0.93	2.17	0.89
Butadiene,13	5,632.65	6,897.26	7,139.92	11,832.63	6,412.39	7,712.45	6,341.42
Chromium	9.16	14.91	13.53	30.77	7.81	18.60	7.53
Chrysene	3.45	3.71	4.13	5.59	4.34	3.86	4.32
Copper	99.24	67.26	100.78	34.54	154.43	44.92	156.41
Dibenz(a,h)anthracene	0.18	0.28	0.26	0.58	0.15	0.35	0.15
Ethylbenzene	19,723.88	26,167.97	25,398.01	48,169.81	20,169.23	30,551.39	19,916.97
Fluoranthene	1.29	2.07	1.88	4.25	1.12	2.57	1.08
Formaldehyde	34,207.78	51,901.02	52,849.35	97,114.05	34,481.51	60,678.09	34,702.16
Indeno(1,2,3-cd)pyrene	0.19	0.29	0.27	0.59	0.17	0.36	0.16
Lead	22.44	21.15	40.57	7.67	39.24	11.98	42.99
Manganese	10.61	18.60	16.28	39.90	8.05	23.78	7.64
Mercury	2.30	3.94	4.02	7.65	2.13	4.70	2.18
Naphthalene	1,361.14	871.00	1,226.66	474.64	1,945.46	602.66	1,980.86
Nickel	6.25	10.03	9.28	20.36	5.52	12.38	5.37
Phenanthrene	0.52	0.77	0.72	1.54	0.47	0.94	0.45
Phenol	2.51						
Pyrene	0.98	1.43	1.36	2.78	0.95	1.72	0.93
Styrene	4,952.52	4,803.22	4,804.26	3,903.25	8,722.46	3,948.26	8,838.65
Toluene	103,037.80	119,671.72	122,984.73	200,577.60	114,819.28	132,473.71	114,388.33
Xylene,M	17,996.47	11,440.55	16,239.21	6,277.29	25,545.92	7,917.24	26,013.86
Xylene,O	9,610.37	6,316.33	8,625.27	3,350.85	14,124.53	4,367.84	14,375.11
Xylenes,Iso	78,862.72	105,315.70	101,916.12	195,553.71	79,543.47	123,555.64	78,436.82

Table D-1: Minnesota Mobile Source emissions by county in pounds/year (continued)

	Mahnomen	Marshall	Martin	Mcleod	Meeker	Mille Lacs	Morrison
Acetaldehyde	38,237.22	21,605.11	14,648.51	12,541.95	14,582.86	18,365.03	15,892.21
Acrolein	939.74	1,000.12	1,002.62	950.46	878.58	1,145.25	1,294.24
Anthracene	0.37	0.19	0.12	0.10	0.12	0.15	0.12
Arsenic	0.01	0.02	0.02	0.02	0.02	0.03	0.04
Benz(a)anthracene	5.24	2.60	1.52	1.25	1.57	1.94	1.46
Benz(ghi)perylene	10.34	5.18	3.09	1.59	3.16	3.94	3.00
Benzene	75,738.01	54,962.61	54,717.17	55,325.40	49,332.78	74,461.41	71,100.08
Benzo(a)pyrene	3.11	1.59	0.99	0.84	1.00	1.28	1.00
Benzo(b)fluoranthene	2.76	1.49	1.03	0.92	1.02	1.35	1.12
Benzo(k)fluoranthene	2.92	1.51	0.97	0.83	0.97	1.25	0.99
Butadiene,13	10,020.25	7,061.14	6,842.93	6,867.65	6,203.87	9,287.98	8,800.55
Chromium	25.11	12.93	8.11	6.87	8.19	10.40	8.22
Chrysene	4.87	4.14	4.66	4.86	4.11	6.42	6.32
Copper	43.54	104.76	168.25	187.37	140.02	236.29	249.96
Dibenz(a,h)anthracene	0.48	0.25	0.16	0.13	0.16	0.20	0.16
Ethylbenzene	40,228.96	26,397.81	22,116.47	20,579.88	19,926.00	26,897.50	25,700.37
Fluoranthene	3.47	1.81	1.17	1.01	1.17	1.51	1.21
Formaldehyde	80,143.06	48,840.68	36,181.03	32,029.50	35,247.47	45,566.04	41,556.03
Indeno(1,2,3-cd)pyrene	0.49	0.26	0.17	0.15	0.17	0.23	0.19
Lead	9.68	31.49	42.24	42.28	37.35	52.69	61.83
Manganese	32.35	15.46	8.25	6.36	8.75	10.31	7.23
Mercury	6.25	3.52	2.21	1.75	2.28	2.62	2.30
Naphthalene	594.54	1,547.34	2,246.65	2,364.07	1,759.98	2,712.80	3,098.17
Nickel	16.65	8.82	5.75	4.94	5.75	7.37	6.01
Phenanthrene	1.26	0.69	0.49	0.44	0.48	0.64	0.54
Phenol							
Pyrene	2.29	1.32	1.00	0.93	0.96	1.32	1.15
Styrene	3,829.66	5,833.51	9,461.63	10,330.28	7,977.26	12,228.10	13,548.10
Toluene	171,064.97	132,843.38	128,042.76	123,963.95	110,540.28	155,311.37	157,284.73
Xylene,M	7,862.76	20,469.65	29,548.91	31,044.52	23,111.92	35,605.45	40,681.45
Xylene,O	4,197.78	10,911.75	16,209.03	17,160.18	12,774.90	19,730.99	22,495.35
Xylenes,Iso	163,111.88	105,731.69	87,220.15	80,745.51	78,775.94	105,976.49	100,568.46

Table D-1: Minnesota Mobile Source emissions by county in pounds/year (continued)

	Mower	Murray	Nicollet	Nobles	Norman	Olmsted	Otter Tail
Acetaldehyde	13,597.28	21,365.78	14,238.49	15,867.86	25,481.84	30,685.85	19,540.79
Acrolein	1,193.82	672.14	1,039.72	1,030.54	781.45	5,392.10	2,058.72
Anthracene	0.10	0.20	0.11	0.13	0.24	0.23	0.13
Arsenic	0.03	0.01	0.03	0.02	0.01	0.09	0.06
Benz(a)anthracene	1.26	2.83	1.41	1.69	3.40	1.90	1.51
Benz(ghi)perylene	2.60	5.60	2.88	3.41	6.73	3.97	3.18
Benzene	66,916.85	48,954.32	61,672.31	57,288.41	56,621.99	165,976.89	108,465.13
Benzo(a)pyrene	0.88	1.70	0.95	1.09	2.04	1.49	1.12
Benzo(b)fluoranthene	1.01	1.54	1.04	1.12	1.84	1.95	1.41
Benzo(k)fluoranthene	0.88	1.61	0.93	1.06	1.92	1.51	1.15
Butadiene,13	8,262.70	6,378.75	7,658.74	7,180.66	7,400.36	21,963.49	13,298.93
Chromium	7.19	13.74	7.75	8.90	16.47	11.90	9.30
Chrysene	6.01	3.43	5.41	4.84	3.91	15.34	10.01
Copper	241.64	61.84	207.88	170.54	63.79	666.27	424.58
Dibenz(a,h)anthracene	0.14	0.26	0.15	0.17	0.31	0.25	0.19
Ethylbenzene	24,751.77	24,259.87	22,402.12	23,344.16	28,762.65	55,868.42	37,999.58
Fluoranthene	1.07	1.91	1.13	1.28	2.29	2.07	1.41
Formaldehyde	35,931.82	46,014.72	36,329.98	38,771.88	54,551.56	91,103.49	54,805.74
Indeno(1,2,3-cd)pyrene	0.17	0.27	0.17	0.19	0.32	0.31	0.23
Lead	53.69	13.72	48.28	42.81	14.16	150.03	100.57
Manganese	6.02	17.17	7.22	9.25	20.71	6.19	6.18
Mercury	1.82	3.42	2.02	2.41	4.10	3.12	2.59
Naphthalene	3,171.31	825.68	2,523.17	2,263.02	913.48	8,607.00	5,486.57
Nickel	5.26	9.20	5.57	6.28	11.00	9.31	7.10
Phenanthrene	0.49	0.71	0.49	0.53	0.85	1.90	0.69
Phenol						286.92	0.00
Pyrene	1.05	1.32	1.04	1.08	1.57	2.38	1.55
Styrene	13,105.61	4,462.46	11,108.38	9,564.36	4,122.66	36,247.07	22,729.04
Toluene	155,053.92	111,378.83	134,017.47	133,233.76	131,067.58	375,563.53	248,850.43
Xylene,M	41,697.57	10,846.81	33,129.26	29,766.29	12,082.15	112,655.21	72,116.37
Xylene,O	22,907.75	5,984.66	18,324.61	16,322.98	6,446.58	62,340.35	39,681.11
Xylenes,Iso	96,855.11	97,694.43	87,931.09	92,202.13	116,120.74	216,382.27	147,789.67

Table D-1: Minnesota Mobile Source emissions by county in pounds/year (continued)

	Pennington	Pine	Pipestone	Polk	Pope	Ramsey	Red Lake
Acetaldehyde	16,786.51	20,310.57	20,883.07	15,274.30	20,373.23	185,385.32	42,481.11
Acrolein	679.08	1,570.12	752.53	1,379.46	753.82	11,513.93	1,030.02
Anthracene	0.15	0.16	0.19	0.11	0.19	0.67	0.40
Arsenic	0.01	0.04	0.01	0.04	0.01	0.36	0.01
Benz(a)anthracene	2.11	1.93	2.64	1.36	2.60	6.74	5.81
Benz(ghi)perylene	4.20	3.96	5.23	2.79	5.16	14.63	11.46
Benzene	41,848.58	88,670.66	48,393.07	67,437.38	49,947.25	727,909.79	81,212.38
Benzo(a)pyrene	1.29	1.31	1.59	0.93	1.58	5.51	3.44
Benzo(b)fluoranthene	1.19	1.45	1.46	1.05	1.46	7.62	3.04
Benzo(k)fluoranthene	1.22	1.29	1.51	0.93	1.50	5.79	3.23
Butadiene,13	5,399.80	10,995.55	6,277.72	8,342.15	6,426.93	74,921.64	10,777.97
Chromium	10.41	10.73	12.92	7.68	12.76	45.09	27.79
Chrysene	3.09	7.83	3.47	6.01	3.66	63.20	5.13
Copper	71.34	304.83	71.31	239.04	81.08	2,780.19	35.37
Dibenz(a,h)anthracene	0.20	0.21	0.25	0.15	0.24	0.94	0.53
Ethylbenzene	20,287.40	32,912.21	23,263.44	26,007.75	23,810.03	201,020.33	43,841.78
Fluoranthene	1.46	1.57	1.80	1.13	1.78	7.20	3.84
Formaldehyde	37,196.06	52,459.90	45,957.93	40,221.62	44,310.83	335,172.07	88,907.09
Indeno(1,2,3-cd)pyrene	0.21	0.24	0.26	0.17	0.25	1.21	0.54
Lead	17.90	74.20	22.06	61.39	18.64	632.29	9.93
Manganese	12.65	9.76	15.93	6.67	15.51	19.85	35.97
Mercury	2.67	2.93	3.44	2.23	3.25	12.08	6.98
Naphthalene	1,037.48	3,883.85	899.71	3,280.07	1,060.52	31,204.71	497.05
Nickel	7.04	7.79	8.72	5.65	8.58	35.86	18.42
Phenanthrene	0.55	0.69	0.67	0.51	0.67	3.81	1.39
Phenol						186.02	
Pyrene	1.04	1.47	1.26	1.08	1.27	8.81	2.52
Styrene	4,042.70	15,481.38	4,783.29	10,849.98	5,190.10	175,193.40	3,755.72
Toluene	99,445.12	200,320.45	108,595.83	162,346.76	113,732.83	1,349,747.82	183,668.86
Xylene,M	13,723.01	51,132.46	11,815.67	43,378.77	13,947.50	405,971.49	6,574.13
Xylene,O	7,320.01	27,914.06	6,528.81	23,158.83	7,653.40	234,687.54	3,507.90
Xylenes,Iso	81,463.05	129,309.00	93,453.61	102,343.00	95,570.81	768,315.13	177,878.33

Table D-1: Minnesota Mobile Source emissions by county in pounds/year (continued)

	Redwood	Renville	Rice	Rock	Roseau	Scott	Sherburne
Acetaldehyde	15,545.60	15,809.60	16,794.24	23,596.53	15,907.70	39,464.64	17,755.29
Acrolein	817.87	874.30	1,708.66	951.34	714.62	2,384.97	1,689.68
Anthracene	0.13	0.14	0.12	0.21	0.14	0.16	0.13
Arsenic	0.02	0.02	0.05	0.02	0.01	0.07	0.05
Benz(a)anthracene	1.80	1.81	1.35	2.91	1.96	1.72	1.45
Benz(ghi)perylene	3.62	3.64	2.82	5.78	3.91	3.66	3.02
Benzene	50,038.72	54,127.54	90,445.15	60,506.40	46,065.66	147,304.38	92,708.09
Benzo(a)pyrene	1.13	1.15	0.99	1.77	1.21	1.32	1.05
Benzo(b)fluoranthene	1.12	1.15	1.21	1.66	1.16	1.70	1.27
Benzo(k)fluoranthene	1.09	1.11	1.00	1.69	1.16	1.36	1.78
Butadiene,13	6,329.65	6,822.55	11,104.35	7,780.66	5,879.58	15,234.50	11,394.23
Chromium	9.22	9.35	8.15	14.40	9.81	10.91	8.66
Chrysene	4.06	4.46	8.31	4.54	3.58	12.67	0.47
Copper	128.89	147.63	348.76	112.56	100.43	543.89	353.43
Dibenz(a,h)anthracene	0.18	0.18	0.16	0.27	0.19	0.22	0.17
Ethylbenzene	21,044.26	22,219.35	32,301.68	27,787.85	20,601.09	43,643.36	31,616.52
Fluoranthene	1.31	1.33	1.23	2.01	1.38	1.67	1.30
Formaldehyde	36,425.76	37,447.88	46,526.27	52,903.98	36,047.59	72,073.38	48,788.73
Indeno(1,2,3-cd)pyrene	0.19	0.20	0.20	0.29	0.20	0.27	0.21
Lead	30.65	33.39	82.40	31.34	22.33	125.97	84.86
Manganese	10.28	10.18	5.75	17.29	11.46	6.62	6.35
Mercury	2.38	2.36	2.24	3.82	2.45	2.96	2.42
Naphthalene	1,650.58	1,880.06	4,567.56	1,431.90	1,348.32	6,329.94	4,333.68
Nickel	6.38	6.49	6.16	9.79	6.69	8.41	6.52
Phenanthrene	0.52	0.54	0.59	0.77	0.54	0.83	0.62
Phenol							
Pyrene	1.03	1.08	1.31	1.46	1.04	1.89	1.37
Styrene	7,534.37	8,491.28	18,437.16	6,719.37	4,963.04	35,425.88	18,738.30
Toluene	113,148.00	121,926.20	209,951.14	136,160.01	106,318.47	284,523.66	202,771.48
Xylene,M	21,678.89	24,691.58	60,082.34	18,837.95	17,830.57	82,377.61	56,901.52
Xylene,O	11,973.03	13,640.42	32,937.41	10,320.14	9,521.46	47,534.84	31,473.02
Xylenes,Iso	83,533.68	88,041.00	125,885.17	111,288.75	82,451.21	167,573.63	123,065.41

Table D-1: Minnesota Mobile Source emissions by county in pounds/year (continued)

	Sibley	St. Louis	Stearns	Steele	Stevens	Swift	Todd
Acetaldehyde	17,013.88	51,534.52	30,705.77	15,682.61	20,141.44	20,999.42	14,374.45
Acrolein	766.64	7,234.64	3,687.25	1,303.91	696.51	810.35	945.55
Anthracene	0.15	0.33	0.20	0.12	0.18	0.19	0.11
Arsenic	0.01	0.18	0.11	0.04	0.01	0.02	0.02
Benz(a)anthracene	2.08	3.27	2.06	1.43	2.57	2.61	1.49
Benz(ghi)perylene	4.14	7.04	4.44	2.93	5.09	5.19	3.01
Benzene	50,704.08	317,143.12	191,526.79	70,360.92	44,581.39	50,679.09	52,655.52
Benzo(a)pyrene	1.29	2.65	1.65	0.98	1.55	1.59	0.96
Benzo(b)fluoranthene	1.24	3.63	2.23	1.10	1.40	1.47	1.00
Benzo(k)fluoranthene	1.23	2.77	1.72	0.97	1.46	1.50	0.94
Butadiene,13	6,457.10	39,156.40	23,379.87	8,705.54	5,808.02	6,548.11	6,588.31
Chromium	10.43	21.81	13.74	8.05	12.53	12.86	7.89
Chrysene	3.99	29.79	17.98	6.27	3.13	3.71	4.48
Copper	115.53	1,308.75	785.56	248.70	57.24	83.70	160.90
Dibenz(a,h)anthracene	0.20	0.45	0.28	0.16	0.24	0.25	0.15
Ethylbenzene	21,957.45	113,742.79	65,833.72	25,939.60	22,100.64	23,931.90	20,589.62
Fluoranthene	1.47	3.48	2.14	1.18	1.74	1.79	1.13
Formaldehyde	38,821.02	152,986.80	89,960.78	41,140.94	43,968.03	46,655.08	35,505.06
Indeno(1,2,3-cd)pyrene	0.21	0.57	0.35	0.18	0.25	0.26	0.17
Lead	25.71	314.13	182.95	62.22	18.91	25.38	42.00
Manganese	12.06	10.06	6.89	7.02	15.62	15.68	8.07
Mercury	2.61	6.45	3.81	2.28	3.34	3.45	2.20
Naphthalene	1,455.12	18,221.41	10,283.34	3,185.68	752.20	1,066.86	2,020.62
Nickel	7.13	17.41	10.82	5.90	8.43	8.72	5.60
Phenanthrene	0.58	2.00	1.10	0.53	0.65	0.68	0.47
Phenol		112.73					
Pyrene	1.12	4.21	2.55	1.13	1.20	1.28	0.97
Styrene	6,860.10	54,812.29	41,258.24	13,059.22	4,122.00	5,459.22	8,862.97
Toluene	113,348.07	781,528.74	445,214.91	159,971.32	101,348.04	114,218.53	117,845.96
Xylene,M	19,107.10	241,218.03	135,257.31	41,905.32	9,880.76	14,012.18	26,549.28
Xylene,O	10,564.93	127,970.05	74,178.71	22,971.42	5,453.60	7,738.97	14,635.29
Xylenes,Iso	87,511.13	444,578.96	255,368.24	101,637.56	88,913.65	95,958.67	81,188.39

Table D-1: Minnesota Mobile Source emissions by county in pounds/year (continued)

	Traverse	Wabasha	Wadena	Waseca	Washington	Watonwan	Wilkin
Acetaldehyde	43,646.79	13,746.70	17,858.93	14,066.05	73,432.05	19,729.44	29,143.76
Acrolein	1,106.19	724.35	743.05	689.38	4,647.71	786.46	1,046.55
Anthracene	0.41	0.12	0.16	0.12	0.26	0.18	0.26
Arsenic	0.01	0.02	0.02	0.01	0.14	0.02	0.02
Benz(a)anthracene	5.88	1.58	2.17	1.67	2.70	2.44	3.68
Benz(ghi)perylene	11.60	3.16	4.32	3.34	5.84	4.85	7.30
Benzene	81,427.42	43,819.24	45,709.03	42,514.41	282,122.87	50,509.56	67,466.91
Benzo(a)pyrene	3.48	0.99	1.33	1.04	2.19	1.49	2.22
Benzo(b)fluoranthene	3.07	0.98	1.24	1.01	2.99	1.39	2.04
Benzo(k)fluoranthene	3.27	0.95	1.26	1.00	2.29	1.41	2.10
Butadiene,13	10,816.40	5,542.49	5,873.79	5,402.01	28,900.85	6,497.02	8,752.68
Chromium	28.15	8.07	10.78	8.45	18.23	12.07	18.02
Chrysene	5.11	3.55	3.44	3.38	24.50	3.78	4.84
Copper	32.64	113.04	86.56	101.26	1,075.12	93.28	99.12
Dibenz(a,h)anthracene	0.53	0.16	0.21	0.16	0.37	0.23	0.34
Ethylbenzene	44,112.58	18,265.15	20,814.71	18,429.24	80,944.94	23,030.52	32,493.61
Fluoranthene	3.88	1.15	1.51	1.19	2.84	1.69	2.51
Formaldehyde	91,842.59	32,310.39	40,234.06	32,470.77	133,490.28	44,177.41	64,133.22
Indeno(1,2,3-cd)pyrene	0.54	0.17	0.22	0.17	0.47	0.24	0.36
Lead	15.52	27.22	25.45	24.52	252.25	25.63	29.92
Manganese	36.47	8.99	12.91	9.66	8.68	14.50	22.22
Mercury	7.30	2.09	2.91	2.19	5.14	3.18	4.77
Naphthalene	435.24	1,420.35	1,076.74	1,310.94	12,472.53	1,149.79	1,262.87
Nickel	18.70	5.58	7.35	5.81	14.45	8.20	12.16
Phenanthrene	1.40	0.46	0.58	0.47	1.48	0.64	0.94
Phenol							
Pyrene	2.54	0.91	1.10	0.92	3.44	1.22	1.76
Styrene	4,073.37	6,539.61	5,344.02	6,086.93	68,856.22	5,755.25	6,486.91
Toluene	183,440.44	97,957.11	101,971.39	96,695.40	540,558.45	112,122.16	151,842.34
Xylene,M	5,718.10	18,651.57	14,140.55	17,217.15	162,380.59	15,098.21	16,604.19
Xylene,O	3,153.81	10,310.16	7,813.50	9,511.06	93,527.72	8,347.35	9,123.16
Xylenes,Iso	178,860.75	72,491.82	83,263.25	73,318.24	309,748.42	92,201.42	130,580.40

Table D-1: Minnesota Mobile Source emissions by county in pounds/year (continued)

	Winona	Wright	Yellow Medicine	**State Total**
Acetaldehyde	16,196.28	46,457.65	19,771.50	**2,754,830.85**
Acrolein	1,607.29	2,948.66	807.32	**203,627.68**
Anthracene	0.11	0.18	0.17	**18.50**
Arsenic	0.04	0.09	0.02	**4.12**
Benz(a)anthracene	1.31	1.90	2.42	**220.95**
Benz(ghi)perylene	2.75	4.07	4.80	**446.97**
Benzene	86,006.81	174,261.58	48,574.45	**9,538,123.41**
Benzo(a)pyrene	0.96	1.48	1.47	**147.06**
Benzo(b)fluoranthene	1.17	1.95	1.37	**159.31**
Benzo(k)fluoranthene	0.97	1.53	1.40	**143.74**
Butadiene,13	10,566.49	17,957.87	6,261.10	**1,138,658.07**
Chromium	7.90	12.32	11.95	**1,192.66**
Chrysene	7.88	15.04	3.60	**792.47**
Copper	329.36	650.67	85.49	**30,351.68**
Dibenz(a,h)anthracene	0.16	0.25	0.23	**23.40**
Ethylbenzene	30,531.60	53,337.87	22,709.29	**3,402,686.57**
Fluoranthene	1.19	1.90	1.67	**178.09**
Formaldehyde	44,651.37	84,993.13	44,299.13	**6,033,856.71**
Indeno(1,2,3-cd)pyrene	0.19	0.31	0.24	**26.48**
Lead	77.37	153.34	26.43	**7,165.06**
Manganese	5.70	6.94	14.46	**1,134.96**
Mercury	2.15	3.44	3.25	**315.30**
Naphthalene	4,265.36	8,098.93	1,095.77	**371,691.72**
Nickel	5.96	9.60	8.12	**855.34**
Phenanthrene	0.57	0.96	0.63	**94.07**
Phenol				**5,887.94**
Pyrene	1.26	2.20	1.20	**161.00**
Styrene	17,357.59	32,799.62	5,518.78	**1,783,628.89**
Toluene	197,495.19	356,514.73	109,835.12	**20,128,495.34**
Xylene,M	56,096.57	106,506.13	14,391.63	**4,859,849.36**
Xylene,O	30,780.77	58,463.13	7,949.32	**2,724,942.04**
Xylenes,Iso	119,018.73	207,116.14	90,930.65	**13,333,555.64**

Appendix E: New York Toxic Emissions Inventory

ON-ROAD SOURCES

All on-road mobile emissions were estimated using the U.S. Environmental Protection Agency's (EPA's) MOBILE5B or PART5 emission models. New York State is modeled as 37 separate areas. These areas are defined on the basis of varying temperature, traffic, and/or air quality programs. Input file scenarios are then created for each hour and road type in that area. All inputs are derived from 1996 data where applicable. The entire year was then modeled by month to yield a more accurate annual inventory.

Inspection and maintenance programs, anti-tampering programs, reformulated gasoline, oxygenated gasoline, and Stage II are all modeled by area type. These inputs reflect the programs and controls that were in effect in that area in 1996.

Mileage accumulation rates were derived from the May 1997 report Update of Fleet Characterization Data for use in MOBILE6 by Acruex Environmental Corporation as prepared for the EPA. This report and the subsequent final EPA report are available on the EPA's Office of Mobile Sources website as M6flt001.pdf and M6flt002.pdf respectively.

Vehicle registration for 1996 was obtained from the NYS Department of Motor Vehicles (NYSDMV) and used to estimate the vehicle age distributions. Vehicle registration data in conjunction with the NYS Department of Transportation's (NYSDOT's) traffic count data were used to obtain a vehicle mix. The NYSDOT through the 1995 National Personal Transportation Survey(NPTS) was able to formulate a temporal distribution for twenty-two different areas. This allowed a better representation of drive times for each location and allowed a more accurate distribution of Vehicle Miles Traveled (VMT) within each area.

Temperature data for 1996 was obtained from the National Weather Service. This data was from thirteen different airport locations throughout New York and surrounding locations. This data was then analyzed to yield an average temperature for each hour for each month. This yielded thirteen different temperature profiles for each month. Each area modeled was then assigned to a geographically relevant temperature location from which the hourly temperature would be pulled.

Measured RVP values were also obtained for 1996. These values were provided by the New York State Department of Agriculture and Markets. The data included sample RVP values taken year round throughout the state. Analysis provided average monthly RVP values for oxygenated and reformulated gas areas and conventional gas areas. These monthly values were then used in the corresponding input files.

Speed and Hot/Cold start data was obtained from the March 1993 report New York State 1990 Base Ozone Year Carbon Monoxide and Ozone Precursor On-Road Mobile Source Inventory by Radian Corporation and the New York State Department of Environmental Conservation.

Vehicle Miles Traveled information was obtained through the NYSDOT from 1996 Highway Performance Monitoring System (HPMS) data. This HPMS count data was then adjusted for each month using a Seasonal Adjustment Factor (SAF) before being apportioned to the county roadway level.

NON-ROAD SOURCES

Nonroad mobile source emissions were estimated using two separate methodologies. New York is modeled for all sixty-two counties separately. In addition, New York is separated into two areas due to the federally mandated Reformulated Gas (RFG) Program. This program is in place in the New York City Metropolitan Area.

Emissions from 2-stroke gasoline, 4-stroke gasoline and diesel fueled off-highway vehicles as well as emissions from recreational marine vessels, were estimated using the U.S. EPA Draft Nonroad Model. Emissions from aircraft, commercial marine vessels and locomotives were estimated using New York's 1990 Baseline mobile source emissions. This data was then grown to a value for 1996 using Bureau of Economic Analysis (BEA) growth factors.

Using the EPA Nonroad Model, nonroad emissions from New York were estimated for each individual county for each month of the year. Temperature and fuels blend data varied by month for each county across the state.

Temperature data for 1996 was acquired from the National Weather Service which included historical weather data from thirteen airport locations across the state of New York as well as surrounding locations. This information was used to develop average high and low temperatures for each month on a county by county basis. The results were input into the Nonroad Model.

Fuels blend data for 1996 was acquired from the New York State Department of Agriculture and Markets. This data is based on thousands of samples collected across the state from fueling stations and retention areas. These samples are then analyzed for many profiles including oxygen content, Reid Vapor Pressure (RVP) and sulfur content. The data provided average monthly fuels profiles on a county by county basis. The results were input into the Nonroad Model.

Aircraft, commercial marine and locomotive data was downloaded from the U.S. EPA inventory website. This data is grouped by SCC codes. 1990 nonroad emissions for New York were then grown to 1996 using BEA growth factors based on gross state product.

Speciation of all pollutants to develop an air toxics inventory was completed using the RAPIDS emission estimator. Results for New York include twenty-five TOG speciated pollutants and six PM speciated pollutants.

INFORMATION

For more information about New York's air toxics inventory, please contact:

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Table E-1: New York Mobile Source emissions by county in pounds/year

	Albany	Allegany	Bronx	Broome	Cattaraugus	Cayuga	Chautauqua
Acetaldehyde	163282.89	22241.04	184165.96	81388.59	49913.03	43114.21	70226.84
Acrolein	23597.28	2045.5	14745.39	9547.12	3983.49	3443.83	6346.85
Anthracene	0.65	0.1	0.42	0.3	0.48	0.39	0.46
Arsenic	0	0	0	0	0	0	0
Benz(a)anthracene	8.15	1.52	6.08	4.27	6.92	5.64	6.67
Benz(ghi)perylene	15.88	3	11.99	8.4	13.63	11.11	13.13
Benzene	457186.47	66086.17	463902.52	283048.07	160422.91	137922.1	218308.93
Benzo(a)pyrene	4.81	0.9	3.59	2.52	4.08	3.32	3.93
Benzo(b)fluoranthene	4.14	0.78	3.12	2.19	3.55	2.9	3.42
Benzo(k)fluoranthene	4.44	0.84	3.36	2.35	3.81	3.11	3.68
Butadiene,13	124747.36	16473.58	124317.1	75742.92	33188.13	29392.02	51024.24
Chromium	38.63	6.01	54.95	16.34	14.3	11.71	18.69
Chrysene	6.11	1.15	4.6	3.22	5.23	4.27	5.04
Copper	45.34	8.06	46.37	32.23	13.1	11.09	25.16
Dibenz(a,h)anthracene	0.76	0.15	0.46	0.43	0.72	0.58	0.68
Ethylbenzene	310272.32	46605.09	311986.97	195474.72	119813.68	101789.7	156101.39
Fluoranthene	5.59	1	3.98	2.81	4.53	3.69	4.36
Formaldehyde	454802.22	59925.88	491923.72	230942.77	127443.59	110561.63	186798.93
Indeno(1,2,3-cd)pyrene	0.77	0.15	0.46	0.43	0.72	0.59	0.69
Lead	509.72	93.07	559.44	360.06	143.13	123.5	285.43
Manganese	48.11	7.27	66.03	22.28	16.96	14.14	22.51
Mercury	17.06	3.13	21.69	9.88	6.17	4.74	9.84
Naphthalene	17319.61	2167	17321	10188.2	3815	3422	6380
Nickel	26.02	3.85	32.15	12.89	8.23	7.39	12.31
Phenanthrene	3.4	0.36	1.43	1.1	1.62	1.32	1.56
Phenol	1341.2	0	0	167.95	0	0	0
Pyrene	3.67	0.64	2.56	1.81	2.9	2.37	2.8
Styrene	62984.81	8765.25	65743.93	40128.24	17339.65	15176.98	26747.42
Toluene	1985622.71	288563.6	2061205.52	1262914.6	662932.71	571295.08	924436.41
Xylene,M	12013.13	2503.78	13773.31	10585.76	4879.4	2904.63	7702.61
Xylene,O	300191.72	41385.36	331151.3	194067.16	73606.76	65527.58	121663.37
Xylene,p	361256	50084	398983	235529	88116	78979	147301
Xylenes,Iso	1241198.9	189148.91	1235774.06	784403.52	497592.36	421738.09	639186.58

Table E-1: New York Mobile Source emissions by county in pounds/year (continued)

	Chemung	Chenango	Clinton	Columbia	Cortland	Delaware	Dutchess
Acetaldehyde	37495.44	27470	42498.96	33895.42	24853.02	31135.84	105513.49
Acrolein	3681.15	2134.94	4144.31	3668.43	2272.4	2814.66	10629.78
Anthracene	0.15	0.18	0.57	0.62	0.05	0.43	1.01
Arsenic	0	0	0	0	0	0	0
Benz(a)anthracene	2.14	2.61	8.31	9.01	0.7	6.29	14.56
Benz(ghi)perylene	4.2	5.14	16.37	17.76	1.37	12.39	28.68
Benzene	118639.26	78101.08	169891.37	165502.99	69400.83	121133.19	402305.47
Benzo(a)pyrene	1.26	1.54	4.9	5.31	0.41	3.71	8.58
Benzo(b)fluoranthene	1.1	1.34	4.27	4.63	0.36	3.23	7.48
Benzo(k)fluoranthene	1.18	1.44	4.58	4.97	0.38	3.47	8.03
Butadiene,13	31149.83	17793.11	33430.08	30542.68	18968.99	23056.72	89330.23
Chromium	9.24	8.27	10.67	7.19	6.58	8.12	25.97
Chrysene	1.61	1.97	6.28	6.82	0.53	4.75	11
Copper	13.11	8.06	14.09	11.07	10.06	9.05	31.3
Dibenz(a,h)anthracene	0.2	0.26	0.89	0.99	0.053	0.67	1.54
Ethylbenzene	81558.13	56081.31	131264.84	130838.65	46780.07	93959.68	299739.17
Fluoranthene	1.41	1.71	5.44	5.9	0.46	4.11	9.53
Formaldehyde	102616.43	71248.23	109546.91	86445.3	67966.52	78962.93	280287.34
Indeno(1,2,3-cd)pyrene	0.21	0.26	0.91	1	0.05	0.68	1.56
Lead	142.58	87.12	158.82	119.81	109.91	98.83	350.72
Manganese	11.67	9.56	13.15	9.61	8.83	9.49	33.22
Mercury	5.03	3.77	5.15	3.44	3.29	3.71	11.32
Naphthalene	4095.01	2189	3668	3185	2677	2436	10982
Nickel	6.31	4.84	7.55	5.46	5.09	4.84	17.75
Phenanthrene	0.55	0.61	1.95	2.11	0.16	1.47	3.41
Phenol	92.14	0	0	0	0	0	0
Pyrene	0.91	1.1	3.49	3.79	0.29	2.64	6.11
Styrene	16235.7	9297.84	17548.48	15897.22	10111.51	12011.16	47083.43
Toluene	523277.36	328651.74	701032.52	677204.73	312520.9	493935.74	1721726.66
Xylene,M	3235.84	2476.22	4026.89	2363.55	2772.26	2691.25	8894.57
Xylene,O	78591.56	42031.14	69948.66	60681.44	51174.51	46738.64	209520.45
Xylene,p	94753	50584	84665	73279	61715	56264	253151
Xylenes,Iso	325943.2	229797.73	552747.85	554061.75	185047.92	396140.69	1239876.31

Table E-1: New York Mobile Source emissions by county in pounds/year (continued)

	Erie	Essex	Franklin	Fulton	Genesee	Greene	Hamilton
Acetaldehyde	332837.9	32539.44	25301.91	17831.67	42589.32	26940.49	7599.46
Acrolein	32438.64	3577.48	2539.7	1681.757	4322.87	3296.86	962.59
Anthracene	1.59	0.99	0.36	0.05	0.38	0.48	0.26
Arsenic	1	0	0	0	0	0	0
Benz(a)anthracene	22.19	14.29	5.22	0.77	5.49	6.94	3.8
Benz(ghi)perylene	43.62	28.16	10.28	1.52	10.82	13.67	7.48
Benzene	1023868.25	191914.79	105670.56	54860.6	156255.03	135873.5	51934.25
Benzo(a)pyrene	13.08	8.43	3.08	0.45	3.23	4.09	2.24
Benzo(b)fluoranthene	11.37	7.34	2.68	0.4	2.82	3.56	1.95
Benzo(k)fluoranthene	12.21	7.88	2.88	0.42	3.03	3.83	2.09
Butadiene,13	259852.31	27626.51	20822.9	14691.31	35010.92	26019.6	7677.97
Chromium	92.68	6.75	5.39	4.51	10.73	4.88	0.8
Chrysene	16.75	10.81	3.94	0.58	4.15	5.25	2.87
Copper	109.1	10.04	7.06	5.06	17.07	12.05	2.01
Dibenz(a,h)anthracene	2.15	1.58	0.56	0.07	0.58	0.77	0.42
Ethylbenzene	693656.97	161188.27	81725.55	36152.75	116480.26	107172.42	43551.93
Fluoranthene	14.68	9.35	3.42	0.5	3.6	4.54	2.49
Formaldehyde	901957.37	77088.07	65175.96	48827.45	113715.97	70925.43	18170.41
Indeno(1,2,3-cd)pyrene	2.18	1.6	0.57	0.07	0.59	0.78	0.43
Lead	1237.1	109.26	74.95	62.23	193.67	136.83	23.31
Manganese	116.42	8.23	7.69	5.8	13.08	7.2	1.91
Mercury	41.51	3.31	2.23	1.98	5.89	3.79	0.22
Naphthalene	33096.9	2000	2247.28	1944	4364	2839	568
Nickel	61.25	4.34	4.05	2.66	8.08	4.42	1.42
Phenanthrene	6.13	3.35	1.25	0.18	1.29	1.62	0.89
Phenol	643.18	0	32.67	0	0	0	0
Pyrene	9.48	6	2.2	0.32	2.31	2.91	1.6
Styrene	132092.05	14321.82	10825.67	7474.18	18661.5	13773.8	3937.74
Toluene	4339301.11	745258.83	436671.03	236302.98	672291.27	563693.68	202924.76
Xylene,M	29863.77	2968.44	1867.23	1749.43	4115.62	2824.72	496.77
Xylene,O	632780.42	38145.09	43070.98	37286.5	82984.35	53756.52	10803.31
Xylene,p	763347	46022	51909	44937	100582	65331	13095
Xylenes,Iso	2772250.04	699136.7	343873.29	142676.87	482252.22	453597.95	188717.22

Table E-1: New York Mobile Source emissions by county in pounds/year (continued)

	Herkimer	Jefferson	Kings	Lewis	Livingston	Madison	Monroe
Acetaldehyde	37804.88	61588.03	296478.95	21224.35	37971.29	31959.57	325174.99
Acrolein	3504.79	5376.51	25342.33	1628.67	3470.69	2937.95	31947.66
Anthracene	0.44	0.42	1.23	0.35	0.5	0.18	1.4
Arsenic	0	0	0	0	0	0	1
Benz(a)anthracene	6.39	6.06	17.79	5.07	7.2	2.66	18.65
Benz(ghi)perylene	12.59	11.94	35.04	9.99	14.19	5.25	36.52
Benzene	140574.55	188181.29	862030.62	80484.84	144115.48	99278.4	948995.66
Benzo(a)pyrene	3.77	3.57	10.48	2.99	4.25	1.57	11
Benzo(b)fluoranthene	3.28	3.11	9.13	2.6	3.7	1.37	9.52
Benzo(k)fluoranthene	3.52	3.34	9.81	2.8	3.97	1.47	10.22
Butadiene,13	28550.08	43469.89	219004.25	13535.28	27973.4	23909.75	246802.62
Chromium	9.14	16.3	85.95	5.93	10.17	7.89	90.12
Chrysene	4.83	4.58	13.45	3.83	5.44	2.01	14.03
Copper	11.08	21.13	64.62	4.03	12.08	12.08	73.83
Dibenz(a,h)anthracene	0.68	0.62	1.66	0.54	0.77	0.27	1.72
Ethylbenzene	107244.51	136946.3	570226.62	64178.48	111745.04	70927.52	649417.07
Fluoranthene	4.18	3.96	11.64	3.32	4.71	1.74	12.54
Formaldehyde	97731.73	162639.19	791974.19	51492.05	96949.25	85532.85	875175.04
Indeno(1,2,3-cd)pyrene	0.69	0.62	1.68	0.55	0.78	0.27	1.74
Lead	126.95	236.8	812.09	43.66	140.94	135.28	846.21
Manganese	11.55	19.86	104.08	6.15	12.53	10.21	108.63
Mercury	4	8.47	32.11	2.39	5.02	4.66	33.6
Naphthalene	3250	5465	27903	1233	3075	3111	32024.67
Nickel	6.29	10.55	50.47	3.25	6.26	5.68	55.09
Phenanthrene	1.5	1.42	4.17	1.19	1.69	0.62	6.34
Phenol	0	0	0	0	0	0	682.61
Pyrene	2.68	2.54	7.47	2.13	3.03	1.12	8.16
Styrene	15021.23	23070.62	109612.46	6961.83	14741.74	12671.88	126636.73
Toluene	584420.03	806057.54	3589575.39	317893.89	594186.17	429646.18	4131861.49
Xylene,M	3507.99	5946.92	22805.71	1350.06	3087.59	3159.6	23373.44
Xylene,O	62075.21	104067.89	534113.29	23737.75	58511.48	59160.58	615780.88
Xylene,p	74972	126171	643791	28475	70844	71699	739033
Xylenes,Iso	449091.4	563932.72	2265712.99	273910.02	471096.88	289409.57	2595151.71

Table E-1: New York Mobile Source emissions by county in pounds/year (continued)

	Montgomery	Nassau	New York	Niagara	Oneida	Onondaga	Ontario
Acetaldehyde	30714.41	508782.07	670223.66	77859.81	92314.88	177970.11	58697.84
Acrolein	3059.61	62273.09	24676.21	6712.71	9706.1	17634.95	4803.69
Anthracene	0.24	2.06	3.48	0.7	0.71	0.72	0.3
Arsenic	0	1	0	0	0	0	0
Benz(a)anthracene	3.42	29.82	50.25	10.11	10.2	10.29	4.32
Benz(ghi)perylene	6.74	58.75	98.99	19.91	20.08	20.26	8.51
Benzene	105326.21	1974198.99	1128052.66	263427.48	341410.72	576701.49	166449.56
Benzo(a)pyrene	2.02	17.58	29.62	5.96	6.01	6.07	2.55
Benzo(b)fluoranthene	1.76	15.31	25.8	5.19	5.23	5.28	2.22
Benzo(k)fluoranthene	1.89	16.45	27.71	5.57	5.62	5.67	2.38
Butadiene,13	24090.76	527318.33	232359.74	57688.42	80616.74	150566.75	40424.15
Chromium	7.96	93.31	284.63	21.51	22.06	46.76	17.27
Chrysene	2.59	22.55	37.99	7.64	7.71	7.78	3.27
Copper	13.06	149.5	39.77	19.25	30.27	54.54	19.11
Dibenz(a,h)anthracene	0.36	3.08	4.29	1.05	1.07	0.99	0.42
Ethylbenzene	77559.74	1374031.5	669619.39	190414.34	246035.46	391366.86	117503.93
Fluoranthene	2.24	19.52	32.9	6.62	6.68	6.77	2.83
Formaldehyde	82382.21	1449796.23	1613821.58	202959.65	250490.42	487128.7	154699.96
Indeno(1,2,3-cd)pyrene	0.36	3.11	4.34	1.06	1.08	1	0.42
Lead	148.11	1696	503.79	226.24	344.15	620.93	210.96
Manganese	10.23	126.23	301.19	26.61	28.24	59.11	20.78
Mercury	4.39	46.92	85.17	8.91	10.21	20.74	7.75
Naphthalene	3064	71164	20975.82	6649.11	10075.49	19779.5	5267
Nickel	5.26	69.87	133.84	13.06	15.05	31.09	10.95
Phenanthrene	0.8	6.99	11.85	2.4	2.45	2.59	1.01
Phenol	0	0	93.71	108.23	127.03	247.72	0
Pyrene	1.44	12.53	21.12	4.25	4.29	4.35	1.81
Styrene	12905.84	277175.46	96306.47	29234.68	42022.65	77423.85	21279.95
Toluene	453499.11	8876731.95	3656073.47	1082368.21	1464094.07	2504501.96	719004.56
Xylene,M	3518.25	45401.62	37692.17	5728.42	8869.36	15602.02	4834.08
Xylene,O	58103.43	1360511.41	410171.47	127704.49	192400.46	378583.62	100623.89
Xylene,p	70567	1645611	485121	153585	232573	456751	121471
Xylenes,Iso	320162.05	5506027.81	2650873.74	781331.07	1005064.36	1561378.21	476997.87

Table E-1: New York Mobile Source emissions by county in pounds/year (continued)

	Orange	Orleans	Oswego	Otsego	Putnam	Queens	Rensselaer
Acetaldehyde	171197.75	21198.06	48197.89	33314.05	41285.58	668971.04	59522.55
Acrolein	23164.44	1648.63	4992.43	3164.49	4915.69	138132.09	6034.47
Anthracene	0.69	0.23	0.59	0.44	0.31	3.94	0.43
Arsenic	0	0	0	0	0	1	0
Benz(a)anthracene	9.62	3.27	8.53	6.31	4.56	22.41	6.17
Benz(ghi)perylene	18.91	6.45	16.81	12.43	8.98	39.27	12.16
Benzene	454462.59	69660.8	198506.49	127832.73	166636.9	1157211.02	215761.32
Benzo(a)pyrene	5.67	1.93	5.02	3.72	2.69	13.33	3.64
Benzo(b)fluoranthene	4.93	1.68	4.38	3.24	2.34	10.17	3.17
Benzo(k)fluoranthene	5.29	1.8	4.71	3.48	2.51	10.93	3.4
Butadiene,13	119546.78	14009.17	41382.91	25047.39	39999.07	358895.38	51434.83
Chromium	42.45	5.72	10.87	7.93	7.87	146.17	14.32
Chrysene	7.26	2.47	6.45	4.77	3.45	15.47	4.67
Copper	52.37	5.05	17.14	11.07	15.1	91.28	18.18
Dibenz(a,h)anthracene	0.92	0.34	0.92	0.68	0.49	1.6	0.64
Ethylbenzene	312436.46	52850.03	151020.32	98380.52	122697.74	696669.06	156980
Fluoranthene	6.37	2.14	5.58	4.13	2.98	21.82	4.04
Formaldehyde	471203.37	53755.22	126895.96	85770.41	114668.47	1885843.83	160596.09
Indeno(1,2,3-cd)pyrene	0.93	0.35	0.93	0.69	0.5	1.62	0.65
Lead	586.42	54.69	188.51	127.68	170.45	1091.54	207.28
Manganese	52.92	6.94	14.49	10.31	11.32	170.46	18.04
Mercury	19.87	2.33	6.2	4.66	4.36	52.53	6.89
Naphthalene	17175.18	1560	4796	2722	5249	37297.52	6590
Nickel	28.19	3.13	7.69	5.75	6.31	82.15	9.77
Phenanthrene	2.68	0.77	2	1.48	1.07	47.31	1.45
Phenol	1232.24	0	0	0	0	11639.04	0
Pyrene	4.11	1.37	3.58	2.65	1.91	16.24	2.59
Styrene	61123.12	7279.26	21699.71	13115.41	21488.32	156800.36	27157.31
Toluene	1953715.14	287045.89	833732.05	523499.33	737718.39	4449916.29	942388.84
Xylene,M	15044.68	1316.04	4250.67	3198.81	4733	33509.57	5208.31
Xylene,O	286674.76	29924.82	91571.02	51820.41	99646.09	691411.33	126039.01
Xylene,p	345968	36029	110634	62830	120998	821224	152209
Xylenes,Iso	1255058.23	221113.57	630471.04	414427.99	504168.98	2738954.98	642490.11

Table E-1: New York Mobile Source emissions by county in pounds/year (continued)

	Richmond	Rockland	Saratoga	Schenectady	Schoharie	Schuyler	Seneca
Acetaldehyde	113949.66	105446.15	54533.19	93188.66	44014.29	15839.24	7624.2
Acrolein	9360.7	11006.1	4712.45	8924.58	4587.78	1512.8	665.17
Anthracene	0.27	0.66	0.42	0.47	0.17	0.09	0.02
Arsenic	0	0	0	0	0	0	0
Benz(a)anthracene	3.94	9.58	6.01	6.84	2.49	1.3	0.22
Benz(ghi)perylene	7.77	18.87	11.85	13.48	4.9	2.56	0.44
Benzene	294275.27	360304.26	177082.15	304027.4	150024.61	49946.79	19591.98
Benzo(a)pyrene	2.32	5.65	3.54	4.03	1.47	0.76	0.13
Benzo(b)fluoranthene	2.02	4.92	3.09	3.51	1.28	0.67	0.11
Benzo(k)fluoranthene	2.17	5.28	3.32	3.77	1.37	0.71	0.12
Butadiene,13	78515.23	87176.56	40359.31	76277.6	39336.36	12192.88	5363.75
Chromium	33.9	24.84	14.15	23.8	11.49	3.64	2.47
Chrysene	2.98	7.24	4.55	5.17	1.88	0.98	0.17
Copper	30.46	33.32	14.13	28.22	16.17	6.04	3.02
Dibenz(a,h)anthracene	0.31	0.99	0.61	0.68	0.24	0.13	0.02
Ethylbenzene	194623	257028.67	129662.73	217300.72	102816.75	35896.86	13091.86
Fluoranthene	2.58	6.27	3.94	4.48	1.63	0.85	0.15
Formaldehyde	306005.31	287809.32	142767.59	251885.56	121900.09	42700.85	20715.05
Indeno(1,2,3-cd)pyrene	0.31	1	0.62	0.69	0.25	0.13	0.02
Lead	352.86	379.65	161.87	321.66	187.83	66.98	33.14
Manganese	40.49	32.18	16.72	29.69	14.15	4.79	2.55
Mercury	13.57	11.99	6.14	11.02	5.09	1.74	1.41
Naphthalene	10801	11182	4977	10171	5285	1591	741
Nickel	20.24	17.31	9.07	16.06	7.52	3.2	1.66
Phenanthrene	0.92	2.24	1.41	1.6	0.58	0.3	0.05
Phenol	0	0	0	0	0	0	0
Pyrene	1.66	4.02	2.53	2.87	1.04	0.54	0.09
Styrene	40833.19	45879.3	21177.61	40611.95	20465.12	6510.16	2845.64
Toluene	1280595.5	1553888.56	757962.14	1353463.08	659762.84	218619.91	86988.41
Xylene,M	8842.61	9994.72	4124.85	7959.25	4283.71	1582.1	800.52
Xylene,O	205929.78	213066.98	95456.78	194491.11	100850.01	30265.92	14107.48
Xylene,p	248473	257965	115062	234914	121925	36739	17121
Xylenes,Iso	768180.23	1046482.05	533541.21	882032.31	411101.53	146774.8	52070.75

Table E-1: New York Mobile Source emissions by county in pounds/year (continued)

	St. Lawrence	Steuben	Suffolk	Sullivan	Tioga	Tompkins	Ulster
Acetaldehyde	20114.92	72699.15	547068.65	55586.32	26906.2	39708.93	82252.04
Acrolein	1747.31	6066.58	59301.32	7038.14	2744.94	3426.94	8795.49
Anthracene	0.03	0.55	2	2.2	0.23	0.33	1.14
Arsenic	0	0	1	0	0	0	0
Benz(a)anthracene	0.49	7.92	28.4	31.86	3.4	4.76	16.53
Benz(ghi)perylene	0.97	15.61	55.88	62.77	6.69	9.36	32.58
Benzene	53144.74	213164.28	1746380.25	407416.02	99808.43	128641.32	357573.34
Benzo(a)pyrene	0.29	4.67	16.74	18.78	2	2.8	9.75
Benzo(b)fluoranthene	0.25	4.07	14.57	16.36	1.74	2.44	8.49
Benzo(k)fluoranthene	0.27	4.37	15.64	17.57	1.87	2.62	9.12
Butadiene,13	14707.92	47095.29	461763.39	56281.17	22687.92	28702.05	71760.96
Chromium	5.86	19.45	134.58	8.29	6.29	11.05	19.08
Chrysene	0.37	5.99	21.45	24.09	2.57	3.59	12.5
Copper	7.04	25.11	171.56	11.08	11.06	9.11	29.19
Dibenz(a,h)anthracene	0.03	0.81	2.72	3.55	0.36	0.49	1.79
Ethylbenzene	35966.6	157890.2	1185617.56	347985.39	74041.3	94238	275872.92
Fluoranthene	0.32	5.19	18.69	20.85	2.22	3.12	10.82
Formaldehyde	54629	189443.33	1516507.59	127681.95	72024.74	103403.99	215295.24
Indeno(1,2,3-cd)pyrene	0.03	0.82	2.75	3.6	0.36	0.49	1.82
Lead	79.95	284.94	1943.21	123.21	119.14	102.75	330
Manganese	7.01	23.98	172.55	11.14	8.58	13.47	25.07
Mercury	3.09	11.37	61.29	3.71	4.2	4.55	9.65
Naphthalene	2092	5762	62295.84	3605	2809	3415.77	8206
Nickel	3.73	12.9	92.39	6.24	5	7.08	14.14
Phenanthrene	0.12	1.86	7.28	7.47	0.8	1.18	3.88
Phenol	0	0	1386.99	0	0	103.94	0
Pyrene	0.21	3.33	12.03	13.38	1.43	2.01	6.95
Styrene	7886.38	25259.08	239003.68	28925.19	12033.65	14894.65	37822.14
Toluene	242281.37	903708.4	7645111.8	1581767.85	430492.5	543610.13	1493442.66
Xylene,M	1803.58	7549.47	43340.89	2933.87	2723.93	2503.26	7590.43
Xylene,O	39915.31	109635.5	1173455.75	68969.92	53753.94	65653.82	156003.75
Xylene,p	48259	133100	1414675	83361	64928	78893	188745
Xylenes,Iso	142603.64	656044.56	4701923.57	1516480.32	305772.39	387730.97	1157482.76

Table E-1: New York Mobile Source emissions by county in pounds/year (continued)

	Warren	Washington	Wayne	Westchester	Wyoming	Yates	**State Total**
Acetaldehyde	49812.9	27537.81	38216.09	365858.93	24692.47	14579.51	**6674915.99**
Acrolein	5238.2	2407.53	2960.94	35106.9	1718.43	1259.86	**705584.39**
Anthracene	1.27	0.18	0.27	1.57	0.36	0.28	**41.79**
Arsenic	0	0	0	1	0	0	**6.00**
Benz(a)anthracene	18.34	2.58	3.9	22.56	5.22	3.99	**565.00**
Benz(ghi)perylene	36.13	5.09	7.69	44.44	10.29	7.87	**1107.61**
Benzene	267100.94	87322.44	113024.57	1073360.72	84712.5	61224.96	**20089655.11**
Benzo(a)pyrene	10.81	1.52	2.3	13.3	3.08	2.35	**333.19**
Benzo(b)fluoranthene	9.42	1.33	2	11.58	2.68	2.05	**288.62**
Benzo(k)fluoranthene	10.11	1.42	2.15	12.44	2.88	2.2	**309.92**
Butadiene,13	41892.57	20683.48	25527.64	271339.94	14499.34	10073.62	**4883721.18**
Chromium	11.63	7.5	10.9	95.57	7.3	4	**1772.53**
Chrysene	13.86	1.95	2.95	17.06	3.95	3.02	**425.49**
Copper	12.07	8.07	9.11	118.03	4.05	3.03	**1724.89**
Dibenz(a,h)anthracene	2.02	0.26	0.39	2.19	0.55	0.43	**56.19**
Ethylbenzene	220249.07	62927.71	81169.71	744940.09	66408.01	49334.01	**14037505.92**
Fluoranthene	12	1.69	2.55	14.79	3.42	2.61	**377.98**
Formaldehyde	120597.14	72717.99	99137.4	995654.21	59802.02	35526.68	**17893044.51**
Indeno(1,2,3-cd)pyrene	2.04	0.26	0.4	2.22	0.56	0.44	**56.88**
Lead	137.68	86.64	108.65	1336.47	47.65	37.45	**19739.90**
Manganese	14.26	8.79	13.33	119.63	8.56	4.17	**2154.15**
Mercury	5.4	3.55	4.51	44.84	2.78	1.84	**750.07**
Naphthalene	3462.62	2618	3098	35955.62	1329	877	**605604.14**
Nickel	7.09	4.5	7.03	64.21	3.84	2.38	**1106.19**
Phenanthrene	4.31	0.61	0.92	5.42	1.22	0.94	**180.65**
Phenol	15.84	0	0	246.98	0	0	**18161.47**
Pyrene	7.71	1.08	1.64	9.5	2.19	1.68	**245.16**
Styrene	21681.77	10849.41	13153.85	143558.09	7350.99	5184.11	**2485813.22**
Toluene	1054413.97	377144.8	472735.27	4660754.24	331335.31	240706.88	**84538479.51**
Xylene,M	3667.11	2054.41	2712.7	35656.85	1314.58	984.4	**529270.73**
Xylene,O	66261.05	50175.91	59436.14	684563.42	25575.82	16747.49	**11472055.99**
Xylene,p	79896	60515	71516	828604	30694	20278	**13826101.00**
Xylenes,Iso	949141.47	257186.57	332538.35	2999454.93	282422.15	211673.07	**56932625.09**

Appendix F: Ohio Toxic Emissions Inventory

DATA SOURCES

On-Road Mobile Sources

Construction of the on-road inventory required coordination with the Ohio Department of Transportation (ODOT) and Ohio EPA's Mobile Source Section. ODOT has provided Ohio EPA with average daily vehicles-miles of travel (VMT) for each of the eight types of highway vehicles and for each arterial classification (road type) . EPA's Mobile Source Section generated TOG and PM10 emission factors by running U.S.EPA's Mobile5a and Part5 Models. The TOG emission factors included tailpipe exhaust and evaporative organic compounds except emissions from vehicle refueling and the PM10 emission factors included tailpipe exhaust, break-wear and tire-wear emissions. The emission inventory program utilized the daily VMT data file and the emission factors to construct intelligent import data files and import into the Regional Air Pollutant Inventory Development System (RAPIDS). RAPIDS accepted the raw data and calculated TOG and PM10 emissions for each one of the Ohio's 88 counties, vehicle type and arterial classification. Toxic emissions were calculated using RAPIDS speciation profiles.

Off-Road Mobile Sources

Ohio created an off-road inventory of 140 mobile sources and utilized RAPIDS ability to inventory and speciate for toxic pollutants. RAPIDS used inverse county population and housing surrogates among other surrogates to calculate equipment population. RAPIDS applied a number of default factors such as equipment horsepower, equipment use and load factors to calculate exhaust hydrocarbons and PM10. Toxic emissions were calculated using RAPIDS speciation profiles.

Aircraft Sources

The US Department of Transportation Bureau of Transportation Statistics, Office of Airline Information supplied us with detailed scheduled and non-scheduled aircraft type departures for major airports in Ohio. Each departure was equated with an LTO (landing and take-off). An Aircraft LTO count intelligent import file was created and inserted in RAPIDS. RAPIDS applied default or generic values for Time-in-Mode (TIM) and calculated TOG emissions. Toxic emissions were calculated using RAPIDS speciation profiles.

INFORMATION

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Table F-1: Ohio's Mobile Source emissions by county in pounds/year

	Adams	Allen	Ashland	Ashtabula	Athens	Auglaize	Belmont
Acetaldehyde	10790.05	17698.85	13961.00	16825.13	10867.41	11440.13	15688.33
Acrolein	720.71	2379.62	1512.55	2192.94	1211.48	1149.48	1924.36
Anthracene	0.07	0.02	0.04	0.02	0.03	0.04	0.03
Benz(a)anthracene	1.06	0.24	0.56	0.27	0.45	0.60	0.38
Benzene	25701.95	63358.51	35834.22	54241.98	33677.85	30499.33	46472.14
Benzo(a)pyrene	0.62	0.14	0.33	0.16	0.26	0.35	0.22
Benzo(b)fluoranthene	0.54	0.12	0.29	0.14	0.23	0.31	0.19
Benzo(k)fluoranthene	0.58	0.13	0.31	0.15	0.25	0.33	0.21
Butadiene,13	9445.97	17543.66	10836.87	15110.07	10038.66	9508.73	13213.79
Chromium	7.39	11.96	8.78	11.45	7.35	7.37	10.39
Chrysene	0.80	0.18	0.43	0.20	0.34	0.45	0.29
Dibenz(a,h)anthracene	0.10	0.02	0.05	0.02	0.04	0.06	0.03
Ethylbenzene	16419.42	44873.78	24675.14	38374.01	23235.16	20710.07	32600.28
Fluoranthene	0.69	0.16	0.37	0.18	0.29	0.39	0.25
Formaldehyde	26142.43	52158.43	38644.13	49246.00	30131.61	30861.44	45076.51
Indeno(1,2,3-cd)pyrene	0.10	0.02	0.05	0.03	0.04	0.06	0.04
Manganese	7.13	5.17	5.44	5.02	4.44	5.14	5.07
Mercury	1.21	0.56	0.77	0.55	0.50	0.66	0.42
Naphthalene	584.03	2836.79	1360.20	2397.08	1322.58	1086.76	1972.37
Nickel	5.10	8.48	6.17	8.22	5.14	5.15	7.41
Phenanthrene	0.25	0.06	0.13	0.06	0.11	0.14	0.09
Phenol							
Pyrene	0.44	0.10	0.24	0.11	0.19	0.25	0.16
Styrene	2284.07	9457.59	4767.14	8078.26	4494.12	3792.49	6690.88
Toluene	89265.87	301292.01	155046.38	255634.41	148640.61	127631.69	213335.45
Xylene,O	10724.09	52793.63	25130.07	44546.70	24501.03	20039.85	36545.06
Xylenes,Iso	64700.04	173669.98	95516.96	148325.37	90147.33	80387.74	125925.51

Table F-1: Ohio's Mobile Source emissions by county in pounds/year (continued)

	Brown	Butler	Carroll	Champaign	Clark	Clermont	Clinton
Acetaldehyde	10700.88	28919.56	9519.96	9541.22	22615.77	20649.56	12483.90
Acrolein	914.15	4215.23	600.80	793.89	3046.24	2845.71	1192.64
Anthracene	0.05	0.01	0.07	0.05	0.01	0.01	0.05
Benz(a)anthracene	0.77	0.09	1.01	0.74	0.18	0.18	0.76
Benzene	26044.45	118677.01	25142.20	25874.52	70353.91	74255.57	34440.01
Benzo(a)pyrene	0.45	0.05	0.60	0.44	0.11	0.10	0.45
Benzo(b)fluoranthene	0.39	0.05	0.52	0.38	0.09	0.09	0.39
Benzo(k)fluoranthene	0.42	0.05	0.56	0.41	0.10	0.10	0.42
Butadiene,13	8743.38	32103.63	9280.10	8754.37	18829.85	19994.41	10974.26
Chromium	7.08	21.60	7.15	6.54	14.90	15.44	8.61
Chrysene	0.58	0.07	0.76	0.56	0.14	0.13	0.57
Dibenz(a,h)anthracene	0.07	0.01	0.09	0.07	0.02	0.02	0.07
Ethylbenzene	17216.01	84615.76	16094.03	17129.44	49972.42	52640.12	23217.92
Fluoranthene	0.50	0.06	0.66	0.49	0.12	0.12	0.50
Formaldehyde	27603.78	87361.08	22653.19	24311.05	67185.04	61472.59	33103.35
Indeno(1,2,3-cd)pyrene	0.07	0.01	0.09	0.07	0.02	0.02	0.07
Manganese	5.72	7.49	6.82	5.47	5.75	5.84	6.13
Mercury	0.85	0.10	1.12	0.82	0.20	0.20	0.84
Naphthalene	777.46	5521.99	578.76	775.66	3230.97	3408.08	1177.90
Nickel	4.94	15.61	4.89	4.51	10.68	11.10	5.94
Phenanthrene	0.18	0.02	0.24	0.17	0.04	0.04	0.18
Phenol							
Pyrene	0.32	0.04	0.43	0.31	0.08	0.07	0.32
Styrene	2830.13	18167.29	2248.88	2819.46	10676.20	11136.44	4126.79
Toluene	100329.99	577641.25	88740.28	101016.77	334643.51	354495.86	141723.40
Xylene,O	14283.55	102937.83	10721.90	14357.63	59728.02	63151.43	21747.02
Xylenes,Iso	67153.92	327605.19	63683.37	67128.15	192057.67	202934.93	90391.03

Table F-1: Ohio's Mobile Source emissions by county in pounds/year (continued)

	Columbiana	Coshocton	Crawford	Cuyahoga	Darke	Defiance	Delaware
Acetaldehyde	15314.57	10267.42	8410.89	149681.40	9628.04	9849.60	20440.51
Acrolein	2009.90	901.19	791.63	29646.16	998.70	896.58	2584.13
Anthracene	0.02	0.05	0.04	0.26	0.03	0.05	0.03
Benz(a)anthracene	0.25	0.76	0.56	0.28	0.50	0.68	0.40
Benzene	51618.63	30006.49	26149.04	558811.04	29394.87	28755.91	62840.18
Benzo(a)pyrene	0.15	0.45	0.33	0.18	0.29	0.40	0.24
Benzo(b)fluoranthene	0.13	0.39	0.29	0.01	0.26	0.35	0.21
Benzo(k)fluoranthene	0.14	0.42	0.31	0.01	0.28	0.38	0.22
Butadiene,13	14367.81	9905.65	8395.44	155466.40	9015.95	9423.51	17485.85
Chromium	10.88	7.07	5.98	109.63	6.92	6.77	12.84
Chrysene	0.19	0.57	0.42	0.06	0.38	0.52	0.30
Dibenz(a,h)anthracene	0.02	0.07	0.05	0.00	0.05	0.06	0.04
Ethylbenzene	36492.26	20043.26	17643.54	392887.11	20059.41	19322.89	44196.56
Fluoranthene	0.16	0.50	0.37	0.90	0.33	0.45	0.26
Formaldehyde	44850.27	26468.32	22069.73	459382.41	26084.90	25659.26	59307.81
Indeno(1,2,3-cd)pyrene	0.02	0.07	0.05	0.00	0.05	0.06	0.04
Manganese	4.60	5.69	4.43	36.82	4.48	5.18	5.94
Mercury	0.27	0.84	0.62	0.02	0.55	0.75	0.44
Naphthalene	2285.23	961.81	896.55	28512.40	1091.45	945.23	2739.14
Nickel	7.72	4.91	4.11	79.77	4.77	4.69	9.20
Phenanthrene	0.06	0.18	0.13	4.28	0.12	0.16	0.09
Phenol				1115.64			
Pyrene	0.10	0.32	0.23	0.80	0.21	0.29	0.17
Styrene	7656.72	3419.65	3132.27	86039.96	3727.48	3378.81	9144.44
Toluene	243533.69	120863.00	108767.93	2687051.32	125975.29	117645.89	291309.20
Xylene,O	42479.39	17835.91	16652.01	482461.63	20191.60	17573.53	50667.03
Xylenes,Iso	141126.78	78475.97	68980.34	1518943.70	77971.15	75657.46	170383.91

Table F-1: Ohio's Mobile Source emissions by county in pounds/year (continued)

	Erie	Fairfield	Fayette	Franklin	Fulton	Gallia	Geauga
Acetaldehyde	18581.82	15431.57	13505.85	149791.48	12576.42	11893.03	12498.52
Acrolein	2321.21	2027.66	1155.75	32499.15	1224.31	999.38	1557.44
Anthracene	0.02	0.02	0.07	0.35	0.05	0.06	0.02
Benz(a)anthracene	0.35	0.26	0.98	0.38	0.70	0.87	0.33
Benzene	51372.28	53533.64	33938.21	539179.10	32020.64	28050.20	42894.21
Benzo(a)pyrene	0.21	0.15	0.58	0.24	0.41	0.51	0.19
Benzo(b)fluoranthene	0.18	0.13	0.50	0.02	0.36	0.44	0.17
Benzo(k)fluoranthene	0.19	0.14	0.54	0.01	0.38	0.48	0.18
Butadiene,13	14401.12	14841.55	11347.72	152220.24	9996.29	9489.57	12323.00
Chromium	11.33	10.27	8.86	94.41	8.23	7.71	9.01
Chrysene	0.26	0.20	0.74	0.09	0.53	0.66	0.25
Dibenz(a,h)anthracene	0.03	0.02	0.09	0.00	0.06	0.08	0.03
Ethylbenzene	36242.75	37773.36	22458.94	376351.66	21560.87	18466.74	30090.61
Fluoranthene	0.23	0.17	0.64	1.20	0.46	0.57	0.22
Formaldehyde	53897.23	45161.03	34811.39	461383.39	33676.61	30577.20	35859.87
Indeno(1,2,3-cd)pyrene	0.03	0.02	0.09	0.00	0.07	0.08	0.03
Manganese	5.31	4.56	7.28	31.79	5.78	6.30	4.36
Mercury	0.39	0.29	1.08	0.03	0.77	0.96	0.37
Naphthalene	2223.16	2372.89	1026.08	28453.76	1111.65	815.01	1820.04
Nickel	8.13	7.43	6.18	68.63	5.76	5.34	6.36
Phenanthrene	0.08	0.06	0.23	5.67	0.16	0.20	0.08
Phenol				1547.43			
Pyrene	0.15	0.11	0.41	1.07	0.29	0.36	0.14
Styrene	7593.69	7873.10	3705.08	82858.16	3830.35	2985.94	6148.65
Toluene	238008.90	251934.48	131571.37	2572452.94	130670.30	106494.75	198627.34
Xylene,O	41165.30	44045.21	18867.12	462445.15	20348.47	14939.39	33887.87
Xylenes,Iso	139674.04	145996.85	87633.24	1454077.63	83437.87	72008.81	116757.35

Table F-1: Ohio's Mobile Source emissions by county in pounds/year (continued)

	Greene	Guernsey	Hamilton	Hancock	Hardin	Harrison	Henry
Acetaldehyde	19237.49	16252.13	87768.54	16010.75	9207.75	13299.46	11463.38
Acrolein	2674.98	1741.30	13008.62	1956.37	674.03	617.30	921.20
Anthracene	0.01	0.05	0.00	0.03	0.06	0.11	0.06
Benz(a)anthracene	0.20	0.69	0.03	0.41	0.86	1.67	0.92
Benzene	75052.71	41975.02	372080.83	49366.65	25964.86	28911.09	29390.19
Benzo(a)pyrene	0.11	0.41	0.02	0.24	0.51	0.98	0.54
Benzo(b)fluoranthene	0.10	0.35	0.02	0.21	0.44	0.86	0.47
Benzo(k)fluoranthene	0.11	0.38	0.02	0.23	0.47	0.92	0.51
Butadiene,13	20386.46	12754.93	98391.25	13896.35	9124.72	11966.79	10054.59
Chromium	15.07	10.35	74.91	10.39	6.66	9.16	7.66
Chrysene	0.15	0.52	0.02	0.31	0.65	1.26	0.70
Dibenz(a,h)anthracene	0.02	0.06	0.00	0.04	0.08	0.15	0.09
Ethylbenzene	53141.01	28840.69	264706.45	34477.26	16955.54	17636.85	19297.50
Fluoranthene	0.13	0.45	0.02	0.27	0.56	1.09	0.60
Formaldehyde	57215.13	44812.28	266725.74	45885.60	22631.88	30012.94	29010.24
Indeno(1,2,3-cd)pyrene	0.02	0.06	0.00	0.04	0.08	0.16	0.09
Manganese	5.91	6.45	25.18	5.19	6.02	10.38	6.59
Mercury	0.22	0.76	0.03	0.45	0.95	1.84	1.02
Naphthalene	3426.82	1577.94	17569.94	2100.73	706.49	362.56	841.07
Nickel	10.90	7.23	54.33	7.43	4.64	6.17	5.29
Phenanthrene	0.05	0.16	0.01	0.10	0.20	0.39	0.22
Phenol							
Pyrene	0.08	0.29	0.01	0.17	0.36	0.70	0.39
Styrene	11176.37	5526.77	56459.17	6968.56	2614.76	1833.34	3069.32
Toluene	358660.14	180682.92	1807025.72	225014.91	97799.82	85268.13	111611.87
Xylene,O	63620.46	29147.18	326007.51	38766.83	13111.40	6681.18	15482.50
Xylenes,Iso	205346.92	111687.45	1021364.56	132921.30	66804.41	70567.01	75536.76

Table F-1: Ohio's Mobile Source emissions by county in pounds/year (continued)

	Highland	Hocking	Holmes	Huron	Jackson	Jefferson	Knox
Acetaldehyde	8816.17	10339.19	5189.06	11413.65	11030.31	11891.99	9024.07
Acrolein	699.84	670.87	119.59	1254.59	887.32	1478.04	873.46
Anthracene	0.05	0.07	0.06	0.03	0.06	0.02	0.04
Benz(a)anthracene	0.75	1.05	0.82	0.48	0.89	0.33	0.56
Benzene	25245.46	25443.23	10433.08	32903.06	28338.24	42088.96	27986.39
Benzo(a)pyrene	0.44	0.62	0.48	0.28	0.52	0.20	0.33
Benzo(b)fluoranthene	0.39	0.54	0.42	0.24	0.46	0.17	0.29
Benzo(k)fluoranthene	0.41	0.58	0.45	0.26	0.49	0.18	0.31
Butadiene,13	8632.68	9395.05	4898.49	9987.60	9731.74	12140.21	8872.41
Chromium	6.35	7.14	6.57	7.36	7.40	8.63	6.33
Chrysene	0.57	0.79	0.62	0.36	0.67	0.25	0.43
Dibenz(a,h)anthracene	0.07	0.10	0.08	0.04	0.08	0.03	0.05
Ethylbenzene	16646.89	16242.46	5969.17	22728.12	18630.60	29494.19	18941.96
Fluoranthene	0.49	0.69	0.53	0.31	0.58	0.22	0.37
Formaldehyde	22119.62	24845.55	10710.56	31581.84	27915.08	34031.48	23890.34
Indeno(1,2,3-cd)pyrene	0.07	0.10	0.08	0.04	0.08	0.03	0.05
Manganese	5.44	7.01	5.75	4.49	6.35	4.34	4.56
Mercury	0.83	1.16	0.90	0.53	0.98	0.37	0.62
Naphthalene	740.34	573.56		1264.46	808.86	1778.47	981.98
Nickel	4.42	4.86	4.57	5.25	5.04	6.18	4.42
Phenanthrene	0.18	0.25	0.19	0.11	0.21	0.08	0.13
Phenol							
Pyrene	0.31	0.44	0.34	0.20	0.37	0.14	0.24
Styrene	2685.37	2245.68	311.12	4421.21	2979.21	6000.66	3405.59
Toluene	97917.45	88460.76	23785.26	144725.20	107967.24	194716.12	117399.06
Xylene,O	13731.04	10563.68		23504.12	14932.14	33137.82	18215.78
Xylenes,Iso	65396.54	64115.99	24356.72	88344.02	73008.83	114548.96	73937.73

Table F-1: Ohio's Mobile Source emissions by county in pounds/year (continued)

	Lake	Lawrence	Licking	Logan	Lorain	Lucas	Madison
Acetaldehyde	26217.29	9702.76	23579.54	10344.94	29543.87	73476.60	14995.82
Acrolein	3778.37	1097.85	3181.88	979.74	4292.37	16588.51	1523.79
Anthracene	0.01	0.03	0.01	0.04	0.01	0.20	0.05
Benz(a)anthracene	0.12	0.43	0.21	0.63	0.10	0.26	0.72
Benzene	106464.56	35429.49	76532.24	27862.11	119972.82	260992.61	36629.10
Benzo(a)pyrene	0.07	0.26	0.12	0.37	0.06	0.16	0.43
Benzo(b)fluoranthene	0.06	0.22	0.11	0.32	0.05	0.03	0.37
Benzo(k)fluoranthene	0.07	0.24	0.11	0.35	0.05	0.03	0.40
Butadiene,13	28673.04	10494.65	20421.59	8955.20	32411.66	74988.32	11228.19
Chromium	21.97	7.72	15.79	6.89	23.61	41.43	9.38
Chrysene	0.09	0.33	0.16	0.48	0.07	0.08	0.55
Dibenz(a,h)anthracene	0.01	0.04	0.02	0.06	0.01	0.00	0.07
Ethylbenzene	75707.78	24428.78	54216.93	18769.83	85515.60	181862.20	24844.64
Fluoranthene	0.08	0.28	0.14	0.41	0.06	0.71	0.47
Formaldehyde	78915.00	26821.64	69985.82	27382.11	89188.17	226522.44	40761.16
Indeno(1,2,3-cd)pyrene	0.01	0.04	0.02	0.06	0.01	0.00	0.07
Manganese	7.80	4.45	6.13	5.01	8.30	14.14	6.37
Mercury	0.14	0.48	0.23	0.70	0.11	0.06	0.80
Naphthalene	4943.60	1413.02	3513.75	938.72	5582.09	13912.98	1316.94
Nickel	16.03	5.42	11.49	4.73	17.02	30.15	6.57
Phenanthrene	0.03	0.10	0.05	0.15	0.02	3.27	0.17
Phenol						850.67	
Pyrene	0.05	0.18	0.09	0.27	0.04	0.63	0.30
Styrene	16129.21	4695.34	11477.23	3328.14	18349.15	40306.29	4549.75
Toluene	514997.80	157820.90	362837.58	114139.23	583334.86	1244604.76	151876.74
Xylene,O	91932.83	26215.01	64868.93	17350.23	104009.77	222589.53	24102.71
Xylenes,Iso	292681.35	94958.30	208305.70	73134.20	330948.78	704189.28	95906.39

Table F-1: Ohio's Mobile Source emissions by county in pounds/year (continued)

	Mahoning	Marion	Medina	Meigs	Mercer	Miami	Monroe
Acetaldehyde	33750.78	11378.66	20698.46	11136.20	9824.45	16739.20	14374.69
Acrolein	4873.38	1309.58	2726.53	686.23	897.11	2210.67	727.73
Anthracene	0.01	0.03	0.01	0.08	0.05	0.02	0.12
Benz(a)anthracene	0.10	0.42	0.22	1.17	0.68	0.29	1.73
Benzene	130405.00	35717.47	61226.77	25744.74	29319.47	60311.85	32714.91
Benzo(a)pyrene	0.06	0.25	0.13	0.69	0.40	0.17	1.02
Benzo(b)fluoranthene	0.05	0.21	0.11	0.60	0.35	0.15	0.89
Benzo(k)fluoranthene	0.06	0.23	0.12	0.64	0.37	0.16	0.95
Butadiene,13	35541.11	10492.99	16444.65	9765.85	9507.16	16719.19	13142.45
Chromium	23.18	7.50	14.19	7.51	7.21	12.30	9.99
Chrysene	0.08	0.32	0.17	0.88	0.51	0.22	1.31
Dibenz(a,h)anthracene	0.01	0.04	0.02	0.11	0.06	0.03	0.16
Ethylbenzene	93262.78	24756.38	43377.56	16264.38	19681.79	42525.91	20231.29
Fluoranthene	0.07	0.27	0.14	0.76	0.44	0.19	1.13
Formaldehyde	101851.56	31881.08	61107.47	26518.14	25600.07	48992.26	32892.66
Indeno(1,2,3-cd)pyrene	0.01	0.04	0.02	0.11	0.06	0.03	0.16
Manganese	7.99	4.32	5.72	7.62	5.39	5.28	10.94
Mercury	0.11	0.46	0.24	1.29	0.75	0.32	1.91
Naphthalene	6050.27	1438.82	2781.49	518.44	976.67	2675.42	503.80
Nickel	16.66	5.26	10.24	5.10	5.01	8.65	6.80
Phenanthrene	0.02	0.10	0.05	0.27	0.16	0.07	0.41
Phenol							
Pyrene	0.04	0.18	0.09	0.49	0.29	0.12	0.73
Styrene	20229.20	4866.94	9205.24	2127.14	3426.84	8836.00	2312.20
Toluene	636983.25	159677.79	288515.13	86017.62	119948.65	283977.60	101699.07
Xylene,O	113044.26	26660.68	51320.59	9527.57	18100.82	49666.97	9307.16
Xylenes,Iso	361425.87	95954.15	166514.00	64325.87	76928.18	164444.12	80692.53

Table F-1: Ohio's Mobile Source emissions by county in pounds/year (continued)

	Montgomery	Morgan	Morrow	Muskingum	Noble	Ottawa	Paulding
Acetaldehyde	100068.28	14307.10	29107.69	32737.70	18384.13	11299.08	11223.40
Acrolein	48702.78	611.29	2572.91	4426.11	807.85	1077.01	601.12
Anthracene	1.19	0.13	0.13	0.02	0.16	0.05	0.09
Benz(a)anthracene	1.26	1.89	1.93	0.33	2.37	0.67	1.31
Benzene	42370.13	33098.34	106416.00	110598.04	39555.73	29768.43	26121.70
Benzo(a)pyrene	0.80	1.11	1.14	0.19	1.39	0.40	0.77
Benzo(b)fluoranthene	0.03	0.97	0.99	0.17	1.21	0.34	0.67
Benzo(k)fluoranthene	0.02	1.04	1.07	0.18	1.30	0.37	0.72
Butadiene,13	38930.16	13656.91	22575.58	29726.48	16596.18	9391.00	10282.55
Chromium	52.73	10.26	18.94	22.39	12.64	7.60	7.82
Chrysene	0.27	1.43	1.46	0.25	1.79	0.51	0.99
Dibenz(a,h)anthracene	0.00	0.18	0.18	0.03	0.22	0.06	0.12
Ethylbenzene	4045.72	20172.17	45509.02	78294.95	23974.17	19995.21	16271.64
Fluoranthene	4.13	1.24	1.27	0.21	1.55	0.44	0.86
Formaldehyde	322697.69	31757.09	75937.92	97045.30	41117.73	30016.24	25942.53
Indeno(1,2,3-cd)pyrene	0.00	0.18	0.18	0.03	0.22	0.06	0.12
Manganese	17.95	11.73	14.73	8.73	14.56	5.40	8.39
Mercury	0.05	2.09	168.13	0.36	2.62	0.74	1.45
Naphthalene	12246.90	426.02	2121.19	5053.14	444.84	1017.37	447.58
Nickel	38.35	6.90	19469.26	16.19	8.53	5.27	5.33
Phenanthrene	19.73	0.44	0.45	0.08	0.55	0.16	0.31
Phenol	5156.81						
Pyrene	3.68	0.79	160.38	0.14	0.99	0.28	0.55
Styrene	8482.77	2071.78	42551.70	16516.79	2370.06	3511.14	1949.44
Toluene	12921.89	98222.85	407755.59	524532.05	113875.32	120994.05	83446.73
Xylene,O	4082.72	7863.80	38747.47	93429.11	8192.43	18656.96	8252.64
Xylenes,Iso	11689.71	80786.10	176722.70	301308.56	96096.03	77543.99	64725.33

Table F-1: Ohio's Mobile Source emissions by county in pounds/year (continued)

	Perry	Pickaway	Pike	Portage	Preble	Putnam	Richland
Acetaldehyde	9827.73	13289.40	12379.17	24232.11	11057.20	8903.40	20219.31
Acrolein	779.19	1452.63	896.68	3303.13	1048.07	681.63	2744.92
Anthracene	0.06	0.04	0.08	0.01	0.05	0.05	0.01
Benz(a)anthracene	0.85	0.56	1.11	0.19	0.67	0.79	0.21
Benzene	29350.77	38154.18	28825.14	79691.57	29256.55	25483.43	70183.15
Benzo(a)pyrene	0.50	0.33	0.65	0.11	0.39	0.47	0.12
Benzo(b)fluoranthene	0.44	0.29	0.57	0.10	0.34	0.41	0.11
Benzo(k)fluoranthene	0.47	0.31	0.61	0.10	0.37	0.44	0.12
Butadiene,13	9961.38	11341.46	10373.16	21473.77	9345.99	8780.47	19101.38
Chromium	7.41	8.88	8.12	17.09	7.48	6.72	13.36
Chrysene	0.64	0.42	0.84	0.14	0.51	0.60	0.16
Dibenz(a,h)anthracene	0.08	0.05	0.10	0.02	0.06	0.07	0.02
Ethylbenzene	19362.48	26212.33	18586.37	56655.51	19678.98	16718.20	49763.59
Fluoranthene	0.56	0.36	0.72	0.12	0.44	0.52	0.14
Formaldehyde	24602.75	36748.45	30612.30	72121.81	29305.17	22129.05	59925.06
Indeno(1,2,3-cd)pyrene	0.08	0.05	0.10	0.02	0.06	0.07	0.02
Manganese	6.13	5.35	7.52	6.49	5.43	5.65	5.38
Mercury	0.94	0.61	1.22	0.21	0.74	0.88	0.24
Naphthalene	875.55	1480.58	703.85	3658.28	988.09	727.79	3189.14
Nickel	5.07	6.29	5.58	12.34	5.23	4.65	9.56
Phenanthrene	0.20	0.13	0.26	0.04	0.16	0.19	0.05
Phenol							
Pyrene	0.36	0.23	0.46	0.08	0.28	0.33	0.09
Styrene	3126.10	5007.46	2718.55	12117.16	3471.78	2635.12	10539.07
Toluene	114438.70	165818.00	102699.95	380977.08	119267.49	97461.51	334356.31
Xylene,O	16223.76	27284.20	12921.59	67806.66	18200.81	13471.25	59174.95
Xylenes,Iso	76031.31	101377.46	73014.60	218246.81	76529.27	65697.64	192043.25

Table F-1: Ohio's Mobile Source emissions by county in pounds/year (continued)

	Ross	Sandusky	Scioto	Seneca	Shelby	Stark	Summit
Acetaldehyde	15972.94	17826.39	12015.84	10001.64	13079.35	39123.75	60159.73
Acrolein	1974.17	2133.61	1462.25	1095.00	1393.39	5758.13	8893.16
Anthracene	0.03	0.03	0.02	0.03	0.04	0.00	0.00
Benz(a)anthracene	0.39	0.43	0.33	0.45	0.60	0.07	0.05
Benzene	50203.77	47010.68	38246.79	31776.87	37086.41	161162.53	252764.45
Benzo(a)pyrene	0.23	0.26	0.20	0.26	0.35	0.04	0.03
Benzo(b)fluoranthene	0.20	0.22	0.17	0.23	0.31	0.04	0.03
Benzo(k)fluoranthene	0.21	0.24	0.18	0.25	0.33	0.04	0.03
Butadiene,13	14100.35	13128.75	10978.87	9491.73	11242.09	44025.90	67451.35
Chromium	10.73	10.60	7.86	7.02	8.74	28.18	51.14
Chrysene	0.29	0.33	0.25	0.34	0.45	0.05	0.04
Dibenz(a,h)anthracene	0.04	0.04	0.03	0.04	0.06	0.01	0.00
Ethylbenzene	35125.72	32796.47	26747.32	21833.49	25414.64	115324.90	180098.79
Fluoranthene	0.25	0.28	0.22	0.29	0.39	0.05	0.03
Formaldehyde	45926.04	51056.81	34312.89	27538.89	35866.16	118545.95	182635.40
Indeno(1,2,3-cd)pyrene	0.04	0.04	0.03	0.04	0.06	0.01	0.00
Manganese	5.27	5.43	4.01	4.32	5.48	9.58	17.33
Mercury	0.43	0.48	0.37	0.50	0.66	0.08	0.06
Naphthalene	2150.87	1988.22	1606.34	1236.09	1400.39	7493.81	11882.85
Nickel	7.73	7.61	5.56	4.88	6.12	20.53	37.16
Phenanthrene	0.09	0.10	0.08	0.10	0.14	0.02	0.01
Phenol							
Pyrene	0.16	0.18	0.14	0.19	0.25	0.03	0.02
Styrene	7139.00	6638.89	5421.20	4158.85	4809.64	25023.63	38589.40
Toluene	230125.57	211435.96	175033.67	139088.59	159832.19	790530.33	1230690.10
Xylene,O	39741.85	36486.03	29805.06	22859.23	25866.32	140233.89	220988.53
Xylenes,Iso	135489.60	125810.71	103542.85	84695.55	98531.22	447581.71	696013.28

Table F-1: Ohio's Mobile Source emissions by county in pounds/year (continued)

	Trumbull	Tuscarawas	Union	Van Wert	Vinton	Warren	Washington
Acetaldehyde	32341.64	15987.33	12940.75	10198.05	17378.01	19628.02	13249.55
Acrolein	4629.61	2024.14	1176.60	775.75	641.03	2646.26	1567.62
Anthracene	0.01	0.02	0.06	0.06	0.17	0.02	0.03
Benz(a)anthracene	0.12	0.32	0.84	0.88	2.42	0.24	0.43
Benzene	121586.23	49833.68	32960.33	25679.24	37867.72	69499.35	41714.46
Benzo(a)pyrene	0.07	0.19	0.49	0.52	1.42	0.14	0.25
Benzo(b)fluoranthene	0.06	0.16	0.43	0.45	1.24	0.12	0.22
Benzo(k)fluoranthene	0.06	0.18	0.46	0.49	1.33	0.13	0.24
Butadiene,13	33139.34	13950.48	10679.24	9055.22	16283.44	18689.14	12239.31
Chromium	21.83	11.08	8.72	6.78	12.28	15.43	8.88
Chrysene	0.09	0.24	0.63	0.67	1.83	0.18	0.33
Dibenz(a,h)anthracene	0.01	0.03	0.08	0.08	0.22	0.02	0.04
Ethylbenzene	86934.10	35077.68	21988.28	16763.62	22630.00	49035.38	29099.50
Fluoranthene	0.08	0.21	0.55	0.58	1.58	0.15	0.28
Formaldehyde	97404.40	46373.57	33933.67	25444.82	37806.51	58005.25	37461.48
Indeno(1,2,3-cd)pyrene	0.01	0.03	0.08	0.08	0.23	0.02	0.04
Manganese	7.68	5.02	6.54	6.16	14.71	6.07	4.80
Mercury	0.13	0.35	0.93	0.97	2.67	0.26	0.48
Naphthalene	5630.91	2166.43	1066.12	684.49	334.23	3161.73	1705.85
Nickel	15.83	7.86	6.07	4.65	8.24	11.02	6.40
Phenanthrene	0.03	0.07	0.20	0.21	0.57	0.05	0.10
Phenol							
Pyrene	0.05	0.13	0.35	0.37	1.01	0.10	0.18
Styrene	18853.42	7272.34	3756.57	2593.99	1979.22	10224.63	5846.06
Toluene	592764.62	231577.79	130985.66	95592.04	103916.21	327967.89	189393.99
Xylene,O	105153.01	40147.56	19562.74	12665.80	6143.13	58390.18	31738.02
Xylenes,Iso	336733.87	135421.81	85479.58	65903.65	91071.34	188718.27	112952.57

Table F-1: Ohio's Mobile Source emissions by county in pounds/year (continued)

	Wayne	Williams	Wood	Wyandot	**State Total**
Acetaldehyde	17914.34	12054.20	25550.38	13671.68	**1892409.38**
Acrolein	2356.85	1130.00	3426.55	993.66	**290547.34**
Anthracene	0.02	0.05	0.02	0.08	**5.63**
Benz(a)anthracene	0.26	0.73	0.24	1.21	**55.42**
Benzene	58696.92	30116.23	81535.25	30733.04	**5974988.07**
Benzo(a)pyrene	0.16	0.43	0.14	0.71	**32.75**
Benzo(b)fluoranthene	0.14	0.37	0.12	0.62	**27.41**
Benzo(k)fluoranthene	0.15	0.40	0.13	0.66	**29.43**
Butadiene,13	16287.68	9623.12	21626.77	11105.80	**1756712.20**
Chromium	12.20	7.70	17.05	8.71	**1304.87**
Chrysene	0.20	0.55	0.18	0.91	**40.76**
Dibenz(a,h)anthracene	0.02	0.07	0.02	0.11	**4.94**
Ethylbenzene	41562.14	20173.06	57666.56	19784.26	**4097814.35**
Fluoranthene	0.17	0.47	0.15	0.79	**41.78**
Formaldehyde	52581.67	31925.91	75735.67	33883.13	**5441345.22**
Indeno(1,2,3-cd)pyrene	0.02	0.07	0.02	0.11	**5.00**
Manganese	5.14	5.73	6.70	8.14	**667.81**
Mercury	0.29	0.80	0.26	1.33	**225.76**
Naphthalene	2609.40	1000.39	3745.83	736.06	**265564.60**
Nickel	8.72	5.33	12.23	5.98	**20386.67**
Phenanthrene	0.06	0.17	0.06	0.28	**45.40**
Phenol					**8670.54**
Pyrene	0.11	0.30	0.10	0.51	**188.09**
Styrene	8770.72	3509.06	12153.41	2875.29	**869284.08**
Toluene	277520.67	120855.54	384841.61	108514.87	**26939244.33**
Xylene,O	48499.90	18339.27	68991.59	13491.53	**4553778.10**
Xylenes,Iso	160637.03	78259.30	221196.21	77679.33	**15876628.84**

Appendix G: Ontario Toxic Emissions Inventory

BACKGROUND

The Province of Ontario, Canada, has developed a mobile source air toxic emissions inventory on the target compounds for the Great Lakes Regional Air Toxic Emissions Inventory Project for calendar year 1996. In 1996, Ontario had a population of 10,753,573 million people, which represented 11.7 percent of the total population of the Great Lakes region. The table below provides a brief demographic overview of the province of Ontario.

Demographic Characteristics for the Ontario Area of Great Lakes Regional Air Toxics Emissions Inventory

	Ontario
Total Population, 1996	10,753,573
Urban Population, 1996	8,958,741
Rural Population, 1996	1,794,832

Source: 1996 Statistics Canada Census

This inventory is Part 2 of a comprehensive 1996 air toxic emissions inventory which included point, area, and mobile sources. The point and area source emission inventory had been developed in Part 1 and completed in November 1999. Ontario followed the Air Toxic Emissions Inventory Protocol and the transportation sources methodologies agreed upon by the project's Technical Steering Committee in developing the regional inventory where applicable. Targeted emissions information were estimated from domestic activities and statistics from various organizations (e.g., Ontario Ministry of Transportation, Statistics Canada). These sources of information were deposited into Ontario's Regional Air Pollution Inventory Development System (RAPIDS Version 2.0) and emissions were compiled using its Reference Tables and the air toxic emission factors from the Factor Information Retrieval System (FIRE).

DATA SOURCES

Mobile Sources

The mobile source inventory for this GLC inventory includes 2 major categories, the on-road sources and the non-road sources.

On-road Mobile Sources

The on-road mobile sources include the vehicle categories as defined by the U.S. transportation model MOBILE 5. They are light-duty gasoline vehicles (LDGV); light-duty gasoline trucks

(LDGT); heavy-duty gasoline vehicles (HDGV); light-duty diesel vehicles (LDDV); light-duty diesel trucks (LDDT); heavy-duty diesel vehicles (HDDV) and motorcycles (MC).

The Canadian version of the MOBILE model (MOBILE 5C) was used to estimate the evaporative and exhaust VOC emissions of the on-road vehicles and the PART5 model was used to estimate the particulate (PM) emissions. Toxic substance speciation profiles were then applied to the VOC and PM emissions to obtain the toxic emissions.

Non-road Mobile Sources

Non-road mobile sources include the following categories: i) off-road gasoline engines/vehicles; ii) off-road diesel engines/vehicles; iii) off-road equipment; iv) locomotives, marine engines, and aviation. The following sections give details on the emission estimation methodologies.

Off-road Gasoline Engines/Vehicles

The fuel consumption of off-road gasoline engines/vehicles was obtained from provincial statistics and used to estimate VOC and PM emissions. Corresponding toxic substance speciation profiles were then applied to the VOC and PM emissions to obtain the toxic emissions.

Off-road Diesel Engines/Vehicles

The fuel consumption of off-road diesel engines/vehicles was obtained from provincial statistics and used to estimate VOC and PM emissions. Corresponding toxic substance speciation profiles were then applied to the VOC and PM emissions to obtain the toxic emissions.

Off-road Equipment

The estimated number of off-road equipment (lawnmowers) was obtained from a field survey and used to estimate VOC and PM emissions. Corresponding toxic substance speciation profiles were then applied to the VOC and PM emissions to obtain the toxic emissions.

Locomotives

The fuel consumption of locomotives was obtained from provincial statistics and used to estimate VOC and PM emissions. Corresponding toxic substance speciation profiles were then applied to the VOC and PM emissions to obtain the toxic emissions.

Marine Engines

The fuel consumption and the operating statistics (movement) of marine engines (vessels) was obtained from provincial statistics, whereas the number of pleasure crafts was estimated via the census. This information was used to estimate VOC and PM emissions. Corresponding toxic substance speciation profiles were then applied to the VOC and PM emissions to obtain the toxic emissions.

Aviation

The aircraft movement statistics for each airport were obtained from the Ministry of Transportation to derive the landing-takeoff (LTO) cycles. Corresponding toxic substance speciation profiles were then applied to the estimated VOC and PM emissions to obtain the toxic emissions.

QUALITY CHECK ACTIVITIES

During the development of this air toxic emissions inventory, quality check activities, such as technical reviews and accuracy checks, were performed to ensure that representative activity information was obtained and that the most appropriate emission profiles were used for each source.

UNCERTAINTIES

Most of the emission estimates in this air toxic emissions inventory were based on the best available activity information and source emission profiles.

Uncertainties also exist on the use of emission factor tables which vary in terms of data quality. In preparing this emission inventory, Ontario has further updated some of the RAPIDS emission factor tables with the most recent information from FIRE, AP-42, and EIIP.

RESULTS

Ontario's 1996 Great Lakes Toxic Emissions Inventory for mobile sources included toxic estimates of 31 substances out of 82 Great Lakes air toxic substances. The emissions from mobile sources for each county in Ontario are provided in the County Emissions table at the end of Ontario's portion of the report document.

INFORMATION

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Table G-1: Ontario Mobile Source emissions by county in pounds/year

	Algoma	Brant	Bruce	Cochrane	Dufferin	Durham	Elgin
Acetaldehyde	46,856	45,029	32,721	44,267	22,328	132,266	45,163
Acrolein	4,996	3,278	2,019	4,242	1,675	14,113	3,338
Anthracene	7.200E-01	4.100E-01	3.200E-01	6.200E-01	2.300E-01	1.490E+00	3.800E-01
Arsenic	2.900E-01	2.200E-01	1.100E-01	2.100E-01	1.200E-01	9.300E-01	2.300E-01
Benz(a)Anthracene	11	6	5	9	3	24	6
Benzene	151,374	99,897	72,197	125,917	52,446	401,092	92,436
Benzo(a)pyrene	8	5	4	7	3	21	5
Benzo(b)fluoranthene	10	7	5	8	4	27	6
Benzo(g,h,i)perylene	23	14	11	20	8	55	13
Benzo(k)fluoranthene	8	5	4	7	3	21	5
Butadiene,13	29,528	21,683	13,997	23,742	11,001	91,488	20,049
Chromium	54	40	25	28	13	66	28
Chrysene	9	6	4	8	3	22	5
Copper	73	43	18	22	11	99	28
Dibenzo(a,h)anthracene	1.410E+00	8.400E-01	6.300E-01	1.170E+00	4.600E-01	3.460E+00	7.700E-01
Ethylbenzene	113,326	67,729	51,441	94,596	37,041	277,693	63,714
Fluoranthene	9	6	4	7	3	22	5
Formaldehyde	122,172	111,960	77,544	110,137	55,433	357,671	112,334
Indeno(1,2,3-CD)pyrene	1.730E+00	1.100E+00	8.000E-01	1.410E+00	5.800E-01	4.580E+00	1.010E+00
Lead	90	50	8	16		16	33
Manganese	27	13	3	0		4	3
Naphthalene	3,937	3,192	1,889	3,012	1,609	13,964	3,007
Nickel	3,191	1,532	410	20	9	493	390
Phenanthrene	3.660E+00	2.270E+00	1.690E+00	3.160E+00	1.190E+00	9.090E+00	2.150E+00
Phenol	1.933E+01	1.162E+01	1.560E+00	1.026E+01		2.758E+01	8.980E+00
Pyrene	8.270E+00	5.770E+00	3.960E+00	6.790E+00	2.990E+00	2.343E+01	5.340E+00
Styrene	15,921	11,516	7,467	12,748	6,014	49,224	11,028
Toluene	620,492	404,147	286,368	507,754	216,249	1,693,893	380,874
Xylene,O	71,942	58,583	34,887	55,150	29,778	257,261	55,273
Xylene,P	86,258	70,244	41,838	66,129	35,711	308,496	66,278
Xylenes,Iso	463,062	267,480	209,029	388,885	148,210	1,090,524	252,353

Table G-1: Ontario Mobile Source emissions by county in pounds/year (continued)

	Essex	Frontenac	Grey	Haldimand-Norfolk	Haliburton	Halton	Hamilton-Wentworth
Acetaldehyde	104,181	43,476	47,244	46,981	7,186	106,845	115,516
Acrolein	9,176	4,778	2,617	3,340	732	11,471	14,976
Anthracene	9.700E-01	4.800E-01	4.300E-01	4.300E-01	1.100E-01	1.050E+00	1.230E+00
Arsenic	6.400E-01	3.400E-01	1.700E-01	2.300E-01	5.000E-02	8.200E-01	8.100E-01
Benz(a)Anthracene	15	8	7	7	2	17	19
Benzene	246,105	126,251	93,274	100,653	23,740	306,031	327,651
Benzo(a)pyrene	13	7	5	5	1	16	17
Benzo(b)fluoranthene	17	9	6	7	2	21	22
Benzo(g,h,i)perylene	34	17	14	15	4	40	43
Benzo(k)fluoranthene	13	7	5	5	1	16	17
Butadiene,13	55,135	28,894	18,356	21,246	4,637	72,692	79,263
Chromium	99	27	35	27	4	69	88
Chrysene	14	7	6	6	1	16	17
Copper	139	44	24	25	5	119	143
Dibenzo(a,h)anthracene	2.080E+00	1.090E+00	7.900E-01	8.700E-01	2.200E-01	2.600E+00	2.770E+00
Ethylbenzene	164,747	87,614	64,972	69,651	18,087	209,039	217,245
Fluoranthene	13	7	5	6	1	16	17
Formaldehyde	271,337	118,522	110,812	115,945	18,677	294,742	320,704
Indeno(1,2,3-CD)pyrene	2.730E+00	1.440E+00	9.900E-01	1.120E+00	2.800E-01	3.530E+00	3.700E+00
Lead	316	43	11	44		103	185
Manganese	44	7	4	0		23	38
Naphthalene	8,042	4,404	2,512	3,082	650	11,508	11,787
Nickel	5,050	855	532	18	3	2,648	4,375
Phenanthrene	5.680E+00	2.920E+00	2.160E+00	2.290E+00	5.500E-01	6.880E+00	8.600E+00
Phenol	1.722E+01	1.102E+01					2.798E+01
Pyrene	1.416E+01	7.380E+00	5.160E+00	5.740E+00	1.300E+00	1.828E+01	1.938E+01
Styrene	29,120	15,670	9,779	11,535	2,597	39,803	40,999
Toluene	993,584	534,396	367,016	408,561	100,097	1,316,574	1,356,141
Xylene,O	148,034	81,003	46,496	57,051	12,038	213,030	216,110
Xylene,P	177,514	97,133	55,761	68,419	14,437	255,479	259,144
Xylenes,Iso	643,459	343,818	262,323	277,134	74,092	810,759	839,775

Table G-1: Ontario Mobile Source emissions by county in pounds/year (continued)

	Hastings	Huron	Kenora	Kent	Lambton	Lanark	Leeds and Grenville
Acetaldehyde	50,708	49,481	35,593	80,592	61,772	24,756	47,707
Acrolein	4,775	2,041	3,324	5,481	3,938	1,896	4,605
Anthracene	5.300E-01	4.200E-01	4.100E-01	5.600E-01	5.200E-01	2.700E-01	4.700E-01
Arsenic	3.300E-01	1.300E-01	1.900E-01	4.500E-01	2.400E-01	1.300E-01	3.300E-01
Benz(a)Anthracene	9	6	6	9	8	4	8
Benzene	134,729	81,133	90,308	129,375	123,420	62,443	125,361
Benzo(a)pyrene	7	5	5	7	7	3	7
Benzo(b)fluoranthene	9	5	6	9	8	4	9
Benzo(g,h,i)perylene	19	13	14	19	18	9	17
Benzo(k)fluoranthene	7	4	5	7	6	3	7
Butadiene,13	29,314	14,498	18,049	26,611	26,083	12,589	28,392
Chromium	25	48	21	45	118	15	34
Chrysene	8	5	5	8	7	4	7
Copper	34	33	21	53	153	13	50
Dibenzo(a,h)anthracene	1.190E+00	6.900E-01	8.100E-01	1.090E+00	1.030E+00	5.400E-01	1.090E+00
Ethylbenzene	95,954	57,081	65,746	90,018	83,634	44,811	88,444
Fluoranthene	7	5	5	7	7	4	7
Formaldehyde	132,772	111,287	90,804	199,095	152,936	61,223	127,049
Indeno(1,2,3-CD)pyrene	1.540E+00	8.300E-01	9.900E-01	1.400E+00	1.330E+00	6.800E-01	1.440E+00
Lead	41	30	44	273	205	10	26
Manganese	0	12	0	2	78	0	11
Naphthalene	4,419	1,827	2,373	3,830	3,749	1,762	4,451
Nickel	20	1,465	15	169	9,090	10	1,300
Phenanthrene	3.080E+00	1.910E+00	2.230E+00	2.960E+00	2.860E+00	1.440E+00	2.850E+00
Phenol	4.060E+00		1.460E+00		3.470E+00		1.890E+00
Pyrene	7.800E+00	4.350E+00	4.930E+00	7.340E+00	7.020E+00	3.480E+00	7.400E+00
Styrene	16,249	7,738	9,847	15,347	13,898	6,806	15,901
Toluene	569,448	307,514	366,753	520,662	492,979	253,986	540,792
Xylene,O	81,634	33,811	43,747	70,900	69,231	32,616	82,318
Xylene,P	97,896	40,548	52,463	85,027	83,023	39,115	98,719
Xylenes,Iso	381,739	234,361	264,438	358,552	331,630	180,963	348,773

Table G-1: Ontario Mobile Source emissions by county in pounds/year (continued)

	Lennox and Addington	Manitoulin	Middlesex	Muskoka	Niagara	Nipissing	Northumberland
Acetaldehyde	21,264	6,206	120,998	27,527	131,556	36,781	53,997
Acrolein	2,063	485	11,560	2,934	12,334	4,271	4,741
Anthracene	2.000E-01	8.000E-02	1.140E+00	3.700E-01	1.270E+00	5.200E-01	4.700E-01
Arsenic	1.500E-01	4.000E-02	7.300E-01	1.900E-01	8.300E-01	2.500E-01	3.600E-01
Benz(a)Anthracene	3	1	18	6	20	8	7
Benzene	54,525	17,870	293,294	82,629	339,367	111,806	121,417
Benzo(a)pyrene	3	1	15	4	18	6	6
Benzo(b)fluoranthene	4	1	20	5	23	7	8
Benzo(g,h,i)perylene	8	3	40	12	46	17	17
Benzo(k)fluoranthene	3	1	15	4	18	6	6
Butadiene,13	12,307	3,169	66,950	17,094	77,753	22,795	27,445
Chromium	25	10	61	23	70	18	39
Chrysene	3	1	16	5	18	7	7
Copper	39	12	77	34	90	25	56
Dibenzo(a,h)anthracene	4.700E-01	1.700E-01	2.480E+00	7.600E-01	2.880E+00	1.030E+00	1.040E+00
Ethylbenzene	38,708	13,734	196,254	61,598	230,311	83,230	85,282
Fluoranthene	3	1	16	5	18	6	7
Formaldehyde	57,309	15,197	315,745	73,158	345,270	97,486	141,324
Indeno(1,2,3-CD)pyrene	6.200E-01	2.100E-01	3.260E+00	9.500E-01	3.820E+00	1.280E+00	1.370E+00
Lead	46	13	179	23	89	35	73
Manganese	15	5	1	10	4	0	13
Naphthalene	1,933	397	9,839	2,496	11,843	3,176	4,329
Nickel	1,733	632	44	1,130	468	16	1,488
Phenanthrene	1.260E+00	4.300E-01	7.010E+00	1.970E+00	7.790E+00	2.750E+00	2.790E+00
Phenol		4.200E-01	2.667E+01	4.230E+00	2.235E+01	1.529E+01	
Pyrene	3.240E+00	9.500E-01	1.701E+01	4.680E+00	1.989E+01	6.230E+00	7.190E+00
Styrene	6,967	1,735	35,293	9,598	41,723	12,521	15,645
Toluene	236,072	72,153	1,194,906	352,088	1,414,918	466,591	523,020
Xylene,O	35,784	7,326	180,698	45,991	218,172	58,017	80,140
Xylene,P	42,915	8,785	216,678	55,151	261,623	69,563	96,108
Xylenes,Iso	152,812	57,147	764,727	249,566	899,928	337,812	335,747

Table G-1: Ontario Mobile Source emissions by county in pounds/year (continued)

	Ottawa-Carleton	Oxford	Parry Sound	Peel	Perth	Peterborough	Prescott and Russell
Acetaldehyde	199,268	57,482	24,586	375,727	36,566	37,776	30,669
Acrolein	35,537	4,612	2,949	103,839	2,247	3,341	2,685
Anthracene	2.250E+00	4.400E-01	3.400E-01	4.140E+00	3.300E-01	4.600E-01	3.400E-01
Arsenic	1.190E+00	3.400E-01	2.200E-01	1.400E+00	1.500E-01	2.100E-01	2.000E-01
Benz(a)Anthracene	30	7	5	36	5	7	5
Benzene	519,542	117,944	76,995	670,318	77,329	108,083	80,253
Benzo(a)pyrene	27	6	4	32	4	6	4
Benzo(b)fluoranthene	35	8	5	41	5	7	5
Benzo(g,h,i)perylene	67	16	12	79	12	16	12
Benzo(k)fluoranthene	26	6	4	30	4	6	4
Butadiene,13	131,949	26,378	15,406	207,300	15,429	22,594	17,226
Chromium	75	30	12	99	47	22	16
Chrysene	27	7	5	32	5	6	5
Copper	119	36	27	140	53	21	19
Dibenzo(a,h)anthracene	4.320E+00	9.900E-01	7.200E-01	5.050E+00	6.600E-01	9.600E-01	7.000E-01
Ethylbenzene	340,111	81,390	59,612	403,523	54,307	76,458	56,943
Fluoranthene	28	6	4	39	4	6	4
Formaldehyde	561,485	146,759	67,870	1,102,887	88,228	95,797	78,832
Indeno(1,2,3-CD)pyrene	5.750E+00	1.330E+00	9.000E-01	6.770E+00	8.500E-01	1.210E+00	9.100E-01
Lead	91	78	77	53	60	2	13
Manganese	0	0	2	0	23	0	0
Naphthalene	18,071	4,077	2,237	22,659	2,142	3,204	2,559
Nickel	61	21	220	75	2,719	16	12
Phenanthrene	1.868E+01	2.690E+00	1.770E+00	4.713E+01	1.790E+00	2.480E+00	1.850E+00
Phenol	2.458E+01	2.590E+00				7.730E+00	
Pyrene	3.092E+01	6.920E+00	4.340E+00	4.150E+01	4.310E+00	6.090E+00	4.610E+00
Styrene	64,878	14,853	9,053	88,605	8,276	11,935	9,452
Toluene	2,102,058	496,418	333,108	2,509,297	308,387	440,422	335,645
Xylene,O	328,681	75,368	41,405	397,778	39,654	58,951	47,359
Xylene,P	394,150	90,383	49,656	477,039	47,555	70,690	56,796
Xylenes,Iso	1,318,173	319,875	243,284	1,547,618	219,016	306,525	227,006

Table G-1: Ontario Mobile Source emissions by county in pounds/year (continued)

	Prince Edward	Rainy River	Renfrew	Simcoe	Stormont, Dundas	Sudbury District	Sudbury Region
Acetaldehyde	9,111	13,146	39,278	126,421	51,804	25,251	33,382
Acrolein	696	1,075	3,501	12,993	4,461	2,950	3,812
Anthracene	1.000E-01	1.900E-01	4.800E-01	1.470E+00	5.000E-01	5.700E-01	3.700E-01
Arsenic	5.000E-02	7.000E-02	2.300E-01	8.900E-01	3.100E-01	2.000E-01	2.200E-01
Benz(a)Anthracene	2	3	8	23	8	8	6
Benzene	23,350	36,374	111,258	373,376	128,207	99,877	100,505
Benzo(a)pyrene	1	2	6	20	7	6	5
Benzo(b)fluoranthene	2	2	7	25	9	6	7
Benzo(g,h,i)perylene	3	6	17	53	18	17	13
Benzo(k)fluoranthene	1	2	6	19	7	5	5
Butadiene,13	4,842	6,751	22,703	81,732	28,509	14,772	24,256
Chromium	5	8	22	76	30	16	15
Chrysene	1	2	7	21	7	7	5
Copper	5	6	23	112	37	24	23
Dibenzo(a,h)anthracene	2.000E-01	3.300E-01	1.000E+00	3.310E+00	1.110E+00	1.040E+00	8.400E-01
Ethylbenzene	16,437	27,515	81,052	267,366	89,541	85,805	65,072
Fluoranthene	1	2	6	21	7	6	5
Formaldehyde	22,588	32,185	100,030	337,660	133,717	64,531	91,347
Indeno(1,2,3-CD)pyrene	2.600E-01	4.000E-01	1.270E+00	4.290E+00	1.450E+00	1.170E+00	1.140E+00
Lead			11	45	12	108	18
Manganese			0	15	3	2	0
Naphthalene	688	881	3,231	12,356	4,375	1,554	3,638
Nickel	4	6	17	1,751	416	178	12
Phenanthrene	5.30E-01	8.70E-01	2.56E+00	8.53E+00	2.92E+00	2.370E+00	2.350E+00
Phenol		7.10E-01	1.80E+00	1.18E+01		1.900E-01	1.777E+01
Pyrene	1.31E+00	1.97E+00	6.23E+00	2.16E+01	7.49E+00	5.020E+00	5.900E+00
Styrene	2,580	3,708	12,405	45,077	15,744	8,884	12,357
Toluene	94,865	148,134	461,256	1,588,842	542,307	412,278	410,956
Xylene,O	12,740	16,255	59,728	228,200	80,990	28,760	66,489
Xylene,P	15,279	19,494	71,628	273,660	97,128	34,490	79,720
Xylenes,Iso	65,883	113,430	327,414	1,064,295	353,675	367,787	248,440

Table G-1: Ontario Mobile Source emissions by county in pounds/year (continued)

	Thunder Bay	Timiskaming	Toronto	Victoria	Waterloo	Wellington	York	**Province Total**
Acetaldehyde	75,839	27,913	525,407	33,033	109,082	74,357	161,456	**3,656,549**
Acrolein	8,855	1,762	56,341	2,764	10,827	5,861	18,279	**434,587**
Anthracene	8.600E-01	3.100E-01	5.420E+00	3.600E-01	1.150E+00	6.600E-01	1.730E+00	**39**
Arsenic	3.700E-01	1.100E-01	3.930E+00	1.800E-01	6.700E-01	3.800E-01	1.220E+00	**22**
Benz(a)Anthracene	12	5	89	6	18	11	28	**572**
Benzene	183,680	61,981	1,590,050	85,360	302,432	169,033	483,435	**9,386,127**
Benzo(a)pyrene	10	3	82	5	16	9	25	**491**
Benzo(b)fluoranthene	12	4	110	6	21	11	33	**630**
Benzo(g,h,i)perylene	27	10	207	13	41	24	64	**1,289**
Benzo(k)fluoranthene	10	3	81	5	16	9	25	**481**
Butadiene,13	39,067	11,370	380,934	17,432	69,413	37,111	113,115	**2,163,048**
Chromium	245	19	267	18	68	43	73	**2,361**
Chrysene	11	4	83	5	16	9	26	**512**
Copper	360	11	446	19	85	38	125	**3,211**
Dibenzo(a,h)anthracene	1.610E+00	5.600E-01	1.340E+01	7.600E-01	2.570E+00	1.450E+00	4.150E+00	**80**
Ethylbenzene	130,788	45,961	1,051,855	62,086	203,333	115,807	329,929	**6,416,591**
Fluoranthene	11	4	83	5	16	9	26	**515**
Formaldehyde	204,665	65,684	1,443,032	83,421	287,190	186,251	443,195	**9,756,001**
Indeno(1,2,3-CD)pyrene	2.020E+00	6.700E-01	1.813E+01	9.600E-01	3.400E+00	1.890E+00	5.520E+00	**105**
Lead	502	1	390	17	37	2	72	**3,591**
Manganese	198	0	32	0	12	0	2	**608**
Naphthalene	5,184	1,485	58,882	2,508	10,351	5,591	17,392	**312,086**
Nickel	23,104	12	3,824	14	1,393	28	292	**71,283**
Phenanthrene	5.360E+00	1.470E+00	3.549E+01	1.970E+00	7.110E+00	3.850E+00	1.107E+01	**256**
Phenol	2.972E+01	7.900E-01	3.628E+01		2.841E+01	3.799E+01	5.214E+01	**468**
Pyrene	1.030E+01	3.370E+00	9.443E+01	4.810E+00	1.762E+01	9.750E+00	2.841E+01	**546**
Styrene	20,391	6,246	200,375	9,650	36,231	19,971	60,585	**1,133,943**
Toluene	740,191	247,993	6,654,792	354,685	1,244,169	695,017	2,042,396	**38,661,243**
Xylene,O	93,914	27,435	1,088,227	46,428	190,158	101,888	319,526	**5,726,955**
Xylene,P	112,599	32,901	1,305,030	55,679	228,020	122,153	383,144	**6,867,649**
Xylenes,Iso	526,874	189,284	4,045,666	250,671	794,467	457,521	1,286,049	**25,242,051**

Appendix H: Pennsylvania Toxic Emissions Inventory

ON-ROAD EMISSIONS

Highway Vehicles

Highway vehicle emissions comprise a significant portion of Pennsylvania's toxic emission inventory. This impact is due to both tailpipe and evaporative emissions from vehicles operating in both urban and surrounding areas. DEP has coordinated with the Pennsylvania Department of Transportation (PennDOT) to develop the necessary data to produce highway vehicle emission estimates.

Pennsylvania's emission inventory includes the following vehicle classifications:

Light-Duty Gasoline Vehicles (passenger cars) [LDGV]
Light-Duty Gasoline Trucks 0-6000 lbs. gross vehicle weight rating [LDGT1]
Light-Duty Gasoline Trucks 6001-8500 lbs. gross vehicle weight rating [LDGT2]
Heavy-Duty Gasoline Vehicles [HDGV]
Light-Duty Diesel Vehicles [LDDV]
Light-Duty Diesel Trucks [LDDT]
Heavy-Duty Diesel Vehicles [HDDV]
Motorcycles [MC]

The inventory illustrates each county's emissions. The data and methods presented in the inventory represent the Commonwealth's approach based on EPA guidance. The MOBILE Model is used for calculating emissions factors. The MOBILE Model is the only methodology approved by EPA to calculate highway vehicle emissions. It is supported by the Post Processor for Air Quality (PPAQ). The results of this process were then imported into the RAPIDS system for speciation.

Highway vehicle emissions are based on Vehicle Miles of Travel (VMT). These projections are developed using a fairly complex procedure comprised of a combination of estimations, trend analyses, and models. The process is summarized below.

The emission calculation process used for Pennsylvania is summarized in the following diagram, where:

VMT is vehicle miles of travel

RMS is roadway management system - a facility to store and maintain information related to each highway segment (link). The types of data stored in RMS include: administrative, traffic, pavement structure, pavement condition, highway performance monitoring system.

HPMS is highway performance monitoring system - a subsystem of the RMS established to meet the data reporting requirements of the Federal Highway Administration (FHWA) and to serve as

PennDOT's official source of highway information. Like the RMS, the HPMS is a data storage and maintenance facility and contains additional information required by the FHWA.

PPAQ is Post Processor for Air Quality - provides a flexible linkage between network-based transportation demand forecasting systems and EPA's MOBILE model. Using a standard highway planning network or database as a starting point, the PPAQ system provides all the tools necessary to analyze the network, to drive MOBILE efficiently, and to display and evaluate the results of MOBILE runs.

Roadway Data Source Used for Analysis		Growth Method to Future years		Method to Calculate VMT & Speeds		Method to Calculate Emissions
PennDOT RMS data for each county	⇨	Use historic HPMS VMT growth trends	⇨	PPAQ	⇨	MOBILE Model

Roadway Data Sources Used for Analysis

The emissions calculation process used by PennDOT involves the use of databases or microcomputer-based travel demand models, both of which represent the existing and future highway systems. The roadway data source is based on an adaptation of the RMS state highway database maintained by PennDOT. This database is downloaded to microcomputers and enhanced to provide additional data needed for VMT and speed determinations. The database contains all state highways, arterials, collectors, and locals; however, it does not contain facilities under local jurisdiction. Transit networks are not explicitly modeled.

Travel Estimation Procedure

For purposes of projecting emissions to be used as the basis for speciation, growth factors are used to project some traffic volumes. Separate factors are derived for each county and highway functional class from an analysis of historic HPMS traffic growth trends, coupled with estimates of population and employment growth from the Bureau of Economic Analysis (BEA). The factors are then applied to base year traffic volumes on each highway link in the RMS network database to produce future volumes.

Estimation of Traffic Flow Variables

For purposes of the GLC inventory, PPAQ software is used to compile and compute traffic flow variables, control the MOBILE run, and produce summary emission reports. The traffic flow variables include VMT, vehicle type distributions, and speeds. VMT are calculated from traffic volumes and link or segment distances. VMT is reconciled with totals compiled from the HPMS. Further adjustments are applied to produce VMT estimates which represent conditions for a typical day in each of four seasons. Traffic speeds are calculated using complex algorithms based upon the 1994 Highway Capacity Manual plus additional algorithms for specialized conditions. Speeds are separately calculated for each highway segment or link, and for each hour of the day. In addition to the estimate traffic volumes, these speed calculations are based upon a variety of physical characteristics including functional class, area (urban/rural), number of lanes, and the number of traffic signals. Vehicle type

distributions are compiled and adjusted to match recorded and estimated truck volumes on each highway segment or link.

NON-ROAD MOBILE SOURCES

Pennsylvania assembled a 1996 inventory of Volatile Organic Compound (VOC) for each of the 67 counties following the methodologies listed below. Those data were then exported into the Regional Air Pollutant Inventory Development System (RAPIDS) where they were speciated into their toxic components.

Lawn and Garden Equipment

This category includes off-highway exhaust emissions from small engines that would typically have residential applications such as lawn mowers, garden tractors, electric generators, etc. Emissions from lawn and garden equipment are calculated by apportioning state off-highway fuel use to the local level to determine an activity factor, then apply emission factors from Tables I-03 and I-04 of the *EPA Non-road Engine and Vehicle Emission Study-Report*[6]. The emission factors are weighted assuming the reference above. The activity factor used for calculating these emissions is the quantity of fuel used annually by lawn and garden equipment. The state off-highway gasoline fuel usage for 1995 is 68,550,000 gallons from *Highway Statistics 1995*[5]. The national average of off highway fuel used for lawn and garden equipment is 20 percent based on *NEDS Fuel Use Report*[8] and the Highway Statistics. It is therefore assumed that 20 percent of the statewide off-highway fuel use is used by lawn and garden equipment. The 20 percent statewide fuel use is then multiplied by the housing density that is apportioned to the county which determines the activity factor in gallons. The housing density for a county is the fraction of single dwellings in the county divided by the total dwellings for the state. The reference for the number of dwellings for each county and the state is from the *1990 Census of Population and Housing, Summary Social, Economic and Housing Characteristics, Pennsylvania (1990 CPH-5-40)*[10]. The activity factor is then multiplied by the emission factor and converted to tons per year. The emission factor used was 240 g/gal for VOC. The methodology used for calculating lawn and garden equipment is from *Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources*[2].

Industrial Equipment

Industrial equipment includes a variety of types and sizes of machinery. Examples of the types of equipment included in this category are forklifts, mobile refrigeration units, auxiliary engines for hydraulic pump service on garbage trucks and other large vehicles, generator and pump services for utilities, airports, and state maintained organizations, logging, mining, quarrying, oil field operations. The majority of these equipment types are found at companies operating in SIC major groups 10 through 14, 20 through 39, 50 and 51. Methodologies are from *Procedures for Emission Inventory Preparation, Volume IV Mobile Sources*[2]. *County Business Patterns 1994, U.S.A* was used to obtain national employment statistics. *County Business Patterns 1993, Pennsylvania*[1] was used to derive county employment statistics. Emission factors were found in *Compilation of Air Pollutant Emission Factors* under Table 3.3-1, Emission Factors for Gasoline and Diesel Powered Industrial Equipment.

Construction Equipment

The construction equipment category includes off-highway construction equipment which consumes either diesel fuel or gasoline. The activity level used to inventory emissions from construction equipment is the utilization, in horsepower-hours, of each type of equipment used in construction. Since direct estimates of equipment use for the construction industry are not available, surrogate data must be used to derive the estimates. The surrogate data consist of national statistics concerning the construction equipment population by type and horsepower, and construction industry employment statistics for both the state and nation. These equipment populations are distributed to the respective counties on the basis of employment and population, using methodologies described in *Procedures for Emission Inventory Preparation, Mobile Sources*[2] and employment statistics for heavy duty construction, Standard Industrial Classification (SIC) 16 from *County Business Patterns 1993: Pennsylvania*[1] *and County Business Patterns 1994: United States*. This data was then used to estimate the total number of each type of equipment in the respective counties. Emission factors for construction equipment were from *Compilation of Air Pollutant Emissions Factors*[3].

Railroads

The approach to inventorying emissions from railroad locomotives involves the derivation of an activity factor based on the quantity of diesel fuel used by locomotives. The estimated fuel use is then used with an emission factor, defined in terms of quantity of pollutant produced per gallon of fuel burned, to derive the emission estimates.

The allocation of statewide fuel use to a study area is based on identifying an appropriate surrogate parameter whose relative distribution (study area to statewide) can be assumed to approximate the relative level of railroad activity. The BAQ used state railroad track mileage to apportion locomotive fuel data. This method of apportioning state fuel use to a particular county assumes that usage is directly proportional to the miles of track.

This method of apportioning state fuel use to a county level assumes that usage is directly proportional to the miles of track. Track mileage for Pennsylvania was available from detailed state maps. Fuel consumption for Pennsylvania railroads was found in *the National Petroleum News, Market Facts 1997,* and the methodologies in *Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources*[2]. The annual emissions for the state. The emission factors of VOC-0.0211 lb./gal was found in *Compilation of Air Pollutant Emissions Factors*[3].

Agriculture Equipment

The two types of sources within the farm equipment category are tractors and all other types of motorized equipment. Tractors account for most of the emissions produced from farm equipment. The primary types of equipment, other than tractors, are combines, balers, harvesters, and general purpose machines. The type and number of farm vehicles was obtained from the *1992 Census of Agriculture, Pennsylvania*[4]. Emissions were calculated using the methodologies described in *Procedures for Emission Inventory Preparation, Mobile Sources*[2] where an estimate of the total number of gallons of gasoline and diesel fuel were calculated.

Emission factors for farm equipment were from *Compilation of Air Pollutant Emission Factors*[3]. Hydrocarbon emissions for gasoline powered equipment is the sum of exhaust, crankcase, and evaporative loss. Diesel emissions are reflective of exhaust only.

The *1992 Census of Agriculture*, Pennsylvania was the latest available data as of July 1, 1994. The report is issued every five years and then takes approximately a year to be released for publication. The 1992 edition was compared to the 1987 edition to determine if enough variations exist to make projections.

Vessels (Commercial)

Commercial and military vessel emissions were estimated based on the quantity of fuel sold for marine use. The emissions are estimated using a standard set of assumptions regarding the percentage of fuel sold that is actually used within the port area, and the emission rate associated with the use of the fuel.

Sales data for residual and distillate oil use for marine purposes in the state were found in the *National Petroleum Factbook*[7] published as state summaries. To apportion state fuel sales to a particular port or harbor, the relative level of port activity must be established. To do this, an inventory of vessel activity for port and state was obtained from *Waterborne Commerce of the Unites States*[9]. In part 2 of that document, a table is provided for each port within the state, indicating the number of commercial vessels, by size (draft), that enter and leave.

In apportioning total statewide marine fuel sales, distillate fuel and residual fuel are considered separately. To apportion residual fuel, the assumption is made that only vessels with a draft of 18 feet or more use residual oil. The quantity of distillate oil sold in port is estimated in a similar fashion using *Waterborne Commerce of the Unites States*[9]. to determine the total number of vessels with drafts of 18 feet or more and those with drafts of less than 18 feet. The proportioning equations for distillate and residual fuel oil are found *in Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources*[2].

All of the fuel sold in port is not used there. An assumption can be made, however, that 25 percent of the residual oil and 75 percent of the distillate oil sold in port is used there. This is based on method developed by the EPA.

To estimate emissions, an emission factor is applied to the quantities of residual and distillate fuel oils used in port. These emission factors are found in *Compilation of Air Pollutant Emission Factors*[3] for motor vessels and steamships. An assumption is made that all distillate oil is used by motorships, while all residual oil is used by steamships.

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INFORMATION

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Table H-1: Pennsylvania Mobile Source emissions by county in pounds/year

	Adams	Allegheny	Armstrong	Beaver	Bedford	Berks	Blair
Acetaldehyde	32150.42	18082.94	3039.79	5218.54	27881.23	76871.51	28520.61
Acrolein	4122.67			138.24	3527.08	9723.17	3612.54
Arsenic	0.07	0.69	0.05	0.12	0.14	0.27	0.10
Benzene	203120.25	22116.17	4507.62	10422.00	150657.85	478017.89	175669.37
Butadiene,13	25248.57			748.68	18693.92	59416.36	22074.08
Chromium	2.47	25.51	1.93	4.45	4.07	8.96	3.38
Copper	491.53	6071.57	390.24	919.96	623.89	1867.15	675.90
Ethylbenzene	84145.99	8467.33	1725.77	4188.03	62361.09	193939.38	71313.55
Formaldehyde	84411.11	53503.14	8994.01	15122.71	74561.04	202230.53	75018.33
Lead	131.06	1289.31	100.29	232.23	269.11	503.50	185.57
Manganese	4.43	46.30	3.48	8.01	6.76	15.76	6.00
Mercury	2.59	24.03	1.93	4.51	6.61	10.66	3.82
Naphthalene	12303.44			364.80	9093.34	28743.61	10678.56
Nickel	3.17	32.30	2.46	5.68	5.56	11.67	4.38
Styrene	38692.06			1155.21	27684.55	74791.48	27777.03
Toluene	574339.25	37660.67	7675.82	24533.81	424521.66	1330657.23	491075.49
Xylene,M	171102.03	23506.33	4790.95	9748.96	126862.57	401289.43	147042.02
Xylene,O	90673.62	11500.41	2343.96	4975.71	66932.46	208936.19	76621.23
Xylenes,Iso	316932.35			9417.99	234383.00	733986.95	272680.79

Table H-1: Pennsylvania Mobile Source emissions by county in pounds/year (continued)

	Bradford	Bucks	Butler	Cambria	Cameron	Carbon	Centre
Acetaldehyde	13888.56	121520.76	33556.25	28722.64	1598.92	15547.54	32842.95
Acrolein	1411.91	11727.64	4131.42	3611.18	177.62	2079.60	4204.52
Arsenic	0.04	0.34	0.14	0.09	0.01	0.07	0.16
Benzene	75309.06	564358.08	197913.38	181314.44	8429.16	98225.43	183197.95
Butadiene,13	8678.93	69700.57	24560.09	22829.63	1057.73	12484.12	22945.09
Chromium	1.59	11.53	4.80	3.58	0.21	2.24	4.64
Copper	322.56	2759.86	958.50	723.79	43.27	421.55	838.85
Ethylbenzene	30695.62	228952.69	81036.62	73733.21	3462.30	40318.84	75001.85
Formaldehyde	37409.98	329972.81	88862.69	75295.47	4281.96	40703.74	87437.50
Lead	84.50	610.48	266.77	183.11	10.91	130.44	292.86
Manganese	2.85	20.66	8.47	6.49	0.37	3.90	7.83
Mercury	1.67	12.08	5.58	3.45	0.22	2.86	6.93
Naphthalene	4212.46	33712.74	11916.26	11053.83	513.64	6059.62	11119.81
Nickel	2.04	14.78	6.23	4.55	0.26	2.95	6.25
Styrene	11998.46	87462.69	33695.35	29410.94	1485.15	17307.70	30687.14
Toluene	205091.52	1566801.64	554181.02	508120.49	23749.96	277878.87	513870.21
Xylene,M	64537.79	474535.59	166447.96	151748.55	7071.02	82098.28	153609.76
Xylene,O	33666.77	246845.24	87274.85	79260.13	3718.95	43179.86	80377.73
Xylenes,Iso	107988.56	861121.82	305526.12	282398.99	13182.58	155414.52	285169.99

Table H-1: Pennsylvania Mobile Source emissions by county in pounds/year (continued)

	Chester	Clarion	Clearfield	Clinton	Columbia	Crawford	Cumberland
Acetaldehyde	105125.69	15701.46	25354.89	14512.99	16971.23	20144.07	59441.36
Acrolein	9638.07	1907.74	3279.15	1873.99	2072.72	2356.49	7676.38
Arsenic	0.31	0.09	0.14	0.08	0.07	0.08	0.29
Benzene	447033.92	76191.68	132303.66	78940.38	99853.01	115419.28	333289.69
Butadiene,13	55308.45	9498.59	16753.16	9981.24	12273.91	14012.58	41938.05
Chromium	10.15	2.40	4.10	2.17	2.27	2.69	8.19
Copper	2394.42	376.25	654.22	360.77	411.66	534.89	1516.05
Ethylbenzene	181849.88	31473.29	55043.67	32533.36	40809.27	46983.78	136735.21
Formaldehyde	287571.21	42426.10	67909.80	38704.88	45005.29	53655.15	158076.06
Lead	554.63	162.59	267.60	140.89	132.60	149.59	524.73
Manganese	18.00	3.95	6.85	3.64	3.94	4.76	13.75
Mercury	11.39	4.07	6.50	3.41	2.92	3.12	12.57
Naphthalene	26766.20	4613.19	8155.83	4845.83	5952.32	6788.08	20337.04
Nickel	13.11	3.30	5.58	2.95	2.99	3.50	11.07
Styrene	70738.62	13574.05	25389.44	14047.96	16623.79	18397.24	57071.90
Toluene	1243698.76	214473.70	376591.39	223163.19	278286.05	319376.88	937853.44
Xylene,M	375805.17	64030.69	110851.38	66079.20	84168.90	97553.87	279196.12
Xylene,O	195774.28	33668.45	58711.88	34757.77	44047.12	50868.31	146374.64
Xylenes,Iso	684587.47	118837.93	210579.12	124600.78	152536.92	173711.81	521930.60

Table H-1: Pennsylvania Mobile Source emissions by county in pounds/year (continued)

	Dauphin	Delaware	Elk	Erie	Fayette	Forest	Franklin
Acetaldehyde	66821.14	95158.03	7480.89	54486.23	25392.62	2710.38	24913.50
Acrolein	9000.05	10040.20	882.54	6764.43	3199.81	352.28	2262.84
Arsenic	0.26	0.26	0.03	0.21	0.09	0.01	
Benzene	427408.58	488473.75	40084.94	319507.51	161796.78	15225.25	196718.10
Butadiene,13	54152.17	60651.96	4942.51	39697.87	20288.13	1936.29	24083.04
Chromium	8.24	8.82	1.05	6.72	3.49	0.39	0.00
Copper	1781.83	2180.58	217.73	1369.49	699.17	72.79	
Ethylbenzene	173487.33	197165.34	16370.93	129129.97	66267.66	6262.81	57043.84
Formaldehyde	174727.76	255811.55	20036.79	144365.50	66521.28	7197.69	63493.32
Lead	472.51	458.28	60.32	394.29	178.32	23.42	
Manganese	14.39	15.88	1.84	11.64	6.32	0.68	
Mercury	10.23	8.86	1.30	8.73	3.37	0.53	
Naphthalene	26187.42	29286.65	2394.75	19171.27	9848.46	939.65	11715.62
Nickel	10.78	11.24	1.38	8.85	4.43	0.52	
Styrene	67506.19	72167.79	6555.76	47552.76	28087.28	2686.41	33012.63
Toluene	1197871.94	1353837.37	111678.19	886194.89	455202.29	43089.62	498814.40
Xylene,M	356896.05	409821.09	33747.18	268031.92	135730.45	12721.97	166233.79
Xylene,O	185927.71	212386.29	17626.71	138958.02	71318.85	6687.90	87612.33
Xylenes,Iso	668601.72	746307.70	61366.67	488878.89	252374.67	24133.25	

Table H-1: Pennsylvania Mobile Source emissions by county in pounds/year (continued)

	Fulton	Greene	Huntingdon	Indiana	Jefferson	Juniata	Lackawanna
Acetaldehyde	7682.71	10236.34	10899.38	20085.15	15060.33	7309.05	45967.84
Acrolein	735.88	1248.81	1315.37	2307.51	1721.90	827.37	6185.97
Arsenic		0.04	0.04	0.08	0.08	0.02	0.17
Benzene	63442.75	62106.53	65514.77	109669.58	69213.49	39856.88	294115.94
Butadiene,13	7831.89	7677.83	8009.89	13513.36	8552.02	4748.25	37290.56
Chromium		1.36	1.52	2.68	2.12	0.74	5.49
Copper		273.62	283.81	513.25	343.20	129.70	1088.57
Ethylbenzene	18347.25	25358.54	26937.59	45112.75	28535.53	16392.02	118689.22
Formaldehyde	19407.80	27028.75	28849.61	53692.70	40930.81	19610.80	120183.15
Lead		74.84	81.06	147.92	144.30	43.43	322.05
Manganese		2.41	2.72	4.75	3.48	1.28	9.52
Mercury		1.55	1.61	3.06	3.62	0.96	7.12
Naphthalene	3809.83	3723.11	3894.29	6567.20	4151.47	2308.83	17997.95
Nickel		1.76	1.95	3.48	2.92	0.97	7.24
Styrene	10725.63	10346.83	11590.54	19389.97	12068.82	6922.44	43731.94
Toluene	161298.30	173399.93	183156.89	307338.64	193951.26	110384.95	820978.92
Xylene,M	53494.92	52271.14	55366.43	92475.97	58289.83	33907.01	245312.62
Xylene,O	28213.10	27361.96	29136.77	48649.83	30590.40	17808.84	127174.07
Xylenes,Iso		95336.86	100051.96	168756.45	106888.03	59391.40	458397.32

Table H-1: Pennsylvania Mobile Source emissions by county in pounds/year (continued)

	Lancaster	Lawrence	Lebanon	Lehigh	Luzerne	Lycoming	Mc Kean
Acetaldehyde	92933.16	19050.55	24195.95	67819.84	67684.10	26537.58	3433.10
Acrolein	11092.32	2280.84	3073.88	9237.33	8949.91	3509.65	
Arsenic	0.33	0.07	0.12	0.23	0.27	0.10	0.04
Benzene	542998.52	114994.53	138400.82	461886.58	424350.64	169499.57	6046.39
Butadiene,13	66050.07	14092.99	17260.65	58606.89	53523.07	21414.11	
Chromium	10.63	2.45	3.47	8.01	8.58	3.58	1.21
Copper	2246.03	481.02	646.75	1717.46	1700.10	736.32	241.11
Ethylbenzene	221051.79	46696.03	57092.00	186850.29	171948.40	68954.50	2314.90
Formaldehyde	246938.11	50385.54	64265.40	175792.22	177548.00	69431.10	10157.73
Lead	602.19	133.08	213.12	427.09	501.58	195.05	70.27
Manganese	18.65	4.36	5.93	14.31	14.90	6.37	2.10
Mercury	12.86	2.71	4.92	8.52	11.05	3.98	1.54
Naphthalene	31996.33	6822.43	8390.37	28323.27	25868.63	10365.51	
Nickel	13.87	3.17	4.64	10.28	11.30	4.63	1.59
Styrene	86694.88	18091.14	25003.34	71328.12	65623.83	27431.94	
Toluene	1503612.65	318815.46	390025.46	1292949.25	1185796.61	475456.92	10296.14
Xylene,M	458720.79	96927.83	116347.41	385409.13	354681.05	141711.42	6426.45
Xylene,O	239227.16	50496.89	61310.70	200476.80	184450.04	73985.26	3144.12
Xylenes,Iso	818782.27	174327.84	215839.93	721885.12	660083.13	264886.73	

Table H-1: Pennsylvania Mobile Source emissions by county in pounds/year (continued)

	Mercer	Mifflin	Monroe	Montgomery	Montour	Northampton	Northumberland
Acetaldehyde	31872.42	10173.87	29018.04	169165.47	7012.94	44742.29	17392.50
Acrolein	3892.39	1214.57	3950.67	15599.88	846.61	5792.94	2139.73
Arsenic	0.14	0.04	0.14	0.45	0.04	0.15	0.07
Benzene	175331.91	61057.38	181493.47	748727.01	35787.99	285872.31	106883.72
Butadiene,13	21595.62	7434.71	23187.77	90898.42	4415.38	36072.83	13118.19
Chromium	4.30	1.37	4.40	15.69	1.04	5.32	2.49
Copper	760.58	256.69	853.02	3964.74	175.29	1143.00	486.46
Ethylbenzene	71424.41	25000.47	74131.63	302689.44	14783.95	115959.36	43821.50
Formaldehyde	85138.58	26947.07	76017.53	461946.56	18875.93	117073.87	45893.46
Lead	265.89	74.61	258.66	820.26	68.23	282.32	133.91
Manganese	7.32	2.43	7.62	28.21	1.73	9.52	4.43
Mercury	6.18	1.53	5.74	15.97	1.67	5.60	2.70
Naphthalene	10453.41	3609.86	11232.38	43917.49	2146.20	17447.74	6371.27
Nickel	5.75	1.77	5.80	20.04	1.42	6.82	3.20
Styrene	27879.51	10382.19	30441.22	110501.10	6423.87	45103.77	18461.17
Toluene	487299.09	169940.05	512325.97	2060443.85	100469.55	800067.90	298588.02
Xylene,M	147584.79	51621.67	151330.14	632069.16	30170.05	238995.89	90193.76
Xylene,O	76898.99	27071.11	79226.81	327513.36	15881.17	124526.56	47363.64
Xylenes,Iso	267608.40	92587.51	287500.04	1120692.57	55288.04	445296.61	163466.89

Table H-1: Pennsylvania Mobile Source emissions by county in pounds/year (continued)

	Perry	Philadelphia	Pike	Potter	Schuylkill	Snyder	Somerset
Acetaldehyde	12033.46	202863.73	11306.88	4958.30	31860.22	9682.31	25919.18
Acrolein	1453.30	22759.25	1527.23	598.73	4080.57	1121.97	3133.51
Arsenic	0.06	0.44	0.83	0.02	0.14	0.04	0.13
Benzene	66599.11	1205193.05	64211.34	28842.74	193680.90	57318.67	134030.79
Butadiene,13	8174.52	147925.30	8251.28	3515.19	24208.06	6873.97	16516.63
Chromium	1.84	15.59	1.82	0.68	4.68	1.28	3.80
Copper	333.83	3574.13	142.07	136.94	868.11	247.34	631.13
Ethylbenzene	27733.86	482630.76	26352.20	11783.24	79682.05	23455.60	55414.00
Formaldehyde	32135.25	537451.27	29952.86	13178.73	83993.95	25730.63	69679.75
Lead	106.58	798.78	71.01	37.56	266.71	69.33	243.49
Manganese	3.21	28.18	2.98	1.20	8.18	2.29	6.38
Mercury	2.32	15.17	1.63	0.78	5.73	1.40	5.83
Naphthalene	3988.63	71297.32	3999.35	1704.65	11762.66	3338.08	8031.88
Nickel	2.42	19.80	1.73	0.88	6.12	1.65	5.14
Styrene	13005.43	164839.78	11087.66	4759.35	34553.48	9636.63	24287.86
Toluene	188006.83	3310836.84	182021.15	80116.17	545590.36	158646.28	376424.71
Xylene,M	56320.02	1013374.49	53469.93	24365.91	162692.30	48652.30	113049.27
Xylene,O	29903.14	522418.22	28048.84	12741.17	85663.86	25490.28	59565.29
Xylenes,Iso	103066.72	1810475.33	102601.82	43689.30	302132.22	85630.83	206974.30

Table H-1: Pennsylvania Mobile Source emissions by county in pounds/year (continued)

	Sullivan	Susquehanna	Tioga	Union	Venango	Warren	Washington
Acetaldehyde	2774.09	14558.72	11519.11	12033.29	14545.87	9949.88	51732.09
Acrolein	271.59	1720.08	1293.45	1467.71	1816.41	1194.14	6609.76
Arsenic	0.01	0.07	0.05	0.06	0.07	0.04	0.22
Benzene	12553.98	75478.74	62734.55	65809.32	78267.10	55892.06	305962.67
Butadiene,13	1522.18	9216.91	7484.23	8082.60	9794.88	6872.63	38348.40
Chromium	0.31	2.01	1.57	1.77	2.22	1.43	6.91
Copper	58.76	342.62	302.07	303.25	397.44	293.77	1355.90
Ethylbenzene	5150.57	31057.08	25772.19	26995.93	32163.96	22924.43	124515.73
Formaldehyde	7561.92	39164.54	30906.32	32173.73	38881.22	26522.87	136789.40
Lead	18.09	128.16	89.10	109.35	138.11	80.06	401.14
Manganese	0.55	3.39	2.76	3.02	3.78	2.52	12.02
Mercury	0.39	3.05	1.90	2.54	3.22	1.69	8.78
Naphthalene	739.01	4476.39	3637.90	3921.90	4752.51	3336.10	18558.41
Nickel	0.41	2.72	2.05	2.37	2.98	1.86	9.08
Styrene	2133.62	13092.64	10804.80	11178.51	13551.45	9574.73	48997.84
Toluene	34897.44	210626.92	173700.86	183661.68	220054.82	156137.94	855455.90
Xylene,M	10624.96	63775.56	53342.28	55498.87	65677.63	47129.63	256324.55
Xylene,O	5568.57	33474.14	27997.20	29080.53	34464.72	24720.97	133664.50
Xylenes,Iso	18982.93	115137.71	93525.97	100710.22	122083.11	85635.89	474560.45

Table H-1: Pennsylvania Mobile Source emissions by county in pounds/year (continued)

	Wayne	Westmoreland	Wyoming	York	**State Total**
Acetaldehyde	9535.31	68681.11	6724.97	66950.49	**2269558.73**
Acrolein	1105.90	8857.36	781.53	8384.39	**263874.72**
Arsenic	0.04	0.30	0.03	0.26	**9.61**
Benzene	53349.07	410135.29	37075.19	406415.95	**12756306.49**
Butadiene,13	6443.66	51577.27	4504.06	50236.30	**1578798.29**
Chromium	1.29	9.88	0.95	9.03	**293.59**
Copper	260.41	1928.01	186.32	1863.17	**60944.49**
Ethylbenzene	21845.16	167503.50	15341.42	165825.52	**5158737.36**
Formaldehyde	25478.29	181323.77	17986.27	176772.33	**6045105.18**
Lead	72.00	566.39	53.16	489.68	**16408.51**
Manganese	2.27	17.26	1.67	16.06	**516.66**
Mercury	1.52	12.24	1.12	9.96	**346.11**
Naphthalene	3127.74	24990.01	2193.90	24348.32	**764376.74**
Nickel	1.67	12.94	1.23	11.65	**381.31**
Styrene	8958.56	68178.59	6860.29	66884.30	**2036087.36**
Toluene	147976.66	1151150.19	103839.95	1133627.63	**35449657.91**
Xylene,M	45192.13	343482.62	31410.44	341985.69	**10724935.06**
Xylene,O	23666.86	179688.63	16593.33	178798.45	**5593083.69**
Xylenes,Iso	80264.76	639899.01	56548.35	623391.08	**19149028.26**

Appendix I: Wisconsin Toxic Emissions Inventory

DATA SOURCES

On-Road Sources

This report section describes the Wisconsin Department of Natural Resource's (WDNR's) construction of a statewide inventory of toxic air pollutants for the year 1996 for on-road sources. In the estimation both vehicle-miles of travel (VMT) based emission factors and speciation from VOC and PM10 were used.

WDNR calculated estimates of 1996 annual VOC and PM10 emissions for each of Wisconsin's 72 counties. VOC emissions were broken down into tailpipe exhaust VOC (EXHC) and all evaporative VOCs (EVHC) except emission from vehicle refueling (Refueling emissions were calculated separately). PM10 emissions were divided into tailpipe exhaust emissions (EXPM), break-wear emissions (BW10), and tire-wear emissions (TW10). Fugitive dust emissions were not included. Within each of these counties, the emission estimates included individual emission estimates for each of the eight types of highway vehicles. These types are:

Light-Duty Gasoline Vehicles (passenger cars) [LDGV]
Light-Duty Gasoline Trucks 0-6000 lbs. gross vehicle weight rating [LDGT1]
Light-Duty Gasoline Trucks 6001-8500 lbs. gross vehicle weight rating [LDGT2]
Heavy-Duty Gasoline Vehicles [HDGV]
Light-Duty Diesel Vehicles [LDDV]
Light-Duty Diesel Trucks [LDDT]
Heavy-Duty Diesel Vehicles [HDDV]
Motorcycles [MC]

In general, the emission estimates were obtained by multiplying an activity factor by an emission factor. The activity factor was VMT. The VOC emission factors were obtained from the U.S. EPA's MOBILE5a model, 26-Mar-93. PM10 emission factors were obtained from U.S. EPA's PART5 model, revised 02-24-95.

A more detailed description of the VMT activity factor and the MOBILE5a and PART5 emission factor modeling follows.

VMT Activity Factor

The Southeastern Wisconsin Regional Planning Commission (SEWRPC) provided estimated 1996 VMTs for each of the seven counties in their planning region: Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha Counties. These estimates were based on traffic counts conducted throughout SEWRPC's travel network as well as SEWRPC's estimates of off-

network VMT (about 10% of the total VMT). The Wisconsin Department of Transportation (WDOT) provided estimated 1996 VMTs for the remaining 65 counties of Wisconsin. These estimates were obtained from the Highway Performance Monitoring System (HPMS), a nationwide system for compiling transportation data. The WDNR allocated the VMT to the eight vehicle types based on:

(1) Vehicle type distributions compiled by SEWRPC.

(2) Vehicle type distributions compiled by WDOT (for HPMS).

(3) Statistical summaries of the number of LDGVs, LDGT1s, and LDGT2s tested in Wisconsin's motor vehicle inspection and maintenance (I/M) program.

A summary of the resulting 1996 statewide VMT estimates follows:

Wisconsin 1996 Statewide VMT Estimates

Vehicle Type	Average Daily VMT	Annual VMT	VMT Distribution
LDGV	86,488,059	31,654,629,716	62.6%
LDGT1	29,710,805	10,874,154,633	21.5%
LDGT2	9,381,363	3,433,578,809	6.8%
HDGV	2,890,616	1,057,965,591	2.1%
LDDV	1,033,685	378,328,699	0.7%
LDDT	276,131	101,063,860	0.2%
HDDV	7,529,385	2,755,754,890	5.5%
MC	755,338	276,453,659	0.5%
All	138,065,382	50,531,929,857	100.0%

SEWRPC and WDOT also provided monthly VMT adjustment factors, which allowed WDNR to calculate VMTs for each month of the year.

Additionally, for each of the seven SEWRPC counties, SEWRPC provided a distribution of the county total VMT into 14 speed classes (12 speed classes for travel on freeways, the same 12 speed classes for travel on standard arterials, and 2 additional speed classes for travel on the off-network roadways). And, for each of the 65 non-SEWRPC counties, WDOT provided VMT estimates for each of the 12 HPMS functional classes.

MOBILE5a Emission Factors for VOCs

The WDNR calculated sets of MOBILE5a VOC emission factors for the following four regions of the state:

(1) Six Severe Nonattainment Counties for Ozone: Kenosha, Milwaukee, Ozaukee, Racine, Washington, and Waukesha Counties. (These six counties, all in the SEWRPC planning region,

are subject to both a vehicle inspection and maintenance (I/M) program and to federal reformulated gasoline (RFG).)

(2) Walworth County. (This is the only county in the SEWRPC planning region that is not subject to I/M and not subject to RFG.)

(3) Sheboygan County. (This is the only county outside of the SEWRPC planning region that is subject to I/M. It is not subject to RFG.)

(4) Remaining 64 Counties of Wisconsin. (These counties, all outside of the SEWRPC planning region, are not subject to I/M and are not subject to RFG.)

For regions (1) and (2), which comprise the seven SEWPPC counties, WDNR computed month-specific and vehicle-type-specific emission factors for the 14 different speed classes provided by SEWRPC. And, for regions (3) and (4), which comprise the 65 non-SEWRPC counties, WDNR computed month-specific and vehicle-type-specific emission factors for 12 different speeds provided by WDOT (one speed for each of the 12 HPMS functional classes).

For each of the eight vehicle types within each of the 72 counties, WDNR then computed final monthly emission factors for each of the 12 months by taking a VMT-weighted average of the month-specific emission factors for each of the different speeds. These monthly emission factors were then multiplied by the monthly VMT to obtain monthly emission estimates for each of the eight vehicle types within each of the 72 counties. These monthly emission estimates were then summed to obtain annual emission estimates.

PART5 Emission Factors for PM10

The WDNR's methodology for calculating PM10 emission factors was consistent with its methodology for calculating VOC emission factors described above. Since the PART5 model required a smaller set of inputs than MOBILE5a, some of the complexities of the VOC emission factor calculation were not necessary in calculating the PM10 emission factors. For example, the calculation of monthly emission factors was not necessary since the PART5 model does not include inputs for the modeling parameters that vary significantly by month of the year (e.g., ambient temperature and fuel volatility).

Toxic Emission Estimation

Emissions were calculated by speciating the relevant GLC toxic pollutants from the TOG and PM10 emission estimations. VMT emission factors were used for four pollutants (acetaldehyde, benzene, formaldehyde, and 1,3 butadiene). These emission factors were obtained from the Wisconsin portion of the Mobile5 run for the 1996 National Toxics Inventory. VOC estimations from MOBILE5a were converted to TOG by applying a TOG to VOC emission factor. For accurate toxics estimations TOG and PM10 data were broken out into the component parts. For TOG the components are tailpipe exhaust (EXHC) and all evaporative emissions (EVHC) except emission from vehicle refueling. PM10 components included tailpipe exhaust emissions (EXPM), break-wear emissions (BW10), and tire-wear emissions (TW10). Fugitive dust emissions were not included.

Off-Road Sources

This report section describes the WDNR's estimation procedures for toxic air pollutant emissions from off-road sources. In general, toxic pollutants were speciated from EXHC and PM10 data estimations for each off-road equipment type.

A more detailed description of the components and procedures used follows.

EXHC and PM10 Estimation

EXHC and PM10 data were calculated from the application of an emission factor based on horsepower hour (HP-HR), for which default data was used based on equipment type, and equipment population. The evaporative component of the VOC data (EVHC) was not available. For off-road sources EXHC represents the total VOC emissions.

Equipment Population

Equipment population is defined by the total number of a certain type of equipment being use in a particular county. Some examples of equipment types are lawnmowers, outdoor grills, construction equipment, chain saws, and off-road recreational equipment. Equipment population data were obtained from the 1992 USEPA publication/database called Methodology to Calculate Non-Road Emissions Inventories at the County and Sub-County Level. The database had equipment population activity for the 6 county area (Kenosha, Milwaukee, Ozaukee, Racine, Washington, and Waukesha Counties), as well as Sheboygan County. The equipment populations were estimated from surveys on suppliers and users of non-road equipment. We then apportioned the equipment to rest of the counties using per capita estimates. This state specific equipment population was incorporated into RAPIDS using intelligent import Method I. Intelligent import Method I allows the user to supply SCC specific activity data by season for the purposes of emission estimation.

AIRCRAFT SOURCES

This report section describes the WDNR's estimation procedures for toxic air pollutant emissions from aircraft sources. In general, toxic pollutants were speciated from TOG data estimations for each aircraft type.

A more detailed description of the components and procedures used follows.

TOG Estimation

TOG data were calculated from the application of an emission factor based on time-in-mode (TIM), the amount of time spent in each phase of the lift off and landing cycle for a particular aircraft, and the number of landings and take-offs for the same aircraft type (LTO). Default data were used for the TIM estimates. LTO data for each county were obtained from the US Department of Transportation, Bureau of Transportation Statistics; 1996 Airport Activity Statistics document. TOG estimates were incorporated into RAPIDS using intelligent import Method II. Intelligent import Method II allows the user to supply pre-calculated TOG estimates by aircraft type for emission estimation.

INFORMATION

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Table I-1: Wisconsin Mobile Source emissions by county in pounds/year

	Adams	Ashland	Barron	Bayfield	Brown	Buffalo
Acetaldehyde	6931.03	5982.44	16375.78	7240.82	68509.00	5604.39
Acrolein	656.97	681.30	1706.97	730.59	8595.10	546.01
Anthracene	0.06	0.06	0.16	0.06	0.78	0.05
Arsenic	0.03	0.03	0.08	0.04	0.27	0.03
Benz(a)anthracene	1.07	0.99	2.67	1.01	12.58	0.92
Benzene	44814.64	38802.05	105942.62	47695.14	424679.70	37489.27
Benzo(a)pyrene	0.52	0.49	1.32	0.48	6.49	0.45
Benzo(b)fluoranthene	0.45	0.43	1.15	0.42	5.64	0.39
Benzo(ghi)perylene	1.74	1.65	4.43	1.60	21.63	1.51
Benzo(k)fluoranthene	0.49	0.46	1.24	0.45	6.06	0.42
Butadiene,13	6168.82	5387.78	14656.31	6376.42	61097.07	5109.81
Chromium	4.22	3.74	10.03	4.26	43.18	3.47
Chrysene	0.67	0.63	1.70	0.61	8.31	0.58
Copper	147.05	123.91	340.11	163.36	1262.21	121.06
Dibenz(a,h)anthracene	0.09	0.09	0.24	0.09	1.18	0.08
Ethylbenzene	19048.13	19522.01	49148.40	20141.71	226507.95	16198.62
Fluoranthene	0.58	0.55	1.47	0.53	7.27	0.50
Formaldehyde	18168.65	15453.14	42617.14	19257.23	174702.66	14704.31
Indeno(1,2,3-cd)pyrene	0.10	0.09	0.24	0.09	1.19	0.08
Lead	30.50	24.57	70.89	34.74	250.41	23.93
Manganese	3.89	3.55	9.43	3.66	44.35	3.23
Mercury	0.94	0.80	2.26	0.99	9.19	0.72
Naphthalene	1241.85	1193.38	3049.11	1397.64	12536.96	1033.35
Nickel	3.47	3.07	8.27	3.50	35.80	2.87
Phenanthrene	0.21	0.20	0.53	0.19	2.97	0.18
Phenol					103.02	
Pyrene	0.37	0.35	0.94	0.34	4.68	0.32
Styrene	6490.74	6569.68	16251.31	7228.56	69648.03	5504.37
Toluene	109428.81	114093.90	283514.03	118680.27	1293203.19	92543.22
Xylene,M	22527.64	24470.74	59073.31	25899.68	263262.31	18783.65
Xylene,O	12160.18	13112.42	31718.85	13946.72	140669.80	10158.02
Xylenes,Iso	77585.97	79356.70	199949.51	81658.12	924224.34	66064.98

Table I-1: Wisconsin Mobile Source emissions by county in pounds/year (continued)

	Burnett	Calumet	Chippewa	Clark	Columbia	Crawford
Acetaldehyde	5419.58	12165.52	19677.27	12494.12	27229.70	6942.25
Acrolein	544.37	1294.73	2151.01	1216.10	2927.91	757.62
Anthracene	0.05	0.13	0.20	0.12	0.17	0.06
Arsenic	0.03	0.05	0.09	0.06	0.16	0.03
Benz(a)anthracene	0.91	2.24	3.39	2.02	3.21	1.03
Benzene	35625.67	78977.86	128358.15	80308.94	164052.46	45829.24
Benzo(a)pyrene	0.45	1.14	1.70	1.00	1.48	0.49
Benzo(b)fluoranthene	0.39	1.00	1.48	0.87	1.29	0.43
Benzo(ghi))perylene	1.51	3.82	5.69	3.35	4.94	1.65
Benzo(k)fluoranthene	0.42	1.07	1.59	0.94	1.38	0.46
Butadiene,13	4898.73	11069.15	17861.94	11127.45	22177.75	6216.98
Chromium	3.35	7.77	12.42	7.64	14.64	4.23
Chrysene	0.58	1.47	2.18	1.29	1.90	0.63
Copper	114.08	240.11	401.38	257.48	596.46	153.18
Dibenz(a,h)anthracene	0.08	0.21	0.31	0.18	0.27	0.09
Ethylbenzene	16055.56	39243.86	62576.03	35499.05	71647.26	21114.63
Fluoranthene	0.50	1.27	1.89	1.11	1.64	0.55
Formaldehyde	14134.89	31089.44	50842.74	32542.89	72720.93	18254.72
Indeno(1,2,3-cd)pyrene	0.08	0.21	0.31	0.18	0.27	0.09
Lead	23.47	46.82	79.83	53.85	158.91	30.44
Manganese	3.17	7.74	12.06	7.19	12.07	3.76
Mercury	0.74	1.62	2.63	1.72	4.73	0.90
Naphthalene	991.28	2239.76	3752.07	2216.04	5110.43	1405.88
Nickel	2.78	6.42	10.26	6.28	12.22	3.45
Phenanthrene	0.18	0.45	0.68	0.40	0.59	0.20
Phenol			0.40			
Pyrene	0.32	0.81	1.21	0.72	1.05	0.35
Styrene	5290.64	12343.22	20481.34	11701.71	26029.42	7557.20
Toluene	91618.89	222776.84	360445.12	202686.67	432042.40	125019.91
Xylene,M	18562.73	44605.29	74865.87	41189.88	99456.63	27578.13
Xylene,O	10002.38	23943.92	40171.85	22187.54	53194.22	14823.99
Xylenes,Iso	65545.51	160398.08	254587.09	144606.28	288728.75	85512.82

Table I-1: Wisconsin Mobile Source emissions by county in pounds/year (continued)

Pollutant	Dane	Dodge	Door	Douglas	Dunn	Eau Claire
Butadiene,13	118973.99	25270.25	10187.91	14388.99	15090.25	26650.12
Acetaldehyde	138912.53	28065.66	11368.71	15866.94	18432.42	30337.98
Acrolein	17312.29	2803.82	1192.31	1905.51	2017.70	3486.61
Anthracene	1.49	0.29	0.10	0.15	0.14	0.32
Arsenic	0.58	0.12	0.05	0.07	0.10	0.14
Benz(a)anthracene	24.07	4.95	1.69	2.66	2.42	5.35
Benzene	816673.90	179287.40	75360.87	104708.16	110112.44	186819.98
Benzo(a)pyrene	12.41	2.51	0.81	1.32	1.15	2.74
Benzo(b)fluoranthene	10.79	2.19	0.71	1.15	1.01	2.38
Benzo(ghi))perylene	41.39	8.40	2.72	4.42	3.86	9.14
Benzo(k)fluoranthene	11.58	2.35	0.76	1.24	1.08	2.56
Chromium	83.13	17.59	6.93	9.93	10.19	18.74
Chrysene	15.89	3.23	1.04	1.69	1.48	3.51
Copper	2477.29	552.79	250.57	333.02	386.85	576.67
Dibenz(a,h)anthracene	2.25	0.46	0.15	0.24	0.21	0.50
Ethylbenzene	419915.37	84085.98	33606.50	54035.62	51060.78	99129.65
Fluoranthene	13.88	2.79	0.90	1.47	1.28	3.04
Formaldehyde	356841.70	72218.98	29922.38	41087.01	48634.88	77314.17
Indeno(1,2,3-cd)pyrene	2.28	0.46	0.15	0.24	0.21	0.50
Lead	567.30	114.57	49.23	64.76	102.40	130.90
Manganese	85.15	17.39	6.17	9.35	8.91	18.76
Mercury	20.71	3.91	1.45	2.06	3.20	4.66
Naphthalene	23558.29	4900.24	2245.96	3303.35	3411.40	5603.19
Nickel	69.54	14.56	5.65	8.15	8.51	15.60
Phenanthrene	5.58	1.00	0.32	0.53	0.46	1.09
Phenol	308.54					
Pyrene	8.94	1.79	0.58	0.94	0.82	1.95
Styrene	126171.94	26395.86	12021.53	18359.22	17614.15	30863.25
Toluene	2379684.83	474467.71	197614.02	317713.18	303935.72	569955.57
Xylene,M	476272.76	93660.90	42935.85	69138.46	68112.84	118099.26
Xylene,O	254385.42	50362.18	23130.62	37015.77	36357.87	63011.65
Xylenes,Iso	1715423.57	343600.22	136159.31	219130.58	206529.72	403909.13

Table I-1: Wisconsin Mobile Source emissions by county in pounds/year (continued)

	Florence	Fond Du Lac	Forest	Grant	Green	Green Lake
Acetaldehyde	1986.76	31998.38	4062.65	17486.40	10232.84	6473.14
Acrolein	189.60	3394.20	403.86	1702.69	1056.11	643.02
Anthracene	0.02	0.34	0.03	0.18	0.12	0.07
Arsenic	0.01	0.14	0.02	0.08	0.04	0.03
Benz(a)anthracene	0.31	5.66	0.61	3.01	1.91	1.22
Benzene	12407.58	205992.41	26802.89	110300.05	65688.21	42227.35
Benzo(a)pyrene	0.15	2.87	0.29	1.53	0.98	0.63
Benzo(b)fluoranthene	0.13	2.50	0.26	1.33	0.86	0.55
Benzo(ghi))perylene	0.51	9.60	0.98	5.10	3.28	2.09
Benzo(k)fluoranthene	0.14	2.69	0.27	1.43	0.92	0.59
Butadiene,13	1700.77	28935.52	3615.30	12856.53	7625.36	4905.26
Chromium	1.22	20.17	2.42	10.87	6.51	4.12
Chrysene	0.19	3.68	0.38	1.96	1.26	0.80
Copper	40.83	635.58	89.04	342.84	197.36	126.72
Dibenz(a,h)anthracene	0.03	0.52	0.05	0.28	0.18	0.11
Ethylbenzene	5494.74	100552.60	11419.95	50768.09	32135.56	19903.36
Fluoranthene	0.17	3.19	0.33	1.69	1.09	0.69
Formaldehyde	5162.59	82153.52	10735.98	45035.25	26156.08	16606.21
Indeno(1,2,3-cd)pyrene	0.03	0.53	0.05	0.28	0.18	0.12
Lead	8.95	128.21	18.38	72.79	40.15	25.12
Manganese	1.16	19.84	2.14	10.71	6.58	4.15
Mercury	0.29	4.36	0.54	2.48	1.41	0.87
Naphthalene	347.66	5874.08	763.88	2986.96	1798.11	1120.81
Nickel	1.01	16.65	1.98	8.99	5.40	3.43
Phenanthrene	0.06	1.14	0.12	0.61	0.39	0.25
Phenol						
Pyrene	0.11	2.05	0.21	1.09	0.70	0.45
Styrene	1806.65	31843.64	3997.86	15907.54	9848.77	6125.11
Toluene	31514.32	573540.50	66430.03	286185.90	180441.62	110912.51
Xylene,M	6452.77	116328.99	14103.27	56357.39	35180.12	21184.63
Xylene,O	3469.69	62381.12	7604.18	30305.39	18895.18	11417.48
Xylenes,Iso	22481.04	410254.35	46311.35	207497.70	131501.48	81516.71

Table I-1: Wisconsin Mobile Source emissions by county in pounds/year (continued)

	Iowa	Iron	Jackson	Jefferson	Juneau	Kenosha
Acetaldehyde	9963.82	3412.30	14755.41	27768.78	18763.96	47050.97
Acrolein	1013.70	379.50	1626.74	2966.04	2051.33	3271.52
Anthracene	0.08	0.02	0.06	0.26	0.08	0.51
Arsenic	0.05	0.02	0.10	0.14	0.12	0.15
Benz(a)anthracene	1.39	0.41	1.27	4.36	1.66	8.26
Benzene	65137.38	22307.35	84355.35	166540.00	104752.93	183674.71
Benzo(a)pyrene	0.66	0.18	0.52	2.19	0.70	4.37
Benzo(b)fluoranthene	0.58	0.16	0.45	1.91	0.61	3.81
Benzo(ghi))perylene	2.21	0.61	1.73	7.31	2.33	14.61
Benzo(k)fluoranthene	0.62	0.17	0.49	2.05	0.65	4.09
Butadiene,13	7636.46	2642.41	10241.20	19659.60	12788.49	28904.70
Chromium	5.86	1.95	7.14	16.24	9.06	26.42
Chrysene	0.85	0.23	0.67	2.81	0.90	5.61
Copper	221.90	78.97	336.22	542.82	415.04	668.59
Dibenz(a,h)anthracene	0.12	0.03	0.09	0.40	0.13	0.80
Ethylbenzene	27773.90	9664.21	35151.15	80894.21	44144.87	110691.55
Fluoranthene	0.73	0.20	0.58	2.43	0.78	4.85
Formaldehyde	26452.37	9166.98	40139.58	71872.31	50826.06	81021.90
Indeno(1,2,3-cd)pyrene	0.12	0.03	0.10	0.40	0.13	0.80
Lead	47.41	17.02	102.30	137.07	130.92	126.17
Manganese	5.07	1.56	5.12	15.57	6.73	29.13
Mercury	1.37	0.47	2.94	4.63	3.87	5.44
Naphthalene	1915.18	714.34	2801.35	4859.08	3439.83	5424.02
Nickel	4.81	1.58	6.03	13.59	7.68	22.03
Phenanthrene	0.26	0.07	0.21	0.87	0.28	1.74
Phenol					0.01	0.05
Pyrene	0.47	0.13	0.37	1.56	0.50	3.11
Styrene	9911.97	3696.91	13658.72	25794.91	16632.04	27674.43
Toluene	163818.83	59165.09	220646.90	466451.63	275285.29	579876.58
Xylene,M	35886.69	14039.28	54972.02	97357.57	67868.47	92235.52
Xylene,O	19302.64	7524.41	29274.11	52023.06	36075.35	49637.98
Xylenes,Iso	112384.60	38644.20	140500.67	329261.54	176558.74	458883.02

Table I-1: Wisconsin Mobile Source emissions by county in pounds/year (continued)

	Kewaunee	La Crosse	Lafayette	Langlade	Lincoln	Manitowoc
Butadiene,13	4722.29	23489.25	4890.87	5374.15	8969.57	19567.75
Acetaldehyde	6233.61	32457.45	6474.04	7146.86	11895.59	27588.66
Acrolein	587.26	4015.57	640.37	756.35	1226.01	2972.65
Anthracene	0.07	0.38	0.06	0.08	0.10	0.30
Arsenic	0.03	0.13	0.03	0.03	0.06	0.12
Benz(a)anthracene	1.21	6.18	1.01	1.29	1.76	4.97
Benzene	40654.80	200853.34	42050.67	46316.34	77012.38	167059.99
Benzo(a)pyrene	0.63	3.21	0.49	0.66	0.85	2.56
Benzo(b)fluoranthene	0.55	2.79	0.43	0.57	0.74	2.23
Benzo(ghi))perylene	2.10	10.72	1.65	2.19	2.85	8.57
Benzo(k)fluoranthene	0.59	3.00	0.46	0.61	0.80	2.40
Chromium	4.02	20.64	3.96	4.53	7.18	17.12
Chrysene	0.80	4.12	0.63	0.84	1.09	3.29
Copper	119.46	586.65	137.58	141.67	256.44	507.79
Dibenz(a,h)anthracene	0.11	0.58	0.09	0.12	0.15	0.47
Ethylbenzene	18795.10	109561.41	18503.25	22614.59	34308.56	86153.99
Fluoranthene	0.70	3.59	0.55	0.73	0.95	2.85
Formaldehyde	15915.27	82328.75	16930.27	18358.41	31257.41	70120.63
Indeno(1,2,3-cd)pyrene	0.12	0.59	0.09	0.12	0.16	0.47
Lead	22.92	118.48	27.99	28.28	53.76	119.04
Manganese	4.12	21.57	3.66	4.48	6.47	17.62
Mercury	0.82	4.48	0.87	0.96	1.63	4.38
Naphthalene	1031.65	5893.54	1195.16	1307.23	2268.97	4735.74
Nickel	3.34	17.17	3.25	3.74	5.88	14.35
Phenanthrene	0.25	1.41	0.20	0.26	0.34	1.02
Phenol		45.41				0.01
Pyrene	0.45	2.31	0.35	0.47	0.61	1.83
Styrene	5687.44	33378.37	6335.24	7183.76	11888.11	26102.34
Toluene	103163.72	622319.41	106904.99	128451.13	200992.92	487139.46
Xylene,M	18892.39	124972.42	22309.20	25776.80	43356.30	96893.72
Xylene,O	10222.51	66823.07	12025.62	13848.89	23291.28	51816.69
Xylene,Iso	77155.45	447462.18	75296.30	92308.10	139184.36	352044.70

Table I-1: Wisconsin Mobile Source emissions by county in pounds/year (continued)

	Marathon	Marinette	Marquette	Menominee	Milwaukee	Monroe
Acetaldehyde	41625.70	17618.92	7537.82	2120.49	307671.75	22033.03
Acrolein	4555.25	1912.18	793.71	228.03	31902.62	2461.14
Anthracene	0.45	0.15	0.04	0.02	3.88	0.14
Arsenic	0.18	0.08	0.04	0.01	0.83	0.13
Benz(a)anthracene	7.37	2.72	0.83	0.31	57.50	2.57
Benzene	259544.27	116927.41	43447.25	14791.21	1149487.08	129909.51
Benzo(a)pyrene	3.77	1.32	0.38	0.14	31.21	1.18
Benzo(b)fluoranthene	3.28	1.15	0.33	0.12	27.06	1.03
Benzo(ghi))perylene	12.58	4.41	1.26	0.48	103.84	3.95
Benzo(k)fluoranthene	3.52	1.23	0.35	0.13	29.06	1.11
Butadiene,13	30370.15	13621.98	5237.75	1696.30	194459.46	15530.90
Chromium	26.02	10.75	3.92	1.30	168.77	11.69
Chrysene	4.83	1.69	0.48	0.18	39.89	1.52
Copper	791.52	384.53	161.40	50.66	3652.32	475.68
Dibenz(a,h)anthracene	0.68	0.24	0.07	0.03	5.65	0.22
Ethylbenzene	127451.76	54012.34	18688.35	6497.14	749977.19	59257.88
Fluoranthene	4.20	1.47	0.42	0.16	35.32	1.31
Formaldehyde	106772.91	46229.05	20136.41	5634.87	572324.19	58692.12
Indeno(1,2,3-cd)pyrene	0.69	0.24	0.07	0.03	5.72	0.22
Lead	166.00	76.06	46.53	9.11	717.78	132.06
Manganese	26.22	9.69	3.20	1.09	199.09	9.65
Mercury	5.87	2.28	1.42	0.24	35.83	4.00
Naphthalene	7271.80	3516.05	1352.65	454.99	31958.22	4168.82
Nickel	21.60	8.80	3.28	1.06	142.22	9.78
Phenanthrene	1.60	0.52	0.15	0.06	16.36	0.47
Phenol	42.21				1105.54	
Pyrene	2.70	0.94	0.27	0.10	22.88	0.84
Styrene	39229.56	18977.10	6732.56	2477.91	182340.96	21267.45
Toluene	722244.09	317225.44	113149.21	38709.37	3863470.14	359263.45
Xylene,M	144081.51	68806.48	26307.82	8610.18	579641.44	83667.36
Xylene,O	77192.44	36999.49	14035.10	4657.52	313675.19	44611.48
Xylene,Iso	520626.87	218842.85	75207.84	26361.29	3115133.23	238739.99

Table I-1: Wisconsin Mobile Source emissions by county in pounds/year (continued)

	Oconto	Oneida	Outagamie	Ozaukee	Pepin	Pierce
Acetaldehyde	14560.01	13234.43	48160.19	35157.91	2392.58	11296.17
Acrolein	1440.72	1335.72	5669.61	2432.82	224.27	1098.53
Anthracene	0.12	0.12	0.56	0.29	0.02	0.12
Arsenic	0.07	0.06	0.19	0.13	0.01	0.05
Benz(a)anthracene	2.07	2.11	9.14	4.96	0.41	2.04
Benzene	94613.16	84646.66	304955.42	132165.38	15310.07	71908.03
Benzo(a)pyrene	0.99	1.04	4.72	2.51	0.21	1.04
Benzo(b)fluoranthene	0.86	0.91	4.11	2.19	0.18	0.91
Benzo(ghi))perylene	3.31	3.49	15.77	8.39	0.69	3.49
Benzo(k)fluoranthene	0.93	0.98	4.41	2.35	0.19	0.98
Butadiene,13	11088.46	9893.66	35411.41	15542.94	1808.03	8363.60
Chromium	8.61	8.09	31.04	17.97	1.48	7.19
Chrysene	1.27	1.34	6.05	3.22	0.26	1.34
Copper	319.38	272.74	898.20	561.41	47.18	217.71
Dibenz(a,h)anthracene	0.18	0.19	0.86	0.46	0.04	0.19
Ethylbenzene	39948.48	38277.62	160719.73	74525.52	6691.81	33597.56
Fluoranthene	1.10	1.16	5.27	2.79	0.23	1.16
Formaldehyde	38540.49	34492.35	122248.24	59689.67	6194.60	28920.15
Indeno(1,2,3-cd)pyrene	0.18	0.19	0.87	0.46	0.04	0.19
Lead	68.07	57.73	172.73	110.13	9.61	43.76
Manganese	7.55	7.63	32.06	17.71	1.44	7.24
Mercury	2.00	1.85	6.38	3.81	0.32	1.54
Naphthalene	2725.99	2400.65	8815.93	4469.40	402.21	1921.35
Nickel	7.05	6.67	25.72	14.81	1.21	5.94
Phenanthrene	0.39	0.42	2.03	1.00	0.08	0.41
Phenol		2.85	39.50			
Pyrene	0.71	0.74	3.39	1.79	0.15	0.74
Styrene	14105.77	12681.06	49081.55	21711.15	2147.33	10460.67
Toluene	233893.61	220429.76	912129.19	408358.94	37575.41	187979.73
Xylene,M	50399.67	45719.26	182833.57	74626.10	7348.22	36296.89
Xylene,O	27140.48	24570.47	97811.73	40184.00	3968.42	19559.79
Xylene,Iso	161848.94	155671.50	656623.79	306064.63	27209.81	137419.27

Table I-1: Wisconsin Mobile Source emissions by county in pounds/year (continued)

	Polk	Portage	Price	Racine	Richland	Rock
Acetaldehyde	12781.05	24258.64	6755.01	57679.23	6338.78	50683.56
Acrolein	1220.02	2605.82	672.32	4112.34	662.08	5723.92
Anthracene	0.13	0.24	0.06	0.66	0.06	0.52
Arsenic	0.06	0.11	0.03	0.18	0.03	0.23
Benz(a)anthracene	2.26	4.01	1.00	10.59	1.08	8.71
Benzene	82279.83	148514.39	43602.37	227821.98	41413.86	310835.36
Benzo(a)pyrene	1.14	2.03	0.49	5.65	0.54	4.43
Benzo(b)fluoranthene	1.00	1.77	0.42	4.92	0.47	3.86
Benzo(ghi))perylene	3.83	6.78	1.62	18.88	1.81	14.82
Benzo(k)fluoranthene	1.07	1.90	0.45	5.29	0.51	4.15
Butadiene,13	9564.83	17443.44	5084.01	26394.71	4838.08	36360.57
Chromium	8.01	14.55	4.02	32.69	3.98	31.22
Chrysene	1.47	2.60	0.62	7.25	0.70	5.69
Copper	254.24	472.47	145.76	800.68	129.36	970.02
Dibenz(a,h)anthracene	0.21	0.37	0.09	1.03	0.10	0.81
Ethylbenzene	37218.33	72931.70	18933.01	140896.24	19424.25	161628.61
Fluoranthene	1.27	2.25	0.54	6.27	0.60	4.92
Formaldehyde	32948.55	62560.11	17778.50	99526.33	16422.26	129713.47
Indeno(1,2,3-cd)pyrene	0.21	0.37	0.09	1.04	0.10	0.82
Lead	51.68	112.60	31.36	149.27	25.57	223.29
Manganese	7.88	14.17	3.61	36.48	3.85	31.22
Mercury	1.74	3.84	0.95	6.69	0.84	7.88
Naphthalene	2185.25	4295.01	1251.57	6615.87	1175.46	9273.91
Nickel	6.62	12.14	3.31	27.24	3.29	26.07
Phenanthrene	0.46	0.81	0.19	2.25	0.22	1.77
Phenol						1.13
Pyrene	0.82	1.45	0.35	4.03	0.39	3.16
Styrene	11756.40	22887.14	6504.46	34680.91	6402.70	50806.74
Toluene	208445.50	418268.53	110118.69	734375.94	111260.99	930229.22
Xylene,M	40302.52	86165.68	23350.78	114777.58	22812.21	193177.18
Xylene,O	21751.40	46045.74	12561.38	61788.55	12274.61	103149.16
Xylene,Iso	152348.52	297174.34	76986.24	584734.78	78968.14	658338.09

Table I-1: Wisconsin Mobile Source emissions by county in pounds/year (continued)

	Rusk	Sauk	Sawyer	Shawano	Sheboygan	St. Croix
Acetaldehyde	5721.14	22627.64	6341.69	14841.71	48773.65	26688.37
Acrolein	563.58	2425.94	625.15	1513.60	3516.85	2888.72
Anthracene	0.06	0.18	0.06	0.14	0.51	0.20
Arsenic	0.03	0.12	0.03	0.07	0.14	0.14
Benz(a)anthracene	0.97	3.20	0.99	2.38	8.08	3.55
Benzene	36906.75	138268.43	41995.77	95301.12	171828.78	159921.56
Benzo(a)pyrene	0.48	1.55	0.48	1.18	4.31	1.70
Benzo(b)fluoranthene	0.42	1.35	0.42	1.03	3.76	1.48
Benzo(ghi))perylene	1.62	5.18	1.62	3.94	14.42	5.69
Benzo(k)fluoranthene	0.45	1.45	0.45	1.10	4.04	1.59
Butadiene,13	4284.93	16327.98	4874.52	11100.15	20103.58	19033.87
Chromium	3.54	12.95	3.88	9.06	24.86	14.78
Chrysene	0.62	1.99	0.62	1.51	5.53	2.18
Copper	117.25	471.13	137.75	307.89	618.31	558.30
Dibenz(a,h)anthracene	0.09	0.28	0.09	0.21	0.77	0.31
Ethylbenzene	16735.76	64043.50	18193.52	43535.04	114925.30	73487.90
Fluoranthene	0.54	1.72	0.54	1.31	4.79	1.89
Formaldehyde	14825.47	59396.53	16647.92	38657.12	86446.77	70426.11
Indeno(1,2,3-cd)pyrene	0.09	0.29	0.09	0.22	0.78	0.31
Lead	24.46	116.57	27.35	65.09	135.93	147.64
Manganese	3.38	11.65	3.52	8.49	26.71	12.99
Mercury	0.80	3.67	0.82	2.07	5.96	4.61
Naphthalene	1015.72	4168.31	1187.48	2721.16	5446.00	4885.85
Nickel	2.92	10.76	3.18	7.46	20.09	12.36
Phenanthrene	0.19	0.62	0.19	0.47	1.72	0.68
Phenol						
Pyrene	0.34	1.10	0.34	0.84	3.07	1.21
Styrene	5413.32	21822.76	6325.12	14421.53	30859.88	25128.93
Toluene	95018.93	376832.23	105040.86	250813.36	613392.38	435706.49
Xylene,M	19012.14	82286.81	21861.78	52070.75	103251.45	96872.39
Xylene,O	10239.24	44029.32	11811.47	27977.26	55635.14	51717.63
Xylene,Iso	68418.29	259562.95	74057.39	177265.05	475878.44	297273.12

Table I-1: Wisconsin Mobile Source emissions by county in pounds/year (continued)

	Taylor	Trempealeau	Vernon	Vilas	Walworth	Washburn
Acetaldehyde	6439.18	11116.76	10174.21	9376.24	28986.06	7402.23
Acrolein	619.00	1091.79	999.86	944.29	3039.08	764.96
Anthracene	0.07	0.09	0.10	0.06	0.30	0.06
Arsenic	0.03	0.05	0.05	0.05	0.13	0.04
Benz(a)anthracene	1.22	1.66	1.64	1.21	5.03	1.02
Benzene	41771.60	71195.80	65596.48	62508.51	190406.09	48200.50
Benzo(a)pyrene	0.63	0.81	0.81	0.55	2.52	0.48
Benzo(b)fluoranthene	0.55	0.71	0.71	0.48	2.20	0.42
Benzo(ghi))perylene	2.10	2.71	2.72	1.85	8.43	1.60
Benzo(k)fluoranthene	0.59	0.76	0.76	0.52	2.36	0.45
Butadiene,13	4858.68	8329.12	7640.09	7343.66	21790.63	5634.01
Chromium	4.11	6.61	6.25	5.50	18.48	4.31
Chrysene	0.80	1.04	1.04	0.71	3.23	0.61
Copper	124.62	236.79	211.05	216.99	596.32	166.47
Dibenz(a,h)anthracene	0.11	0.15	0.15	0.10	0.46	0.09
Ethylbenzene	19400.39	30739.16	29239.99	25447.57	89824.65	20731.75
Fluoranthene	0.70	0.90	0.90	0.61	2.80	0.53
Formaldehyde	16489.82	29211.34	26482.40	25114.01	74273.58	19687.67
Indeno(1,2,3-cd)pyrene	0.12	0.15	0.15	0.10	0.46	0.09
Lead	24.69	51.62	43.42	43.88	115.22	36.62
Manganese	4.16	5.97	5.88	4.55	17.77	3.68
Mercury	0.87	1.58	1.39	1.19	3.77	1.05
Naphthalene	1083.30	2016.05	1832.55	1867.63	5406.34	1437.60
Nickel	3.41	5.44	5.14	4.46	15.16	3.55
Phenanthrene	0.25	0.32	0.32	0.22	1.00	0.19
Phenol						
Pyrene	0.45	0.58	0.58	0.39	1.80	0.34
Styrene	5909.64	10550.78	9727.61	9693.55	27852.91	7391.67
Toluene	107366.24	177893.42	167506.43	152359.86	514726.60	122817.75
Xylene,M	20127.76	37305.25	34281.14	34451.93	105661.43	27140.88
Xylene,O	10863.02	20098.64	18467.33	18589.88	56430.48	14575.93
Xylene,Iso	79537.11	124981.85	119153.75	102390.52	366435.14	83994.89

Table I-1: Wisconsin Mobile Source emissions by county in pounds/year (continued)

	Washington	Waukesha	Waupaca	Waushara	Winnebago	Wood	**State Total**
Acetaldehyde	37504.72	129780.41	16592.45	10899.59	46590.46	22554.90	**1867624.42**
Acrolein	3151.92	9179.75	1678.39	1125.75	5180.86	2467.13	**190251.17**
Anthracene	0.41	1.24	0.18	0.08	0.54	0.28	**19.29**
Arsenic	0.17	0.45	0.07	0.06	0.19	0.09	**7.55**
Benz(a)anthracene	6.84	20.40	2.98	1.40	8.89	4.51	**315.32**
Benzene	246185.99	497328.38	105940.90	67281.57	298431.09	144456.94	**10125371.71**
Benzo(a)pyrene	3.47	10.57	1.52	0.66	4.58	2.35	**161.91**
Benzo(b)fluoranthene	3.02	9.21	1.32	0.57	3.99	2.05	**140.88**
Benzo(ghi))perylene	11.60	35.32	5.08	2.19	15.32	7.86	**540.51**
Benzo(k)fluoranthene	3.25	9.89	1.42	0.61	4.29	2.20	**151.29**
Butadiene,13	28081.32	58090.51	12295.82	7990.02	34369.36	16627.34	**1322721.06**
Chromium	24.44	69.13	10.51	6.04	30.48	14.89	**1096.04**
Chrysene	4.45	13.55	1.95	0.84	5.88	3.02	**207.48**
Copper	754.13	1972.80	323.27	237.57	884.74	415.97	**32899.70**
Dibenz(a,h)anthracene	0.63	1.92	0.28	0.12	0.83	0.43	**29.41**
Ethylbenzene	99455.89	292377.28	50637.24	28823.21	156666.45	76391.37	**5228401.71**
Fluoranthene	3.85	11.73	1.69	0.73	5.09	2.61	**180.67**
Formaldehyde	95257.94	221505.32	42516.91	29025.06	117692.51	56759.23	**4329987.37**
Indeno(1,2,3-cd)pyrene	0.64	1.95	0.28	0.12	0.84	0.43	**29.77**
Lead	138.29	379.29	65.45	59.91	171.31	78.65	**7011.16**
Manganese	24.13	71.73	10.50	5.14	31.40	15.65	**1112.55**
Mercury	4.87	14.42	2.28	1.79	6.31	3.00	**252.93**
Naphthalene	5904.50	15983.38	2913.33	2009.13	8636.07	4061.00	**294498.30**
Nickel	20.08	57.23	8.68	5.03	25.25	12.33	**910.69**
Phenanthrene	1.38	4.20	0.60	0.26	1.82	0.94	**69.77**
Phenol					0.16		**1648.84**
Pyrene	2.47	7.53	1.08	0.47	3.27	1.68	**116.24**
Styrene	29098.41	81591.98	15831.91	10203.10	47537.49	23045.71	**1580653.71**
Toluene	539347.27	1571263.31	285589.54	171186.98	890074.80	428659.50	**29285388.23**
Xylene,M	95486.65	271073.45	56290.67	38154.01	178893.79	83405.59	**5679215.81**
Xylene,O	51678.18	146337.20	30259.83	20444.08	95579.97	44727.62	**3047731.22**
Xylene,Iso	409242.19	1205364.55	207006.64	116490.10	640179.30	312853.04	**21400601.57**

Appendix J: 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
081	Timber Tracts
0811	Timber Tracts
0821	Forest Nurseries & Seed Gather
083	Forest Nurseries & Gathering of Forest Products
0831	Forest Products
0843	Extraction of Pine Gum
0849	Gathering of Forest Products
085	Forestry Services
0851	Forestry Services
09	Fishing, Hunting and Trapping
091	Commercial Fishing
0912	Finfish
0913	Shellfish
0919	Miscellaneous Marine Products
092	Fish Hatcheries and Preserves
0921	Fish Hatcheries and Preserves
097	Hunting, Trapping, & Game Propagation
0971	Hunting, Trapping, & Game Propagation
10	Metal Mining
101	Iron Ores
1011	Iron Ores
102	Copper Ores
1021	Copper Ores
103	Lead and Zinc Ores
1031	Lead and Zinc Ores
104	Gold and Silver Ores
1041	Gold Ores
1044	Silver Ores

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
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 Slaughtering & Processing
2016	Poultry Dressing Plants
2017	Poultry and Egg Processing
202	Dairy Products

SIC	DESCRIPTION
2021	Creamery Butter
2022	Cheese Natural and Processed
2023	Condensed and Evaporated Milk
2024	Ice Cream and Frozen Desserts
2026	Fluid Milk
203	Preserved Fruits and Vegetables
2032	Canned Specialties
2033	Canned Fruits and Vegetables
2034	Dehydrated Fruits/Vegetable Soups
2035	Pickles Sauces and Salad Dress
2037	Frozen Fruits and Vegetables
2038	Frozen Specialties
204	Grain Mill Products
2041	Flour & Other Grain Mill Prod
2042	Grain Mill Products
2043	Cereal Breakfast Foods
2044	Rice Milling
2045	Blended and Prepared Flour
2046	Wet Corn Milling
2047	Dog Cat and Other Pet Food
2048	Prepared Feeds, n.e.c.
205	Bakery Products
2051	Bread Cake and Related Product
2052	Cookies and Crackers
2053	Frozen Bakery Products, Except Bread
206	Sugar and Confectionery Products
2061	Raw Cane Sugar
2062	Cane Sugar Refining
2063	Beet Sugar
2064	Candy and Other Confectionery Products
2065	Confectionery Products
2066	Chocolate and Cocoa Products
2067	Chewing Gum
2068	Salted and Roasted Nuts and Seeds
207	Fats and Oils
2074	Cottonseed Oil Mills
2075	Soybean Oil Mills
2076	Vegetable Oil Mills, n.e.c.
2077	Animal and Marine Fats and Oil
2079	Shortening and Cooking Oils
208	Beverages
2082	Malt Beverages
2083	Malt
2084	Wines Brandy & Brandy Spirits
2085	Distilled Liquor Except Brandy
2086	Bottled and Canned Soft Drinks
2087	Flavoring Extracts and Syrups, n.e.c.
209	Misc. Food Preparations & Kindred Products
2091	Canned and Cured Seafoods
2092	Fresh or Frozen Packaged Fish
2095	Roasted Coffee
2096	Potato Chips and Similar Snacks
2097	Manufactured Ice
2098	Macaroni and Spaghetti
2099	Food Preparations, n.e.c.
21	Tobacco Products
211	Cigarettes
2111	Cigarettes
212	Cigars
2121	Cigars
213	Chewing and Smoking Tobacco and Snuff
2131	Chewing and Smoking Tobacco
214	Tobacco Stemming and Redrying
2141	Tobacco Stemming and Redrying
22	Textile Mill Products
221	Broadwoven Fabric Mills, Cotton
2211	Weaving Mills, Cotton
222	Broadwoven Fabric Mills, Manmade Fiber & Silk
2221	Weaving Mills, Synthetics
223	Broadwoven Fabric Mills, Wool (Including Dyeing & Finishing)
2231	Weaving & Finishing Mills Wool
224	Narrow Fabric & Smallwares Mills: Cotton, Wool, Silk, & Manmade Fiber
2241	Narrow Fabric Mills
225	Knitting Mills
2251	Women's Hosiery, Except Socks
2252	Hosiery, n.e.c.
2253	Knit Outerwear Mills
2254	Knit Underwear Mills
2257	Circular Knit Fabric Mills
2258	Warp Knit Fabric Mills
2259	Knitting Mills, n.e.c.
226	Dyeing & Finishing Textiles, Except Wool Fabrics & Knit Goods
2261	Finishing Plants, Cotton
2262	Finishing Plants, Synthetics
2269	Finishing Plants, n.e.c.
227	Carpets and Rugs
2271	Woven Carpets and Rugs
2272	Tufted Carpets and Rugs
2273	Carpets and Rugs
2279	Carpets and Rugs, n.e.c.
228	Yarn and Thread Mills
2281	Yarn Mills, Except Wool
2282	Throwing and Winding Mills
2283	Wool Yarn Mills
2284	Thread Mills
229	Miscellaneous Textile Goods
291	Felt Goods Except Woven Felt/Hats
2292	Lace Goods
2293	Padding & Upholstery Filling
2294	Processed Textile Waste
2295	Coated Fabrics, Not Rubberized
2296	Tire Cord and Fabric
2297	Nonwoven Fabrics
2298	Cordage and Twine
2299	Textile Goods, n.e.c.
23	Apparel & Other Finished Products Made from Fabric
231	Men's and Boys' Suits, Coats, & Overcoats
2311	Men's and Boys' Suits and Coat
232	Men's & Boys' Furnishings, Work Clothing, & Allied Garments
2321	Men & Boys Shirts/nightwear
2322	Men's and Boy's Underwear

SIC	DESCRIPTION
2323	Men's and Boys' Neckwear
2325	Men's and Boy's Trousers and Slacks
2326	Men's and Boy's Work Clothing
2327	Men & Boys Separate Trousers
2328	Men's and Boys' Work Clothing
2329	Men's and Boys' Clothing, n.e.c.
233	Outerwear: Women, Misses, & Juniors
2331	Women's & Misses' Blouses & Shirts
2335	Women's and Misses' Dresses
2337	Women's & Misses Suits & Coats
2339	Women's & Misses Outerwear n.e.c.
234	Undergarments: Women, Misses, Childrens, & Infants
2341	Women's & Children's Underwear
2342	Brassieres and Allied Garments
235	Hats, Caps, and Millinery
2351	Millinery
2352	Hats & Caps Except Millinery
2353	Hats, Caps, and Millinery
236	Outerwear: Girls, Children, & Infants
2361	Children's Dresses and Blouses
2363	Children's Coats and Suits
2369	Children's Outerwear, n.e.c.
237	Fur Goods
2371	Fur Goods
238	Miscellaneous Apparel & Accessories
2381	Fabric Dress and Work Gloves
2384	Robes and Dressing Gowns
2385	Waterproof Outergarments
2386	Leather & Sheep Lined Clothing
2387	Apparel Belts
2389	Apparel and Accessories, n.e.c.
239	Misc. Fabricated Textile Products
2391	Curtains and Draperies
2392	House Furnishings, n.e.c.
2393	Textile Bags
2394	Canvas and Related Products
2395	Pleating and Stitching
2396	Automotive & Apparel Trimmings
2397	Schiffli Machine Embroideries
2399	Fabricated Textile Products
24	Lumber & Wood Products, Except Furniture
241	Logging
2411	Logging
242	Sawmills and Planing Mills
2421	Sawmills & Planing Mills General
2426	Hardwood Dimension & Flooring
2429	Special Product Sawmills, n.e.c.
243	Millwork, Veneer, Plywood & Structural Members
2431	Millwork
2434	Wood Kitchen Cabinets
2435	Hardwood Veneer and Plywood
2436	Softwood Veneer and Plywood
2439	Structural Wood Members, n.e.c.
244	Wood Containers
2441	Nailed Wood Boxes and Shook
2448	Wood Pallets and Skids
2449	Wood Containers, n.e.c.
245	Wood Buildings and Mobile Homes
2451	Mobile Homes
2452	Prefabricated Wood Buildings
249	Miscellaneous Wood Products
2491	Wood Preserving
2492	Particleboard
2493	Reconstituted Wood Products
2499	Wood Products, n.e.c.
25	Furniture and Fixtures
251	Household Furniture
2511	Wood Household Furniture
2512	Upholstered Household Furniture
2514	Metal Household Furniture
2515	Mattresses and Bedsprings
2517	Wood TV and Radio Cabinets
2519	Household Furniture, n.e.c.
252	Office Furniture
2521	Wood Office Furniture
2522	Metal Office Furniture
253	Public Building & Related Furniture
2531	Public Building & Related Furniture
254	Partitions, Shelving, Lockers, & Office & Store Fixtures
2541	Wood Partitions and Fixtures
2542	Metal Partitions and Fixtures
259	Miscellaneous Furniture and Fixtures
2591	Drapery Hardware/Blinds/Shades
2599	Furniture and Fixtures, n.e.c.
26	Paper and Allied Products
261	Pulp Mills
2611	Pulp Mills
262	Paper Mills
2621	Paper Mills Except Building Paper
263	Paperboard Mills
2631	Paperboard Mills
2641	Paper Coating and Glazing
2642	Envelopes
2643	Bags, Except Textile Bags
2645	Die-cut Paper and Board
2646	Pressed and Molded Pulp Goods
2647	Sanitary Paper Products
2648	Stationery Products
2649	Converted Paper Products, n.e.c.
265	Paperboard Containers and Boxes
2651	Folding Paperboard Boxes
2652	Set-up Paperboard Boxes
2653	Corrugated and Solid Fiber Box
2654	Sanitary Food Containers
2655	Fiber Cans Drums like Products
2656	Sanitary Food Containers
2657	Folding Paperboard Boxes
2661	Building Paper and Board Mills
267	Converted Paper & Paperboard Products, Except Containers & Boxes
2671	Paper Coated and Laminated Packaging
2672	Paper Coated and Laminated, n.e.c.
2673	Bags: Plastics, Laminated, and Coated
2674	Bags: Uncoated Paper and Multiwall

SIC	DESCRIPTION
2675	Die-cut Paper and Board
2676	Sanitary Paper Products
2677	Envelopes
2678	Stationery Products
2679	Converted Paper Products, n.e.c.
27	Printing, Publishing and Allied Industries
271	Newspapers: Publishing, or Publishing & Printing
2711	Newspapers
272	Periodicals: Publishing, or Publishing & Printing
2721	Periodicals
273	Books
2731	Book Publishing
2732	Book Printing
274	Miscellaneous Publishing
2741	Miscellaneous Publishing
275	Commercial Printing
2751	Commercial Printing Letterpress
2752	Commercial Printing Lithograph
2753	Engraving and Plate Printing
2754	Commercial Printing, Gravure
2759	Commercial Printing, n.e.c.
276	Manifold Business Forms
2761	Manifold Business Forms
277	Greeting Cards
2771	Greeting Card Publishing
278	Blankbooks, Looseleaf Binders, & Bookbinding & Related Work
2782	Blankbooks & Looseleaf Binders
2789	Bookbinding and Related Work
279	Service Industries for the Printing Trade
2791	Typesetting
2793	Photoengraving
2794	Electrotyping and Stereotyping
2795	Lithographic Platemaking Services
2796	Platemaking Services
28	Chemicals and Allied Products
281	Industrial Inorganic Chemicals
2812	Alkalies and Chlorine
2813	Industrial Gases
2816	Inorganic Pigments
2819	Industrial Inorganic Chemicals
282	Plastics Materials and Synthetics
2821	Plastics Materials and Resins
2822	Synthetic Rubber
2823	Cellulosic Man-Made Fibers
2824	Organic Fibers, Noncellulosic
283	Drugs
2831	Biological Products
2833	Medicinals and Botanicals
2834	Pharmaceutical Preparations
2835	Diagnostic Substances
2836	Biological Products, Except Diagnostic
284	Soap, Cleaners, and Toilet Goods
2841	Soap and Other Detergents
2842	Polishes and Sanitation Goods
2843	Surface Active Agents
2844	Toilet Preparations
285	Paints, Varnishes, Lacquers, Enamels, & Allied Products
2851	Paints and Allied Products
286	Industrial Organic Chemicals
2861	Gum and Wood Chemicals
2865	Cyclic Crudes and Intermediate
2869	Industrial Organic Chemicals, n.e.c.
287	Agricultural Chemicals
2873	Nitrogenous Fertilizers
2874	Phosphatic Fertilizers
2875	Fertilizers, Mixing Only
2879	Agricultural Chemicals, n.e.c.
289	Miscellaneous Chemical Products
2891	Adhesives and Sealants
2892	Explosives
2893	Printing Ink
2895	Carbon Black
2899	Chemical Preparations, n.e.c.
29	Petroleum Refining and Related Industries
291	Petroleum Refining
2911	Petroleum Refining
295	Asphalt Paving and Roofing Materials
2951	Paving Mixtures and Blocks
2952	Asphalt Felts and Coatings
299	Misc. Petroleum and Coal Products
2992	Lubricating Oils and Greases
2999	Petroleum and Coal Products, n.e.c.
30	Rubber and Miscellaneous Plastics Products
301	Tires and Inner Tubes
3011	Tires and Inner Tubes
302	Rubber and Plastics Footwear
3021	Rubber and Plastics Footwear
3031	Reclaimed Rubber
3041	Rubber & Plastics Hose and Belting
305	Gaskets, Packing, Sealing Devices, & Rubber & Plastics Hose & Belting
3052	Rubber and Plastics Hose and Belting
3053	Gaskets, Packing and Sealing Devices
306	Fabricated Rubber Products, n.e.c.
3061	Mechanical Rubber Goods
3069	Fabricated Rubber Products, n.e.c.
3079	Miscellaneous Plastics Products
308	Miscellaneous Plastics Products, n.e.c.
3081	Unsupported Plastics Film and Sheet
3082	Unsupported Plastics Profile Shapes
3083	Laminated Plastics Plate and Sheet
3084	Plastics Pipe
3085	Plastics Bottles
3086	Plastics Foam Products
3087	Custom Compound Purchased Resins
3088	Plastics Plumbing Fixtures
3089	Plastics Products, n.e.c.
31	Leather and Leather Products
311	Leather Tanning and Finishing
3111	Leather Tanning and Finishing
313	Boot & Shoe Cut Stock & Findings
3131	Boot and Shoe Cut Stock and Findings
314	Footwear, Except Rubber

SIC	DESCRIPTION
3142	House Slippers
3143	Men's Footwear, Except Athletic
3144	Women's Footwear, Except Athletic
3149	Footwear, Except Rubber, n.e.c.
315	Leather Gloves and Mittens
3151	Leather Gloves and Mittens
316	Luggage
3161	Luggage
317	Handbags and Personal Leather Goods
3171	Women's Handbags and Purses
3172	Personal Leather Goods, n.e.c.
319	Leather Goods, n.e.c.
3199	Leather Goods, n.e.c.
32	Stone, Clay, Glass and Concrete Products
321	Flat Glass
3211	Flat Glass
322	Glass and Glassware, Pressed or Blown
3221	Glass Containers
3229	Pressed and Blown Glass, n.e.c.
323	Glass Products, Made of Purchased Glass
3231	Products of Purchased Glass
324	Cement, Hydraulic
3241	Cement, Hydraulic
325	Structural Clay Products
3251	Brick and Structural Clay Tile
3253	Ceramic Wall and Floor Tile
3255	Clay Refractories
3259	Structural Clay Products, n.e.c.
326	Pottery and Related Products
3261	Vitreous Plumbing Fixtures
3262	Vitreous China Food Utensils
3263	Fine Earthenware Food Utensils
3264	Porcelain Electrical Supplies
3269	Pottery Products, n.e.c.
327	Concrete, Gypsum, and Plaster Products
3271	Concrete Block and Brick
3272	Concrete Products, n.e.c.
3273	Ready-mixed Concrete
3274	Lime
3275	Gypsum Products
328	Cut Stone and Stone Products
3281	Cut Stone and Stone Products
329	Abrasive, Asbestos, & Misc. Nonmetallic Mineral Products
3291	Abrasive Products
3292	Asbestos Products
3293	Gaskets/packing/sealing Device
3295	Minerals, Ground or Treated
3296	Mineral Wool
3297	Nonclay Refractories
3299	Nonmetallic Mineral Products
33	Primary Metal Industries
331	Steel Works, Blast Furnaces, & Rolling & Finishing Mills
3312	Blast Furnaces and Steel Mills
3313	Electrometalurgical Products
3315	Steel Wire and Related Products
3316	Cold Finishing of Steel Shapes
3317	Steel Pipe and Tubes
332	Iron and Steel Foundries
3321	Gray Iron Foundries
3322	Malleable Iron Foundries
3324	Steel Investment Foundries
3325	Steel Foundries, n.e.c.
333	Primary Smelting & Refining of Nonferrous Metals
3331	Primary Copper
3332	Primary Lead
3333	Primary Zinc
3334	Primary Aluminum
3339	Primary Nonferrous Metals, n.e.c.
334	Secondary Smelting & Refining of Nonferrous Metals
3341	Secondary Nonferrous Metals
335	Rolling, Drawing, & Extruding of Nonferrous Metals
3351	Copper Rolling and Drawing
3353	Aluminum Sheet Plate & Foil
3354	Aluminum Extruded Products
3355	Aluminum Rolling & Drawing n.e.c.
3356	Nonferrous Rolling and Drawing
3357	Nonferrous Wire Drawing/Insulating
336	Nonferrous Foundries (Castings)
3361	Aluminum Foundries
3362	Brass Bronze & Copper Foundry
3363	Aluminum Die-castings
3364	Nonferrous Die-castings, Except Aluminum
3365	Aluminum Foundries
3366	Copper Foundries
3369	Nonferrous Foundries, n.e.c.
339	Miscellaneous Primary Metal Products
3398	Metal Heat Treating
3399	Primary Metal Products, n.e.c.
34	Fabricated Metal Products, Except Machinery & Transportation Equipment
341	Metal Cans and Shipping Containers
3411	Metal Cans
3412	Metal Barrels, Drums & Pails
342	Cutlery, Handtools, and General Hardware
3421	Cutlery
3423	Hand and Edge Tools, n.e.c.
3425	Hand Saws and Saw Blades
3429	Hardware, n.e.c.
343	Heating Equipment, Except Electric & Warm Air; & Plumbing Fixtures
3431	Metal Sanitary Ware
3432	Plumbing Fittings & Brass Good
3433	Heating Equipment, Except Elec.
344	Fabricated Structural Metal Products
3441	Fabricated Structural Metal
3442	Metal Doors, Sash, and Trim
3443	Fabricated Plate Work (Boiler Shops)
3444	Sheet Metal Work
3446	Architectural Metal Work
3448	Prefabricated Metal Buildings
3449	Miscellaneous Metal Work

SIC	DESCRIPTION
345	Screw Machine Products, Bolts, Nuts, Screws, Rivets, and Washers
3451	Screw Machine Products
3452	Bolts Nuts Rivets & Washers
346	Metal Forgings and Stampings
3462	Iron and Steel Forgings
3463	Nonferrous Forgings
3465	Automotive Stampings
3466	Crowns and Closures
3469	Metal Stampings, n.e.c.
347	Coating, Engraving, and Allied Services
3471	Electroplating, Polishing, Anodizing, and Coloring
3479	Metal Coating and Allied Services, n.e.c.
348	Ordnance and Accessories, Except Vehicles and Guided Missiles
3482	Small Arms Ammunition
3483	Ammunition, Exc. For Small Arm
3484	Small Arms
3489	Ordnance and Accessories, n.e.c.
349	Misc. Fabricated Metal Products
3491	Industrial Valves
3492	Fluid Power Valves and Hose Fittings
3493	Steel Springs, Except Wire
3494	Valves and Pipe Fittings
3495	Wire Springs
3496	Misc. Fabricated Wire Products
3497	Metal Foil and Leaf
3498	Fabricated Pipe and Fittings
3499	Fabricated Metal Products, n.e.c.
35	Industrial and Commercial Machinery & Computer Equipment
351	Engines and Turbines
3511	Turbines and Turbine Generator
3519	Internal Combustion Engines
352	Farm and Garden Machinery and Equipment
3523	Farm Machinery and Equipment
3524	Lawn and Garden Equipment
353	Construction, Mining, and Materials Handling Machinery & Equipment
3531	Construction Machinery
3532	Mining Machinery
3533	Oil Field Machinery
3534	Elevators and Moving Stairways
3535	Conveyors and Conveying Equipment
3536	Hoists, Cranes, and Monorails
3537	Industrial Trucks and Tractors
354	Metalworking Machinery and Equipment
3541	Machine Tools Metal Cutting Types
3542	Machine Tools Metal Forming Types
3543	Industrial Patterns
3544	Special Dies/Tools/Jigs/Fixtures
3545	Machine Tool Accessories
3546	Power Driven Hand Tools
3547	Rolling Mill Machinery
3548	Welding Apparatus
3549	Metalworking Machinery, n.e.c.
355	Special Industry Machinery, Except Metalworking Machinery
3551	Food Products Machinery
3552	Textile Machinery
3553	Woodworking Machinery
3554	Paper Industries Machinery
3555	Printing Trades Machinery
3556	Food Products Machinery
3559	Special Industry Machinery, n.e.c.
356	General Industrial Machinery and Equipment
3561	Pumps and Pumping Equipment
3562	Ball and Roller Bearings
3563	Air and Gas Compressors
3564	Blowers and Fans
3565	Packaging Machinery
3566	Speed Changers Drives & Gears
3567	Industrial Furnaces and Ovens
3568	Power Transmission Equipment
3569	General Industrial Machinery, n.e.c.
357	Computer and Office Equipment
3571	Electronic Computers
3572	Computer Storage Devices
3573	Electronic Computing Equipment
3574	Calculating & Accounting Mach
3575	Computer Terminals
3576	Scales & Balances Except Lab
3577	Computer Peripheral Equipment, n.e.c.
3578	Calculating and Accounting Equipment
3579	Office Machines, n.e.c.
358	Refrigeration & Service Industry Machinery
3581	Automatic Vending Machines
3582	Commercial Laundry Equipment
3585	Refrigeration & Heating Equipment
3586	Measuring and Dispensing Pumps
3589	Service Industry Machinery, n.e.c.
359	Misc. Industrial & Commercial Machinery and Equipment
3592	Carburetors, Pistons, Rings, & Valves
3593	Fluid Power Cylinders and Actuators
3594	Fluid Power Pumps and Motors
3596	Scales and Balances, Except Laboratory
3599	Machinery Except Electrical, n.e.c.
36	Electronic & Other Electrical Equipment & Components
361	Electric Transmission and Distribution Equipment
3612	Transformers
3613	Switchgear & Switchboard Apparatus
362	Electrical Industrial Apparatus
3621	Motors and Generators
3622	Industrial Controls
3623	Welding Apparatus, Electric
3624	Carbon and Graphite Products
3625	Relays and Industrial Controls
3629	Electrical Industrial Apparatus, n.e.c.
363	Household Appliances
3631	Household Cooking Equipment
3632	Household Refrigerators/Freezers
3633	Household Laundry Equipment
3634	Electric Housewares and Fans
3635	Household Vacuum Cleaners

SIC	DESCRIPTION
3636	Sewing Machines
3639	Household Appliances, n.e.c.
364	Electric Lighting and Wiring Equipment
3641	Electric Lamps
3643	Current-carrying Wiring Device
3644	Noncurrent-carrying Wiring Devices
3645	Residential Lighting Fixtures
3646	Commercial Lighting Fixtures
3647	Vehicular Lighting Equipment
3648	Lighting Equipment, N.e.c.
365	Household Audio and Video Equipment, and Audio Recordings
3651	Radio and TV Receiving Sets
3652	Phonograph Records
366	Communications Equipment
3661	Telephone/Telegraph Apparatus
3662	Radio & TV Communication Equipment
3663	Radio and TV Communications Equipment
3669	Communications Equipment, n.e.c.
367	Electronic Components and Accessories
3671	Electron Tubes, Receiving Type
3672	Printed Circuit Boards
3673	Electron Tubes, Transmitting
3674	Semiconductors & Related Devices
3675	Electronic Capacitors
3676	Electronic Resistors
3677	Electronic Coils & Transformer
3678	Electronic Connectors
3679	Electronic Components, n.e.c.
369	Misc. Electrical Machinery, Equipment, and Supplies
3691	Storage Batteries
3692	Primary Batteries, Dry and Wet
3693	X-ray Apparatus and Tubes
3694	Engine Electrical Equipment
3695	Magnetic and Optical Recording Media
3699	Electrical Equipment & Supply
37	Transportation Equipment
371	Motor Vehicles & Motor Vehicle Equipment
3711	Motor Vehicles and Car Bodies
3713	Truck and Bus Bodies
3714	Motor Vehicle Parts & Accessories
3715	Truck Trailers
3716	Motor Homes
372	Aircraft and Parts
3721	Aircraft
3724	Aircraft Engines & Engine Part
3728	Aircraft Equipment, n.e.c.
373	Ship and Boat Building and Repairing
3731	Ship Building and Repairing
3732	Boat Building and Repairing
374	Railroad Equipment
3743	Railroad Equipment
375	Motorcycles, Bicycles, and Parts
3751	Motorcycles Bicycles & Parts
376	Guided Missiles and Space Vehicles and Parts
3761	Guided Missiles and Space Vehicles
3764	Missile/space Propulsion Units & Parts
3769	Space Vehicle Equipment, n.e.c.
379	Miscellaneous Transportation Equipment
3792	Travel Trailers and Campers
3795	Tanks and Tank Components
3799	Transportation Equipment, n.e.c.
38	Measuring, Analyzing & Controlling Instruments
381	Search and Navigation Equipment
3811	Engineering & Scientific Instruments
3812	Search and Navigation Equipment
382	Lab Apparatus, Analytical, Optical, Measure, & Control Instruments
3821	Laboratory Apparatus and Furniture
3822	Environmental Controls
3823	Process Control Instruments
3824	Fluid Meters & Counting Device
3825	Instruments to Measure Elec.
3826	Analytical Instruments
3827	Optical Instruments and Lenses
3829	Measuring & Controlling Device
3832	Optical Instruments and Lenses
384	Surgical, Medical, Dental Instruments, & Supplies
3841	Surgical & Medical Instruments
3842	Surgical Appliances & Supplies
3843	Dental Equipment and Supplies
3844	X-ray Apparatus and Tubes
3845	Electromedical Equipment
385	Ophthalmic Goods
3851	Ophthalmic Goods
386	Photographic Equipment and Supplies
3861	Photograph Equipment & Supplies
387	Watches, Clocks, Clockwork Operated Devices, & Parts
3873	Watches Clocks & Watchcases
39	Miscellaneous Manufacturing Industries
391	Jewelry, Silverware, and Plated Ware
3911	Jewelry, Precious Metal
3914	Silverware and Plated Ware
3915	Jewelers' Materials & Lapidary
393	Musical Instruments
3931	Musical Instruments
394	Dolls, Toys, Games, and Sporting and Athletic Goods
3942	Dolls
3944	Games/Toys/Children's Vehicles
3949	Sporting & Athletic Goods, n.e.c.
395	Pens, Pencils, and Other Artists' Materials
3951	Pens and Mechanical Pencils
3952	Lead Pencils and Art Goods
3953	Marking Devices
3955	Carbon Paper and Inked Ribbons
396	Costume Jewelry and Notions, Except Precious Metal
3961	Costume Jewelry
3962	Artificial Flowers
3963	Buttons
3964	Needles, Pins, and Fasteners
3965	Fasteners, Buttons, Needles and Pins
399	Miscellaneous Manufacturing Industries

SIC	DESCRIPTION
3991	Brooms and Brushes
3993	Signs and Advertising Displays
3995	Burial Caskets
3996	Hard Surface Floor Coverings
3999	Manufacturing Industries, n.e.c.
40	Railroad Transportation
401	Railroads
4011	Railroads, Line-haul Operating
4013	Switching & Terminal Services
4041	Railway Express Service
41	Local & Suburban Transit & Interurban Hwy Pass
411	Local and Suburban Passenger Transportation
4111	Local and Suburban Transit
4119	Local Passenger Transportation
412	Taxicabs
4121	Taxicabs
413	Intercity and Rural Bus Transportation
4131	Intercity Hwy Transportation
414	Bus Charter Service
4141	Local Passenger Charter Service
4142	Charter Service, Except Local
415	School Buses
4151	School Buses
417	Terminal & Service Facilities: Motor Vehicle Passenger Transportation
4171	Bus Terminal Facilities
4172	Bus Service Facilities
4173	Bus Terminal and Service Facilities
42	Motor Freight Transportation and Warehousing
421	Trucking and Courier Services, Except Air
4212	Local/Trucking w/o Storage
4213	Trucking, Except Local
4214	Local Trucking and Storage
4215	Courier Services, Except by Air
422	Public Warehousing and Storage
4221	Farm Product Warehousing/Store
4222	Refrigerated Warehousing
4224	Household Goods Warehousing
4225	General Warehousing & Storage
4226	Special Warehousing & Storage
423	Terminal & Joint Terminal Maintenance Facilities: Motor Freight Trans
4231	Trucking Terminal Facilities
43	United States Postal Service
431	Unite States Postal Service
4311	United States Postal Service
44	Water Transportation
441	Deep Sea Foreign Transportation of Freight
4411	Deep Sea Foreign Transportation
4412	Deep Sea Foreign Transportation of Freight
442	Deep Sea Domestic Transportation of Freight
4421	Noncontiguous Area Transportation
4422	Coastwise Transportation
4423	Intracoastal Transportation
4424	Deep Sea Domestic Transportation of Freight
443	Freight Transportation on the Great Lakes -St Lawrence Seaway
4431	Great Lakes Transportation
4432	Freight Transportation on the Great Lakes
444	Water Transportation of Freight, n.e.c.
4441	Transport on Rivers & Canals
4449	Water Transportation of Freight, n.e.c.
4452	Ferries
4453	Lighterage
4454	Towing and Tugboat Service
4459	Local Water Transportation, n.e.c.
4463	Marine Cargo Handling
4464	Canal Operation
4469	Water Transportation Services
448	Water Transportation of Passengers
4481	Deep Sea Passenger Transportation, Except by Ferry
4482	Ferries
4489	Water Passenger Transportation, n.e.c.
449	Water Transportation Services
4491	Marine Cargo Handling
4492	Towing and Tug Boat Service
4493	Marinas
4499	Water Transportation Services, n.e.c.
45	Transportation by Air
451	Air Transportation, Scheduled, & Air Courier Services
4511	Certificated Air Transportation
4512	Air Transportation, Scheduled
4513	Air Courier Services
452	Air Transportation, Nonscheduled
4521	Noncertified Air Transportation
4522	Air Transportation, Non-scheduled
458	Airports, Flying Fields, and Airport Terminal Services
4581	Airports, Flying Fields, and Services
4582	Airports and Flying Fields
4583	Airport Terminal Services
46	Pipelines, Except Natural Gas
461	Pipelines, Except Natural Gas
4612	Crude Petroleum Pipe Lines
4613	Refined Petroleum Pipe Lines
4619	Pipe Lines, n.e.c.
47	Transportation Services
4712	Freight Forwarding
472	Passenger Transportation Arrangement
4722	Passenger Transport Arrangement
4723	Freight Transport Arrangement
4724	Travel Agencies
4725	Tour Operators
4729	Passenger Transport Management, n.e.c.
473	Freight and Cargo Transportation Arrangement
4731	Freight Transportation Management
474	Rental of Railroad Cars
4741	Rental of Railroad Cars
4742	Railroad Car Rental with Services
4743	Railroad Rental Car w/o Services
478	Miscellaneous Transportation Services
4782	Inspection & Weighing Services
4783	Packing and Crating
4784	Fixed Facilities for Vehicles
4785	Inspection and Fixed Facilities

SIC	DESCRIPTION
4789	Transportation Services, n.e.c.
48	Communications
481	Telephone Communications
4811	Telephone Communication
4812	Radio Telephone Communications
4813	Telephone Communications, Except Radio
482	Telegraph and Other Message Communications
4821	Telegraph Communication
4822	Telegraph and Other Communications
483	Radio & Television Broadcasting Stations
4832	Radio Broadcasting
4833	Television Broadcasting
484	Cable and Other Pay Television Services
4841	Cable and Other Pay TV Services
489	Communications Services, n.e.c.
4899	Communication Services, n.e.c.
49	Electric, Gas and Sanitary Services
491	Electric Services
4911	Electric Services
492	Gas Production and Distribution
4922	Natural Gas Transmission
4923	Gas Transmission and Distribution
4924	Natural Gas Distribution
4925	Gas Production/distribution
493	Combination Electric, Gas, and Other Utility Services
4931	Elec. & Other Services Combined
4932	Gas & Other Services Combined
4939	Combination Utility Services
494	Water Supply
4941	Water Supply
4950	Sanitary Services
4952	Sewerage Systems
4953	Refuse Systems
4959	Sanitary Services, n.e.c.
496	Steam and Air-conditioning Supply
4961	Steam Supply
497	Irrigation Systems
4971	Irrigation Systems
50	Wholesale Trade-durable Goods
501	Motor Vehicles, Parts, and Supplies
5012	Autos & Other Motor Vehicles
5013	Automotive Parts and Supplies
5014	Tires and Tubes
5015	Motor Vehicle Parts, Used
502	Furniture and Homefurnishings
5021	Furniture
5023	Home Furnishings
503	Lumber and Construction Materials
5031	Lumber, Plywood and Millwork
5032	Brick, Stove, and Related Materials
5033	Roofing, Siding and Insulation
5039	Construction Materials, n.e.c.
504	Professional and Commercial Equipment and Supplies
5041	Sporting & Recreational Goods
5042	Toys & Hobby Goods and Supplies
5043	Photograph Equipment & Supply
5044	Office Equipment
5045	Computers, Peripherals, and Software
5046	Commercial Equipment, n.e.c.
5047	Medical and Hospital Equipment
5048	Ophthalmic Goods
5049	Professional Equipment, n.e.c.
505	Metals and Minerals, Except Petroleum
5051	Metals Services Centers & Offices
5052	Coal & Other Minerals & Ores
506	Electrical Goods
5063	Elec. Apparatus & Equipment
5064	Elec. Appliances TV & Radios
5065	Electronic Parts and Equipment
507	Hardware, Plumbing, Heating Equipment, and Supplies
5072	Hardware
5074	Plumbing/Hydronics Heat Supply
5075	Warm Air Heat & Air Condition
5078	Refrigeration Equip & Supplies
508	Machinery, Equipment, and Supplies
5081	Commercial Machines & Equipment
5086	Professional Equipment & Supplies
5087	Service Establishment Equipment
5088	Transportation Equipment & Supplies
509	Miscellaneous Durable Goods
5091	Sporting and Recreational Goods
5092	Toys and Hobby Goods and Supplies
5093	Scrap and Waste Materials
5094	Jewelry, Watches, & Precious Stones
5099	Durable Goods, n.e.c.
51	Wholesale Trade-Nondurable Goods
511	Paper and Paper Products
5111	Printing and Writing Paper
5112	Stationery Supplies
5113	Industrial & Personal Service
512	Drugs, Drug Proprietaries, & Druggists' Sundries
5122	Drugs, Proprietaries, and Sundries
513	Apparel, Piece Goods, and Notions
5131	Piece Goods and Notions
5133	Piece Goods
5134	Notions and Other Dry Goods
5136	Men's Clothing and Furnishings
5137	Women's and Children's Clothing
5139	Footwear
514	Groceries and Related Products
5141	Groceries, General Line
5142	Frozen Foods
5143	Dairy Products
5144	Poultry and Poultry Products
5145	Confectionery
5146	Fish and Seafoods
5147	Meats and Meat Products
5148	Fresh Fruits and Vegetables
5149	Groceries and Related Products
515	Farm-product Raw Materials
5152	Cotton
5153	Grain
5154	Livestock

SIC	DESCRIPTION
5159	Farm-product Raw Materials, n.e.c.
516	Chemicals and Allied Products
5161	Chemicals and Allied Products
5162	Plastics Materials and Basic Shapes
5169	Chemicals and Allied Products, n.e.c.
517	Petroleum and Petroleum Products
5171	Petroleum Bulk Stations & Terminals
5172	Petroleum Products, n.e.c.
518	Beer, Wine, and Distilled Alcoholic Beverages
5181	Beer and Ale
5182	Wines and Distilled Beverages
519	Misc. Nondurable Goods
5191	Farm Supplies
5192	Books, Periodicals and Newspapers
5193	Flowers and Florists Supplies
5194	Tobacco and Tobacco Products
5198	Paints, Varnishes, and Supplies
5199	Nondurable Goods, n.e.c.
52	Building Materials, Hardware, Garden Supply, Mobil
521	Lumber and Other Building Materials Dealers
5211	Lumber and Other Building Materials
523	Paint, Glass, and Wallpaper Stores
5231	Paint, Glass, and Wallpaper Stores
525	Hardware Stores
5251	Hardware Stores
526	Retail Nurseries, Lawn & Garden Supply Stores
5261	Retail Nurseries and Garden Stores
527	Mobile Home Dealers
5271	Mobile Home Dealers
53	General Merchandise Stores
531	Department Stores
5311	Department Stores
533	Variety Stores
5331	Variety Stores
539	Misc. General Merchandise Stores
5399	Misc. General Merchandise Stores
54	Food Stores
541	Grocery Stores
5411	Grocery Stores
542	Meat and Seafood Markets, Including Freezer Provisioners
5421	Meat and Fish Markets
5422	Freezer and Locker Meat Provisions
5423	Meat and Fish (Seafood) Market
543	Fruit and Vegetable Markets
5431	Fruit Stores and Vegetable Markets
544	Candy, Nut, and Confectionery Stores
5441	Candy, Nut, and Confectionery
545	Dairy Products Stores
5451	Dairy Products Stores
546	Retail Bakeries
5461	Retail Bakeries
5462	Retail Bakeries-Baking and Selling
5463	Retail Bakeries-Selling Only
5490	Miscellaneous Food Stores
5499	Miscellaneous Food Stores
55	Automotive Dealers and Gasoline Service Stations
551	Motor Vehicle Dealers (New & Used)
5511	New and Used Car Dealers
552	Motor Vehicle Dealers (Used Only)
5521	Used Car Dealers
553	Auto and Home Supply Stores
5531	Auto and Home Supply Stores
554	Gasoline Service Stations
5541	Gasoline Service Stations
555	Boat Dealers
5551	Boat Dealers
556	Recreational Vehicle Dealers
5561	Recreational Vehicle Dealers
557	Motorcycle Dealers
5571	Motorcycle Dealers
559	Automotive Dealer, n.e.c.
5599	Automotive Dealers, n.e.c.
56	Apparel and Accessory Stores
561	Men's & Boys' Clothing & Accessory Stores
5611	Men's & Boys' Clothing & Accessory Stores
562	Women's Clothing Stores
5621	Women's Ready-to-wear Stores
563	Women's Accessory & Specialty Stores
5631	Women's Accessory and Specialty Stores
5632	Women's Accessory and Specialty Stores
564	Children's & Infants' Wear Stores
5641	Children's and Infants' Wear Stores
565	Family Clothing Stores
5651	Family Clothing Stores
566	Shoe Stores
5661	Shoe Stores
5681	Furriers and Fur Shops
569	Misc. Apparel & Accessory Stores
5699	Miscellaneous Apparel & Access
57	Home Furniture, Furnishings & Equipment Stores
571	Home Furniture & Furnishings Stores
5712	Furniture Stores
5713	Floor Covering Stores
5714	Drapery and Upholstery Stores
5719	Misc. Home Furnishings Stores
572	Household Appliance Stores
5722	Household Appliance Stores
573	Radio, Television, Consumer Electronics, and Music Stores
5731	Radio, Television and Electronic Stores
5732	Radio and Television Stores
5733	Music Stores
5734	Computer and Software Stores
5735	Record and Prerecorded Tape Stores
5736	Musical Instrument Stores
58	Eating and Drinking Places
581	Eating and Drinking Places
5812	Eating Places
5813	Drinking Places
59	Miscellaneous Retail
591	Drug Stores and Proprietary Stores
5912	Drug Stores and Proprietary Stores
592	Liquor Stores
5921	Liquor Stores

SIC	DESCRIPTION
593	Used Merchandise Stores
5931	Used Merchandise Stores
5932	Used Merchandise Stores
594	Misc. Shopping Goods Stores
5941	Sporting Goods and Bicycle Shops
5942	Book Stores
5943	Stationery Stores
5944	Jewelry Stores
5945	Hobby, Toy, and Game Shops
5946	Camera & Photographic Supply Stores
5947	Gift, Novelty, and Souvenir Shops
5948	Luggage and Leather Goods Store
5949	Sewing, Needlework, and Piece Goods Stores
596	Nonstore Retailers
5961	Mail Order Houses
5962	Merchandising Machine Operator
5963	Direct Selling Organizations
598	Fuel Dealers
5982	Fuel and Ice Dealers, n.e.c.
5983	Fuel Oil Dealers
5984	Liquefied Petroleum Gas Dealers
5989	Fuel Dealers, n.e.c.
599	Retail Stores, n.e.c.
5992	Florists
5993	Cigar Stores and Stands
5994	News Dealers and Newsstands
5995	Optical Goods Stores
5999	Miscellaneous Retail Stores, n.e.c.
60	Depository Institutions
601	Central Reserve Depository Institutions
6011	Federal Reserve Banks
6019	Central Reserve Depository, n.e.c.
602	Commercial Banks
6021	National Commercial Banks
6022	State Banks, Federal Reserve
6023	State Banks, Not Fed. Reserve
6024	State Banks, Not Fed Reserve, Not FDIC
6025	National Banks, Federal Reserve
6026	National Banks, Not Fed. Reserve
6027	National Banks, Not FDIC
6028	Private Banks, Not Incorporated, Not FDIC
6029	Commercial Banks, n.e.c.
603	Savings Institutions
6032	Mutual Savings Banks, Federal
6033	Mutual Savings Banks, n.e.c.
6034	Mutual Savings Banks, Not FDIC
6035	Federal Savings Institutions
6036	Savings Institutions, Except Federal
6042	Nondeposit Trusts, Federal Res.
6044	Nondeposit Trusts, Not FDIC
6052	Foreign Exchange Establishment
6054	Safe Deposit Companies
6055	Clearinghouse Associations
6056	Corporations for Banking Abroad
6059	Functions Related to Banking
606	Credit Unions
6061	Federal Credit Unions
6062	State Credit Unions
608	Foreign Banking and Branches & Agencies of Foreign Banks
6081	Foreign Bank and Branches and Agencies
6082	Foreign Trade and International Banks
609	Depository Banking Functions
6091	Nondeposit Trust Facilities
6099	Functions Related to Deposit Banking
61	Nondepository Credit Institutions
611	Federal & Federally-sponsored Credit Agencies
6111	Federal and Federally-sponsored Credit
6112	Rediscounting, Not for Agriculture
6113	Rediscounting, for Agriculture
6122	Federal Saving & Loan Associations
6123	State Associations, Insured
6124	State Associations, Noninsured
6125	State Associations, Noninsured
6131	Agricultural Credit Institutions
614	Personal Credit Institutions
6141	Personal Credit Institutions
6142	Federal Credit Unions
6143	State Credit Unions
6144	Nondeposit Industrial Loan Companies
6145	Licensed Small Loan Lenders
6146	Installment Sales Finance Companies
6149	Misc. Personal Credit Institutions
615	Business Credit Institutions
6153	Short-term Business Credit
6159	Misc. Business Credit Institute
616	Mortgage Bankers and Brokers
6162	Mortgage Bankers and Correspondents
6163	Loan Brokers
62	Security & Commodity Brokers, Dealers, Exchanges
621	Security Brokers, Dealers, & Flotation Companies
6211	Security Brokers and Dealers
622	Commodity Contracts Brokers & Dealers
6221	Commodity Contracts Brokers, Dealers
623	Security and Commodity Exchanges
6231	Security and Commodity Exchanges
628	Exchange of Security and Commodity Services
6281	Security and Commodity Service
6282	Investment Advice
6289	Security and Commodity Services, n.e.c.
63	Insurance Carriers
631	Life Insurance
6311	Life Insurance
632	Accident & Health Insurance & Medical Service Plans
6321	Accident and Health Insurance
6324	Hospital and Medical Service Plans
633	Fire, Marine, and Casualty Insurance
6331	Fire, Marine, and Casualty Ins
635	Surety Insurance
6351	Surety Insurance
636	Title Insurance
6361	Title Insurance
637	Pension, Health, and Welfare Funds
6371	Pension, Health, and Welfare Funds

SIC	DESCRIPTION
639	Insurance Carriers, n.e.c.
6399	Insurance Carriers, n.e.c.
64	Insurance Agents, Brokers and Service
641	Insurance Agents, Brokers, and Service
6411	Insurance Agents, Brokers & Service
65	Real Estate
651	Real Estate Operators (Except Developers) & Lessors
6512	Nonresidential Building Operators
6513	Apartment Building Operators
6514	Dwelling Operators, Except Apart
6515	Mobile Home Site Operators
6517	Railroad Property Lessors
6519	Real Property Lessors, n.e.c.
653	Real Estate Agents and Managers
6531	Real Estate Agents and Manager
654	Title Abstract Offices
6541	Title Abstract Offices
655	Land Subdividers and Developers
6552	Subdividers & Developers, Except Cemeteries
6553	Cemetery Subdividers and Developers
6611	Combined Real Estate, Insurance
67	Holding and Other Investment Offices
671	Holding Offices
6711	Holding Offices
6712	Bank Holding Companies
6719	Holding Companies, n.e.c.
672	Investment Offices
6722	Management Investment, Open-end
6723	Management Investment, Closed-end
6724	Unit Investment Trusts
6725	Face-amount Certificate Offices
6726	Investment Offices, n.e.c.
673	Trusts
6732	Educational, Religious, and Charitable Trusts
6733	Trusts, n.e.c.
679	Miscellaneous Investing
6792	Oil Royalty Traders
6793	Commodity Traders
6794	Patent Owners and Lessors
6798	Real Estate Investment Trusts
6799	Investors, n.e.c.
70	Hotels, Rooming Houses, Camps, & Other Lodging Place
701	Hotels and Motels
7011	Hotels and Motels
702	Rooming and Boarding Houses
7021	Rooming and Boarding Houses
703	Camps and Recreational Vehicle Parks
7032	Sporting and Recreational Camp
7033	Recreational Vehicle Parks and Campsites
704	Membership-basis: Organization Hotels & Lodging Houses
7041	Membership-basis Organization
72	Personal Services
721	Laundry, Cleaning, and Garment Services
7211	Power Laundries, Family & Commercial
7212	Garment Pressing & Cleaners' Agents
7213	Linen Supply
7214	Diaper Service
7215	Coin-operated Laundries and Drycleaning
7216	Dry Cleaning Plants, Except Rugs
7217	Carpet and Upholstery Cleaning
7218	Industrial Launderers
7219	Laundry and Garment Services
722	Photographic Studios, Portrait
7221	Photographic Studios, Portrait
723	Beauty Shops
7231	Beauty Shops
724	Barber Shops
7241	Barber Shops
725	Shoe Repair and Shoeshine Parlors
7251	Shoe Repair Shops and Shoeshine Parlors
726	Funeral Service and Crematories
7261	Funeral Service and Crematories
729	Miscellaneous Personal Services
7291	Tax Return Preparation Services
7299	Miscellaneous Personal Service
73	Business Services
731	Advertising
7311	Advertising Agencies
7312	Outdoor Advertising Services
7313	Radio, TV, Publisher Advertising Representatives
7319	Advertising, n.e.c.
732	Credit & Mercantile Reporting, Adjustment & Collection Agencies
7321	Credit Reporting and Collection
7322	Adjustment and Collection Services
7323	Credit Reporting Services
733	Mailing, reproduction, Commercial Art, Photography, & Steno Services
7331	Direct Mail Advertising Service
7332	Blueprinting and Photocopying
7333	Commercial Photography and Art
7334	Photocopying and Duplicating Services
7335	Commercial Photography
7336	Commercial Art and Graphic Design
7338	Secretarial and Court Reporting
7339	Stenographic and Reproduction, n.e.c.
734	Services to Dwellings & Other n.e.c. Buildings
7341	Window Cleaning
7342	Disinfecting and Exterminating
7349	Building Maintenance Services,
735	Misc. Equipment Rental & Leasing
7351	News Syndicates
7352	Medical Equipment Rental
7353	Heavy Construction Equipment Rental
7359	Equipment Rental and Leasing, n.e.c.
736	Personnel Supply Services
7361	Employment Agencies
7362	Temporary Help Supply Services
7363	Help Supply Services
7369	Personnel Supply Services, n.e.c.
737	Computer and Data Processing Services
7371	Custom Computer Programming Services
7372	Prepackaged Software

SIC	DESCRIPTION
7373	Computer Integrated Systems Design
7374	Data Processing Services
7375	Information Retrieval Services
7376	Computer Facilities Management
7377	Computer Rental and Leasing
7378	Computer Maintenance and Repair
7379	Computer Related Services, n.e.c.
738	Miscellaneous Business Services
7381	Detective and Armored Car Services
7382	Security Systems Services
7383	News Syndicate
7384	Photofinishing Laboratories
7389	Business Services, n.e.c.
7391	Research & Development Laboratories
7392	Management and Public Relations
7393	Detective and Protective Services
7394	Equipment Rental and Leasing
7395	Photofinishing Laboratories
7396	Trading Stamp Services
7397	Commercial Testing Laboratories
7399	Business Services, n.e.c.
75	Automotive Repair, Services & Parking
751	Automotive Rental and Leasing, Without Drivers
7512	Passenger Car Rental and Leasing
7513	Truck Rental and Leasing
7514	Passenger Car Rental
7515	Passenger Car Leasing
7519	Utility Trailer Rental
752	Automobile Parking
7521	Automobile Parking
7523	Parking Lots
7525	Parking Structures
753	Automotive Repair Shops
7531	Top and Body Repair Shops
7532	Top and Body Repair and Paint Shops
7533	Auto Exhaust System Repair Shops
7534	Tire Retreading and Repair Shops
7535	Paint Shops
7536	Automotive Glass Replacement Shops
7537	Automotive Transmission Repair Shops
7538	General Automotive Repair Shop
7539	Automotive Repair Shops, n.e.c.
754	Automotive Services, Except Repair
7542	Car Washes
7549	Automotive Services, n.e.c.
76	Miscellaneous Repair Services
7620	Electrical Repair Shops
7622	Radio and Television Repair
7623	Refrigeration Service and Repair Shops
7629	Electrical Repair Shops, n.e.c.
763	Watch, Clock, and Jewelry Repair
7631	Watch, Clock, and Jewelry Repair Shops
764	Reupholstery and Furniture Repair
7641	Reupholstery and Furniture Repair
769	Misc. Repair Shops and Related Services
7692	Welding Repair
7694	Armature Rewinding Shops
7699	Repair Services, n.e.c.

SIC	DESCRIPTION
78	Motion Pictures
781	Motion Picture Production & Allied Services
7812	Motion Picture and Video Production
7813	Motion Picture Production, Except TV
7814	Motion Picture Production for TV
7819	Services Allied to Motion Pictures
782	Motion Picture Distribution & Allied Services
7822	Motion Picture and Tape Distribution
7823	Motion Picture Film Exchanges
7824	Film or Tape Distribution for TV
7829	Motion Picture Distribution Services
783	Motion Picture Theaters
7832	Motion Picture Theaters, Except Drive-ins
7833	Drive-in Motion Picture Theaters
784	Video Tape Rental
7841	Video Tape Rental
79	Amusement and Recreation Services
791	Dance Studios, Schools, & Halls
7911	Dance Halls, Studios, and Schools
792	Theatrical Producers (Non Motion Picture), Orchestras, Entertainers
7922	Theatrical Producers and Services
7929	Entertainers & Entertainment Groups
793	Bowling Centers
7932	Billiard and Pool Establishments
7933	Bowling Alleys
794	Commercial Sports
7941	Sports Clubs and Promoters
7948	Racing, Including Track Operation
799	Misc. Amusement and Recreation Services
7991	Physical Fitness Facilities
7992	Public Golf Courses
7993	Coin-operated Amusement Device
7996	Amusement Parks
7997	Membership Sports & Recreation Clubs
7999	Amusement and Recreation, n.e.c.
80	Health Services
801	Offices & Clinics of Medical Doctors
8011	Offices of Physicians
802	Offices and Clinics of Dentists
8021	Offices of Dentists
803	Offices of Osteopathic Doctors
8031	Offices of Osteopathic Physicians
804	Offices & Clinics of Other Health Practitioners
8041	Offices of Chiropractors
8042	Offices of Optometrists
8043	Offices and Clinics of Podiatrists
8049	Offices of Health Practitioner
805	Nursing and Personal Care Facilities
8051	Skilled Nursing Care Facilities
8052	Intermediate Care Facilities
8059	Nursing and Personal Care, n.e.c.
806	Hospitals
8061	Hospitals
8062	General Medical & Surgical Hospitals
8063	Psychiatric Hospitals
8069	Specialty Hospitals, Except Psychiatric
807	Medical and Dental Laboratories

SIC	DESCRIPTION
8071	Medical Laboratories
8072	Dental Laboratories
808	Home Health Care Services
8081	Outpatient Care Facilities
8082	Home Health Care Services
809	Misc. Health & Allied Services, n.e.c.
8091	Health and Allied Services, n.e.c.
8092	Kidney Dialysis Centers
8099	Health and Allied Services, n.e.c.
81	Legal Services
811	Legal Services
8111	Legal Services
82	Educational Services
821	Elementary and Secondary Schools
8211	Elementary and Secondary Schools
822	Colleges, Universities, Professional Schools, & Junior Colleges
8221	Colleges and Universities, n.e.c.
8222	Junior Colleges
823	Libraries
8231	Libraries and Information Centers
824	Vocational Schools
8241	Correspondence Schools
8243	Data Processing Schools
8244	Business and Secretarial Schools
8249	Vocational School, n.e.c.
829	Schools & Educational Services, n.e.c.
8299	Schools & Educational Services
83	Social Services
832	Individual and Family Social Services
8321	Individual and Family Services
8322	Individual and Family Services
833	Job Training, Vocational Rehabilitation Services
8331	Job Training and Related Services
835	Child Day Care Services
8351	Child Day Care Services
836	Residential Care
8361	Residential Care
839	Social Services, n.e.c.
8399	Social Services, n.e.c.
84	Museums, Art Galleries & Botanical & Zoological Gardens
841	Museums and Art Galleries
8411	Museums and Art Galleries
8412	Museums and Art Galleries
842	Arboreta, Botanical, or Zoological Gardens
8421	Botanical and Zoological Gardens
8422	Botanical and Zoological Gardens
86	Membership Organizations
861	Business Associations
8611	Business Associations
862	Professional Membership Organizations
8621	Professional Organizations
863	Labor Unions/similar Labor Organizations
8631	Labor Organizations
864	Civic, Social, & Fraternal Associations
8641	Civic and Social Associations
865	Political Organizations
8651	Political Organizations
866	Religious Organizations
8661	Religious Organizations
869	Membership Organizations, n.e.c.
8699	Membership Organizations, n.e.c.
87	Engineering, Accounting, Research, Management
871	Engineering, Architectural, & Surveying Services
8711	Engineering Services
8712	Architectural Services
8713	Surveying Services
872	Accounting, Auditing, & Bookkeeping Services
8721	Accounting, Auditing, and Bookkeeping
873	Research, Development, & Testing Services
8731	Commercial Physical Research
8732	Commercial Nonphysical Research
8733	Noncommercial Research Organizations
8734	Testing Laboratories
874	Management & Public Relations Services
8741	Management Services
8742	Management Consulting Services
8743	Public Relations Services
8744	Facilities Support Services
8748	Business Consulting, n.e.c.
88	Private Households
881	Private Households
8811	Private Households
89	Services Not Elsewhere Classified
8911	Engineering & Architectural Services
8922	Noncommercial Research Organizations
8931	Accounting, Auditing & Bookkeeping
899	Services, n.e.c.
8999	Services, n.e.c.
91	Executive, Legislative, & General Government Except Finance
911	Executive Offices
9111	Executive Offices
9120	Legislative Bodies
9121	Legislative Bodies
913	Executive & Legislative Offices Combined
9131	Executive and Legislative Combined
919	General Government, n.e.c.
9199	General Government, n.e.c.
92	Justice, Public Order and Safety
921	Courts
9211	Courts
922	Public Order and Safety
9221	Police Protection
9222	Legal Counsel and Prosecution
9223	Correctional Institutions
9224	Fire Protection
9229	Public Order and Safety, n.e.c.
93	Public Finance, Taxation, & Monetary Policy
931	Public Finance, Taxation, & Monetary Policy
9311	Finance, Taxation, & Monetary Policy
94	Administration of Human Resource Programs
941	Educational Programs Administration
9411	Educational Programs Administration
943	Public Health Programs Administration

SIC	DESCRIPTION
9431	Public Health Program Administration
944	Social, Human Resource & Income Maintenance Program Administration
9441	Admin of Social & Manpower Programs
945	Veterans' Affairs (Except Health & Insurance) Administration
9451	Administration of Veterans' Affairs
95	Admin. of Environmental, Quality & Housing Program
951	Environmental Quality Programs Administration
9511	Air, Water, & Solid Waste Management
9512	Land, Mineral, Wildlife Conservation
953	Housing & Urban Development Programs Administration
9531	Housing Programs
9532	Urban and Community Development
96	Administration of Economic Programs
961	General Economic Program Administration
9611	Admin of General Economic Programs
962	Transportation Programs Regulation & Administration
9621	Regulation, Administration of Transportation
963	Communications, electric, gas, & Utilities Regulation & Administration
9631	Regulation, Admin of Utilities
964	Agricultural Marketing & Commodities Regulation
9641	Regulation of Agricultural Marketing & Commodities
965	Misc. Commercial Sectors Regulation, Licensing, & Inspection
9651	Regulation Misc. Commercial Sectors
966	Space Research and Technology
9661	Space Research and Technology
97	National Security and International Affairs
971	National Security
9711	National Security
972	International Affairs
9721	International Affairs
999	Nonclassifiable Establishments
9999	Nonclassifiable Establishments

Appendix K: Index of SCC/AMS codes

SCC Code	Description
2201001000	Light Duty Gasoline Vehicles (LDGV), Total: All Road Types
2201001110	Light Duty Gasoline Vehicles (LDGV), Interstate: Rural Total
2201001111	Light Duty Gasoline Vehicles (LDGV), Interstate: Rural Time 1
2201001112	Light Duty Gasoline Vehicles (LDGV), Interstate: Rural Time 2
2201001113	Light Duty Gasoline Vehicles (LDGV), Interstate: Rural Time 3
2201001114	Light Duty Gasoline Vehicles (LDGV), Interstate: Rural Time 4
2201001130	Light Duty Gasoline Vehicles (LDGV), Other Principal Arterial: Rural Total
2201001131	Light Duty Gasoline Vehicles (LDGV), Other Principal Arterial: Rural Time 1
2201001132	Light Duty Gasoline Vehicles (LDGV), Other Principal Arterial: Rural Time 2
2201001133	Light Duty Gasoline Vehicles (LDGV), Other Principal Arterial: Rural Time 3
2201001134	Light Duty Gasoline Vehicles (LDGV), Other Principal Arterial: Rural Time 4
2201001150	Light Duty Gasoline Vehicles (LDGV), Minor Arterial: Rural Total
2201001151	Light Duty Gasoline Vehicles (LDGV), Minor Arterial: Rural Time 1
2201001152	Light Duty Gasoline Vehicles (LDGV), Minor Arterial: Rural Time 2
2201001153	Light Duty Gasoline Vehicles (LDGV), Minor Arterial: Rural Time 3
2201001154	Light Duty Gasoline Vehicles (LDGV), Minor Arterial: Rural Time 4
2201001170	Light Duty Gasoline Vehicles (LDGV), Major Collector: Rural Total
2201001171	Light Duty Gasoline Vehicles (LDGV), Major Collector: Rural Time 1
2201001172	Light Duty Gasoline Vehicles (LDGV), Major Collector: Rural Time 2
2201001173	Light Duty Gasoline Vehicles (LDGV), Major Collector: Rural Time 3
2201001174	Light Duty Gasoline Vehicles (LDGV), Major Collector: Rural Time 4
2201001190	Light Duty Gasoline Vehicles (LDGV), Minor Collector: Rural Total
2201001191	Light Duty Gasoline Vehicles (LDGV), Minor Collector: Rural Time 1
2201001192	Light Duty Gasoline Vehicles (LDGV), Minor Collector: Rural Time 2
2201001193	Light Duty Gasoline Vehicles (LDGV), Minor Collector: Rural Time 3
2201001194	Light Duty Gasoline Vehicles (LDGV), Minor Collector: Rural Time 4
2201001210	Light Duty Gasoline Vehicles (LDGV), Local: Rural Total
2201001211	Light Duty Gasoline Vehicles (LDGV), Local: Rural Time 1
2201001212	Light Duty Gasoline Vehicles (LDGV), Local: Rural Time 2
2201001213	Light Duty Gasoline Vehicles (LDGV), Local: Rural Time 3
2201001214	Light Duty Gasoline Vehicles (LDGV), Local: Rural Time 4
2201001230	Light Duty Gasoline Vehicles (LDGV), Interstate: Urban Total
2201001231	Light Duty Gasoline Vehicles (LDGV), Interstate: Urban Time 1
2201001232	Light Duty Gasoline Vehicles (LDGV), Interstate: Urban Time 2
2201001233	Light Duty Gasoline Vehicles (LDGV), Interstate: Urban Time 3
2201001234	Light Duty Gasoline Vehicles (LDGV), Interstate: Urban Time 4
2201001250	Light Duty Gasoline Vehicles (LDGV), Other Freeways and Expressways: Urban Total
2201001251	Light Duty Gasoline Vehicles (LDGV), Other Freeways and Expressways: Urban Time 1
2201001252	Light Duty Gasoline Vehicles (LDGV), Other Freeways and Expressways: Urban Time 2
2201001253	Light Duty Gasoline Vehicles (LDGV), Other Freeways and Expressways: Urban Time 3
2201001254	Light Duty Gasoline Vehicles (LDGV), Other Freeways and Expressways: Urban Time 4
2201001270	Light Duty Gasoline Vehicles (LDGV), Other Principal Arterial: Urban Total
2201001271	Light Duty Gasoline Vehicles (LDGV), Other Principal Arterial: Urban Time 1
2201001272	Light Duty Gasoline Vehicles (LDGV), Other Principal Arterial: Urban Time 2
2201001273	Light Duty Gasoline Vehicles (LDGV), Other Principal Arterial: Urban Time 3
2201001274	Light Duty Gasoline Vehicles (LDGV), Other Principal Arterial: Urban Time 4

SCC Code	Description
2201001290	Light Duty Gasoline Vehicles (LDGV), Minor Arterial: Urban Total
2201001291	Light Duty Gasoline Vehicles (LDGV), Minor Arterial: Urban Time 1
2201001292	Light Duty Gasoline Vehicles (LDGV), Minor Arterial: Urban Time 2
2201001293	Light Duty Gasoline Vehicles (LDGV), Minor Arterial: Urban Time 3
2201001294	Light Duty Gasoline Vehicles (LDGV), Minor Arterial: Urban Time 4
2201001310	Light Duty Gasoline Vehicles (LDGV), Collector: Urban Total
2201001311	Light Duty Gasoline Vehicles (LDGV), Collector: Urban Time 1
2201001312	Light Duty Gasoline Vehicles (LDGV), Collector: Urban Time 2
2201001313	Light Duty Gasoline Vehicles (LDGV), Collector: Urban Time 3
2201001314	Light Duty Gasoline Vehicles (LDGV), Collector: Urban Time 4
2201001330	Light Duty Gasoline Vehicles (LDGV), Local: Urban Total
2201001331	Light Duty Gasoline Vehicles (LDGV), Local: Urban Time 1
2201001332	Light Duty Gasoline Vehicles (LDGV), Local: Urban Time 2
2201001333	Light Duty Gasoline Vehicles (LDGV), Local: Urban Time 3
2201001334	Light Duty Gasoline Vehicles (LDGV), Local: Urban Time 4
2201020000	Light Duty Gasoline Trucks 1 (LDGT1), Total: All Road Types
2201020110	Light Duty Gasoline Trucks 1 (LDGT1), Interstate: Rural Total
2201020111	Light Duty Gasoline Trucks 1 (LDGT1), Interstate: Rural Time 1
2201020112	Light Duty Gasoline Trucks 1 (LDGT1), Interstate: Rural Time 2
2201020113	Light Duty Gasoline Trucks 1 (LDGT1), Interstate: Rural Time 3
2201020114	Light Duty Gasoline Trucks 1 (LDGT1), Interstate: Rural Time 4
2201020130	Light Duty Gasoline Trucks 1 (LDGT1), Other Principal Arterial: Rural Total
2201020131	Light Duty Gasoline Trucks 1 (LDGT1), Other Principal Arterial: Rural Time 1
2201020132	Light Duty Gasoline Trucks 1 (LDGT1), Other Principal Arterial: Rural Time 2
2201020133	Light Duty Gasoline Trucks 1 (LDGT1), Other Principal Arterial: Rural Time 3
2201020134	Light Duty Gasoline Trucks 1 (LDGT1), Other Principal Arterial: Rural Time 4
2201020150	Light Duty Gasoline Trucks 1 (LDGT1), Minor Arterial: Rural Total
2201020151	Light Duty Gasoline Trucks 1 (LDGT1), Minor Arterial: Rural Time 1
2201020152	Light Duty Gasoline Trucks 1 (LDGT1), Minor Arterial: Rural Time 2
2201020153	Light Duty Gasoline Trucks 1 (LDGT1), Minor Arterial: Rural Time 3
2201020154	Light Duty Gasoline Trucks 1 (LDGT1), Minor Arterial: Rural Time 4
2201020170	Light Duty Gasoline Trucks 1 (LDGT1), Major Collector: Rural Total
2201020171	Light Duty Gasoline Trucks 1 (LDGT1), Major Collector: Rural Time 1
2201020172	Light Duty Gasoline Trucks 1 (LDGT1), Major Collector: Rural Time 2
2201020173	Light Duty Gasoline Trucks 1 (LDGT1), Major Collector: Rural Time 3
2201020174	Light Duty Gasoline Trucks 1 (LDGT1), Major Collector: Rural Time 4
2201020190	Light Duty Gasoline Trucks 1 (LDGT1), Minor Collector: Rural Total
2201020191	Light Duty Gasoline Trucks 1 (LDGT1), Minor Collector: Rural Time 1
2201020192	Light Duty Gasoline Trucks 1 (LDGT1), Minor Collector: Rural Time 2
2201020193	Light Duty Gasoline Trucks 1 (LDGT1), Minor Collector: Rural Time 3
2201020194	Light Duty Gasoline Trucks 1 (LDGT1), Minor Collector: Rural Time 4
2201020210	Light Duty Gasoline Trucks 1 (LDGT1), Local: Rural Total
2201020211	Light Duty Gasoline Trucks 1 (LDGT1), Local: Rural Time 1
2201020212	Light Duty Gasoline Trucks 1 (LDGT1), Local: Rural Time 2
2201020213	Light Duty Gasoline Trucks 1 (LDGT1), Local: Rural Time 3
2201020214	Light Duty Gasoline Trucks 1 (LDGT1), Local: Rural Time 4
2201020230	Light Duty Gasoline Trucks 1 (LDGT1), Interstate: Urban Total
2201020231	Light Duty Gasoline Trucks 1 (LDGT1), Interstate: Urban Time 1
2201020232	Light Duty Gasoline Trucks 1 (LDGT1), Interstate: Urban Time 2
2201020233	Light Duty Gasoline Trucks 1 (LDGT1), Interstate: Urban Time 3
2201020234	Light Duty Gasoline Trucks 1 (LDGT1), Interstate: Urban Time 4
2201020250	Light Duty Gasoline Trucks 1 (LDGT1), Other Freeways and Expressways: Urban Total

SCC Code	Description
2201020251	Light Duty Gasoline Trucks 1 (LDGT1), Other Freeways and Expressways: Urban Time 1
2201020252	Light Duty Gasoline Trucks 1 (LDGT1), Other Freeways and Expressways: Urban Time 2
2201020253	Light Duty Gasoline Trucks 1 (LDGT1), Other Freeways and Expressways: Urban Time 3
2201020254	Light Duty Gasoline Trucks 1 (LDGT1), Other Freeways and Expressways: Urban Time 4
2201020270	Light Duty Gasoline Trucks 1 (LDGT1), Other Principal Arterial: Urban Total
2201020271	Light Duty Gasoline Trucks 1 (LDGT1), Other Principal Arterial: Urban Time 1
2201020272	Light Duty Gasoline Trucks 1 (LDGT1), Other Principal Arterial: Urban Time 2
2201020273	Light Duty Gasoline Trucks 1 (LDGT1), Other Principal Arterial: Urban Time 3
2201020274	Light Duty Gasoline Trucks 1 (LDGT1), Other Principal Arterial: Urban Time 4
2201020290	Light Duty Gasoline Trucks 1 (LDGT1), Minor Arterial: Urban Total
2201020291	Light Duty Gasoline Trucks 1 (LDGT1), Minor Arterial: Urban Time 1
2201020292	Light Duty Gasoline Trucks 1 (LDGT1), Minor Arterial: Urban Time 2
2201020293	Light Duty Gasoline Trucks 1 (LDGT1), Minor Arterial: Urban Time 3
2201020294	Light Duty Gasoline Trucks 1 (LDGT1), Minor Arterial: Urban Time 4
2201020310	Light Duty Gasoline Trucks 1 (LDGT1), Collector: Urban Total
2201020311	Light Duty Gasoline Trucks 1 (LDGT1), Collector: Urban Time 1
2201020312	Light Duty Gasoline Trucks 1 (LDGT1), Collector: Urban Time 2
2201020313	Light Duty Gasoline Trucks 1 (LDGT1), Collector: Urban Time 3
2201020314	Light Duty Gasoline Trucks 1 (LDGT1), Collector: Urban Time 4
2201020330	Light Duty Gasoline Trucks 1 (LDGT1), Local: Urban Total
2201020331	Light Duty Gasoline Trucks 1 (LDGT1), Local: Urban Time 1
2201020332	Light Duty Gasoline Trucks 1 (LDGT1), Local: Urban Time 2
2201020333	Light Duty Gasoline Trucks 1 (LDGT1), Local: Urban Time 3
2201020334	Light Duty Gasoline Trucks 1 (LDGT1), Local: Urban Time 4
2201040000	Light Duty Gasoline Trucks 2 (LDGT2), Total: All Road Types
2201040110	Light Duty Gasoline Trucks 2 (LDGT2), Interstate: Rural Total
2201040111	Light Duty Gasoline Trucks 2 (LDGT2), Interstate: Rural Time 1
2201040112	Light Duty Gasoline Trucks 2 (LDGT2), Interstate: Rural Time 2
2201040113	Light Duty Gasoline Trucks 2 (LDGT2), Interstate: Rural Time 3
2201040114	Light Duty Gasoline Trucks 2 (LDGT2), Interstate: Rural Time 4
2201040130	Light Duty Gasoline Trucks 2 (LDGT2), Other Principal Arterial: Rural Total
2201040131	Light Duty Gasoline Trucks 2 (LDGT2), Other Principal Arterial: Rural Time 1
2201040132	Light Duty Gasoline Trucks 2 (LDGT2), Other Principal Arterial: Rural Time 2
2201040133	Light Duty Gasoline Trucks 2 (LDGT2), Other Principal Arterial: Rural Time 3
2201040134	Light Duty Gasoline Trucks 2 (LDGT2), Other Principal Arterial: Rural Time 4
2201040150	Light Duty Gasoline Trucks 2 (LDGT2), Minor Arterial: Rural Total
2201040151	Light Duty Gasoline Trucks 2 (LDGT2), Minor Arterial: Rural Time 1
2201040152	Light Duty Gasoline Trucks 2 (LDGT2), Minor Arterial: Rural Time 2
2201040153	Light Duty Gasoline Trucks 2 (LDGT2), Minor Arterial: Rural Time 3
2201040154	Light Duty Gasoline Trucks 2 (LDGT2), Minor Arterial: Rural Time 4
2201040170	Light Duty Gasoline Trucks 2 (LDGT2), Major Collector: Rural Total
2201040171	Light Duty Gasoline Trucks 2 (LDGT2), Major Collector: Rural Time 1
2201040172	Light Duty Gasoline Trucks 2 (LDGT2), Major Collector: Rural Time 2
2201040173	Light Duty Gasoline Trucks 2 (LDGT2), Major Collector: Rural Time 3
2201040174	Light Duty Gasoline Trucks 2 (LDGT2), Major Collector: Rural Time 4
2201040190	Light Duty Gasoline Trucks 2 (LDGT2), Minor Collector: Rural Total
2201040191	Light Duty Gasoline Trucks 2 (LDGT2), Minor Collector: Rural Time 1
2201040192	Light Duty Gasoline Trucks 2 (LDGT2), Minor Collector: Rural Time 2
2201040193	Light Duty Gasoline Trucks 2 (LDGT2), Minor Collector: Rural Time 3
2201040194	Light Duty Gasoline Trucks 2 (LDGT2), Minor Collector: Rural Time 4
2201040210	Light Duty Gasoline Trucks 2 (LDGT2), Local: Rural Total
2201040211	Light Duty Gasoline Trucks 2 (LDGT2), Local: Rural Time 1
2201040212	Light Duty Gasoline Trucks 2 (LDGT2), Local: Rural Time 2

SCC Code	Description
2201040213	Light Duty Gasoline Trucks 2 (LDGT2), Local: Rural Time 3
2201040214	Light Duty Gasoline Trucks 2 (LDGT2), Local: Rural Time 4
2201040230	Light Duty Gasoline Trucks 2 (LDGT2), Interstate: Urban Total
2201040231	Light Duty Gasoline Trucks 2 (LDGT2), Interstate: Urban Time 1
2201040232	Light Duty Gasoline Trucks 2 (LDGT2), Interstate: Urban Time 2
2201040233	Light Duty Gasoline Trucks 2 (LDGT2), Interstate: Urban Time 3
2201040234	Light Duty Gasoline Trucks 2 (LDGT2), Interstate: Urban Time 4
2201040250	Light Duty Gasoline Trucks 2 (LDGT2), Other Freeways and Expressways: Urban Total
2201040251	Light Duty Gasoline Trucks 2 (LDGT2), Other Freeways and Expressways: Urban Time 1
2201040252	Light Duty Gasoline Trucks 2 (LDGT2), Other Freeways and Expressways: Urban Time 2
2201040253	Light Duty Gasoline Trucks 2 (LDGT2), Other Freeways and Expressways: Urban Time 3
2201040254	Light Duty Gasoline Trucks 2 (LDGT2), Other Freeways and Expressways: Urban Time 4
2201040270	Light Duty Gasoline Trucks 2 (LDGT2), Other Principal Arterial: Urban Total
2201040271	Light Duty Gasoline Trucks 2 (LDGT2), Other Principal Arterial: Urban Time 1
2201040272	Light Duty Gasoline Trucks 2 (LDGT2), Other Principal Arterial: Urban Time 2
2201040273	Light Duty Gasoline Trucks 2 (LDGT2), Other Principal Arterial: Urban Time 3
2201040274	Light Duty Gasoline Trucks 2 (LDGT2), Other Principal Arterial: Urban Time 4
2201040290	Light Duty Gasoline Trucks 2 (LDGT2), Minor Arterial: Urban Total
2201040291	Light Duty Gasoline Trucks 2 (LDGT2), Minor Arterial: Urban Time 1
2201040292	Light Duty Gasoline Trucks 2 (LDGT2), Minor Arterial: Urban Time 2
2201040293	Light Duty Gasoline Trucks 2 (LDGT2), Minor Arterial: Urban Time 3
2201040294	Light Duty Gasoline Trucks 2 (LDGT2), Minor Arterial: Urban Time 4
2201040310	Light Duty Gasoline Trucks 2 (LDGT2), Collector: Urban Total
2201040311	Light Duty Gasoline Trucks 2 (LDGT2), Collector: Urban Time 1
2201040312	Light Duty Gasoline Trucks 2 (LDGT2), Collector: Urban Time 2
2201040313	Light Duty Gasoline Trucks 2 (LDGT2), Collector: Urban Time 3
2201040314	Light Duty Gasoline Trucks 2 (LDGT2), Collector: Urban Time 4
2201040330	Light Duty Gasoline Trucks 2 (LDGT2), Local: Urban Total
2201040331	Light Duty Gasoline Trucks 2 (LDGT2), Local: Urban Time 1
2201040332	Light Duty Gasoline Trucks 2 (LDGT2), Local: Urban Time 2
2201040333	Light Duty Gasoline Trucks 2 (LDGT2), Local: Urban Time 3
2201040334	Light Duty Gasoline Trucks 2 (LDGT2), Local: Urban Time 4
2201060000	Light Duty Gasoline Trucks 1 & 2 (LDGT), Total: All Road Types
2201060110	Light Duty Gasoline Trucks 1 & 2 (LDGT), Interstate: Rural Total
2201060111	Light Duty Gasoline Trucks 1 & 2 (LDGT), Interstate: Rural Time 1
2201060112	Light Duty Gasoline Trucks 1 & 2 (LDGT), Interstate: Rural Time 2
2201060113	Light Duty Gasoline Trucks 1 & 2 (LDGT), Interstate: Rural Time 3
2201060114	Light Duty Gasoline Trucks 1 & 2 (LDGT), Interstate: Rural Time 4
2201060130	Light Duty Gasoline Trucks 1 & 2 (LDGT), Other Principal Arterial: Rural Total
2201060131	Light Duty Gasoline Trucks 1 & 2 (LDGT), Other Principal Arterial: Rural Time 1
2201060132	Light Duty Gasoline Trucks 1 & 2 (LDGT), Other Principal Arterial: Rural Time 2
2201060133	Light Duty Gasoline Trucks 1 & 2 (LDGT), Other Principal Arterial: Rural Time 3
2201060134	Light Duty Gasoline Trucks 1 & 2 (LDGT), Other Principal Arterial: Rural Time 4
2201060150	Light Duty Gasoline Trucks 1 & 2 (LDGT), Minor Arterial: Rural Total
2201060151	Light Duty Gasoline Trucks 1 & 2 (LDGT), Minor Arterial: Rural Time 1
2201060152	Light Duty Gasoline Trucks 1 & 2 (LDGT), Minor Arterial: Rural Time 2
2201060153	Light Duty Gasoline Trucks 1 & 2 (LDGT), Minor Arterial: Rural Time 3
2201060154	Light Duty Gasoline Trucks 1 & 2 (LDGT), Minor Arterial: Rural Time 4
2201060170	Light Duty Gasoline Trucks 1 & 2 (LDGT), Major Collector: Rural Total
2201060171	Light Duty Gasoline Trucks 1 & 2 (LDGT), Major Collector: Rural Time 1
2201060172	Light Duty Gasoline Trucks 1 & 2 (LDGT), Major Collector: Rural Time 2
2201060173	Light Duty Gasoline Trucks 1 & 2 (LDGT), Major Collector: Rural Time 3
2201060174	Light Duty Gasoline Trucks 1 & 2 (LDGT), Major Collector: Rural Time 4

SCC Code	Description
2201060190	Light Duty Gasoline Trucks 1 & 2 (LDGT), Minor Collector: Rural Total
2201060191	Light Duty Gasoline Trucks 1 & 2 (LDGT), Minor Collector: Rural Time 1
2201060192	Light Duty Gasoline Trucks 1 & 2 (LDGT), Minor Collector: Rural Time 2
2201060193	Light Duty Gasoline Trucks 1 & 2 (LDGT), Minor Collector: Rural Time 3
2201060194	Light Duty Gasoline Trucks 1 & 2 (LDGT), Minor Collector: Rural Time 4
2201060210	Light Duty Gasoline Trucks 1 & 2 (LDGT), Local: Rural Total
2201060211	Light Duty Gasoline Trucks 1 & 2 (LDGT), Local: Rural Time 1
2201060212	Light Duty Gasoline Trucks 1 & 2 (LDGT), Local: Rural Time 2
2201060213	Light Duty Gasoline Trucks 1 & 2 (LDGT), Local: Rural Time 3
2201060214	Light Duty Gasoline Trucks 1 & 2 (LDGT), Local: Rural Time 4
2201060230	Light Duty Gasoline Trucks 1 & 2 (LDGT), Interstate: Urban Total
2201060231	Light Duty Gasoline Trucks 1 & 2 (LDGT), Interstate: Urban Time 1
2201060232	Light Duty Gasoline Trucks 1 & 2 (LDGT), Interstate: Urban Time 2
2201060233	Light Duty Gasoline Trucks 1 & 2 (LDGT), Interstate: Urban Time 3
2201060234	Light Duty Gasoline Trucks 1 & 2 (LDGT), Interstate: Urban Time 4
2201060250	Light Duty Gasoline Trucks 1 & 2 (LDGT), Other Freeways and Expressways: Urban Total
2201060251	Light Duty Gasoline Trucks 1 & 2 (LDGT), Other Freeways and Expressways: Urban Time 1
2201060252	Light Duty Gasoline Trucks 1 & 2 (LDGT), Other Freeways and Expressways: Urban Time 2
2201060253	Light Duty Gasoline Trucks 1 & 2 (LDGT), Other Freeways and Expressways: Urban Time 3
2201060254	Light Duty Gasoline Trucks 1 & 2 (LDGT), Other Freeways and Expressways: Urban Time 4
2201060270	Light Duty Gasoline Trucks 1 & 2 (LDGT), Other Principal Arterial: Urban Total
2201060271	Light Duty Gasoline Trucks 1 & 2 (LDGT), Other Principal Arterial: Urban Time 1
2201060272	Light Duty Gasoline Trucks 1 & 2 (LDGT), Other Principal Arterial: Urban Time 2
2201060273	Light Duty Gasoline Trucks 1 & 2 (LDGT), Other Principal Arterial: Urban Time 3
2201060274	Light Duty Gasoline Trucks 1 & 2 (LDGT), Other Principal Arterial: Urban Time 4
2201060290	Light Duty Gasoline Trucks 1 & 2 (LDGT), Minor Arterial: Urban Total
2201060291	Light Duty Gasoline Trucks 1 & 2 (LDGT), Minor Arterial: Urban Time 1
2201060292	Light Duty Gasoline Trucks 1 & 2 (LDGT), Minor Arterial: Urban Time 2
2201060293	Light Duty Gasoline Trucks 1 & 2 (LDGT), Minor Arterial: Urban Time 3
2201060294	Light Duty Gasoline Trucks 1 & 2 (LDGT), Minor Arterial: Urban Time 4
2201060310	Light Duty Gasoline Trucks 1 & 2 (LDGT), Collector: Urban Total
2201060311	Light Duty Gasoline Trucks 1 & 2 (LDGT), Collector: Urban Time 1
2201060312	Light Duty Gasoline Trucks 1 & 2 (LDGT), Collector: Urban Time 2
2201060313	Light Duty Gasoline Trucks 1 & 2 (LDGT), Collector: Urban Time 3
2201060314	Light Duty Gasoline Trucks 1 & 2 (LDGT), Collector: Urban Time 4
2201060330	Light Duty Gasoline Trucks 1 & 2 (LDGT), Local: Urban Total
2201060331	Light Duty Gasoline Trucks 1 & 2 (LDGT), Local: Urban Time 1
2201060332	Light Duty Gasoline Trucks 1 & 2 (LDGT), Local: Urban Time 2
2201060333	Light Duty Gasoline Trucks 1 & 2 (LDGT), Local: Urban Time 3
2201060334	Light Duty Gasoline Trucks 1 & 2 (LDGT), Local: Urban Time 4
2201070000	Heavy Duty Gasoline Vehicles (HDGV), Total: All Road Types
2201070110	Heavy Duty Gasoline Vehicles (HDGV), Interstate: Rural Total
2201070111	Heavy Duty Gasoline Vehicles (HDGV), Interstate: Rural Time 1
2201070112	Heavy Duty Gasoline Vehicles (HDGV), Interstate: Rural Time 2
2201070113	Heavy Duty Gasoline Vehicles (HDGV), Interstate: Rural Time 3
2201070114	Heavy Duty Gasoline Vehicles (HDGV), Interstate: Rural Time 4
2201070130	Heavy Duty Gasoline Vehicles (HDGV), Other Principal Arterial: Urban Total
2201070131	Heavy Duty Gasoline Vehicles (HDGV), Other Principal Arterial: Urban Time 1
2201070132	Heavy Duty Gasoline Vehicles (HDGV), Other Principal Arterial: Urban Time 2
2201070133	Heavy Duty Gasoline Vehicles (HDGV), Other Principal Arterial: Urban Time 3
2201070134	Heavy Duty Gasoline Vehicles (HDGV), Other Principal Arterial: Urban Time 4
2201070150	Heavy Duty Gasoline Vehicles (HDGV), Minor Arterial: Rural Total
2201070151	Heavy Duty Gasoline Vehicles (HDGV), Minor Arterial: Rural Time 1

SCC Code	Description
2201070152	Heavy Duty Gasoline Vehicles (HDGV), Minor Arterial: Rural Time 2
2201070153	Heavy Duty Gasoline Vehicles (HDGV), Minor Arterial: Rural Time 3
2201070154	Heavy Duty Gasoline Vehicles (HDGV), Minor Arterial: Rural Time 4
2201070170	Heavy Duty Gasoline Vehicles (HDGV), Major Collector: Rural Total
2201070171	Heavy Duty Gasoline Vehicles (HDGV), Major Collector: Rural Time 1
2201070172	Heavy Duty Gasoline Vehicles (HDGV), Major Collector: Rural Time 2
2201070173	Heavy Duty Gasoline Vehicles (HDGV), Major Collector: Rural Time 3
2201070174	Heavy Duty Gasoline Vehicles (HDGV), Major Collector: Rural Time 4
2201070190	Heavy Duty Gasoline Vehicles (HDGV), Minor Collector: Rural Total
2201070191	Heavy Duty Gasoline Vehicles (HDGV), Minor Collector: Rural Time 1
2201070192	Heavy Duty Gasoline Vehicles (HDGV), Minor Collector: Rural Time 2
2201070193	Heavy Duty Gasoline Vehicles (HDGV), Minor Collector: Rural Time 3
2201070194	Heavy Duty Gasoline Vehicles (HDGV), Minor Collector: Rural Time 4
2201070210	Heavy Duty Gasoline Vehicles (HDGV), Local: Rural Total
2201070211	Heavy Duty Gasoline Vehicles (HDGV), Local: Rural Time 1
2201070212	Heavy Duty Gasoline Vehicles (HDGV), Local: Rural Time 2
2201070213	Heavy Duty Gasoline Vehicles (HDGV), Local: Rural Time 3
2201070214	Heavy Duty Gasoline Vehicles (HDGV), Local: Rural Time 4
2201070230	Heavy Duty Gasoline Vehicles (HDGV), Interstate: Urban Total
2201070231	Heavy Duty Gasoline Vehicles (HDGV), Interstate: Urban Time 1
2201070232	Heavy Duty Gasoline Vehicles (HDGV), Interstate: Urban Time 2
2201070233	Heavy Duty Gasoline Vehicles (HDGV), Interstate: Urban Time 3
2201070234	Heavy Duty Gasoline Vehicles (HDGV), Interstate: Urban Time 4
2201070250	Heavy Duty Gasoline Vehicles (HDGV), Other Freeways and Expressways: Urban Total
2201070251	Heavy Duty Gasoline Vehicles (HDGV), Other Freeways and Expressways: Urban Time 1
2201070252	Heavy Duty Gasoline Vehicles (HDGV), Other Freeways and Expressways: Urban Time 2
2201070253	Heavy Duty Gasoline Vehicles (HDGV), Other Freeways and Expressways: Urban Time 3
2201070254	Heavy Duty Gasoline Vehicles (HDGV), Other Freeways and Expressways: Urban Time 4
2201070270	Heavy Duty Gasoline Vehicles (HDGV), Other Principal Arterial: Urban Total
2201070271	Heavy Duty Gasoline Vehicles (HDGV), Other Principal Arterial: Urban Time 1
2201070272	Heavy Duty Gasoline Vehicles (HDGV), Other Principal Arterial: Urban Time 2
2201070273	Heavy Duty Gasoline Vehicles (HDGV), Other Principal Arterial: Urban Time 3
2201070274	Heavy Duty Gasoline Vehicles (HDGV), Other Principal Arterial: Urban Time 4
2201070290	Heavy Duty Gasoline Vehicles (HDGV), Minor Arterial: Urban Total
2201070291	Heavy Duty Gasoline Vehicles (HDGV), Minor Arterial: Urban Time 1
2201070292	Heavy Duty Gasoline Vehicles (HDGV), Minor Arterial: Urban Time 2
2201070293	Heavy Duty Gasoline Vehicles (HDGV), Minor Arterial: Urban Time 3
2201070294	Heavy Duty Gasoline Vehicles (HDGV), Minor Arterial: Urban Time 4
2201070310	Heavy Duty Gasoline Vehicles (HDGV), Collector: Urban Total
2201070311	Heavy Duty Gasoline Vehicles (HDGV), Collector: Urban Time 1
2201070312	Heavy Duty Gasoline Vehicles (HDGV), Collector: Urban Time 2
2201070313	Heavy Duty Gasoline Vehicles (HDGV), Collector: Urban Time 3
2201070314	Heavy Duty Gasoline Vehicles (HDGV), Collector: Urban Time 4
2201070330	Heavy Duty Gasoline Vehicles (HDGV), Local: Urban Total
2201070331	Heavy Duty Gasoline Vehicles (HDGV), Local: Urban Time 1
2201070332	Heavy Duty Gasoline Vehicles (HDGV), Local: Urban Time 2
2201070333	Heavy Duty Gasoline Vehicles (HDGV), Local: Urban Time 3
2201070334	Heavy Duty Gasoline Vehicles (HDGV), Local: Urban Time 4
2201080000	Motorcycles (MC), Total: All Road Types
2201080110	Motorcycles (MC), Interstate: Rural Total
2201080111	Motorcycles (MC), Interstate: Rural Time 1
2201080112	Motorcycles (MC), Interstate: Rural Time 2
2201080113	Motorcycles (MC), Interstate: Rural Time 3

SCC Code	Description
2201080114	Motorcycles (MC), Interstate: Rural Time 4
2201080130	Motorcycles (MC), Other Principal Arterial: Rural Total
2201080131	Motorcycles (MC), Other Principal Arterial: Rural Time 1
2201080132	Motorcycles (MC), Other Principal Arterial: Rural Time 2
2201080133	Motorcycles (MC), Other Principal Arterial: Rural Time 3
2201080134	Motorcycles (MC), Other Principal Arterial: Rural Time 4
2201080150	Motorcycles (MC), Minor Arterial: Rural Total
2201080151	Motorcycles (MC), Minor Arterial: Rural Time 1
2201080152	Motorcycles (MC), Minor Arterial: Rural Time 2
2201080153	Motorcycles (MC), Minor Arterial: Rural Time 3
2201080154	Motorcycles (MC), Minor Arterial: Rural Time 4
2201080170	Motorcycles (MC), Major Collector: Rural Total
2201080171	Motorcycles (MC), Major Collector: Rural Time 1
2201080172	Motorcycles (MC), Major Collector: Rural Time 2
2201080173	Motorcycles (MC), Major Collector: Rural Time 3
2201080174	Motorcycles (MC), Major Collector: Rural Time 4
2201080190	Motorcycles (MC), Minor Collector: Rural Total
2201080191	Motorcycles (MC), Minor Collector: Rural Time 1
2201080192	Motorcycles (MC), Minor Collector: Rural Time 2
2201080193	Motorcycles (MC), Minor Collector: Rural Time 3
2201080194	Motorcycles (MC), Minor Collector: Rural Time 4
2201080210	Motorcycles (MC), Local: Rural Total
2201080211	Motorcycles (MC), Local: Rural Time 1
2201080212	Motorcycles (MC), Local: Rural Time 2
2201080213	Motorcycles (MC), Local: Rural Time 3
2201080214	Motorcycles (MC), Local: Rural Time 4
2201080230	Motorcycles (MC), Interstate: Urban Total
2201080231	Motorcycles (MC), Interstate: Urban Time 1
2201080232	Motorcycles (MC), Interstate: Urban Time 2
2201080233	Motorcycles (MC), Interstate: Urban Time 3
2201080234	Motorcycles (MC), Interstate: Urban Time 4
2201080250	Motorcycles (MC), Other Freeways and Expressways: Urban Total
2201080251	Motorcycles (MC), Other Freeways and Expressways: Urban Time 1
2201080252	Motorcycles (MC), Other Freeways and Expressways: Urban Time 2
2201080253	Motorcycles (MC), Other Freeways and Expressways: Urban Time 3
2201080254	Motorcycles (MC), Other Freeways and Expressways: Urban Time 4
2201080270	Motorcycles (MC), Other Principal Arterial: Urban Total
2201080271	Motorcycles (MC), Other Principal Arterial: Urban Time 1
2201080272	Motorcycles (MC), Other Principal Arterial: Urban Time 2
2201080273	Motorcycles (MC), Other Principal Arterial: Urban Time 3
2201080274	Motorcycles (MC), Other Principal Arterial: Urban Time 4
2201080290	Motorcycles (MC), Minor Arterial: Urban Total
2201080291	Motorcycles (MC), Minor Arterial: Urban Time 1
2201080292	Motorcycles (MC), Minor Arterial: Urban Time 2
2201080293	Motorcycles (MC), Minor Arterial: Urban Time 3
2201080294	Motorcycles (MC), Minor Arterial: Urban Time 4
2201080310	Motorcycles (MC), Collector: Urban Total
2201080311	Motorcycles (MC), Collector: Urban Time 1
2201080312	Motorcycles (MC), Collector: Urban Time 2
2201080313	Motorcycles (MC), Collector: Urban Time 3
2201080314	Motorcycles (MC), Collector: Urban Time 4
2201080330	Motorcycles (MC), Local: Urban Total
2201080331	Motorcycles (MC), Local: Urban Time 1

SCC Code	Description
2201080332	Motorcycles (MC), Local: Urban Time 2
2201080333	Motorcycles (MC), Local: Urban Time 3
2201080334	Motorcycles (MC), Local: Urban Time 4
2230001000	Light Duty Diesel Vehicles (LDDV), Total: All Road Types
2230001110	Light Duty Diesel Vehicles (LDDV), Interstate: Rural Total
2230001111	Light Duty Diesel Vehicles (LDDV), Interstate: Rural Time 1
2230001112	Light Duty Diesel Vehicles (LDDV), Interstate: Rural Time 2
2230001113	Light Duty Diesel Vehicles (LDDV), Interstate: Rural Time 3
2230001114	Light Duty Diesel Vehicles (LDDV), Interstate: Rural Time 4
2230001130	Light Duty Diesel Vehicles (LDDV), Other Principal Arterial: Rural Total
2230001131	Light Duty Diesel Vehicles (LDDV), Other Principal Arterial: Rural Time 1
2230001132	Light Duty Diesel Vehicles (LDDV), Other Principal Arterial: Rural Time 2
2230001133	Light Duty Diesel Vehicles (LDDV), Other Principal Arterial: Rural Time 3
2230001134	Light Duty Diesel Vehicles (LDDV), Other Principal Arterial: Rural Time 4
2230001150	Light Duty Diesel Vehicles (LDDV), Minor Arterial: Rural Total
2230001151	Light Duty Diesel Vehicles (LDDV), Minor Arterial: Rural Time 1
2230001152	Light Duty Diesel Vehicles (LDDV), Minor Arterial: Rural Time 2
2230001153	Light Duty Diesel Vehicles (LDDV), Minor Arterial: Rural Time 3
2230001154	Light Duty Diesel Vehicles (LDDV), Minor Arterial: Rural Time 4
2230001170	Light Duty Diesel Vehicles (LDDV), Major Collector: Rural Total
2230001171	Light Duty Diesel Vehicles (LDDV), Major Collector: Rural Time 1
2230001172	Light Duty Diesel Vehicles (LDDV), Major Collector: Rural Time 2
2230001173	Light Duty Diesel Vehicles (LDDV), Major Collector: Rural Time 3
2230001174	Light Duty Diesel Vehicles (LDDV), Major Collector: Rural Time 4
2230001190	Light Duty Diesel Vehicles (LDDV), Minor Collector: Rural Total
2230001191	Light Duty Diesel Vehicles (LDDV), Minor Collector: Rural Time 1
2230001192	Light Duty Diesel Vehicles (LDDV), Minor Collector: Rural Time 2
2230001193	Light Duty Diesel Vehicles (LDDV), Minor Collector: Rural Time 3
2230001194	Light Duty Diesel Vehicles (LDDV), Minor Collector: Rural Time 4
2230001210	Light Duty Diesel Vehicles (LDDV), Local: Rural Total
2230001211	Light Duty Diesel Vehicles (LDDV), Local: Rural Time 1
2230001212	Light Duty Diesel Vehicles (LDDV), Local: Rural Time 2
2230001213	Light Duty Diesel Vehicles (LDDV), Local: Rural Time 3
2230001214	Light Duty Diesel Vehicles (LDDV), Local: Rural Time 4
2230001230	Light Duty Diesel Vehicles (LDDV), Interstate: Urban Total
2230001231	Light Duty Diesel Vehicles (LDDV), Interstate: Urban Time 1
2230001232	Light Duty Diesel Vehicles (LDDV), Interstate: Urban Time 2
2230001233	Light Duty Diesel Vehicles (LDDV), Interstate: Urban Time 3
2230001234	Light Duty Diesel Vehicles (LDDV), Interstate: Urban Time 4
2230001250	Light Duty Diesel Vehicles (LDDV), Other Freeways and Expressways: Urban Total
2230001251	Light Duty Diesel Vehicles (LDDV), Other Freeways and Expressways: Urban Time 1
2230001252	Light Duty Diesel Vehicles (LDDV), Other Freeways and Expressways: Urban Time 2
2230001253	Light Duty Diesel Vehicles (LDDV), Other Freeways and Expressways: Urban Time 3
2230001254	Light Duty Diesel Vehicles (LDDV), Other Freeways and Expressways: Urban Time 4
2230001270	Light Duty Diesel Vehicles (LDDV), Other Principal Arterial: Urban Total
2230001271	Light Duty Diesel Vehicles (LDDV), Other Principal Arterial: Urban Time 1
2230001272	Light Duty Diesel Vehicles (LDDV), Other Principal Arterial: Urban Time 2
2230001273	Light Duty Diesel Vehicles (LDDV), Other Principal Arterial: Urban Time 3
2230001274	Light Duty Diesel Vehicles (LDDV), Other Principal Arterial: Urban Time 4
2230001290	Light Duty Diesel Vehicles (LDDV), Minor Arterial: Urban Total
2230001291	Light Duty Diesel Vehicles (LDDV), Minor Arterial: Urban Time 1
2230001292	Light Duty Diesel Vehicles (LDDV), Minor Arterial: Urban Time 2
2230001293	Light Duty Diesel Vehicles (LDDV), Minor Arterial: Urban Time 3

SCC Code	Description
2230001294	Light Duty Diesel Vehicles (LDDV), Minor Arterial: Urban Time 4
2230001310	Light Duty Diesel Vehicles (LDDV), Collector: Urban Total
2230001311	Light Duty Diesel Vehicles (LDDV), Collector: Urban Time 1
2230001312	Light Duty Diesel Vehicles (LDDV), Collector: Urban Time 2
2230001313	Light Duty Diesel Vehicles (LDDV), Collector: Urban Time 3
2230001314	Light Duty Diesel Vehicles (LDDV), Collector: Urban Time 4
2230001330	Light Duty Diesel Vehicles (LDDV), Local: Urban Total
2230001331	Light Duty Diesel Vehicles (LDDV), Local: Urban Time 1
2230001332	Light Duty Diesel Vehicles (LDDV), Local: Urban Time 2
2230001333	Light Duty Diesel Vehicles (LDDV), Local: Urban Time 3
2230001334	Light Duty Diesel Vehicles (LDDV), Local: Urban Time 4
2230060000	Light Duty Diesel Trucks (LDDT), Total: All Road Types
2230060110	Light Duty Diesel Trucks (LDDT), Interstate: Rural Total
2230060111	Light Duty Diesel Trucks (LDDT), Interstate: Rural Time 1
2230060112	Light Duty Diesel Trucks (LDDT), Interstate: Rural Time 2
2230060113	Light Duty Diesel Trucks (LDDT), Interstate: Rural Time 3
2230060114	Light Duty Diesel Trucks (LDDT), Interstate: Rural Time 4
2230060130	Light Duty Diesel Trucks (LDDT), Other Principal Arterial: Rural Total
2230060131	Light Duty Diesel Trucks (LDDT), Other Principal Arterial: Rural Time 1
2230060132	Light Duty Diesel Trucks (LDDT), Other Principal Arterial: Rural Time 2
2230060133	Light Duty Diesel Trucks (LDDT), Other Principal Arterial: Rural Time 3
2230060134	Light Duty Diesel Trucks (LDDT), Other Principal Arterial: Rural Time 4
2230060150	Light Duty Diesel Trucks (LDDT), Minor Arterial: Rural Total
2230060151	Light Duty Diesel Trucks (LDDT), Minor Arterial: Rural Time 1
2230060152	Light Duty Diesel Trucks (LDDT), Minor Arterial: Rural Time 2
2230060153	Light Duty Diesel Trucks (LDDT), Minor Arterial: Rural Time 3
2230060154	Light Duty Diesel Trucks (LDDT), Minor Arterial: Rural Time 4
2230060170	Light Duty Diesel Trucks (LDDT), Major Collector: Rural Total
2230060171	Light Duty Diesel Trucks (LDDT), Major Collector: Rural Time 1
2230060172	Light Duty Diesel Trucks (LDDT), Major Collector: Rural Time 2
2230060173	Light Duty Diesel Trucks (LDDT), Major Collector: Rural Time 3
2230060174	Light Duty Diesel Trucks (LDDT), Major Collector: Rural Time 4
2230060190	Light Duty Diesel Trucks (LDDT), Minor Collector: Rural Total
2230060191	Light Duty Diesel Trucks (LDDT), Minor Collector: Rural Time 1
2230060192	Light Duty Diesel Trucks (LDDT), Minor Collector: Rural Time 2
2230060193	Light Duty Diesel Trucks (LDDT), Minor Collector: Rural Time 3
2230060194	Light Duty Diesel Trucks (LDDT), Minor Collector: Rural Time 4
2230060210	Light Duty Diesel Trucks (LDDT), Local: Rural Total
2230060211	Light Duty Diesel Trucks (LDDT), Local: Rural Time 1
2230060212	Light Duty Diesel Trucks (LDDT), Local: Rural Time 2
2230060213	Light Duty Diesel Trucks (LDDT), Local: Rural Time 3
2230060214	Light Duty Diesel Trucks (LDDT), Local: Rural Time 4
2230060230	Light Duty Diesel Trucks (LDDT), Interstate: Urban Total
2230060231	Light Duty Diesel Trucks (LDDT), Interstate: Urban Time 1
2230060232	Light Duty Diesel Trucks (LDDT), Interstate: Urban Time 2
2230060233	Light Duty Diesel Trucks (LDDT), Interstate: Urban Time 3
2230060234	Light Duty Diesel Trucks (LDDT), Interstate: Urban Time 4
2230060250	Light Duty Diesel Trucks (LDDT), Other Freeways and Expressways: Urban Total
2230060251	Light Duty Diesel Trucks (LDDT), Other Freeways and Expressways: Urban Time 1
2230060252	Light Duty Diesel Trucks (LDDT), Other Freeways and Expressways: Urban Time 2
2230060253	Light Duty Diesel Trucks (LDDT), Other Freeways and Expressways: Urban Time 3
2230060254	Light Duty Diesel Trucks (LDDT), Other Freeways and Expressways: Urban Time 4
2230060270	Light Duty Diesel Trucks (LDDT), Other Principal Arterial: Urban Total

SCC Code	Description
2230060271	Light Duty Diesel Trucks (LDDT), Other Principal Arterial: Urban Time 1
2230060272	Light Duty Diesel Trucks (LDDT), Other Principal Arterial: Urban Time 2
2230060273	Light Duty Diesel Trucks (LDDT), Other Principal Arterial: Urban Time 3
2230060274	Light Duty Diesel Trucks (LDDT), Other Principal Arterial: Urban Time 4
2230060290	Light Duty Diesel Trucks (LDDT), Minor Arterial: Urban Total
2230060291	Light Duty Diesel Trucks (LDDT), Minor Arterial: Urban Time 1
2230060292	Light Duty Diesel Trucks (LDDT), Minor Arterial: Urban Time 2
2230060293	Light Duty Diesel Trucks (LDDT), Minor Arterial: Urban Time 3
2230060294	Light Duty Diesel Trucks (LDDT), Minor Arterial: Urban Time 4
2230060310	Light Duty Diesel Trucks (LDDT), Collector: Urban Total
2230060311	Light Duty Diesel Trucks (LDDT), Collector: Urban Time 1
2230060312	Light Duty Diesel Trucks (LDDT), Collector: Urban Time 2
2230060313	Light Duty Diesel Trucks (LDDT), Collector: Urban Time 3
2230060314	Light Duty Diesel Trucks (LDDT), Collector: Urban Time 4
2230060330	Light Duty Diesel Trucks (LDDT), Local: Urban Total
2230060331	Light Duty Diesel Trucks (LDDT), Local: Urban Time 1
2230060332	Light Duty Diesel Trucks (LDDT), Local: Urban Time 2
2230060333	Light Duty Diesel Trucks (LDDT), Local: Urban Time 3
2230060334	Light Duty Diesel Trucks (LDDT), Local: Urban Time 4
2230070000	Heavy Duty Diesel Vehicles (HDDV), Total: All Road Types
2230070110	Heavy Duty Diesel Vehicles (HDDV), Interstate: Rural Total
2230070111	Heavy Duty Diesel Vehicles (HDDV), Interstate: Rural Time 1
2230070112	Heavy Duty Diesel Vehicles (HDDV), Interstate: Rural Time 2
2230070113	Heavy Duty Diesel Vehicles (HDDV), Interstate: Rural Time 3
2230070114	Heavy Duty Diesel Vehicles (HDDV), Interstate: Rural Time 4
2230070130	Heavy Duty Diesel Vehicles (HDDV), Other Principal Arterial: Rural Total
2230070131	Heavy Duty Diesel Vehicles (HDDV), Other Principal Arterial: Rural Time 1
2230070132	Heavy Duty Diesel Vehicles (HDDV), Other Principal Arterial: Rural Time 2
2230070133	Heavy Duty Diesel Vehicles (HDDV), Other Principal Arterial: Rural Time 3
2230070134	Heavy Duty Diesel Vehicles (HDDV), Other Principal Arterial: Rural Time 4
2230070150	Heavy Duty Diesel Vehicles (HDDV), Minor Arterial: Rural Total
2230070151	Heavy Duty Diesel Vehicles (HDDV), Minor Arterial: Rural Time 1
2230070152	Heavy Duty Diesel Vehicles (HDDV), Minor Arterial: Rural Time 2
2230070153	Heavy Duty Diesel Vehicles (HDDV), Minor Arterial: Rural Time 3
2230070154	Heavy Duty Diesel Vehicles (HDDV), Minor Arterial: Rural Time 4
2230070170	Heavy Duty Diesel Vehicles (HDDV), Major Collector: Rural Total
2230070171	Heavy Duty Diesel Vehicles (HDDV), Major Collector: Rural Time 1
2230070172	Heavy Duty Diesel Vehicles (HDDV), Major Collector: Rural Time 2
2230070173	Heavy Duty Diesel Vehicles (HDDV), Major Collector: Rural Time 3
2230070174	Heavy Duty Diesel Vehicles (HDDV), Major Collector: Rural Time 4
2230070190	Heavy Duty Diesel Vehicles (HDDV), Minor Collector: Rural Total
2230070191	Heavy Duty Diesel Vehicles (HDDV), Minor Collector: Rural Time 1
2230070192	Heavy Duty Diesel Vehicles (HDDV), Minor Collector: Rural Time 2
2230070193	Heavy Duty Diesel Vehicles (HDDV), Minor Collector: Rural Time 3
2230070194	Heavy Duty Diesel Vehicles (HDDV), Minor Collector: Rural Time 4
2230070210	Heavy Duty Diesel Vehicles (HDDV), Local: Rural Total
2230070211	Heavy Duty Diesel Vehicles (HDDV), Local: Rural Time 1
2230070212	Heavy Duty Diesel Vehicles (HDDV), Local: Rural Time 2
2230070213	Heavy Duty Diesel Vehicles (HDDV), Local: Rural Time 3
2230070214	Heavy Duty Diesel Vehicles (HDDV), Local: Rural Time 4
2230070230	Heavy Duty Diesel Vehicles (HDDV), Interstate: Urban Total
2230070231	Heavy Duty Diesel Vehicles (HDDV), Interstate: Urban Time 1
2230070232	Heavy Duty Diesel Vehicles (HDDV), Interstate: Urban Time 2

SCC Code	Description
2230070233	Heavy Duty Diesel Vehicles (HDDV), Interstate: Urban Time 3
2230070234	Heavy Duty Diesel Vehicles (HDDV), Interstate: Urban Time 4
2230070250	Heavy Duty Diesel Vehicles (HDDV), Other Freeways and Expressways: Urban Total
2230070251	Heavy Duty Diesel Vehicles (HDDV), Other Freeways and Expressways: Urban Time 1
2230070252	Heavy Duty Diesel Vehicles (HDDV), Other Freeways and Expressways: Urban Time 2
2230070253	Heavy Duty Diesel Vehicles (HDDV), Other Freeways and Expressways: Urban Time 3
2230070254	Heavy Duty Diesel Vehicles (HDDV), Other Freeways and Expressways: Urban Time 4
2230070270	Heavy Duty Diesel Vehicles (HDDV), Other Principal Arterial: Urban Total
2230070271	Heavy Duty Diesel Vehicles (HDDV), Other Principal Arterial: Urban Time 1
2230070272	Heavy Duty Diesel Vehicles (HDDV), Other Principal Arterial: Urban Time 2
2230070273	Heavy Duty Diesel Vehicles (HDDV), Other Principal Arterial: Urban Time 3
2230070274	Heavy Duty Diesel Vehicles (HDDV), Other Principal Arterial: Urban Time 4
2230070290	Heavy Duty Diesel Vehicles (HDDV), Minor Arterial: Urban Total
2230070291	Heavy Duty Diesel Vehicles (HDDV), Minor Arterial: Urban Time 1
2230070292	Heavy Duty Diesel Vehicles (HDDV), Minor Arterial: Urban Time 2
2230070293	Heavy Duty Diesel Vehicles (HDDV), Minor Arterial: Urban Time 3
2230070294	Heavy Duty Diesel Vehicles (HDDV), Minor Arterial: Urban Time 4
2230070310	Heavy Duty Diesel Vehicles (HDDV), Collector: Urban Total
2230070311	Heavy Duty Diesel Vehicles (HDDV), Collector: Urban Time 1
2230070312	Heavy Duty Diesel Vehicles (HDDV), Collector: Urban Time 2
2230070313	Heavy Duty Diesel Vehicles (HDDV), Collector: Urban Time 3
2230070314	Heavy Duty Diesel Vehicles (HDDV), Collector: Urban Time 4
2230070330	Heavy Duty Diesel Vehicles (HDDV), Local: Urban Total
2230070331	Heavy Duty Diesel Vehicles (HDDV), Local: Urban Time 1
2230070332	Heavy Duty Diesel Vehicles (HDDV), Local: Urban Time 2
2230070333	Heavy Duty Diesel Vehicles (HDDV), Local: Urban Time 3
2230070334	Heavy Duty Diesel Vehicles (HDDV), Local: Urban Time 4
2260000000	All Off-highway Vehicle: Gasoline, 2-Stroke, Total
2260001000	Gasoline, 2-Stroke, Recreational Vehicles, Total
2260001010	Gasoline, 2-Stroke, Recreational Vehicles, Motorcycles: Off-Road
2260001020	Gasoline, 2-Stroke, Recreational Vehicles, Snowmobiles
2260001030	Gasoline, 2-Stroke, Recreational Vehicles, All Terrain Vehicles
2260001040	Gasoline, 2-Stroke, Recreational Vehicles, Minibikes
2260001050	Gasoline, 2-Stroke, Recreational Vehicles, Golf Carts
2260001060	Gasoline, 2-Stroke, Recreational Vehicles, Speciality Vehicle Carts
2260002000	Gasoline, 2-Stroke, Construction Equipment, Total
2260002003	Gasoline, 2-Stroke, Construction Equipment, Asphalt Pavers
2260002006	Gasoline, 2-Stroke, Construction Equipment, Tampers/Rammers
2260002009	Gasoline, 2-Stroke, Construction Equipment, Plate Compactors
2260002012	Gasoline, 2-Stroke, Construction Equipment, Concrete Pavers
2260002015	Gasoline, 2-Stroke, Construction Equipment, Rollers
2260002018	Gasoline, 2-Stroke, Construction Equipment, Scrapers
2260002021	Gasoline, 2-Stroke, Construction Equipment, Paving Equipment
2260002024	Gasoline, 2-Stroke, Construction Equipment, Surfacing Equipment
2260002027	Gasoline, 2-Stroke, Construction Equipment, Signal Boards
2260002030	Gasoline, 2-Stroke, Construction Equipment, Trenchers
2260002033	Gasoline, 2-Stroke, Construction Equipment, Bore/Drill Rigs
2260002036	Gasoline, 2-Stroke, Construction Equipment, Excavators
2260002039	Gasoline, 2-Stroke, Construction Equipment, Concrete/Industrial Saws
2260002042	Gasoline, 2-Stroke, Construction Equipment, Cement and Mortar Mixers
2260002045	Gasoline, 2-Stroke, Construction Equipment, Cranes
2260002048	Gasoline, 2-Stroke, Construction Equipment, Graders
2260002051	Gasoline, 2-Stroke, Construction Equipment, Off-highway Trucks

SCC Code	Description
2260002054	Gasoline, 2-Stroke, Construction Equipment, Crushing/Processing Equipment
2260002057	Gasoline, 2-Stroke, Construction Equipment, Rough Terrain Forklifts
2260002060	Gasoline, 2-Stroke, Construction Equipment, Rubber Tire Loaders
2260002063	Gasoline, 2-Stroke, Construction Equipment, Rubber Tire Dozers
2260002066	Gasoline, 2-Stroke, Construction Equipment, Tractors/Loaders/Backhoes
2260002069	Gasoline, 2-Stroke, Construction Equipment, Crawler Tractors
2260002072	Gasoline, 2-Stroke, Construction Equipment, Skid Steer Loaders
2260002075	Gasoline, 2-Stroke, Construction Equipment, Off-Highway Tractors
2260002078	Gasoline, 2-Stroke, Construction Equipment, Dumpers/Tenders
2260002081	Gasoline, 2-Stroke, Construction Equipment, Other Construction Equipment
2260003000	Gasoline, 2-Stroke, Industrial Equipment, Total
2260003010	Gasoline, 2-Stroke, Industrial Equipment, Aerial Lifts
2260003020	Gasoline, 2-Stroke, Industrial Equipment, Forklifts
2260003030	Gasoline, 2-Stroke, Industrial Equipment, Sweepers/Scrubbers
2260003040	Gasoline, 2-Stroke, Industrial Equipment, Other General Industrial Equipment
2260003050	Gasoline, 2-Stroke, Industrial Equipment, Other Material Handling Equipment
2260004000	Gasoline, 2-Stroke, Lawn and Garden Equipment, Total
2260004010	Gasoline, 2-Stroke, Lawn and Garden Equipment, Lawn mowers
2260004015	Gasoline, 2-Stroke, Lawn and Garden Equipment, Rotary Tillers < 5 HP
2260004020	Gasoline, 2-Stroke, Lawn and Garden Equipment, Chain Saws < 4 HP
2260004025	Gasoline, 2-Stroke, Lawn and Garden Equipment, Trimmers/Edgers/Brush Cutters
2260004030	Gasoline, 2-Stroke, Lawn and Garden Equipment, Leafblowers/Vacuums
2260004035	Gasoline, 2-Stroke, Lawn and Garden Equipment, Snowblowers
2260004040	Gasoline, 2-Stroke, Lawn and Garden Equipment, Rear Engine Riding Mowers
2260004045	Gasoline, 2-Stroke, Lawn and Garden Equipment, Front Mowers
2260004050	Gasoline, 2-Stroke, Lawn and Garden Equipment, Shredders < 5 HP
2260004055	Gasoline, 2-Stroke, Lawn and Garden Equipment, Lawn and Garden Tractors
2260004060	Gasoline, 2-Stroke, Lawn and Garden Equipment, Wood Splitters
2260004065	Gasoline, 2-Stroke, Lawn and Garden Equipment, Chippers/Stump Grinders
2260004070	Gasoline, 2-Stroke, Lawn and Garden Equipment, Commercial Turf Equipment
2260004075	Gasoline, 2-Stroke, Lawn and Garden Equipment, Other Lawn and Garden Equipment
2260005000	Gasoline, 2-Stroke, Farm Equipment, Total
2260005010	Gasoline, 2-Stroke, Farm Equipment, 2-Wheel Tractors
2260005015	Gasoline, 2-Stroke, Farm Equipment, Agricultural Tractors
2260005020	Gasoline, 2-Stroke, Farm Equipment, Combines
2260005025	Gasoline, 2-Stroke, Farm Equipment, Balers
2260005030	Gasoline, 2-Stroke, Farm Equipment, Agricultural Mowers
2260005035	Gasoline, 2-Stroke, Farm Equipment, Sprayers
2260005040	Gasoline, 2-Stroke, Farm Equipment, Tillers > 5 HP
2260005045	Gasoline, 2-Stroke, Farm Equipment, Swathers
2260005050	Gasoline, 2-Stroke, Farm Equipment, Hydro-power Units
2260005055	Gasoline, 2-Stroke, Farm Equipment, Other Agricultural Equipment
2260006000	Gasoline, 2-Stroke, Light Commercial, Total
2260006005	Gasoline, 2-Stroke, Light Commercial, Generator Sets < 50 HP
2260006010	Gasoline, 2-Stroke, Light Commercial, Pumps < 50 HP
2260006015	Gasoline, 2-Stroke, Light Commercial, Air Compressors < 50 HP
2260006020	Gasoline, 2-Stroke, Light Commercial, Gas Compressors < 50 HP
2260006025	Gasoline, 2-Stroke, Light Commercial, Welders < 50 HP
2260006030	Gasoline, 2-Stroke, Light Commercial, Pressure Washers < 50 HP
2260007000	Gasoline, 2-Stroke, Logging Equipment, Total
2260007005	Gasoline, 2-Stroke, Logging Equipment, Chain Saws > 4 HP
2260007010	Gasoline, 2-Stroke, Logging Equipment, Shredders > 5 HP
2260007015	Gasoline, 2-Stroke, Logging Equipment, Skidders

SCC Code	Description
2260007020	Gasoline, 2-Stroke, Logging Equipment, Fellers/Bunchers
2260008000	Gasoline, 2-Stroke, Airport Service Equipment, Total
2260008005	Gasoline, 2-Stroke, Airport Service Equipment, Airport Support Equipment
2260008010	Gasoline, 2-Stroke, Airport Service Equipment, Terminal Tractors
2265000000	All Off-highway Vehicle: Gasoline, 4-Stroke, Total
2265001000	Gasoline, 4-Stroke, Recreational Vehicles, Total
2265001010	Gasoline, 4-Stroke, Recreational Vehicles, Motorcycles: Off-Road
2265001020	Gasoline, 4-Stroke, Recreational Vehicles, Snowmobiles
2265001030	Gasoline, 4-Stroke, Recreational Vehicles, All Terrain Vehicles
2265001040	Gasoline, 4-Stroke, Recreational Vehicles, Minibikes
2265001050	Gasoline, 4-Stroke, Recreational Vehicles, Golf Carts
2265001060	Gasoline, 4-Stroke, Recreational Vehicles, Speciality Vehicle Carts
2265002000	Gasoline, 4-Stroke, Construction Equipment, Total
2265002003	Gasoline, 4-Stroke, Construction Equipment, Asphalt Pavers
2265002006	Gasoline, 4-Stroke, Construction Equipment, Tampers/Rammers
2265002009	Gasoline, 4-Stroke, Construction Equipment, Plate Compactors
2265002012	Gasoline, 4-Stroke, Construction Equipment, Concrete Pavers
2265002015	Gasoline, 4-Stroke, Construction Equipment, Rollers
2265002018	Gasoline, 4-Stroke, Construction Equipment, Scrapers
2265002021	Gasoline, 4-Stroke, Construction Equipment, Paving Equipment
2265002024	Gasoline, 4-Stroke, Construction Equipment, Surfacing Equipment
2265002027	Gasoline, 4-Stroke, Construction Equipment, Signal Boards
2265002030	Gasoline, 4-Stroke, Construction Equipment, Trenchers
2265002033	Gasoline, 4-Stroke, Construction Equipment, Bore/Drill Rigs
2265002036	Gasoline, 4-Stroke, Construction Equipment, Excavators
2265002039	Gasoline, 4-Stroke, Construction Equipment, Concrete/Industrial Saws
2265002042	Gasoline, 4-Stroke, Construction Equipment, Cement and Mortar Mixers
2265002045	Gasoline, 4-Stroke, Construction Equipment, Cranes
2265002048	Gasoline, 4-Stroke, Construction Equipment, Graders
2265002051	Gasoline, 4-Stroke, Construction Equipment, Off-highway Trucks
2265002054	Gasoline, 4-Stroke, Construction Equipment, Crushing/Processing Equipment
2265002057	Gasoline, 4-Stroke, Construction Equipment, Rough Terrain Forklifts
2265002060	Gasoline, 4-Stroke, Construction Equipment, Rubber Tire Loaders
2265002063	Gasoline, 4-Stroke, Construction Equipment, Rubber Tire Dozers
2265002066	Gasoline, 4-Stroke, Construction Equipment, Tractors/Loaders/Backhoes
2265002069	Gasoline, 4-Stroke, Construction Equipment, Crawler Tractors
2265002072	Gasoline, 4-Stroke, Construction Equipment, Skid Steer Loaders
2265002075	Gasoline, 4-Stroke, Construction Equipment, Off-Highway Tractors
2265002078	Gasoline, 4-Stroke, Construction Equipment, Dumpers/Tenders
2265002081	Gasoline, 4-Stroke, Construction Equipment, Other Construction Equipment
2265003000	Gasoline, 4-Stroke, Industrial Equipment, Total
2265003010	Gasoline, 4-Stroke, Industrial Equipment, Aerial Lifts
2265003020	Gasoline, 4-Stroke, Industrial Equipment, Forklifts
2265003030	Gasoline, 4-Stroke, Industrial Equipment, Sweepers/Scrubbers
2265003040	Gasoline, 4-Stroke, Industrial Equipment, Other General Industrial Equipment
2265003050	Gasoline, 4-Stroke, Industrial Equipment, Other Material Handling Equipment
2265004000	Gasoline, 4-Stroke, Lawn and Garden Equipment, Total
2265004010	Gasoline, 4-Stroke, Lawn and Garden Equipment, Lawn mowers
2265004015	Gasoline, 4-Stroke, Lawn and Garden Equipment, Rotary Tillers < 5 HP
2265004020	Gasoline, 4-Stroke, Lawn and Garden Equipment, Chain Saws < 4 HP
2265004025	Gasoline, 4-Stroke, Lawn and Garden Equipment, Trimmers/Edgers/Brush Cutters
2265004030	Gasoline, 4-Stroke, Lawn and Garden Equipment, Leafblowers/Vacuums
2265004035	Gasoline, 4-Stroke, Lawn and Garden Equipment, Snowblowers

SCC Code	Description
2265004040	Gasoline, 4-Stroke, Lawn and Garden Equipment, Rear Engine Riding Mowers
2265004045	Gasoline, 4-Stroke, Lawn and Garden Equipment, Front Mowers
2265004050	Gasoline, 4-Stroke, Lawn and Garden Equipment, Shredders < 5 HP
2265004055	Gasoline, 4-Stroke, Lawn and Garden Equipment, Lawn and Garden Tractors
2265004060	Gasoline, 4-Stroke, Lawn and Garden Equipment, Wood Splitters
2265004065	Gasoline, 4-Stroke, Lawn and Garden Equipment, Chippers/Stump Grinders
2265004070	Gasoline, 4-Stroke, Lawn and Garden Equipment, Commercial Turf Equipment
2265004075	Gasoline, 4-Stroke, Lawn and Garden Equipment, Other Lawn and Garden Equipment
2265005000	Gasoline, 4-Stroke, Farm Equipment, Total
2265005010	Gasoline, 4-Stroke, Farm Equipment, 2-Wheel Tractors
2265005015	Gasoline, 4-Stroke, Farm Equipment, Agricultural Tractors
2265005020	Gasoline, 4-Stroke, Farm Equipment, Combines
2265005025	Gasoline, 4-Stroke, Farm Equipment, Balers
2265005030	Gasoline, 4-Stroke, Farm Equipment, Agricultural Mowers
2265005035	Gasoline, 4-Stroke, Farm Equipment, Sprayers
2265005040	Gasoline, 4-Stroke, Farm Equipment, Tillers > 5 HP
2265005045	Gasoline, 4-Stroke, Farm Equipment, Swathers
2265005050	Gasoline, 4-Stroke, Farm Equipment, Hydro-power Units
2265005055	Gasoline, 4-Stroke, Farm Equipment, Other Agricultural Equipment
2265006000	Gasoline, 4-Stroke, Light Commercial, Total
2265006005	Gasoline, 4-Stroke, Light Commercial, Generator Sets < 50 HP
2265006010	Gasoline, 4-Stroke, Light Commercial, Pumps < 50 HP
2265006015	Gasoline, 4-Stroke, Light Commercial, Air Compressors < 50 HP
2265006020	Gasoline, 4-Stroke, Light Commercial, Gas Compressors < 50 HP
2265006025	Gasoline, 4-Stroke, Light Commercial, Welders < 50 HP
2265006030	Gasoline, 4-Stroke, Light Commercial, Pressure Washers < 50 HP
2265007000	Gasoline, 4-Stroke, Logging Equipment, Total
2265007005	Gasoline, 4-Stroke, Logging Equipment, Chain Saws > 4 HP
2265007010	Gasoline, 4-Stroke, Logging Equipment, Shredders > 5 HP
2265007015	Gasoline, 4-Stroke, Logging Equipment, Skidders
2265007020	Gasoline, 4-Stroke, Logging Equipment, Fellers/Bunchers
2265008000	Gasoline, 4-Stroke, Airport Service Equipment, Total
2265008005	Gasoline, 4-Stroke, Airport Service Equipment, Airport Support Equipment
2265008010	Gasoline, 4-Stroke, Airport Service Equipment, Terminal Tractors
2270000000	All Off-Highway Vehicle: Diesel, Total
2270001000	Diesel, Recreational Vehicles, Total
2270001010	Diesel, Recreational Vehicles, Motorcycles: Off-Road
2270001020	Diesel, Recreational Vehicles, Snowmobiles
2270001030	Diesel, Recreational Vehicles, All Terrain Vehicles
2270001040	Diesel, Recreational Vehicles, Minibikes
2270001050	Diesel, Recreational Vehicles, Golf Carts
2270001060	Diesel, Recreational Vehicles, Speciality Vehicle Carts
2270002000	Diesel, Construction Equipment, Total
2270002003	Diesel, Construction Equipment, Asphalt Pavers
2270002006	Diesel, Construction Equipment, Tampers/Rammers
2270002009	Diesel, Construction Equipment, Plate Compactors
2270002012	Diesel, Construction Equipment, Concrete Pavers
2270002015	Diesel, Construction Equipment, Rollers
2270002018	Diesel, Construction Equipment, Scrapers
2270002021	Diesel, Construction Equipment, Paving Equipment
2270002024	Diesel, Construction Equipment, Surfacing Equipment
2270002027	Diesel, Construction Equipment, Signal Boards
2270002030	Diesel, Construction Equipment, Trenchers

SCC Code	Description
2270002033	Diesel, Construction Equipment, Bore/Drill Rigs
2270002036	Diesel, Construction Equipment, Excavators
2270002039	Diesel, Construction Equipment, Concrete/Industrial Saws
2270002042	Diesel, Construction Equipment, Cement and Mortar Mixers
2270002045	Diesel, Construction Equipment, Cranes
2270002048	Diesel, Construction Equipment, Graders
2270002051	Diesel, Construction Equipment, Off-highway Trucks
2270002054	Diesel, Construction Equipment, Crushing/Processing Equipment
2270002057	Diesel, Construction Equipment, Rough Terrain Forklifts
2270002060	Diesel, Construction Equipment, Rubber Tire Loaders
2270002063	Diesel, Construction Equipment, Rubber Tire Dozers
2270002066	Diesel, Construction Equipment, Tractors/Loaders/Backhoes
2270002069	Diesel, Construction Equipment, Crawler Tractors
2270002072	Diesel, Construction Equipment, Skid Steer Loaders
2270002075	Diesel, Construction Equipment, Off-Highway Tractors
2270002078	Diesel, Construction Equipment, Dumpers/Tenders
2270002081	Diesel, Construction Equipment, Other Construction Equipment
2270003000	Diesel, Industrial Equipment, Total
2270003010	Diesel, Industrial Equipment, Aerial Lifts
2270003020	Diesel, Industrial Equipment, Forklifts
2270003030	Diesel, Industrial Equipment, Sweepers/Scrubbers
2270003040	Diesel, Industrial Equipment, Other General Industrial Equipment
2270003050	Diesel, Industrial Equipment, Other Material Handling Equipment
2270004000	Diesel, Lawn and Garden Equipment, Total
2270004010	Diesel, Lawn and Garden Equipment, Lawn mowers
2270004015	Diesel, Lawn and Garden Equipment, Rotary Tillers < 5 HP
2270004020	Diesel, Lawn and Garden Equipment, Chain Saws < 4 HP
2270004025	Diesel, Lawn and Garden Equipment, Trimmers/Edgers/Brush Cutters
2270004030	Diesel, Lawn and Garden Equipment, Leafblowers/Vacuums
2270004035	Diesel, Lawn and Garden Equipment, Snowblowers
2270004040	Diesel, Lawn and Garden Equipment, Rear Engine Riding Mowers
2270004045	Diesel, Lawn and Garden Equipment, Front Mowers
2270004050	Diesel, Lawn and Garden Equipment, Shredders < 5 HP
2270004055	Diesel, Lawn and Garden Equipment, Lawn and Garden Tractors
2270004060	Diesel, Lawn and Garden Equipment, Wood Splitters
2270004065	Diesel, Lawn and Garden Equipment, Chippers/Stump Grinders
2270004070	Diesel, Lawn and Garden Equipment, Commercial Turf Equipment
2270004075	Diesel, Lawn and Garden Equipment, Other Lawn and Garden Equipment
2270005000	Diesel, Farm Equipment, Total
2270005010	Diesel, Farm Equipment, 2-Wheel Tractors
2270005015	Diesel, Farm Equipment, Agricultural Tractors
2270005020	Diesel, Farm Equipment, Combines
2270005025	Diesel, Farm Equipment, Balers
2270005030	Diesel, Farm Equipment, Agricultural Mowers
2270005035	Diesel, Farm Equipment, Sprayers
2270005040	Diesel, Farm Equipment, Tillers > 5 HP
2270005045	Diesel, Farm Equipment, Swathers
2270005050	Diesel, Farm Equipment, Hydro-power Units
2270005055	Diesel, Farm Equipment, Other Agricultural Equipment
2270006000	Diesel, Light Commercial, Total
2270006005	Diesel, Light Commercial, Generator Sets < 50 HP
2270006010	Diesel, Light Commercial, Pumps < 50 HP
2270006015	Diesel, Light Commercial, Air Compressors < 50 HP

SCC Code	Description
2270006020	Diesel, Light Commercial, Gas Compressors < 50 HP
2270006025	Diesel, Light Commercial, Welders < 50 HP
2270006030	Diesel, Light Commercial, Pressure Washers < 50 HP
2270007000	Diesel, Logging Equipment, Total
2270007005	Diesel, Logging Equipment, Chain Saws > 4 HP
2270007010	Diesel, Logging Equipment, Shredders > 5 HP
2270007015	Diesel, Logging Equipment, Skidders
2270007020	Diesel, Logging Equipment, Fellers/Bunchers
2270008000	Diesel, Airport Service Equipment, Total
2270008005	Diesel, Airport Service Equipment, Airport Support Equipment
2270008010	Diesel, Airport Service Equipment, Terminal Tractors
2275000000	All Aircraft Types and Operations, Total
2275001000	Military Aircraft, Total
2275020000	Commercial Aircraft, Total: All Types
2275050000	General Aviation, Total
2275060000	Air Taxi, Total
2275070000	Aircraft Auxiliary Power Units, Total
2275085000	Unpaved Airstrips, Total
2275900000	Aircraft, Refueling: All Fuels, All Processes
2275900101	Aircraft, Refueling: All Fuels, Displacement Loss/Uncontrolled
2275900102	Aircraft, Refueling: All Fuels, Displacement Loss/Controlled
2275900103	Aircraft, Refueling: All Fuels, Spillage
2275900201	Aircraft, Refueling: All Fuels, Underground Tank: Total
2275900202	Aircraft, Refueling: All Fuels, Underground Tank: Breathing and Emptying
2280001000	Coal, Total, All Vessel Types
2280001010	Coal, Ocean-Going Vessels
2280001020	Coal, Harbor Vessels
2280001030	Coal, Fishing Vessels
2280001040	Coal, Military Vessels
2280002000	Diesel, Total, All Vessel Types
2280002010	Diesel, Ocean-Going Vessels
2280002020	Diesel, Harbor Vessels
2280002030	Diesel, Fishing Vessels
2280002040	Diesel, Military Vessels
2280003000	Residual, Total, All Vessel Types
2280003010	Residual, Ocean-Going Vessels
2280003020	Residual, Harbor Vessels
2280003030	Residual, Fishing Vessels
2280003040	Residual, Military Vessels
2280004000	Gasoline, Total, All Vessel Types
2280004010	Gasoline, Ocean-Going Vessels
2280004020	Gasoline, Harbor Vessels
2280004030	Gasoline, Fishing Vessels
2280004040	Gasoline, Military Vessels
2282005000	Pleasure Craft, Gasoline 2-Stroke, Total
2282005005	Pleasure Craft, Gasoline 2-Stroke, Inboards
2282005010	Pleasure Craft, Gasoline 2-Stroke, Outboards
2282005015	Pleasure Craft, Gasoline 2-Stroke, Sterndrive
2282005020	Pleasure Craft, Gasoline 2-Stroke, Sailboat Auxiliary Inboard
2282005025	Pleasure Craft, Gasoline 2-Stroke, Sailboat Auxiliary Outboard
2282010000	Pleasure Craft, Gasoline 4-Stroke, Total
2282010005	Pleasure Craft, Gasoline 4-Stroke, Inboards
2282010010	Pleasure Craft, Gasoline 4-Stroke, Outboards

SCC Code	Description
2282010015	Pleasure Craft, Gasoline 4-Stroke, Sterndrive
2282010020	Pleasure Craft, Gasoline 4-Stroke, Sailboat Auxiliary Inboard
2282010025	Pleasure Craft, Gasoline 4-Stroke, Sailboat Auxiliary Outboard
2282020000	Pleasure Craft, Diesel, Total
2282020005	Pleasure Craft, Diesel, Inboards
2282020010	Pleasure Craft, Diesel, Outboards
2282020015	Pleasure Craft, Diesel, Sterndrive
2282020020	Pleasure Craft, Diesel, Sailboat Auxiliary Inboard
2282020025	Pleasure Craft, Diesel, Sailboat Auxiliary Outboard
2285002000	Diesel, Total
2285002005	Diesel, Line Haul Locomotives
2285002010	Diesel, Yard Locomotives
2294000000	All Paved Roads, Total: Fugitives
2294000001	All Paved Roads, Total: Average Conditions - Fugitives
2294000002	All Paved Roads, Total: Sanding/Salting - Fugitives
2294005000	Interstate/Arterial, Total: Fugitives
2294005001	Interstate/Arterial, Total: Average Conditions - Fugitives
2294005002	Interstate/Arterial, Total: Sanding/Salting - Fugitives
2294010000	All Other Public Paved Roads, Total: Fugitives
2294010001	All Other Public Paved Roads, Total: Average Conditions - Fugitives
2294010002	All Other Public Paved Roads, Total: Sanding/Salting - Fugitives
2294015000	Industrial Roads, Total: Fugitives
2294015001	Industrial Roads, Total: Average Conditions - Fugitives
2294015002	Industrial Roads, Total: Sanding/Salting - Fugitives
2296000000	All Unpaved Roads, Total: Fugitives
2296005000	Public Unpaved Roads, Total: Fugitives
2296010000	Industrial Unpaved Roads, Total: Fugitives

Appendix L

Table L-1: Carcinogenicity Ratings for Target Compounds Included in the Regional Toxic Air Emissions Inventory Based on the U.S. EPA's Integrated Risk Information System (IRIS) Database

Pollutant Name	CAS No.	Key for U.S. EPA IRIS Ratings
Non-Metal Compounds (Excluding PAHs)		
Actetaldehyde	75-07-0	B2
Acrolein	107-02-8	C
Acrylamide	79-06-1	B2
Acrylonitrile	107-13-1	B1
Atrazine	1912-24-9	Under Review
Benzene (including benzene from gasoline)	71-43-2	A
1,3-Butadiene	106-99-0	B2
Carbon Tetrachloride	56-23-5	B2
Chlordane	57-74-9	B2
Chloroform	67-66-3	B2
Coke Oven Emissions	8007-45-2	A
Dibutyl Phthalate	84-74-2	D
Dioctyl Phthalate	117-84-0	Under Review
Dichloroethyl ether	111-44-4	B2
Diethylhexyl Phthalate	117-81-7	B2
Ethylbenzene	100-41-4	D
Ethylene dibromide	106-93-4	B2
1,2-Dichloroethane	107-06-2	B2
Ethylene oxide	75-21-8	
Formaldehyde	50-00-0	B1
Glycol ethers		
Heptachlor	76-44-8	B2
Hexachlorobenzene	118-74-1	C
Hexachlorobutadiene	87-68-3	C
Hexachloroethane	67-72-1	C
Hydrazine	302-01-2	B2
Methoxychlor	72-43-5	D
1,1,1-Trichloroethane	71-55-6	D
Methylene Chloride	75-09-2	B2
Methylene diphenyl diisocyanate	101-68-8	D
Parathion	56-38-2	C
Pentachloronitrobenzene	82-68-8	Under Review
Pentachlorophenol (PCP)	87-86-5	B2
Phenol	108-95-2	D
Phosgene	75-44-5	Under Review
Styrene	100-42-5	Under Review
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	B**
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	B**
Tetrachloroethylene	127-18-4	Under Review
Toluene	108-88-3	D
2,4-toluene diisocyanate	26471-62-5	Under Review
Polychlorinated Biphenyls (PCBs)	1336-36-3	B2
Polychlorinated Dibenzodioxins, Total		B**
Polychlorinated Dibenzofurans, Total		B**
Trichloroethylene	79-01-6	In Preparation
2,4,5-Trichlorophenol	95-95-4	To Be Reviewed

2,4,6-Trichlorophenol	88-06-2	B2
Trifluralin	1582-09-8	C
PAH (EPA's 16 PAH approach)		
Acenapthene	83-32-9	Under Review
Acenaphthylene	208-96-8	D
Anthracene	120-12-7	D
Benz(a)anthracene	56-55-3	B2
Benzo(a)pyrene	50-32-8	B2
Benzo(b)fluoranthene	205-99-2	B2
Benzo(ghi)perylene	191-24-2	D
Benzo(k)fluoranthene	207-08-9	B2
Chrysene	218-01-9	B2
Dibenz(a,h)anthracene	53-70-3	B2
Fluoranthene	206-44-0	D
Fluorene	86-73-7	D
Indeno(1,2,3-cd)pyrene	193-39-5	B2
Naphthalene	91-20-3	D
Phenanthrene	85-01-8	D
Pyrene	129-00-0	D
Metal Compounds		
Antimony	7440-36-0	
Arsenic	7440-38-2	A
Beryllium	7440-41-7	B1
Cadmium	7440-43-9	B1
Chromium	7440-47-3	Under Review
Chromium (VI)	18540-29-9	A
Cobalt	7440-48-4	D
Copper	7440-50-8	D
Lead	7439-92-1	B2
Alkylated Lead Compounds		B2
Manganese	7439-96-5	D
Mercury	7439-97-6	Elem. = D, (HgC12 = C)
Nickel	7440-02-0	Ni carbonyl = B2 Ni cyanide = Under Review Ni subsulfied = A (in redining dust) Ni soluble salts = not evaluated

**Not specifically listed or rated in IRIS, but CDD's and CDF's are regarded as likely to present a cancer hazard to humans in the U.S. EPA draft reassessment for 2,3,7,8-TCDD and related compounds.

Key A = human carcinogen
B = probable human carcinogen
B2 = limited human evidence in animals, inadequate evidence in humans
C = possible human carcinogen
D = not classifiable as to human carcinogenicity
E = evidence of non-carcinogenicity for humans

Ratings are from U.S. EPA's Integrated Risk Information System (IRIS) database, containing agency consensus positions on the potential adverse human health effects of approximately 500 substances, updated monthly. The ratings provided above are from August 1998.

Appendix M

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