REPORT

EVALUATION OF PROCESS FUGITIVE EMISSIONS IN THE
MAJOR NON-ATTAINMENT AREAS OF REGION V

VOLUME I

EPA

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PACIFIC ENVIRONMENTAL
SERVICES, INC.

FINAL REPORT

EPA Contract No. 68-01-6319
Task Assignment No. 24

EVALUATION OF PROCESS FUGITIVE EMISSIONS IN THE MAJOR NON-ATTAINMENT AREAS OF REGION V

VOLUME I

Gary Victorine - Task Manager
Douglas Cook - Project Manager
Vinod Bhatia - Principal Investigator

March 1983

Prepared for:

Air Compliance Branch
Air Management Division
U.S. EPA, Region V
230 South Dearborn Street
Chicago, Illinois 60604

Prepared by:

Pacific Environmental Services, Inc.
Midwest Operations Division
465 Fullerton Avenue
Elmhurst, Illinois 60126

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EXECUTIVE SUMMARY

This report is the result of a limited scope study of particulate "process fugitive emissions" from industrial sources located in the major total suspended particulate (TSP) non-attainment areas within the six states of Region V of the United States Environmental Protection Agency (U.S. EPA). For the purpose of this report, an industrial source is defined as a source which has the potential to emit particulate emissions greater than 25 tons per year. In addition, a "major industrial source" is defined as a source that has controlled emissions greater than 50 tons per year.

In this document, "process fugitive emissions" are narrowly defined to include only particulate emissions from industrial operations that escape to the atmosphere without passing through a primary exhaust system (such as a stack or flue) or through an emission control system. This definition can include emissions from manufacturing operations; loading, unloading, and transporting of materials; storage piles; and other industrial processes where particulates escape to the atmosphere, including emissions from those sources which are operated out-of-doors, such as coke pushing operation at coke ovens, rock crushing operation at quarries, and asphalt concrete plants. Process fugitive emissions may also result from poor maintenance of process equipment and from environmentally careless process operations. It does not include dust arising from travel on unpaved roads, wind action on open fields, or agricultural activities.

This study revealed that approximately 184,880 to 337,015 tons per year of potential process fugitive emissions may be generated by operations at major industrial sources located in the counties comprising the major non-attainment areas in the Region V states. These estimated process fugitive emissions are equal to approximately 77 to 141 percent of the total controlled particulate emissions (238,461 tons) from inventoried point sources located in the same area. However, it is estimated that typically 199,664 tons per year of process fugitive emissions (about 84% of point source emissions) are emitted from these same sources. The single largest source of process fugitive emissions (about 18,453 tons or 9.24 percent of the total) is

secondary crushing and screening operations at stone quarry facilities. The five additional processes with the greatest process fugitive emissions in Region V, and their associated emissions, in descending order, are:

2.	Grain Terminal/elevator operations	13,770
3.	Iron production: Iron ore handling and transfer	11,192
4.	Grain process: Grain handling	9,303
5.	Primary aluminum: Material handling	8,326
6.	Lime Manufacturing: Total	8,314

These six types of processes contribute approximately 34.7 percent of the total process fugitive emissions of the region (as described below).

The regional process fugitive emissions total comprises state and non-attainment county subtotals (in tons per year) as follows:

STATE	COUNTY	NON-ATTAINMENT AREA	NON-ATTAINMENT COUNTY SUBTOTAL	NON-ATTAINMENT AREA SUB-TOTALS BY STATE
Illinois:				75,366
	Cook County	Chicago Metropolitan Area	75,366	
Indiana:				18,448
	Marion County	Indianapolis Area	5,291	
	Porter County	Northwestern Indiana	8,823	
	Vigo County	Terre Haute Area	4,334	
Michigan:				29,638
	Wayne County	Detroit Metropolitan Area	29,638	
Minnesota:				33,764
	Dakota County	Minneapolis-St. Paul Metropolitan Area	708	
	Hennepin County		6,623	
	Ramsey County		5,963	
	Washington County		3,435	
	St. Louis County	City of Duluth	17,035	
Ohio:				38,363
	Belmont County	Eastern Portion	229	
	Cuyahoga County	Cleveland Area	1,063	
	Hamilton County	Cincinnati Area	3,128	

	Jefferson County	Eastern Portion (Steubenville Area)	1,736	
	Lake County	Western Portion	1,651	
	Lucas County	Toledo Area	10,356	
	Monroe County	Northeastern Portion	10,640	
Wisconsin:				4,083
	Milwaukee County	City of Milwaukee	4,083	
Total:				199,664

Region V Major Non-Attainment Areas

In addition to the typical proces fugitive emissions tabulated above, an additional study was performed in cooperation with the Minnesota Pollution Control Agency (MPCA) to evaluate the process fugitive emissions from sand and gravel sources located in the Minneapolis-St. Paul metropolitan area. This additional effort wwas necessary because no sand and gravel sources were included in the MPCA point source inventory and thus were not included in the totals above. The results of this study were as follows:

COUNTY	TYPICAL PROCESS FUGITIVE EMISSIONS SAND AND GRAVEL SOURCES (tons/year)
Dakota County	---
Hennepin County	10
Ramsey County	117
Washington County	1,987
Total	2,114

When these results are added to the previously detailed totals, the final results are:

STATE	COUNTY	NON-ATTAINMENT AREA	NON-ATTAINMENT COUNTY SUBTOTAL	NON-ATTAINMENT AREA SUB-TOTALS BY STATE
Minnesota				35,838
	Dakota County		708	
	Hennepin County	Minneapolis - St. Paul	6,633	
	Ramsey County	Metropolitan Area	6,080	
	Washington County		5,422	
	St. Louis County		17,035	
Total:				201,758

Region V Major Non-Attainment Areas

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1.0 INTRODUCTION

1.1 BACKGROUND

The Clean Air Act Amendments of 1977 reaffirmed the commitment that Congress had made toward the goal of reducing nationwide air pollution originally established in the 1970 Clean Air Act (CAA) legislation. The 1977 amendments provided a strong mandate to the regulatory agencies and affected sections of the public to continue the fight to clean up and protect our nation's air resources. The CAA Amendments further reaffirmed the goal of attainment of the National Ambient Air Quality Standards (NAAQS) and the prevention of significant air quality deterioration.

The particulate emission control strategies developed as part of the original State Implementation Plans (SIPs) prepared in response to the Clean Air Act of 1970 (which were revised to meet the goals of the 1977 law) included analyses of the contribution of the conventional industrial point and area sources without much consideration of other less conventional sources of particulate emissions to the atmosphere. Regulations have been traditionally directed primarily at limiting the opacity and mass loading of stack emissions from incinerators, fossil fuel-fired boilers, and major process industries and industrial operations. However, widespread failure to attain the NAAQS for particulate matter in many urban areas has resulted in reexamination of the nature of the particulate problems encountered.

Recent studies indicate that traditional stack-oriented control strategies for particulate matter are sometimes insufficient by themselves to achieve the air quality goals of the Clean Air Act. Thus, federal, state and local air pollution control agencies have begun to examine other possible sources of emissions that have not been taken into prior consideration. One of these sources is "process fugitive emissions" (see Section 1.2 below for definition). Some analyses have indicated that process fugitive emissions may often have a greater effect on air quality in the immediate vicinity of an industrial source than do stack emissions. Stack emissions are released above ground level, generally with a significant upward velocity that aids dispersion and dilution before the emissions reach a ground level receptor.

However, most "process fugitive emissions", by their very nature, occur at or near ground level and remain there, where the potential localized impact on population exposure is likely to be higher.[1]

The associated impacts of "process fugitive emissions" are expected to be a major consideration in the development of future SIPs for those areas which are currently not attaining the NAAQS for particulate matter.

1.2 "PROCESS FUGITIVE EMISSIONS"

There is no universally accepted definition of "process fugitive emissions." Some agency definitions tend to combine process fugitive emissions, which are emissions from industrial operations, with fugitive dust, which is generally related to natural or anthropogenic dusts.

The term "process fugitive emissions", as used in this report, includes particulate emissions from industrial operations that escape to the atmosphere without passing through a primary exhaust system (such as a stack or flue) or through a control system.[2] This includes emissions from manufacturing operations; loading, unloading, and transporting of materials; storage piles; and other industrial processes where particulates escape to the atmosphere, including emissions from those sources which are operated out of doors, such as coke ovens, rock crushing operations at quarries, and sand-blasting operations. Process fugitive emissions may also result from poor maintenance of process equipment and from environmentally careless process operations. For example, process fugitive emissions can result from leakage around coke oven doors when such doors cannot be properly sealed due to excessive warpage.

As distinguished from process fugitive emissions, "fugitive dust" includes natural dust, agricultural dust, and particulate generated from other non-industrial activities (e.g., unpaved roads, commercial construction sites, etc.). Because both process fugitive emissions and fugitive dust are not

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[1] Technical Guidance for Control of Industrial Process Fugitive Particulate Emissions, EPA/450/3-77-010, U.S. EPA, Office of Air Quality and Planning Standards (RTP, North Carolina, March 1977).

[2] F. R. Venditti, J. A. Armstrong, and Mr. Durham, Symposium on the Utilization of Particulate Technology - Volume 4 - Fugitive Dusts and Sampling Analysis, and Characterization of Aerosols, EPA 600/7-79-044d, (February 1979).

emitted from a definable point, they cannot be easily measured by conventional techniques. Therefore, the quantity of emissions and subsequent impacts on air quality are extremely difficult to estimate. Hence, there exists a need for a consistent and traceable emission inventory methodology (see Section 2.0).

This definition of "process fugitive emissions" used in this report is consistent with the general definition utilized by U.S. EPA. For example, U.S. EPA defines "Industrial Process Fugitive Particulate Emissions" as "particulate matter which escapes from a defined process flow stream due to leakage, materials charging/handling, inadequate operational control, lack of reasonably available control technology, transfer or storage."[1]

1.3 TECHNICAL APPROACH

In order to assist the U.S. Environmental Protection Agency, Region V and the individual states within Region V in evaluating the importance and magnitude of process fugitive emissions and the enforceability of regulations in Region V states concerning process fugitive emissions, Pacific Environmental Services, Inc. (PES) was contracted to provide technical expertise and assistance. This study addresses process fugitive emissions from industrial sources in the major non-attainment areas of Region V (as defined by U.S. EPA). The results are expected to be useful to the U.S. EPA, Region V in enforcement prioritization, review of state and local emission inventories, and verification of submittals in future SIP development.

PES established the following eight major sub-tasks in the performance of this project:

1) Identify the status of process fugitive emission inventories in Region V.
2) Obtain state industrial point source emission inventory lists for the non-attainment areas involved.
3) Update the best available process fugitive emission factors via literature review (and add new emission factors as necessary).
4) Screen and "quality assure" the individual state industrial point source emission inventory for the affected sources of interest.

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[1]Venditti, Armstrong, and Durham, op. cit.

5) Quality assure the state and local process fugitive emission inventories (where they exist at the present time).

6) Confirm the affected facilities' process rate(s) by phone or via correspondence.

7) Calculate the industrial process fugitive emissions.

8) Prepare and submit a comprehensive report listing process fugitive emission inventories in Region V, summarized and tabulated in several subcategories.

All data in this report are based on calendar year 1981.

In addition, a more specialized study was performed in cooperation with the Minnesota Pollution Control Agency (MPCA) to evaluate process fugitive emissions from sand and gravel operations in the major non-attainment areas of Minnesota. This was necessary since the MPCA point source inventory used as the basis for the methodology described above did not include sand and gravel sources. The study methodology, implementation and results were described in detail in a report to U.S. EPA and MPCA dated December 10, 1982.

1.4 GEOGRAPHICAL AREAS EVALUATED

The initial definition of the non-attainment areas of concern (and their respective counties) were developed by U.S. EPA and are as follows:

STATE	COUNTY	NON-ATTAINMENT AREA
Illinois:	A. Cook County	Chicago Metropolitan Area
Indiana:	B. Marion County	Indianapolis Area
	C. Porter County	Northwestern Indiana
	D. Vigo County	Terre Haute Area
Michigan:	E. Wayne County	Detroit Metropolitan Area
Minnesota:	F. Dakota County	
	G. Hennepin County	Minneapolis-St. Paul
	H. Ramsey County	Metropolitan Area
	I. Washington County	
	J. St. Louis County	City of Duluth
Ohio:	K. Belmont County	Eastern Portion
	L. Cuyahoga County	Cleveland Metropolitan Area
	M. Hamilton County	Cincinnati Metropolitan Area
	N. Jefferson County	Eastern Portion (Steubenville Area)

	O. Lake County	Western Portion
	P Lucas County	Toledo Metropolitan Area
	Q. Monroe County	Northeastern Portion
Wisconsin:	R Milwaukee County	Milwaukee Metropolitan Area

The total suspended particulate (TSP) non-attainment areas studied for this report are shown in Figures 1-1 through 1-6.

Figure 1-1. Major Non-attainment Areas Studied in State of Illinois

INDIANA

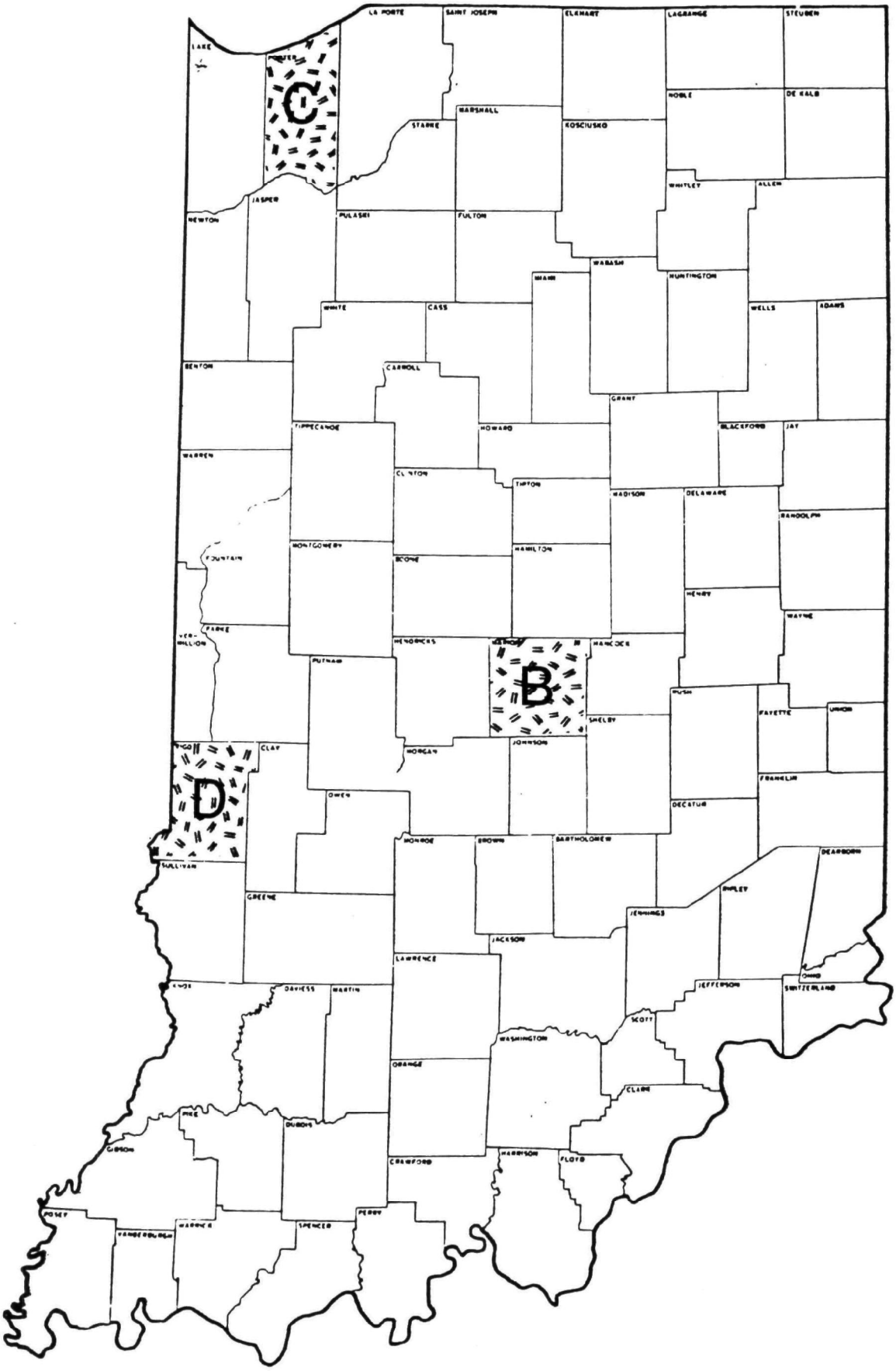

Figure 1-2. Major Non-attainment Areas Studied in State of Indiana

MICHIGAN

Figure 1-3. Major Non-Attainment Areas Studied in State of Michigan

MINNESOTA

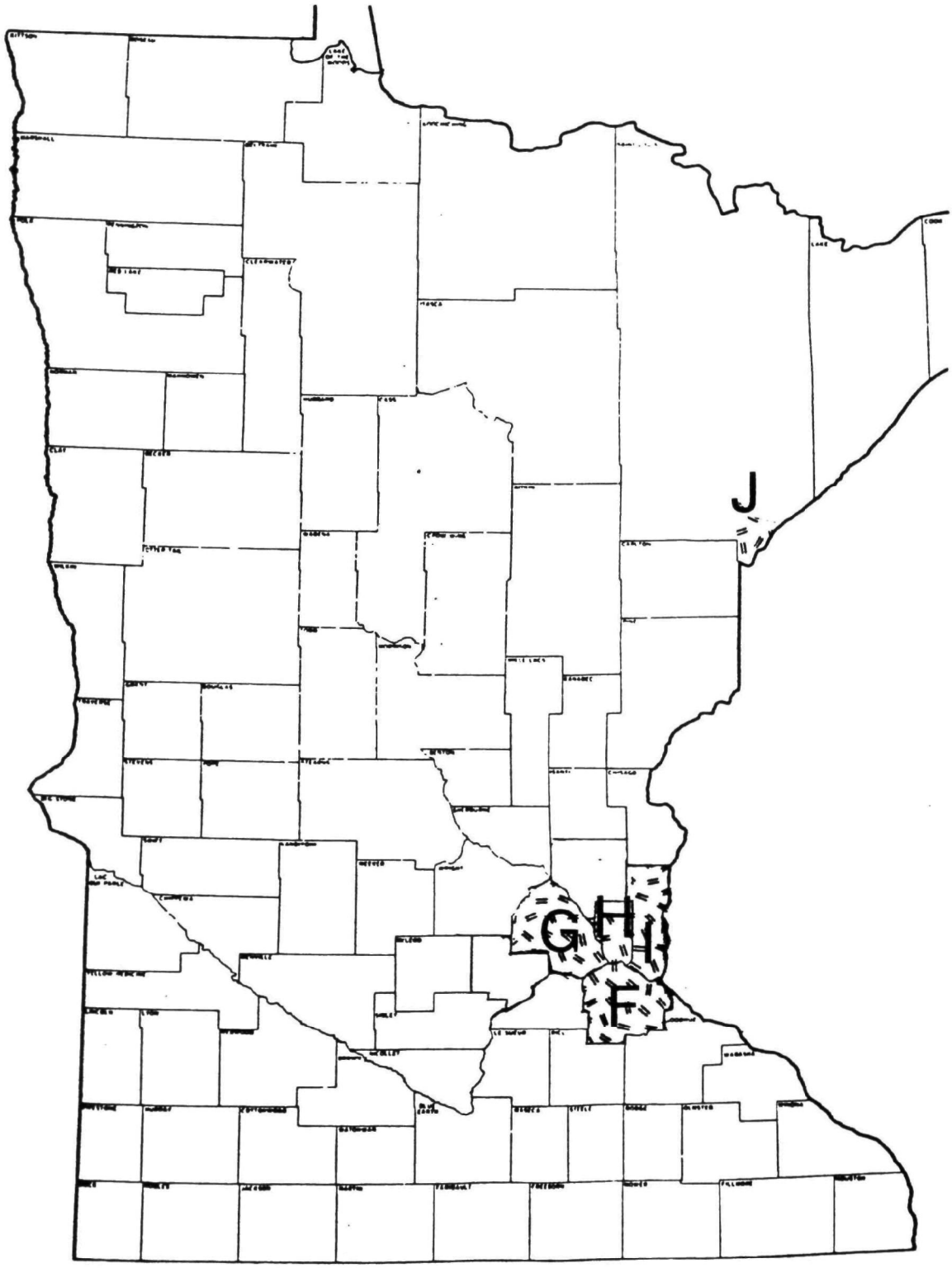

Figure 1-4. Major Non-attainment Areas Studied in State of Minnesota

OHIO

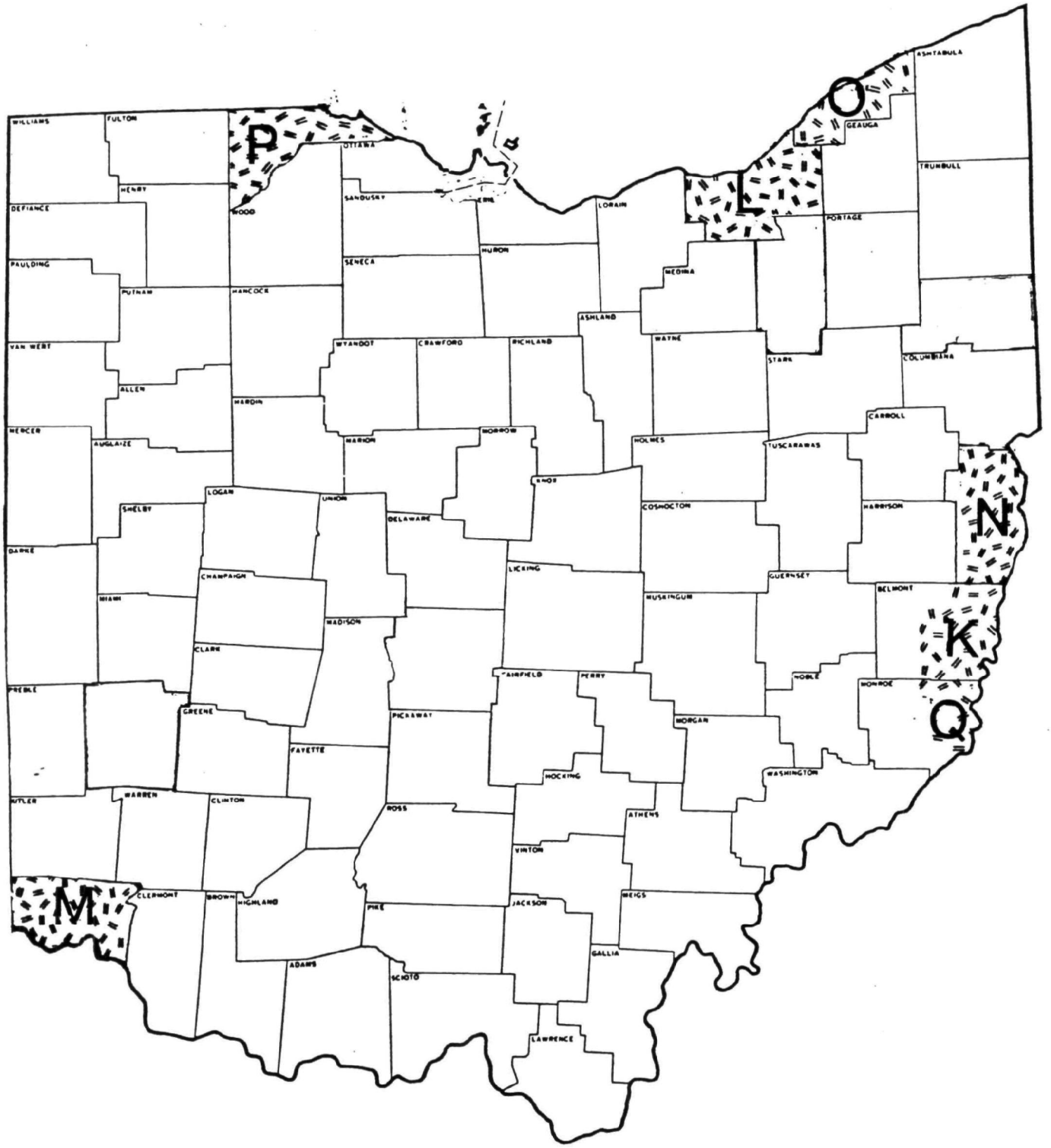

Figure 1-5. Major Non-attainment Areas Studied in State of Ohio

WISCONSIN

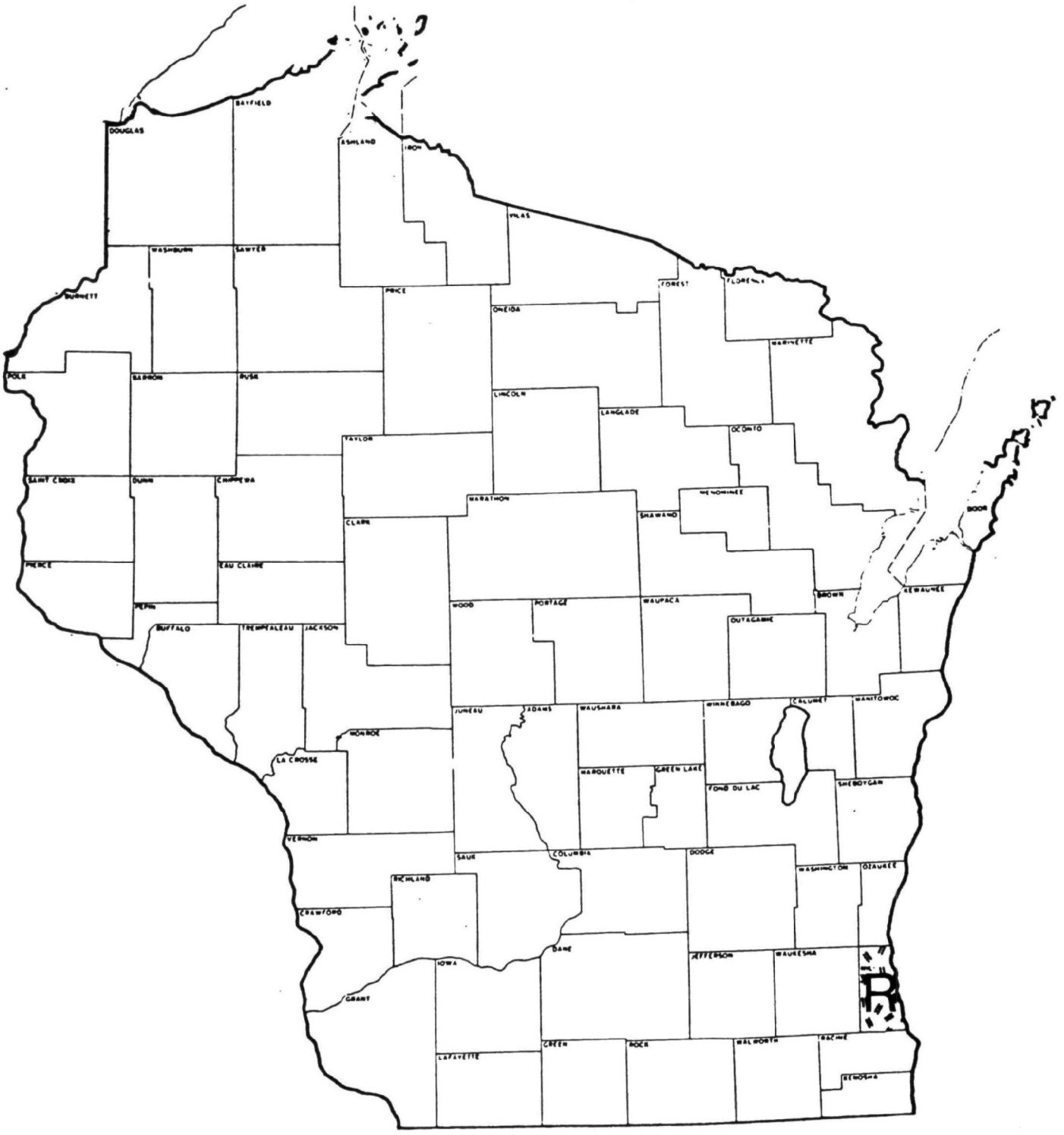

Figure 1-6. Major Non-attainment Areas Studied in State of Wisconsin

2.0 METHODOLOGY

The methodology used in the preparation of this process fugitive emission inventory was developed by PES (and approved by U.S. EPA, Region V) and was based on actual annual process throughputs for each of the affected facilities and the most up-to-date process fugitive emission factors available. A detailed description of this methodology is provided below and shown graphically in Figure 2-1.

2.1 IDENTIFICATION OF THE STATUS OF PROCESS FUGITIVE EMISSION INVENTORIES BY STATE

All states and many local/regional agencies in Region V were contacted to determine the status of process fugitive emission inventories in their respective total suspended particulate (TSP) non-attainment area(s). Information on the type of data available, methodology used, assumptions included, and the time frame of the process fugitive emission inventories were requested for those areas which indicated that they had already completed their inventories. A copy of each completed inventory was requested. In order to avoid duplication of effort, each geographical area found to have such an inventory would require only a quality assurance and consistency check prior to inclusion of the data in the final report.

Initial contacts with state and local agencies indicated that all non-attainment areas in the states of Ohio and Wisconsin and two areas in Indiana had completed process fugitive emission inventories and would only require such a check. However, after evaluating the states' industrial process fugitive emissions inventories, it was discovered that they were, at best, inconsistent. The different definitions of process fugitive emissions alluded to in Section 1.2 helped to create this inconsistency and resulted in a decision by U.S. EPA that the studies obtained were not directly useful for inclusion in this report. Thus, a decision was made to develop the process fugitive emission inventories "from scratch" for each of the states and all non-attainment areas. The decision was based on the lack of available inventories at the state and/or local level and the U.S. EPA's desire to have consistent, traceable emission estimates. A summary of the status of these emission inventories by each county and state is provided below.

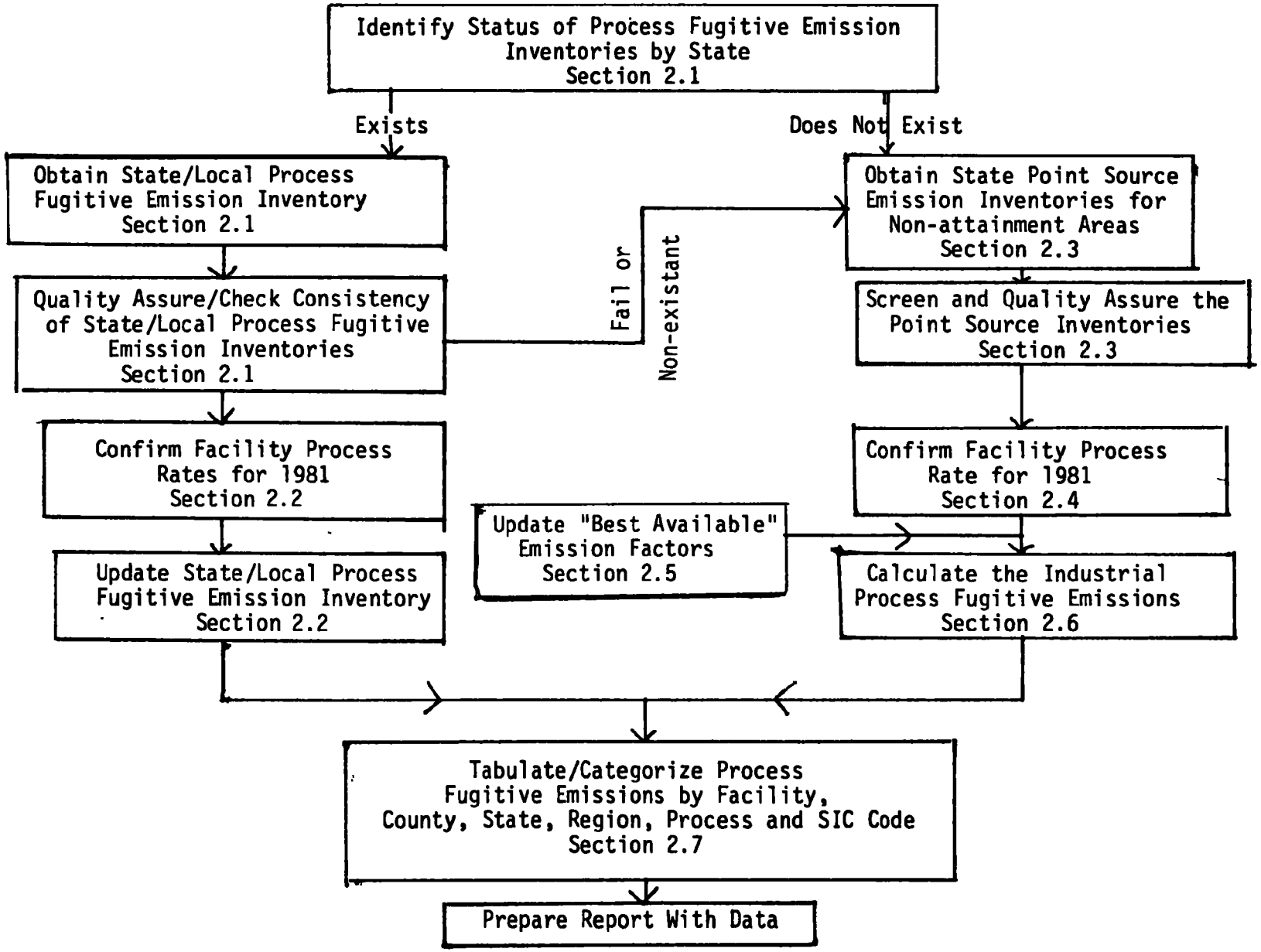

Figure 2-1. Project Methodology

2.1.1 ILLINOIS

Illinois Environmental Protection Agency (IEPA) officials stated that the State of Illinois has no separate industrial process fugitive emission inventory per se, but this category is included as part of the IEPA computerized point source inventory. The IEPA point source inventory includes almost all industrial sources in the State, with the exception that storage piles with potential emissions less than 50 tons/year are not included. However, U.S. EPA had indicated some dissatisfaction with the IEPA methodology some time ago, at which time IEPA had done a mini-study in the St. Louis and Chicago areas on those storage piles with potential emissions less than 50 ton/year. At the end of the study, IEPA concluded that these sources did not significantly contribute to the overall TSP emissions problem. Thus, IEPA decided that no further research would be conducted on the sources with emissions less than the IEPA cutoff point.

Since the industrial source cutoff point for inclusion in this study (per U.S. EPA guidance) was 25 tons per year of uncontrolled emissions, U.S. EPA felt that certain sources would be omitted if only the IEPA process fugitive emission inventory was to be used. To avoid such omissions, it was decided that PES should perform the entire process fugitive emissions inventory for the State of Illinois de novo. The alternative of identifing only sources excluded from the IEPA inventory, and thus supplementing the IEPA inventory was considered to be a less cost effective approach.

2.1.2 INDIANA

The Indiana State Board of Health (ISBH) was contacted to determine the status of process fugitive emission inventories in the State of Indiana. ISBH indicated that the state agency performs inventories only for those areas which are not performing such inventories locally. ISBH personnel further commented that all of the areas under consideration for this study (i.e., the primary non-attainment areas) perform their own inventories. Thus, each of the individual counties were contacted to gather such information.

Marion County officials indicated that the agency annually sends questionnaires to what it considers to be the "major sources," the definition of which is different than the one employed by ISBH. The Marion County agency

uses U.S. EPA approved emission factors; however, once again, these are not approved by the ISBH. For these reasons, Marion County's emission totals differ from the ISBH state-wide inventory results (for Marion County) by a large margin. Due to this difference, the Marion County personnel were reluctant to release the information at that point in time. Thus, a process fugitive emission inventory for Marion County was unavailable.

Appendix VI of the "Technical Support Document, Vigo County Total Suspended Particulates State Implementation Plan Strategy to Show Secondary Attainment with National Ambient Air Quality Standards" was obtained from the Vigo County Air Pollution Control Department. The report contained detailed information and emission calculations on what is considered (for purposes of this report) as fugitive emissions (i.e., dust). However, no relevant information was available on industrial process fugitive emissions.

In addition, no data was available for Porter County. Based on the lack of available and consistent data, a decision was made to develop a process fugitive emission inventory for the three counties in Indiana as part of the overall study effort.

2.1.3 MICHIGAN

The Michigan Department of Natural Resources did not have a comprehensive process fugitive emission inventory at the time of this study. An extensive effort was underway in Detroit and generally consists of data gathering via a combination of questionnaires and forms. Additional research was in progress regarding emissions and ambient air sampling which will be used to develop emission factors. It was felt that the work was directed more toward the fugitive emissions (or dust) area and was primarily concentrated around the monitors that have recorded non-attainment readings. Thus, Wayne County was included in the process fugitive emission inventory effort undertaken in this study.

2.1.4 MINNESOTA

The State of Minnesota had no comprehensive industrial process fugitive emission inventory at the time they were contacted. However, the State had two projects in operation which were related to the topic of interest. The

first project was a fugitive dust inventory which was being performed in the City of Duluth. The second project was being performed by the Minnesota Pollution Control Agency with the assistance of a contractor. The purpose of this project was to gather data on fugitive dust emissions from construction sites. However, neither of these studies was directly responsive to the matter at hand. Thus, the non-attainment areas in the State of Minnesota were added to the list of counties included in the process fugitive emissions inventory detailed here.

2.1.5 OHIO

The Ohio Environmental Protection Agency (OEPA), when contacted regarding the availability of a process fugitive emission inventory for Ohio, stated that the Agency had already conducted an extensive review and analysis of emissions and controls for fugitive sources as part of its SIP on particulate matter. The two documents cited were: 1) "Reasonably Available Control Measures For Fugitive Dust Sources"; and 2) "Compliance Cost Analysis of Proposed Regulations to Control Fugitive Particulate Emissions in Ohio." These documents were reviewed and it was noted that the first document referenced was a listing of various emission factors and the sources of these factors. This document was utilized (and referenced) in the preparation of emission factors for this study. The second document primarily dealt with economic analyses of different controls on various types of sources. This report grouped similar sources together and projected total emission reductions if certain controls were to be implemented.

Based upon a review of the available data from OEPA, PES and U.S. EPA determined that the proposed work effort (i.e., development of a process fugitive emissions inventory) would not be a duplication of any of the previous work. Based on the fact that the State had no comprehensive, accurate, up-to-date industrial process fugitive particulate emission inventory, a full effort was undertaken in Ohio.

2.1.6 WISCONSIN

The Wisconsin Department of Natural Resources (DNR) indicated that the State of Wisconsin had recently completed a TSP fugitive emission inventory for all urban TSP non-attainment areas in the state. The inventory was about

one year old at the time and DNR personnel felt that it was probably the most comprehensive one ever done. A copy of the inventory was requested and reviewed. The DNR report primarily concentrated on fugitive dust rather than industrial process fugitive emissions. After review of the DNR report, it was decided to include Wisconsin in the overall effort.

2.2 FURTHER ANALYSIS OF EXISTING PROCESS FUGITIVE EMISSIONS INVENTORIES

Due to the absence of consistant, reliable fugitive process emission inventories as required by the scope of this project, no further evaluation was conducted on those inventories received from the various states and local agencies as described in Section 2.1. All effort was shifted to the methodological steps necessary to develop the regional process fugitive emissions inventory "from scratch".

2.3 IDENTIFICATION OF PROCESS FUGITIVE EMISSIONS SOURCES

After it was determined that adequate process fugitive emission inventories did not exist at the state or local level, the first sub-task in developing a new inventory was to obtain 1981 industrial point source emission inventories (or the latest inventory available) from each of the six states in Region V of the U.S. Environmental Protection Agency (U.S. EPA). Each of the state agencies identified in Section 2.1 above were again contacted.

The industrial point source inventories submitted by each state were screened (edited) to include only those counties which included non-attainment areas for particulates. Industrial sources consistent with the study's definitions as described earlier and in the Glossary (Section 6.0) were subsequently identified. After the identification of the industrial source locations (i.e., in the major non-attainment areas of each state) was completed, the sources were categorized by their size (i.e., potential point source emissions) and type of industrial process(es). Potential industrial sources with 25 tons per year or greater uncontrolled particulate emissions were selected. Each industrial process within the source was classified as to whether or not process fugitive particulate emissions might originate from it. The selected industrial sources and their processes were then listed along with the following six data categories:

1) Source I.D. - same number as state air pollution permit file;
2) SIC Code - Standard Industrial Classification Code;
3) Annual Process - 1981 annual throughput for that source;
4) Controlled Point Source Emissions - actual point source emissions from that source;
5) Potential Process Fugitive Emissions - estimated process fugitive emissions from that source;
6) Process Description - short process description.

Except for Item 5, all information was available directly from the emission inventory computer printouts supplied by each state. These data were used to aid in the sorting and tabulation of the inventory data at a later point in the project.

The primary quality assurance function performed during this step was clarification of data questions via communication with state agency personnel, verification of process operations included in each industrial source listing, and re-checking of our own and state agency calculations of potential and actual industrial point source emissions.

2.4 CONFIRMATION OF THE FACILITIES' PROCESS RATE(S)

For the purpose of additional quality assurance, the process rates for potentially significant "major industrial sources" (i.e., 50 tons or more emissions per year after controls are applied) were confirmed via a telephone conversation with a representative of the source. A telephone conversation record such as that shown in Figure 2-2 was used for this purpose. The telephone conversation records are presented as Appendix H-1 of Volume II of this report. If confirmation of data by telephone call was not appropriate or if requested by the facility, written correspondence was utilized. All correspondence is included in Appendix H-2 of Volume II.

The process rates for sources smaller than the 50 tons per year "major industrial source" cutoff were used directly as shown on the emissions inventory. Any confidential information contained in the emission inventories or claimed so by the facilities was treated as such and is segregated under separate cover (Volume II). In this situation, both the process information and related process fugitive emission rates are considered confidential for this report.

Figure 2-2. TELEPHONE CONVERSATION RECORD

CONFIDENTIAL: YES____ NO____

DATE: _____ TIME: FROM _____ TO _____

FACILITY NAME: _____

FACILITY I.D.: _____ TELEPHONE NO.: _____

FACILITY REPRESENTATIVE: (NAME) _____ (TITLE) _____

RECORDED BY: _____

(1) ANNUAL PROCESS RATE (TPY): _____

(2) ANNUAL COAL USAGE (TPY): _____

(3) COAL STORAGE/PROCESS MATERIAL STORAGE CAPACITY: (TONS)_____

(VOLUME)_____

(4) ANY CONTROL DEVICE APPLIED TO THE PROCESS? YES _____ NO _____

(5) ANY FUGITIVE EMISSIONS CONTROL PROGRAM? YES _____ NO _____

(6) IF YES, DESCRIBE. _____

_____

_____

_____

_____

(7) ESTIMATED CONTROL EFFICIENCY: _____

(8) BASIS FOR (7) ABOVE: _____

_____

_____

_____

2.5 UPDATE OF THE BEST AVAILABLE PROCESS FUGITIVE EMISSION FACTORS

The process fugitive emission factors listed in previous PES reports entitled, Industrial Process Fugitive Emissions Inventory for the Region V Great Lakes Shoreline (prepared under U.S. EPA Contract No. 68-01-4140) and Evaluation of Process Fugitive Emissions in Lake County, Indiana (prepared under U.S. EPA Contract No. 68-01-6319) were reviewed against the most up-to-date process fugitive emission factors available in the literature and updated as necessary. However, the previous process fugitive emission factors were used directly when there was no more recent data available from the literature or from experts in the particular field. Where additional process fugitive emission factors were required due to additional types of processes being included in the inventory, appropriate data were collected and new factors were prepared (through literature review and/or best engineering judgment) and presented to the EPA Task Manager for approval. These approved emission factors are presented in Appendix A.

The majority of the emission factors have reliability ratings of "D" and "E". The following rating system was employed by U.S. EPA in the development and classification of the factors used:

A - Excellent - Supportable by a large number of tests, process data, and engineering analysis work.

B - Above average - Supportable by multiple tests, moderate process data, and engineering analysis work.

C - Average - Supportable by multiple tests.

D - Below average - Supportable by limited test data and engineering judgment.

E - Poor - Supportable by best engineering judgment (visual observation, emission tests for similar sources, etc.).

Factors with an "E" rating are at best accurate within an order of magnitude. Therefore, actual emission rates from a given facility could differ significantly. As noted earlier, process fugitive emissions are not emitted from a definable point, cannot be measured easily, and are therefore difficult to quantify.

As noted in Appendix A, two types of emission factors are presented - "potential process fugitive emission factors" and "typical process fugitive emission factors". Definitions of those types of emission factors can be found in the Glossary, Section 6.0.

2.6 CALCULATION OF THE PROCESS FUGITIVE EMISSION RATE(S)

The process fugitive emission rate for each process and source was calculated using emission factors which are presented in Appendix A and the facility (i.e., source) process rates described above. The methodology used to develop these emission factors has been previously detailed in this report (Section 2.5).

The estimated process fugitive emission rate for a particular industrial source was calculated by multiplying the appropriate process fugitive emission factor (pounds of emissions per ton of throughput) for that particular process fugitive emission source by the source's annual throughput, and converting to tons per year. For instance, the "typical" process fugitive emission rate for a facility with a coke quenching tower and an annual coke throughput rate of 100,000 ton/year is:

$$\left[\frac{0.20 \text{ lb of particulate*}}{\text{ton of coke throughput}}\right]\left[\frac{100{,}000 \text{ ton/year}}{2{,}000 \text{ lb/ton}}\right] = 10 \text{ tons particulate/year}$$

A source with no control equipment or stack was considered as a process fugitive emission source and the process fugitive emission rate was recorded as the "uncontrolled emission rate" found on the state industrial source emission inventory printout. Whenever available, the process fugitive emissions (no stack or control equipment associated with the point source) as shown in the individual states' emission inventory as "estimated emissions" were listed for reference.

Some facilities control the process fugitive emissions from their operations. Examples of these control techniques include water spray, chemical suppressants, enclosed structures, canvas covers, partial enclosures, etc. The estimated efficiency of these controls range from 50 percent for water spray to 99 percent for complete enclosures with water spray or baghouses. The estimated control efficiencies were selected from the references noted previously, as appropriate. These efficiencies are presented in Table 2-1. Where process fugitive emissions have been controlled by the individual facilities (as specified by the facility representatives - see Appendix H), the applicable control efficiencies were used to determine the "typical" process fugitive emissions. Where a facility could provide fugitive process emission factors that were specific for their facility, these factors were considered in the overall calculation.

* Process fugitive emission factor from Appendix A.

Table 2-1. Percent Control Efficiencies Considered in the Overall Calculations

METHOD	EFFICIENCY
1. Water spray	50 percent
2. Wind guard	50 percent
3. Partial enclosure	50 percent
4. Water injection	75 percent
5. Enclosed structures	75 percent
6. Oiling	80 percent
7. Canvas covers	80 percent
8. Partially enclosed with water spray	85 percent
9. Chemical suppressants	85 - 90 percent
10. Chemical/vegetative stabilization	93 percent
11. Complete enclosure	95 percent
12. Totally enclosed with negative pressure to a bag filter	99 percent
13. Totally enclosed with water spray	99 percent

2.7 SOFTWARE

In order to handle the large amount of data generated in this study, a software package was developed. This program was developed to accommodate the basic calculations and necessary data manipulation. Each facility's data were input into the data base. Facility data consisted of the following:

1. Facility ID - State provided identification number
2. Facility name
3. City
4. County
5. State
6. Non-attainment area - in or out of the non-attainment area
7. Confidential - whether the facility's data are considered confidential
8. Number of processes

For each process, the following information was input:

1. New Emission Factor - If the facility had an emission factor specific to their facility, this was input.
2. Control Factor - Percent control expected due to facility's actions.
3. Annual Process Rate (tons/year)
4. Controlled Point Source Emissions - From the state industrial point source inventory.
5. Process Emission Factor Category - Computer coded. See Appendix A.
6. SIC Code - From the state industrial point source inventory.
7. Process Description

The data were output in several formats. The basic data output consisted of the output by facility and individual processes within the facility. A sample output sheet is presented in Table 2-2. The process fugitive emissions were classified and tabulated by individual facility, facility location (county, state, region) and by process and SIC Codes. An example of each type of summary is presented in the following pages as noted below.

OUTPUT	TABLE
Total process fugitive emission breakdown by state and county	2-3
Total process fugitive emission breakdown by process type and state	2-4
Total process fugitive emission breakdown by process type and county	2-5
Total process fugitive emission breakdown by SIC Code and state	2-6
Total process fugitive emission breakdown by SIC Code and county	2-7

A final summary for the entire region was prepared in the same categories as indicated above.

Table 2-2. Example of Basic Facility Data Output

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
NON-CONFIDENTIAL SOURCES

FACILITY ID	EACILITY NAME AND CITY	ANNUAL PROCESS RATE (TONS/YR)	CONTROLLED POINT SOURCE EMISSIONS (TONS/YR)	POTENTIAL FUGITIVE EMISSIONS (TONS/YR)	TYPICAL FUGITIVE EMISSIONS (TONS/YR)	SIC CODE	PROCESS DESCRIPTION
031003AAM	OZINGA BROTHERS INC ALSIP						
		31489	0.47	3.78 - 3.78	3.78	3270	CEMENT SILOS
		499200	31.20	92.35 - 92.35	92.35	3270	CEMENT BATCHING WEST PLANT
		24978	0.20	3.00 - 3.00	3.00	3270	CEMENT SILOS
		624000	37.44	12.48 - 12.48	12.48	3270	CONVEYOR SYSTEM
031006ABB	CONTINENTAL CEMENT SUMMIT						
		873600	46.80	104.83 - 104.83	104.83	3270	CEMENT HANDLING 6 SILOS 2 LOAD SPOUT
031012ACJ	SUPERIOR GRAPHITE CO BEDFORD PK.						
		8940	0.25	6.70 - 6.70	6.70	3290	SCREENING MACHINE
		3557	0.43	0.89 - 0.89	0.89	3290	ROLLER MILL
		200	0.01	0.05 - 0.05	0.05	3290	CRUSHER
		200	0.01	0.15 - 0.15	0.15	3290	VERTICAL HAMMER MILL
		194100	23.62	32.03 - 32.03	32.03	3290	17 STORAGE BINS
		7500	0.14	1.24 - 1.24	1.24	3290	4 STORAGE BINS
		388	1.38	0.29 - 0.29	0.29	3290	FINE SCREENING MILL
		2	0.00	0.00 - 0.00	0.00	3290	SMALL BALL MILL
		3241	5.00	2.43 - 2.43	2.43	3290	SYNTHETIC GRAPHITE CRUSHER
		3000	5.13	0.22 - 0.22	0.22	3290	MATERIAL HANDLING
		1000	0.63	0.08 - 0.08	0.08	3290	TRANSFER BOOTH
		41600	0.10	3.12 - 3.12	3.12	3290	DUST BOOTH
		1000	0.00	0.08 - 0.08	0.08	3290	RAIL CAR LOADING
031012ACH	STAR MOULDING ATRIM BEDFORD PK.						
		5400	0.60	3.70 - 3.70	3.70	1540	WOODWORKING
031018AAF	MEDUSA CEMENT CO BER BERKLEY						
		150	0.00	0.02 - 0.02	0.02	4220	CEMENT UNLOADING CON

Table 2-3. Example of Fugitive Process Emissions by State and County

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS FOR ALL FACILITIES

TOTALS FOR THE STATE OF ILLINOIS
****

POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 69563.06 - 102458.87
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 75366.41

TOTALS FOR THE STATE OF ILLINOIS BY COUNTY
****

COUNTY OF COOK
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 69563.06 - 102458.87
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 75366.41

Table 2-4. Example of Process Fugitive Emission by Process Type and State

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE

TOTALS FOR THE STATE OF ILLINOIS

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
COAL STORAGE: LOADING ONTO PILE	(S)	144.50 - 825.70	144.50
COAL STORAGE: LOADING OUT (OUTGOING)	8308381	290.79 - 1661.68	332.34
COAL STORAGE: WIND EROSION	(S)	20.26 - 389.52	109.07
COAL STORAGE (TOTAL)	11671970	1692.44 - 7003.18	2100.95
COKE MANUF: COAL CHARGING	(S)	382.50 - 4500.00	382.50
COKE MANUF: COKING (DOOR LEAKING)	(S)	180.00 - 405.00	225.00
COKE MANUF: COKE QUENCHING	(S)	90.00 - 2700.00	90.00
COKE MANUF: COKE HANDLING	(S)	109.52 - 619.03	380.94
COKE MANUF: COKE PUSHING	(S)	157.50 - 450.00	211.50
IRON PROD: SHIP/RAILROAD IRON ORE UNLOAD	(S)	4.60 - 6.90	5.75
IRON PROD: IRON ORE STORAGE (TOTAL)	(S)	132.20 - 237.96	185.08
IRON PROD: IRON ORE HANDLING & TRANSFER	(S)	6672.24 - 6672.24	6672.24
IRON PROD: LIMESTONE HANDLING & TRANSFER	(S)	82.11 - 82.11	82.11
IRON PROD: BLAST FURNACE DUST HANDLING	3638234	545.74 - 545.74	545.74
IRON PROD: SINTER OPERATION	(S)	569.42 - 1658.94	1658.94
IRON PROD: SLAG HANDLING	(S)	30.22 - 31.42	30.82
IRON PROD: CASTING HOUSE	2686482	537.30 - 5278.94	537.30
STEEL PRODUCTION: BASIC OXYGEN FURNACE	10369241	725.85 - 6221.54	2540.46
STEEL PRODUCTION: ELECTRIC ARC FURNACE	729948	65.70 - 1094.92	529.21
STEEL PRODUCTION: SCARFING	(S)	5.49 - 5.49	5.49
SEC ALUMINUM PROD: SWEATING FURNACE	412757	148.59 - 148.59	148.59
SEC ALUMINUM PROD: REVERBERATORY FURNACE	89804	9.88 - 9.88	9.88
SEC ALUMINUM PROD: CRUCIBLE FURNACE	810000	36.45 - 36.45	36.45
SEC ALUMINUM PROD: INDUCTION FURNACE	(S)	0.06 - 0.06	0.06
SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	62458	22.48 - 22.48	22.48
SECONDARY ALUMINUM: SCRAP CRUSHER	(S)	14.82 - 14.82	14.82
SEC LEAD SMELTING: SWETAING FURNACE	(S)	3.65 - 7.98	5.81
SEC LEAD SMELTING: REVERBERATORY FURNACE	57410	80.37 - 450.67	265.52
SEC LEAD SMELTING: BLAST/CUPOLA FURNACE	(S)	79.78 - 79.78	79.78
SEC LEAD SMELTING: POT (KETTLE) FURNACE	100465	2.01 - 2.01	2.01
SEC ZINC SMELT: REVERBERATORY	(S)	0.00 - 0.72	0.36
SEC ZINC SMELT: ROTARY SWEAT FURNACE	5265	1.47 - 3.32	2.40
SEC ZINC SMELT: MUFFLE SWEAT FURNACE	(S)	1.33 - 3.93	2.63
SEC ZINC SMELT: CRUCIBLE FURNACE	11022	0.03 - 0.03	0.03

(S)= PROCESS INFORMATION SUPPRESSED TO INSURE CONFIDENTIALITY

Table 2-5. Example of Process Fugitive Emission by Process Type and County

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS BY COUNTY

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
COOK				
	COAL STORAGE: LOADING ONTO PILE	(S)	144.50 - 825.70	144.50
	COAL STORAGE: LOADING OUT (OUTGOING)	8308381	290.79 - 1661.68	332.34
	COAL STORAGE: WIND EROSION	(S)	20.26 - 389.52	109.07
	COAL STORAGE (TOTAL)	11671970	1692.44 - 7003.18	2100.95
	COKE MANUF: COAL CHARGING	(S)	382.50 - 4500.00	382.50
	COKE MANUF: COKING (DOOR LEAKING)	(S)	180.00 - 405.00	225.00
	COKE MANUF: COKE QUENCHING	(S)	90.00 - 2700.00	90.00
	COKE MANUF: COKE HANDLING	(S)	109.52 - 619.03	380.94
	COKE MANUF: COKE PUSHING	(S)	157.50 - 450.00	211.50
	IRON PROD: SHIP/RAILROAD IRON ORE UNLOAD	(S)	4.60 - 6.90	5.75
	IRON PROD: IRON ORE STORAGE (TOTAL)	(S)	132.20 - 237.96	185.08
	IRON PROD: IRON ORE HANDLING & TRANSFER	(S)	6672.24 - 6672.24	6672.24
	IRON PROD: LIMESTONE HANDLING & TRANSFER	(S)	82.11 - 82.11	82.11
	IRON PROD: BLAST FURNACE DUST HANDLING	3638234	545.74 - 545.74	545.74
	IRON PROD: SINTER OPERATION	(S)	569.42 - 1658.94	1658.94
	IRON PROD: SLAG HANDLING	(S)	30.22 - 31.42	30.82
	IRON PROD: CASTING HOUSE	2686482	537.30 - 5278.94	537.30
	STEEL PRODUCTION: BASIC OXYGEN FURNACE	10369241	725.85 - 6221.54	2540.46
	STEEL PRODUCTION: ELECTRIC ARC FURNACE	729948	65.70 - 1094.92	529.21
	STEEL PRODUCTION: SCARFING	(S)	5.49 - 5.49	5.49
	SEC ALUMINUM PROD: SWEATING FURNACE	412757	148.59 - 148.59	148.59
	SEC ALUMINUM PROD: REVERBERATORY FURNACE	89804	9.88 - 9.88	9.88
	SEC ALUMINUM PROD: CRUCIBLE FURNACE	810000	36.45 - 36.45	36.45
	SEC ALUMINUM PROD: INDUCTION FURNACE	(S)	0.06 - 0.06	0.06
	SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	62458	22.48 - 22.48	22.48
	SECONDARY ALUMINUM: SCRAP CRUSHER	(S)	14.82 - 14.82	14.82
	SEC LEAD SMELTING: SWETAING FURNACE	(S)	3.65 - 7.98	5.81
	SEC LEAD SMELTING: REVERBERATORY FURNACE	57410	80.37 - 450.67	265.52
	SEC LEAD SMELTING: BLAST/CUPOLA FURNACE	(S)	79.78 - 79.78	79.78
	SEC LEAD SMELTING: POT (KETTLE) FURNACE	100465	2.01 - 2.01	2.01
	SEC ZINC SMELT: REVERBERATORY	(S)	0.00 - 0.72	0.36
	SEC ZINC SMELT: ROTARY SWEAT FURNACE	5265	1.47 - 3.32	2.40
	SEC ZINC SMELT: MUFFLE SWEAT FURNACE	(S)	1.33 - 3.93	2.63
	SEC ZINC SMELT: CRUCIBLE FURNACE	11022	0.03 - 0.03	0.03

(S)= PROCESS INFORMATION SUPPRESSED TO INSURE CONFIDENTIALITY

Table 2-6. Example of Process Fugitive Emission by SIC Code and State

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE

TOTALS FOR THE STATE OF ILLINOIS
****

SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
****	**********			*********
1420	9567.46	-	9567.46	9567.46
1440	5563.60	-	5563.60	5563.60
1490	4.13	-	4.13	4.13
1540	3.70	-	3.70	3.70
2030	137.83	-	137.83	137.83
2040	8063.10	-	8427.10	8091.10
2050	161.61	-	161.61	160.42
2060	116.80	-	116.80	116.80
2070	0.04	-	0.04	0.04
2080	288.11	-	288.11	288.11
2090	198.57	-	198.57	198.57
2140	5.43	-	5.43	5.43
2320	8.08	-	8.08	8.08
2380	0.38	-	0.38	0.38
2400	205.27	-	205.27	205.27
2420	2.07	-	2.07	2.07
2430	21.71	-	21.71	21.71
2440	0.41	-	0.41	0.41
2490	37.49	-	37.49	37.49
2500	0.52	-	0.52	0.52
2510	2.05	-	2.05	2.05
2590	1.11	-	1.11	1.11
2640	121.02	-	121.02	121.02
2650	108.27	-	108.27	108.27
2740	6.17	-	6.17	6.17
2750	161.08	-	161.08	161.08
2810	3164.17	-	3168.56	3164.93
2820	63.42	-	63.42	63.42
2830	12.67	-	12.67	12.67
2840	466.28	-	466.28	466.28
2850	566.60	-	566.60	566.60
2890	236.73	-	236.73	236.73
2910	0.00	-	0.00	0.00
2950	3397.43	-	3397.43	3397.43

Table 2-7. Example of Process Fugitive Emission by SIC Code and County

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS BY COUNTY

COUNTY	SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
COOK					
	1420	9567.46	-	9567.46	9567.46
	1440	5563.60	-	5563.60	5563.60
	1490	4.13	-	4.13	4.13
	1540	3.70	-	3.70	3.70
	2030	137.83	-	137.83	137.83
	2040	8063.10	-	8427.10	8091.10
	2050	161.61	-	161.61	160.42
	2060	116.80	-	116.80	116.80
	2070	0.04	-	0.04	0.04
	2080	288.11	-	288.11	288.11
	2090	198.57	-	198.57	198.57
	2140	5.43	-	5.43	5.43
	2320	8.08	-	8.08	8.08
	2380	0.38	-	0.38	0.38
	2400	205.27	-	205.27	205.27
	2420	2.07	-	2.07	2.07
	2430	21.71	-	21.71	21.71
	2440	0.41	-	0.41	0.41
	2490	37.49	-	37.49	37.49
	2500	0.52	-	0.52	0.52
	2510	2.05	-	2.05	2.05
	2590	1.11	-	1.11	1.11
	2640	121.02	-	121.02	121.02
	2650	108.27	-	108.27	108.27
	2740	6.17	-	6.17	6.17
	2750	161.08	-	161.08	161.08
	2810	3164.17	-	3168.56	3164.93
	2820	63.42	-	63.42	63.42
	2830	12.67	-	12.67	12.67
	2840	466.28	-	466.28	466.28
	2850	566.60	-	566.60	566.60

3.0 INVENTORY RESULTS AND DISCUSSIONS

This section summarizes the results of the process fugitive emissions inventory study on a state-by-state basis. It also attempts to interpret some of the relationships between the estimated process fugitive emissions and the associated states, counties, and the significant process fugitive emission data categories (process, SIC Code, etc.).

3.1 U.S. EPA, REGION V

U.S. EPA, Region V is a diverse region consisting of the states of Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. Its vast resources include natural resources such as abundant coal, oil, fertile soil for agricultural purposes, waterways and the Great Lakes, and, of course, the people. This vast array of resources, coupled with an efficient highway, rail, and air transportation system, makes it one of the most ideal places for industry in the world. This industry varies from heavy industry such as iron and steel production to agriculture related industries. Thus, each and every industry contributes in its own unique way to the environmental problem.

As stated earlier in this report, historically the emissions emanating from the stacks or chimneys of these industries have been the target of emission control regulation and emission inventory efforts by both the private and public sector. For purposes of comparison to the process fugitive emission inventory developed by this study, the particulate industrial point source emissions (by individual states in Region V and their corresponding counties containing the major non-attainment areas) are listed in Table 3-1. The major non-attainment counties contribute anywhere from 9 percent of the state industrial point source emission total (Wisconsin) to 63 percent (Indiana). The totals for the State of Indiana are somewhat misleading in the context of this report due to the fact that Lake County is not included in the process fugitive emissions calculations described later. This county was part of a previous process fugitive emission inventory performed by PES for the U.S. EPA.

The results of this process fugitive emission inventory (by county) are presented in Table 3-2. Comparing Tables 3-1 and 3-2, one can see regionwide potential fugitive process emissions range from approximately 77 to 141

Table 3-1. Particulate Industrial Point Source Emissions by State (Total) and Major Non-attainment Areas

STATE	COUNTY	COUNTY EMISSIONS	TOTAL STATE EMISSIONS
Illinois			170,709
	Cook	26,961	
Indiana			251,483*
	Lake	147,964	
	Marion	4,921	
	Porter	2,493	
	Vigo	3,672	
Michigan			77,980
	Wayne	21,003	
Minnesota			156,741
	Dakota	3,487	
	Hennepin	13,382	
	Ramsey	1,332	
	St. Louis	38,891	
	Washington	6,659	
Ohio			273,268
	Belmont	9,453	
	Cuyahoga	10,446	
	Hamilton	10,060	
	Jefferson	64,391	
	Lake	8,667	
	Lucas	7,256	
	Monroe	1,046	
Wisconsin			48,425
	Milwaukee	4,341	
Total:		386,425*	978,606*
		238,461**	

Source: Mr. Barry Bolka, U.S. EPA, Region V

* Includes Lake County, Indiana
** Without Lake County, Indiana

Table 3-2. Process Fugitive Emissions by State (Total) and Major Non-Attainment Areas

STATE	COUNTY	POTENTIAL EMISSIONS	TYPICAL TOTAL COUNTY EMISSIONS	TYPICAL TOTAL STATE EMISSIONS
Illinois				75,366
	Cook	69,563 -102,459	75,366	
Indiana				18,448
	Marion	5,042 - 14,034	5,291	
	Porter	5,269 - 34,297	8,823	
	Vigo	4,260 - 6,024	4,334	
Michigan				29,638
	Wayne	22,049 - 56,041	29,638	
Minnesota				33,765
	Dakota	684 - 988	708	
	Hennepin	6,320 - 7,398	6,623	
	Ramsey	6,007 - 6,715	5,963	
	Washington	3,958 - 4,542	3,435	
	St. Louis	20,063 - 20,382	17,035	
Ohio				38,363
	Belmont	352 - 1,341	229	
	Cuyahoga	9,042 - 26,941	10,623	
	Hamilton	3,192 - 4,875	3,128	
	Jefferson	1,833 - 7,271	1,736	
	Lake	1,897 - 4,589	1,651	
	Lucas	11,382 - 16,637	10,356	
	Monroe	10,618 - 10,832	10,640	
Wisconsin				4,083
	Milwaukee	3,350 - 11,650	4,083	
Total:	Region V Major Non-Attainment Areas	184,880 -337,015	199,664	199,664

percent of the total point source emissions (in the major non-attainment regions studied in this report). The typical process fugitive emissions (as defined earlier) equal 84 percent of the total point source emissions in U.S. EPA, Region V non-attainment areas studied here. This represents a substantial portion of the TSP non-attainment problem in these counties. It appears that it may be worthwhile to perform cost-effectiveness analyses to address the possibility that the control of fugitive emissions would be more cost-effective than further control of point sources.

For purposes of comparison, the previously mentioned Lake County study was performed based on 1980 data (this study uses 1981 as a base year) and estimated Lake County typical process fugitive emissions at 29,773 tons per year. If Lake County were included in the Table 3-2 totals, process fugitive emissions, both in terms of tons per year and in percentage of point source emissions, would be even greater.

Table 3-3 presents the Region V summary of total process fugitive emissions by state for those counties identified in Table 3-2. Illinois (this study includes only Cook County) is the largest contributor (37.7 percent) to the overall total process fugitive emission total. Illinois is followed by the states of Ohio (19.2 percent), Minnesota (16.9 percent), Michigan (14.8 percent), Indiana (9.2 percent), and Wisconsin (2.0 percent). When individual process totals are considered (Table 3-4), the top ten process categories contribute 99,358 tons or 49.9 percent of the total fugitive emissions. Of the top ten, three categories are part of the grain handling and processing industry. When all the processes are considered, this general industry category accounts for 22.5 percent (44,948 tons) of the total process fugitive emissions in the region. This is followed by the quarrying (30,458 tons or 15.3 percent) and iron production (18,219 tons or 9.5 percent) industries. If this data is analyzed by major SIC code (see Table 3-5), SIC code 3310 (Blast Furnace and Basic Steel Products) accounts for 21.4% (42,727 tons) of the total process fugitive emissions in the area studied. This is followed by:

Table 3-3

US EPA REGION V
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY STATE

STATE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
ILLINOIS	69563.06 - 102458.87	75366.41
INDIANA	14571.30 - 54355.23	18448.47
MICHIGAN	22049.29 - 56040.92	29638.24
MINNESOTA	37030.55 - 40023.69	33764.72
OHIO	38315.19 - 72485.62	38363.37
WISCONSIN	3350.47 - 11650.36	4082.99
REGIONAL TOTALS	184879.86 - 337014.70	199664.19

Table 3-4.

US EPA REGION V
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
COAL STORAGE: LOADING ONTO PILE	7933734	277.68 - 1586.75	277.68
COAL STORAGE: LOADING OUT (OUTGOING)	8310881	290.88 - 1662.18	332.44
COAL STORAGE: WIND EROSION	5340649	34.71 - 667.58	186.92
COAL STORAGE (TOTAL)	44779110	6492.97 - 26867.47	6213.93
COKE MANUF: COAL STORAGE	2788709	404.36 - 1673.23	488.66
COKE MANUF: COAL CHARGING	6158826	2617.50 - 30794.13	2284.65
COKE MANUF: COKING (DOOR LEAKING)	7460047	1492.01 - 3357.02	1808.76
COKE MANUF: COKE QUENCHING	9090509	909.05 - 27271.53	886.55
COKE MANUF: COKE HANDLING	12465905	143.36 - 810.28	489.64
COKE MANUF: COKE PUSHING	6158826	1077.79 - 3079.41	1254.53
IRON PROD: SHIP/RAILROAD IRON ORE UNLOAD	460000	4.60 - 6.90	5.75
IRON PROD: IRON ORE STORAGE (TOTAL)	3063362	306.34 - 551.41	428.87
IRON PROD: IRON ORE HANDLING & TRANSFER	11191605	11191.61 - 11191.61	11191.61
IRON PROD: LIMESTONE HANDLING & TRANSFER	973114	97.31 - 97.31	97.31
IRON PROD: BLAST FURNACE DUST HANDLING	11490172	1723.53 - 1723.53	1723.53
IRON PROD: SINTER OPERATION	3802498	2414.59 - 7034.62	7034.62
IRON PROD: SLAG HANDLING	2520071	2545.27 - 2646.07	1779.84
IRON PROD. CASTING HOUSE	10622442	2124.49 - 20873.10	2124.49
STEEL PRODUCTION: BASIC OXYGEN FURNACE	27563099	1929.42 - 16537.86	6752.96
STEEL PRODUCTION: ELECTRIC ARC FURNACE	4401381	396.12 - 6602.07	3191.00
STEEL PRODUCTION: SCARFING	8458040	46.52 - 46.52	39.74
SEC ALUMINUM PROD: SWEATING FURNACE	430164	154.86 - 154.86	154.86
SEC ALUMINUM PROD: REVERBERATORY FURNACE	720052	79.21 - 79.21	79.21
SEC ALUMINUM PROD: CRUCIBLE FURNACE	862567	38.82 - 38.82	38.82
SEC ALUMINUM PROD: INDUCTION FURNACE	3363	0.15 - 0.15	0.15
SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	198489	71.46 - 71.46	68.92
SEC ALUMINUM PROD:CHLORINATION - FLUXING	159401	3985.02 - 3985.02	3985.02
SECONDARY ALUMINUM: SCRAP CRUSHER	82576	20.64 - 20.64	20.64
SEC LEAD SMELTING: SWETAING FURNACE	16260	13.01 - 28.45	20.73
SEC LEAD SMELTING: REVERBERATORY FURNACE	122675	171.75 - 963.00	567.37
SEC LEAD SMELTING. BLAST/CUPOLA FURNACE	71921	431.53 - 431.53	431.53
SEC LEAD SMELTING: POT (KETTLE) FURNACE	176538	3.53 - 3.53	3.53
SEC ZINC SMELT: REVERBERATORY	1100	0.00 - 0.72	0.36
SEC ZINC SMELT: KETTLE SWEAT FURNACE	1498	0.42 - 0.42	0.42

Table 3-4

US EPA REGION V
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
SEC ZINC SMELT: ROTARY SWEAT FURNACE	48270	13.52 - 30.41	21.96
SEC ZINC SMELT: MUFFLE SWEAT FURNACE	4914	1.33 - 3.93	2.63
SEC ZINC SMELT: CRUCIBLE FURNACE	12620	0.03 - 0.03	0.03
SEC ZINC SMELT: KETTLE MELTING FURNACE	177727	0.44 - 0.44	0.44
SEC ZINC SMELT: REVERBERATE MELT FURNACE	16800	0.04 - 0.04	0.04
SEC ZINC SMELT:INDUCTION MELTING FURNACE	372	0.00 - 0.00	0.00
IRON/STEEL FOUNDRY: CUPOLA FURNACE	1326353	66.32 - 1326.35	533.45
IRON/STEEL FOUNDRY: CRUCIBLE FURA CE	184889	9.24 - 55.47	30.08
IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	1102872	579.01 - 1919.00	1067.42
IRON/STEEL FOUNDRY: INDUCTION FURNACE	420299	420.30 - 420.30	375.47
IRON/STEEL FOUNDRY: CASTING SHAKEOUT	1807746	1084.65 - 11569.57	2580.37
IRON/STEEL FOUNDRY: POURING AND COOLING	2759320	137.97 - 5698.00	3634.83
IRON/STEEL FOUNDRY: SAND HANDLING	11545282	1731.79 - 1731.79	1376.63
IRON/STEEL FOUNDRY:FOUNDRY CAST CLEANING	1460070	116.81 - 584.03	275.41
IRON/STEEL FOUNDRY: MOLD MAKING	4382102	153.37 - 153.37	90.86
FOUNDRY: SHOT BLAST GRINDER / FINISHING	11172369	55.86 - 55.86	55.76
STEEL FOUNDRY: CORE MAKING	99947	17.49 - 17.49	17.49
IRON/STEEL FOUNDRY: BALL MILL	158410	336.62 - 336.62	336.62
IRON/STEEL FOUNDRY: MOLTEN IRON TRANSFER	3180088	302.11 - 302.11	302.11
IRON/STEEL FOUNDRY: SOAKING PITS	9924385	0.00 - 0.00	0.00
IRON/STEEL FOUNDRY: STRIP MILLS	7990455	0.00 - 0.00	0.00
IRON/STEEL FOUNDRY: PICKLING TANKS	992421	0.00 - 0.00	0.00
IRON/STEEL FOUNDRY: PLATING	529206	2.65 - 2.65	2.65
IRON/STEEL FOUNDRY: STEEL SHREDDER	32975	0.16 - 0.16	0.16
IRON/STEEL FOUNDRY: AUTO SHREDDER	1209652	6.05 - 6.05	6.05
IRON/STEEL FOUNDRY. METAL SEPARATORS	46800	35.10 - 35.10	35.10
IRON/STEEL FOUNDRY: GRAVITY SEPARATORS	125256	93.94 - 93.94	93.94
IRON/STEEL FOUNDRY: DESULF STATION-STEEL	370000	0.00 - 0.00	0.00
GRAIN ELEVATOR: GRAIN HANDLING (TOTAL)	123094	504.69 - 504.69	504.69
GRAIN CLEANING	3407687	511.15 - 511.15	511.15
GRAIN DRYING	1129823	62.14 - 62.14	62.14
GRAIN TERMINAL: RECEIVING	22882133	1144.11 - 1144.11	1144.11
GRAIN TERMINAL: LOADING	20050774	6516.50 - 6516.50	6516.50
GRAIN TERMINAL: TUNNEL BELT	774300	54.20 - 54.20	54.20

Table 3-4

US EPA REGION V
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
GRAIN TERMINAL: HEADHOUSE	15374390	1153.08 - 1153.08	1153.08
GRAIN TERMINAL: TRIPPER	6704767	335.24 - 335.24	335.24
TERMINAL GRAIN ELEVATOR	13739849	14907.74 - 14907.74	13769.52
GRAIN ELEVATOR: WHEAT MILL	2202411	7708.44 - 7708.44	7708.44
GRAIN PROCESS: CORN MILLING	1259070	755.44 - 755.44	755.44
GRAIN PROCESS: RECEIVING	7454122	372.71 - 372.71	367.75
GRAIN PROCESS: DRYING	4698237	117.46 - 117.46	117.46
GRAIN PROCESS: HANDLING	37216844	9304.21 - 9304.21	9303.02
GRAIN PROCESS: CLEANING	6329119	1898.74 - 1898.74	1898.74
GRAIN PROCESS: BULK LOADING	2984077	746.02 - 746.02	746.02
CEMENT MANUF: TOTAL	174000	983.10 - 1644.30	1261.50
CEMENT MANUF: RAW MATERIAL UNLOADING	60000	0.90 - 12.00	6.45
CEMENT MANUF: CRUSHING	650000	130.00 - 195.00	162.50
CEMENT MANUF: TRANSFER & CONVEYING	3806344	380.63 - 761.27	570.95
CEMENT MANUF: RAW GRINDING	396136	19.81 - 19.81	19.81
CEMENT MANUF: UNLOAD- OUTFALL TOSTORAGE	861380	2153.45 - 4306.90	3230.17
CEMENT MANUFACTURE: KILN	600000	2250.00 - 2250.00	2250.00
LIME MANUF: TOTAL	5262262	8261.75 - 8367.00	8314.37
LIME MANUF: PRIMARY CRUSHING	1285195	321.30 - 321.30	172.12
LIME MANUF: ROTARY KILN	6576134	2630.45 - 2630.45	2630.45
CONCRETE BATCH: TOTAL	9637594	1782.95 - 1782.95	1782.95
CONCRETE BATCH: TRANSFER OF SAND	1601315	32.03 - 32.03	32.03
CONCRETE BATCH: CEMENT UNLOAD TO SILOS	17940954	2152.91 - 2152.91	2152.91
CONCRETE BATCH: HOPPER LOAD OF AGGREGATE	2647928	26.48 - 26.48	26.48
CONCRETE BATCH. MIXER LOAD OF AGGREGATE	2149848	43.00 - 43.00	43.00
CONCRETE BATCH:LOAD OF TRANSIT MIX TRUCK	1675790	16.76 - 16.76	16.76
CONCRETE BATCH: LOAD OF DRY BATCH TRUCK	325668	6.51 - 6.51	6.51
ASPHALT CONCRETE: TOTAL	13750079	4262.52 - 4262.52	4262.52
ASPHALT CONCRETE: BATCHING PROCESS	3778160	547.83 - 547.83	547.83
ASPHALT CONCRETE: AGGREGATE STORAGE	7757759	1280.03 - 1280.03	1280.03
BRICK MANUFACTURING: TOTAL	1816955	263.46 - 263.46	263.46
STONE QUARRY: HANDLING	21050373	1578.78 - 1578.78	1484.38
STONE QUARRY. PRIMARY CRUSHING	32595207	8148.80 - 8148.80	8148.80
STONE QUARRY: SECONDARY CRUSH & SCREEN	25104275	18828.21 - 18828.21	18452.80

Table 3-4

US EPA REGION V
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
STONE QUARRY: STORAGE	11452638	1889.69 - 1889.69	1889.69
ROCK QUARRY: DRYER	371500	482.95 - 482.95	482.95
SECONDARY COPPER SMELTING: REV. FUNACE	9445	12.51 - 37.02	24.89
SECONDARY COPPER SMELTING: EL. IND. FURN	294435	7.36 - 20.61	7.64
SECONDARY COPPER SMELTING: ROTARY FURN.	58729	44.05 - 215.83	130.08
SECONDARY COPPER SMELTING: CRUCIBLE FURN	15415	2.47 - 4.93	3.78
SECONDARY COPPER SMELTING: CASTING	82570	0.41 - 0.83	0.62
SECONDARY COPPER: RECLIAMEER	140160	963.60 - 963.60	963.60
SECONDARY COPPER: WIRE CRUSHER	37440	9.36 - 9.36	9.36
MINING: PRIMARY CRUSHING	71763300	717.63 - 717.63	388.32
MINING: SECONDARY CRUSHING - SCREENING	6182568	494.61 - 494.61	494.61
MINING: HANDLING	96853387	9685.34 - 9685.34	7107.90
MINING: ORE DRYER	3309753	264.78 - 264.78	264.78
MINING: ORE CONCENTRATOR	38672436	4834.05 - 4834.05	4665.89
MINING: UNDERGROUND VENTS	146429	0.00 - 0.00	0.00
MINING. STOCKPILE	5653222	152.64 - 152.64	148.30
ASPHALT ROOFING: TOTAL	1685577	252.84 - 252.84	252.84
PRIMARY ALUMINUM: MAERIAL HANDLING	1665269	8326.34 - 8326.34	8326.34
PRIMARY ALUMINUM: ANODE BAKING FURNACE	190500	285.75 - 285.75	285.75
PRIMARY ALUMINUM: PREBAKED REDUC. CELL	241460	965.84 - 965.84	965.84
CHEMICAL MANUFAC: MIXER DRY	611288	12.23 - 12.23	12.23
CHEMICAL MANUFAC: MIXER WET	157076	1.57 - 1.57	1.57
CHEMICAL MANUFAC: DRYER	1862065	186.21 - 186.21	186.21
CHEMICAL MANUFAC: HANDLING - STORAGE	41352832	3101.46 - 3101.46	3101.46
CHEMICAL MANUFAC: REACTORS	712162	0.00 - 0.00	0.00
CHEMICAL MANUFAC: MILLS	81530	6.52 - 6.52	6.52
CHEMICAL MANUFAC: CALCINERS	62976	7.12 - 7.12	7.12
CHEMICAL MANUFAC: ABSORBERS	4989	0.00 - 0.00	0.00
CHEMICAL MANUFAC: FLAKERS	51108	4.09 - 4.09	4.09
CHEMICAL MANUFAC: GENERAL VENTING	7498	0.00 - 0.00	0.00
CHEMICAL MANUFAC: VERMICULITE EXPANDER	6681	0.75 - 0.75	0.75
CHEMICAL MANUFAC: MONOKOTE EXPANDER	4100	0.46 - 0.46	0.46
CHEMICAL MANUFAC: SULFURIC ACID	106408	0.00 - 0.00	0.00
CHEMICAL MANUFAC: AMMONIUM NITRATE NEUT.	807245	0.00 - 0.00	0.00

Table 3-4

US EPA REGION V
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
CHEMICAL MANUFAC: AN PRILL COOLER	386566	0.00	-	0.00	0.00
CHEMICAL MANUFAC: PELITE EPANDER	418440	47.28	-	47.28	47.28
CHEMICAL MANUFAC: CLOROX; CHLORINATION	97760	0.00	-	0.00	0.00
CHEMICAL MANUFAC: CLOROX; PACKING	50000	0.25	-	0.25	0.25
CHEMICAL MANUFAC: CLOROX; CONVEYORS	375	0.04	-	0.04	0.04
CHEMICAL MANUFAC: OLEUM; SLFONATION	181242	14.50	-	14.50	14.50
CHEMICAL MANUFAC: PHOSPHORIC ACID PLANT	175463	0.00	-	0.00	0.00
CHEMICAL MANUFAC: SOAP MFG. MACHINES	37274	13.05	-	13.05	13.05
CHEMICAL MANUFAC: SOAP PAD; KETTLES	18861	6.60	-	6.60	6.60
CHEMICAL MANUFAC: DETERGENT MANUFAC.	167840	377.64	-	377.64	377.64
CHEMICAL MANUFAC: CYANAMID KILN	14112	52.92	-	52.92	52.92
CHEMICAL MANUFAC: NA-NH4 SALT PLANT	21300	33.65	-	33.65	33.65
CHEMICAL MANUFAC: ALUMINUM CHLORIDE PROD	3675	0.00	-	0.00	0.00
GLASS MANUFAC: GLASS MELT FURNACE	749333	26.23	-	26.23	26.23
GLASS MANUFAC: ANNEALING FURNACE	51438	1.80	-	1.80	1.80
GLASS MANUFAC: HAMMER MILL	112557	84.42	-	84.42	84.42
GLASS MANUFAC: HANDLING & STORAGE	269460	20.21	-	20.21	20.21
GLASS MANUFAC: BATCH PLANT	115188	50.11	-	50.11	50.11
GLASS MANUFAC: HANDLING	461513	36.92	-	36.92	36.92
GLASS MANUFAC: COOLER	9000	0.04	-	0.04	0.04
GYPSUM MANUFAC: HANDLING	503551	75.53	-	75.53	75.53
GYPSUM MANUFAC: DRYER	222850	5.57	-	5.57	5.57
GYPSUM MANUFAC: KETTLES	178400	4.46	-	4.46	4.46
GYPSUM MANUFAC: MILLS	232244	11.61	-	11.61	11.61
GYPSUM MANUFAC: SAWS	1438	0.07	-	0.07	0.07
GYPSUM MANUFAC: PERLITE VENT FURNACE	608	0.07	-	0.07	0.07
GYPSUM MANUFACTURING: MIXERS	55255	1.93	-	1.93	1.93
CERAMIC CLAY: GRINDING	130433	247.82	-	247.82	69.14
CERAMIC CLAY. STORAGE	125393	106.58	-	106.58	26.65
REFINERY: SULFUR RECOVERY PLANT	11186	0.00	-	0.00	0.00
REFINERY: FCL REGENERATION	218151	0.00	-	0.00	0.00
PAPER BOX MANUFAC: HOGGERS	974204	170.49	-	170.49	170.49
PAPER BOX MANUFAC: CUTTERS	1673679	292.89	-	292.89	292.89
PAPER BOX MANUFAC: METAL CONVEYOR	6914	0.03	-	0.03	0.03

Table 3-4

US EPA REGION V
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
PAPER BOX MANUFAC: CORRUGATOR	74584	1.86 - 1.86	1.86
PAPER BOX MANUFAC: GLUER	23416	0.00 - 0.00	0.00
RUBBER MANUFAC: TRIMMING	20869	0.10 - 0.10	0.10
RUBBER MANUFAC: MIXING	47351	0.47 - 0.47	0.47
RUBBER MANUFAC: TIRE BUFFERS	20456	0.10 - 0.10	0.10
RUBBER MANUFAC: HANDLING	343	0.04 - 0.04	0.04
RUBBER MANUFAC: MILLS	29770	0.74 - 0.74	0.74
RUBBER MANUFAC: FARRAL & CALANDER	384	0.00 - 0.00	0.00
RUBBER MANUFAC: GRINDING	30636	0.77 - 0.77	0.77
LEATHER MANUFACTURING: GRINDING	215	0.01 - 0.01	0.01
LEATHER MANUFACTURING:BUFFING	4320	0.11 - 0.11	0.11
LEATHER MANUFACTURING:SHAVING	4320	0.11 - 0.11	0.11
LEATHER MANUFACTURING:DRY BOOTH	10800	0.11 - 0.11	0.11
LEATHER MANUFACTURING:WET BPOTH	10800	0.05 - 0.05	0.05
PAINT MANUFACTURING: SULFONATION	4576	0.46 - 0.46	0.46
PAINT MANUFACTURING: PARA CRESOL NEUT.	149836	149.84 - 149.84	149.84
PAINT MANUFACTURING: PACKAGING	3744	3.74 - 3.74	3.74
PAINT MANUFACTURING: RESIN PLANT	3259	3.26 - 3.26	3.26
PAINT MANUFACTURING: BATCH MILL	143382	143.38 - 143.38	143.38
PAINT MANUFACTURING: MIXERS	169298	169.30 - 169.30	169.30
PAINT MANUFACTURING: PIGMENT DISPERSION	64211	64.21 - 64.21	64.21
PAINT MANUFACTURING: PASTE MIXING	226950	226.95 - 226.95	226.95
CAN MANUFACTURING: SIDE SEAM; SOLDER BTH	2755	0.01 - 0.01	0.01
CAN MANUFACTURING: SIDE SEAM; WIPERS	29283	0.15 - 0.15	0.15
CAN MANUFACTURING: SIDE SEAM; NOZZLES	266	0.00 - 0.00	0.00
FLOOR TILE MANUFAC: PVC HANDLING	64877	4.87 - 4.87	4.87
FLOOR TILE MANUFAC: MIXING	108056	8.10 - 8.10	8.10
FLOOR TILE MANUFAC: CRUSHER	16468	12.35 - 12.35	12.35
FLOOR TILE MANUFAC: ASBESTOS HANDLING	1987	0.15 - 0.15	0.15
INK MANUFACTURING: TOTAL	21400	21.40 - 21.40	21.40
TONER MANUFACTURING: TOTAL	50	0.00 - 0.00	0.00
SPONGE (TAPE) MFG: PRESSES	3216	0.00 - 0.00	0.00
SPONGE (TAPE) MFG: MILLS	37056	0.00 - 0.00	0.00
SPONGE (TAPE) MFG: GRINDIING	1368	0.00 - 0.00	0.00

Table 3-4

US EPA REGION V
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
SPONGE (TAPE) MFG: FINISHING	374	0.00 - 0.00	0.00
GENERAL WOOD WORKING	447459	306.51 - 306.51	306.51
CARBON BLACK	148796	14.88 - 14.88	14.88
PAINT SPRAY BOOTHS	3170399	15.85 - 15.85	15.85
BREWERY: BREWING KETTLES	325454	0.00 - 0.00	0.00
SEASONING STANDS	3600	0.00 - 0.00	0.00
WIRE STRIPPERS	1157	0.00 - 0.00	0.00
CONTACT POT M	478747	117.29 - 117.29	117.29
QUENCH POT	439708	107.73 - 107.73	107.73
RECIRCULATING FURNACE	93510	246.40 - 246.40	246.40
FERTILIZER DRYER	143641	14.36 - 14.36	14.36

Table 3-5

US EPA REGION V
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE

SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
****	**********		**********	*********
130	124.85	-	124.85	124.85
720	44.36	-	99.23	48.58
1010	16006.49	-	16006.49	12927.24
1210	62.91	-	260.34	78.10
1290	157.85	-	653.18	133.25
1420	12224.39	-	12230.71	12227.55
1440	9317.59	-	9317.59	9093.87
1450	344.83	-	344.83	86.21
1460	482.95	-	482.95	482.95
1470	14.85	-	14.85	14.85
1490	4.13	-	4.13	4.13
1540	3.70	-	3.70	3.70
1790	0.00	-	0.00	0.00
2030	137.83	-	137.83	137.83
2040	15920.39	-	16324.81	15951.50
2050	161.68	-	161.68	160.50
2060	256.05	-	256.05	256.05
2070	229.46	-	229.46	229.46
2080	1514.60	-	1518.99	1514.93
2090	198.75	-	198.75	198.75
2110	319.03	-	3155.25	367.50
2140	5.43	-	5.43	5.43
2290	1.91	-	1.91	1.91
2320	8.08	-	8.08	8.08
2380	0.38	-	0.38	0.38
2400	205.27	-	205.27	205.27
2420	2.07	-	2.07	2.07
2430	21.72	-	21.72	21.72
2440	0.67	-	0.67	0.67
2460	5.47	-	5.47	5.47
2490	37.49	-	37.49	37.49
2500	0.52	-	0.52	0.52
2510	4.05	-	10.31	4.53
2590	1.11	-	1.11	1.11

Table 3-5.

US EPA REGION V
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
****	**********			*********
2620	2.93	-	12.10	3.63
2630	19.66	-	81.36	24.41
2640	125.18	-	138.21	123.95
2650	112.61	-	126.13	113.65
2660	10.96	-	10.96	10.96
2740	6.17	-	6.17	6.17
2750	163.05	-	168.42	163.46
2810	3972.38	-	4005.91	3971.34
2820	81.50	-	92.12	82.32
2830	12.67	-	12.67	12.67
2840	487.70	-	549.36	492.44
2850	574.85	-	574.85	574.85
2890	567.09	-	611.94	554.74
2910	0.00	-	0.00	0.00
2950	6380.18	-	6389.51	6384.05
2980	1.15	-	1.15	1.15
2990	2.63	-	2.63	2.63
3010	0.77	-	0.77	0.77
3030	0.33	-	0.33	0.33
3040	1.04	-	1.04	1.04
3060	2.52	-	9.89	3.09
3070	3.44	-	12.84	1.00
3110	0.01	-	0.01	0.01
3120	810.00	-	8055.00	909.00
3150	286.61	-	286.61	286.61
3210	94.55	-	94.55	94.55
3220	45.15	-	48.60	22.70
3230	10.01	-	10.01	10.01
3240	4397.37	-	6224.12	5267.42
3250	36.11	-	46.89	40.59
3260	21.69	-	21.69	21.69
3270	7516.23	-	7732.12	7608.93
3280	1446.90	-	1446.90	1446.90
3290	6290.01	-	6533.34	5896.18

Table 3-5.

US EPA REGION V
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
****	**********	*********
3310	29427.68 - 126830.05	42726.91
3320	6051.37 - 19811.58	9197.14
3330	10556.17 - 10623.25	10590.41
3340	1914.03 - 3465.98	2635.21
3350	82.49 - 82.49	82.49
3360	498.46 - 744.64	605.32
3390	627.32 - 674.24	653.40
3400	1.31 - 1.31	1.31
3410	0.39 - 0.39	0.39
3420	0.03 - 0.03	0.03
3440	102.56 - 119.57	111.78
3450	4.11 - 34.74	9.39
3460	27.07 - 94.38	29.33
3470	21.39 - 74.63	30.27
3490	502.14 - 514.80	506.94
3510	21.41 - 59.00	27.67
3520	23.07 - 77.36	33.11
3530	11.57 - 40.16	22.06
3540	2.35 - 29.32	14.37
3550	0.03 - 0.03	0.03
3560	107.19 - 405.24	171.54
3570	20.80 - 20.80	20.80
3590	38.01 - 38.01	38.01
3600	1.54 - 1.54	1.54
3620	16.05 - 20.38	16.39
3630	4.25 - 4.25	4.25
3640	0.23 - 0.23	0.23
3660	7.55 - 20.62	11.04
3670	8.19 - 8.19	8.19
3690	34.62 - 34.62	34.62
3700	0.08 - 0.08	0.08
3710	327.81 - 1598.50	561.38
3720	935.01 - 1735.01	1335.01
3740	2.57 - 5.83	3.77

Table 3-5

US EPA REGION V
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
****	**********			*********
3770	134.10	-	134.10	134.10
3790	0.01	-	0.01	0.01
3810	0.10	-	0.10	0.10
3840	32.64	-	32.64	32.64
3860	0.00	-	0.00	0.00
3900	2.30	-	2.30	2.30
3940	3.85	-	3.85	3.85
3990	71.47	-	693.06	135.53
4220	18209.94	-	18224.64	18206.06
4460	1693.55	-	2122.96	1874.35
4740	0.00	-	0.00	0.00
4780	113.30	-	343.34	131.00
4910	6671.10	-	26112.22	6399.35
4950	19.80	-	19.80	19.80
4960	11.54	-	47.73	9.06
5030	5421.81	-	5489.70	5455.76
5040	2.60	-	2.60	2.60
5050	346.93	-	405.61	351.45
5080	0.05	-	0.05	0.05
5090	243.50	-	575.98	482.75
5130	0.00	-	0.00	0.00
5150	8925.13	-	8925.13	7786.91
5160	5.27	-	5.27	5.27
5290	90.52	-	90.52	90.52
5330	0.00	-	0.00	0.00
5420	144.14	-	1235.52	504.50
5980	27.30	-	105.10	33.28
5990	0.01	-	0.01	0.01
6420	7.37	-	63.15	25.79
7390	0.56	-	2.34	1.12
8060	3.30	-	13.67	4.10
8090	5.61	-	23.21	6.96
8220	7.44	-	30.79	9.24
9100	0.73	-	3.00	0.90

Table 3-5

US EPA REGION V
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
****	**********	*********
9990	0.80 - 0.80	0.80

	SIC Code/Industry		Emissions (tons/year)	Percent of Region Total
2.	4220	Warehousing (i.e., grain elevators, etc.)	18,206	9.1
3.	2040	Grain Mill Products	15,951	8.0
4.	1010	Iron Ore Mining	12,927	6.5
5.	1420	Crushed and Broken Stone	12,228	6.2

These "top five" SIC codes account for a total of 91,039 tons of process fugitive emissions (or 45.6% of the total) for the region studied.

Thus, it is apparent that a limited number of process and industrial categories contribute a very large percentage (nearly one-half) of all process fugitive emissions in the major non-attainment areas of Region V. In theory, if these major categories of process fugitive emissions could be substantially controlled, the total overall emissions could be drastically reduced.

It should be noted here that Tables 3-2 and 3-3 do not include the results of the previously discussed Minnesota sand and gravel operations study. This separate, special study estimated a total of 2114 tons per year typical process fugitive emissions from sand and gravel operations in the non-attainment areas of Minnesota (primarily Washington County) studied in this report. See Section 3.5 for additional details.

3.2 ILLINOIS

As stated earlier, Illinois (i.e., Cook County) is the largest process fugitive emissions contributor amongst the Region V states (and counties) studied for this report. Summary sheets for the State of Illinois are presented in Appendix B. Detailed source by source process fugitive emissions are not included in this document but are available as a separate report. The process of secondary crushing and screening in the stone quarry industry was the largest contributor (14.4 percent) to the overall state (and county) process fugitive emission total. The following are the five processes with the greatest process fugitive emissions in the State of Illinois:

PROCESS	EMISSIONS (Tons/Year)	PERCENT OF STATE TOTAL
Stone quarry: Secondary crush & screen	10,835	14.4
Iron production: Iron ore handling and transfer	6,672	8.9
Stone quarry: Primary crushing	5,999	8.0
Lime manufacturing: Total	5,464	7.2
Grain process: Grain handling	5,151	6.8
	34,121	45.3

The top five process categories contribute about 45.3 percent of the total process fugitive emissions in the state. Two of the top five are part of the stone quarry industry. Together, these two categories account for 16,834 or 22.3 percent of the state total typical process fugitive emissions.

In terms of SIC code summaries, the SIC code with the greatest total of process fugitive emissions is 3310, Blast Furnace and Basic Steel Products, with 12,940 tons (17.2% of the state total). The remaining five of the top six SIC codes are noted below:

	SIC CODE/INDUSTRY		EMISSIONS (tons/year)	PERCENT OF STATE TOTAL
2.	1420	Crushed and Broken Stone	9567	12.7
3.	2040	Grain Mill Products	8091	10.7
4.	4220	Public Warehousing	5882	7.8
5.	1440	Sand and Gravel	5564	7.4
6.	5030	Lumber & Construction	5456	7.2

The top six SIC codes combine to total 47,500 tons per year of typical process fugitive emissions. This is 63.0% of the total typical process fugitive emissions in the State of Illinois (i.e., Cook County only).

3.3 INDIANA

The three counties in Indiana included in this report are Marion, Porter, and Vigo counties. Since Lake County contains heavy industry, it also contributes significantly to the overall problem. However, this county was part of another study, and is not included. Thus, Indiana's contribution to the overall regional process fugitive emission totals in this report are somewhat

PROCESS	EMISSIONS (tons/year)	PERCENT OF STATE TOTAL
Stone quarry: Secondary crush and screen	4,711	15.9
Iron/steel foundry: Pouring and cooling	2,885	9.7
Iron production: Iron ore handling and transfer	2,778	9.4
Cement manufacturing: Kiln	2,250	7.6
Steel production: Electric arc furnace	2,145	7.2
	14,769	49.8

In sum, these five largest processes account for almost 50 percent (nearly half) of the process fugitive emissions within the county. The top five include three processes that pertain primarily to iron and steel production and account for 26.3 percent of the total countywide process fugitive emissions. The summary results for the State of Michigan are presented in Appendix D.

When evaluating the fugitive process emission totals by SIC code, it is noted that the top three SIC codes are:

	SIC CODE/INDUSTRY		EMISSIONS (tons/year)	PERCENT OF STATE TOTAL
1.	3310	Blast Furnace and Basic Steel Products	12,743	43.0
2.	3240	Cement	4,634	15.8
3.	3290	Misc. Non-metallic Mineral Products	4,593	15.5

These top three SIC codes total 21,970 tons of process fugitive emissions, which equals 74.1% of the total for the area of the State of Michigan addressed in this study.

3.5 MINNESOTA

Minnesota ranks third (just ahead of Michigan) in the order of relative contribution to the regional process fugitive emissions total. However, Minnesota's totals do not include any sand and gravel sources since these are not currently included by permit in the Minnesota industrial point source inventory. PES has recently completed a project with the Minnesota Pollution

Control Agency addressing this deficiency. This effort is the subject of a separate report issued previously. The results of this special study and their impact on the state and region totals are discussed at the end of this section.

The five processes that are the largest contributors of process fugitive emissions in the major non-attainment areas of the State of Minnesota are:

PROCESS	EMISSIONS (tons/year)	PERCENT OF STATE TOTAL
Mining: Handling	7,055	20.9
Mining: Ore concentractor	4,666	13.8
Grain terminal: Loading	4,477	13.3
Terminal grain elevator	3,622	10.7
Grain process: Wheat mill	2,743	8.1
	22,564	66.8

As is evident, two of the five largest process categories are related to the ore mining industry and account for 34.7 percent of the major non-attainment area total process fugitive emissions for the State of Minnesota. The other three processes in the first five are related to the grain handling and processing industries. The top five processes in total account for 66.8 percent of the total state process fugitive emissions. The summary for the State of Minnesota is presented in Appendix E.

Review of the total process fugitive emissions by SIC Code yields the following table of the four SIC Codes with the greatest emissions:

	SIC CODE/INDUSTRY		EMISSIONS (tons/year)	PERCENT OF STATE TOTAL
1.	1010	Iron ore mining	12,927	38.3
2.	4220	Public warehousing	12,324	36.5
3.	2040	Grain mill products	3,600	10.7
4.	1440	Sand and gravel	1,505	4.6

When combined, these four SIC Codes total 30,356 tons of process fugitive emissions per year, or 89.9% of the State of Minnesota total.

If the results of the PES/MPCA study of sand and gravel operations typical process fugitive emissions were included in these totals, changes would occur in the county totals and in the rankings of the processes and SIC codes with the greatest process fugitive emissions. See the following tables for details:

COUNTY	TYPICAL PROCESS FUGITIVE EMISSIONS (tons/year) FROM TABLE 3-2	SAND AND GRAVEL OPERATIONS	TOTAL
Dakota	708	--	708
Hennepin	6,623	10	6,633
Ramsey	5,963	117	6,080
Washington	3,435	1,987	5,422
St. Louis	17,035	--	17,035
Total:	33,765	2,114	35,879

Minnesota Major Non-Attainment Areas

In terms of processes, if the sand and gravel industry operations were grouped with stone quarry operations (as was done in other states), the revised ranking would be as follows:

PROCESS	EMISSIONS (tons/year)	PERCENT STATE TOTAL
Mining: Handling	7,055	19.7
Mining: Ore concentrator	4,666	13.0
Grain terminal: Loading	4,477	12.5
Terminal grain elevator	3,622	10.1
Stone quarry: Secondary crush and screen	2,952	8.2
	22,772	63.5

In a ranking by SIC code, the sand and gravel code moves up one notch:

	SIC CODE/INDUSTRY		EMISSIONS (tons/year)	PERCENT OF STATE TOTAL
1.	1010	Iron Ore Mining	12,927	36.0
2.	4220	Public Warehousing	12,324	34.3
3.	1440	Sand and Gravel	3,619	10.1
4.	2040	Grain Mill Products	3,600	10.0
			32,470	90.5

3.6 OHIO

The State of Ohio ranks as the second largest state contributor to the overall process fugitive emission total in Region V non-attainment areas. The non-attainment areas of Ohio studied here, as a whole, contribute approximately 19.2 percent of the regional total process fugitive emissions. The five largest processes (in terms of process fugitive emissions) in the State of Ohio are listed below:

PROCESS	EMISSIONS (tons/year)	PERCENT OF STATE TOTAL
Primary aluminum: Material handling	8,326	21.7
Terminal grain elevator	7,561	19.7
Lime manufacturing: Total	2,413	6.3
Coal storage: Total	2,311	6.0
Iron production: Iron ore handling and transfer	1,741	4.5
	22,352	58.3

The top five processes contribute over half (58.3 percent) of the total process fugitive emissions in the non-attainment counties of the state. The largest of these is the primary aluminum: material handling category, accounting for 21.7 percent of the total. A summary of results for the State of Ohio is presented in Appendix F.

These findings regarding "processes" are reflected in an evaluation of the major SIC codes contributing to the process fugitive emission total for the State of Ohio. The five SIC codes with the greatest emissions are:

	SIC CODE/INDUSTRY		EMISSIONS (tons/year)	PERCENT OF STATE TOTAL
1.	3330	Primary Non-Ferrous Metals(Al)	10,521	27.4
2.	3310	Blast Furnace and Basic Steel Products	7,791	20.3
3.	5150	Farm Products Raw Materials	7,007	18.8
4.	1420	Crushed Stone	2,420	6.3
5.	3270	Concrete, Gypsum and Plaster Products	2,108	5.5

In total, these five SIC codes comprise 77.8% (29,847 tons) of the total process fugitive emissions in the State of Ohio.

3.7 WISCONSIN

Wisconsin is the smallest contributor of all the states to the overall industrial process fugitive emissions total in the Region V area, accounting for only two percent of the total. The five most significant process operations in the non-attainment areas of the State of Wisconsin (i.e., Milwaukee County only) are as follows:

PROCESS	EMISSIONS (tons/year)	PERCENT OF STATE TOTAL
Iron/steel foundry: Casting shakeout	1,161	28.4
Terminal grain elevator	694	17.4
Cement manufacturing: Total	442	10.8
Iron/steel foundry: Electric arc furnace	223	5.5
Grain process: Corn milling	206	5.1
	2,726	66.8

These five processes account for 66.8 percent of the total fugitive process emissions in the area of the State of Wisconsin included in this study. The largest of these is the Iron/steel foundry: Casting shakeout category which accounts for over 28.4 percent of the state total. It should also be noted that the Iron/steel foundry category has two of the five top spots totalling 1,384 tons, or 33.9% of the Wisconsin total. The grain industry also occupies two of the top categories in Wisconsin, with a total of 900 tons of process fugitive emissions, equalling 22.0% of Wisconsin's total (in the areas evaluated). The summary for the State of Wisconsin is presented in Appendix G.

Examination of the Wisconsin totals by SIC codes yields the following table of the SIC codes with the greatest emissions:

	SIC CODE/INDUSTRY		EMISSIONS (tons/year)	PERCENT OF STATE TOTAL
1.	3320	Iron and Steel Foundries	1561	38.2
2.	2080	Beverages	571	14.0
3.	2040	Grain Mill Products	510	12.5
4.	3240	Cement, Hydraulic	442	10.8

Together, these four SIC codes total 3,084 tons of process fugitive emissions per year, or 75.5% of the total for the areas of the State of Wisconsin addressed in this report.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

This report is the result of a limited scope study of process fugitive emissions (particulate only) from industrial sources located in the major non-attainment areas within the six states of EPA, Region V. For the purpose of this report, an industrial source is defined as a source which has the potential to emit particulate emissions greater than 25 tons per year. A major source is classified as a source that has controlled emissions greater than 50 tons per year.

This study concluded that 199,664 tons of process fugitive emissions were generated in 1981 by industrial sources located in the major non-attainment areas in the Region V states. These estimates represent approximately 84 percent of the total point source particulate emissions (238,461 tons) from facilities located in the same area.

The single process emitting the largest amount of process fugitive emissions (about 9.2% of the regional total) is the secondary crushing and screening process at stone quarry facilities. The top ten processes (in descending order) follow:

PROCESS DESCRIPTION	TYPICAL PROCESS FUGITIVE EMISSIONS (tons/year)
Stone Quarry: Secondary Crush and Screen	18,453
Terminal Grain Elevator	13,770
Iron Production: Iron Ore Handling & Transfer	11,192
Grain Process: Handling	9,303
Primary Aluminum: Material Handling	8,326
Lime Manufacturing: Total	8,314
Stone Quarry: Primary Crushing	8,149
Grain Process: Wheat Mill	7,708
Mining: Handling	7,108
Iron Production: Sinter Operation	7,035

These ten largest emitting processes account for approximately 50 percent of the total process fugitive emissions in the region studied. All of the processes identified in the study area are listed (in descending order of annual emissions) in Table 4-1.

Table 4-1.

US EPA REGION V
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
CONTRIBUTIONS OF VARIOUS PROCESSES IN DESCENDING ORDER

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
STONE QUARRY: SECONDARY CRUSH & SCREEN	25104275	18828.21 - 18828.21	18452.80
TERMINAL GRAIN ELEVATOR	13739849	14907.74 - 14907.74	13769.52
IRON PROD. IRON ORE HANDLING & TRANSFER	11191605	11191.61 - 11191.61	11191.61
GRAIN PROCESS· HANDLING	37216844	9304.21 - 9304.21	9303.02
PRIMARY ALUMINUM MAERIAL HANDLING	1665269	8326.34 - 8326.34	8326.34
LIME MANUF: TOTAL	5262262	8261.75 - 8367.00	8314.37
STONE QUARRY. PRIMARY CRUSHING	32595207	8148.80 - 8148.80	8148.80
GRAIN ELEVATOR: WHEAT MILL	2202411	7708.44 - 7708.44	7708.44
MINING HANDLING	96853387	9685.34 - 9685.34	7107.90
IRON PROD: SINTER OPERATION	3802498	2414.59 - 7034.62	7034.62
STEEL PRODUCTION· BASIC OXYGEN FURNACE	27563099	1929 42 - 16537.86	6752.96
GRAIN TERMINAL: LOADING	20050774	6516.50 - 6516.50	6516.50
COAL STORAGE (TOTAL)	44779110	6492.97 - 26867.47	6213.93
MINING ORE CONCENTRATOR	38672436	4834.05 - 4834.05	4665.89
ASPHALT CONCRETE: TOTAL	13750079	4262.52 - 4262.52	4262.52
SEC ALUMINUM PROD·CHLORINATION - FLUXING	159401	3985.02 - 3985.02	3985.02
IRON/STEEL FOUNDRY: POURING AND COOLING	2759320	137.97 - 5698.00	3634.83
CEMENT MANUF· UNLOAD- OUTFALL TOSTORAGE	861380	2153.45 - 4306.90	3230.17
STEEL PRODUCTION: ELECTRIC ARC FURNACE	4401381	396.12 - 6602.07	3191.00
CHEMICAL MANUFAC: HANDLING - STORAGE	41352832	3101.46 - 3101.46	3101.46
LIME MANUF: ROTARY KILN	6576134	2630.45 - 2630.45	2630.45
IRON/STEEL FOUNDRY: CASTING SHAKEOUT	1807746	1084.65 - 11569.57	2580.37
COKE MANUF· COAL CHARGING	6158826	2617.50 - 30794.13	2284.65
CEMENT MANUFACTURE· KILN	600000	2250.00 - 2250.00	2250.00
CONCRETE BATCH: CEMENT UNLOAD TO SILOS	17940954	2152.91 - 2152.91	2152.91
IRON PROD: CASTING HOUSE	10622442	2124.49 - 20873.10	2124.49
GRAIN PROCESS: CLEANING	6329119	1898.74 - 1898.74	1898.74
STONE QUARRY: STORAGE	11452638	1889.69 - 1889.69	1889.69
COKE MANUF· COKING (DOOR LEAKING)	7460047	1492.01 - 3357.02	1808.76
CONCRETE BATCH: TOTAL	9637594	1782.95 - 1782.95	1782.95
IRON PROD: SLAG HANDLING	2520071	2545.27 - 2646.07	1779.84
IRON PROD: BLAST FURNACE DUST HANDLING	11490172	1723.53 - 1723.53	1723.53
STONE QUARRY: HANDLING	21050373	1578.78 - 1578.78	1484.38
IRON/STEEL FOUNDRY: SAND HANDLING	11545282	1731.79 - 1731.79	1376.63
ASPHALT CONCRETE: AGGREGATE STORAGE	7757759	1280.03 - 1280.03	1280.03

Table 4-1.

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TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
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COKE MANUF· COKE PUSHING	6158826	1077.79	-	3079.41	1254.53
GRAIN TERMINAL. HEADHOUSE	15374390	1153.08	-	1153.08	1153.08
GRAIN TERMINAL RECEIVING	22882133	1144.11	-	1144.11	1144.11
IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	1102872	579.01	-	1919.00	1067.42
PRIMARY ALUMINUM. PREBAKED REDUC. CELL	241460	965.84	-	965.84	965.84
SECONDARY COPPER· RECLIAMEER	140160	963.60	-	963.60	963.60
COKE MANUF: COKE QUENCHING	9090509	909.05	-	27271.53	886.55
GRAIN PROCESS: CORN MILLING	1259070	755.44	-	755.44	755.44
GRAIN PROCESS: BULK LOADING	2984077	746.02	-	746.02	746.02
CEMENT MANUF· TRANSFER & CONVEYING	3806344	380.63	-	761.27	570.95
SEC LEAD SMELTING: REVERBERATORY FURNACE	122675	171.75	-	963.00	567.37
ASPHALT CONCRETE· BATCHING PROCESS	3778160	547.83	-	547.83	547.83
IRON/STEEL FOUNDRY: CUPOLA FURNACE	1326353	66.32	-	1326.35	533.45
GRAIN CLEANING	3407687	511.15	-	511.15	511.15
GRAIN ELEVATOR. GRAIN HANDLING (TOTAL)	123094	504.69	-	504.69	504.69
MINING: SECONDARY CRUSHING - SCREENING	6182568	494.61	-	494.61	494.61
COKE MANUF: COKE HANDLING	12465905	143.36	-	810.28	489.64
COKE MANUF: COAL STORAGE	2788709	404.36	-	1673.23	488.66
ROCK QUARRY: DRYER	371500	482.95	-	482.95	482.95
SEC LEAD SMELTING. BLAST/CUPOLA FURNACE	71921	431.53	-	431.53	431.53
IRON PROD· IRON ORE STORAGE (TOTAL)	3063362	306.34	-	551.41	428.87
MINING PRIMARY CRUSHING	71763300	717.63	-	717.63	388.32
CHEMICAL MANUFAC: DETERGENT MANUFAC.	167840	377.64	-	377.64	377.64
IRON/STEEL FOUNDRY INDUCTION FURNACE	420299	420.30	-	420.30	375.47
GRAIN PROCESS RECEIVING	7454122	372.71	-	372.71	367.75
IRON/STEEL FOUNDRY· BALL MILL	158410	336.62	-	336.62	336.62
GRAIN TERMINAL: TRIPPER	6704767	335.24	-	335.24	335.24
COAL STORAGE: LOADING OUT (OUTGOING)	8310881	290.88	-	1662.18	332.44
GENERAL WOOD WORKING	447459	306.51	-	306.51	306.51
IRON/STEEL FOUNDRY· MOLTEN IRON TRANSFER	3180088	302.11	-	302.11	302.11
PAPER BOX MANUFAC. CUTTERS	1673679	292.89	-	292.89	292.89
PRIMARY ALUMINUM: ANODE BAKING FURNACE	190500	285.75	-	285.75	285.75
COAL STORAGE. LOADING ONTO PILE	7933734	277.68	-	1586.75	277.68
IRON/STEEL FOUNDRY.FOUNDRY CAST CLEANING	1460070	116.81	-	584.03	275.41
MINING. ORE DRYER	3309753	264.78	-	264.78	264.78

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ASPHALT ROOFING: TOTAL	1685577	252.84 -	252.84	252.84
RECIRCULATING FURNACE	93510	246.40 -	246.40	246.40
PAINT MANUFACTURING: PASTE MIXING	226950	226.95 -	226.95	226.95
COAL STORAGE· WIND EROSION	5340649	34.71 -	667.58	186.92
CHEMICAL MANUFAC DRYER	1862065	186.21 -	186.21	186.21
LIME MANUF: PRIMARY CRUSHING	1285195	321.30 -	321.30	172.12
PAPER BOX MANUFAC: HOGGERS	974204	170.49 -	170.49	170.49
PAINT MANUFACTURING. MIXERS	169298	169.30 -	169.30	169.30
CEMENT MANUF: CRUSHING	650000	130.00 -	195.00	162.50
SEC ALUMINUM PROD: SWEATING FURNACE	430164	154.86 -	154.86	154.86
PAINT MANUFACTURING: PARA CRESOL NEUT.	149836	149.84 -	149.84	149.84
MINING. STOCKPILE	5653222	152.64 -	152.64	148.30
PAINT MANUFACTURING: BATCH MILL	143382	143.38 -	143.38	143.38
SECONDARY COPPER SMELTING: ROTARY FURN.	58729	44.05 -	215.83	130.08
GRAIN PROCESS: DRYING	4698237	117.46 -	117.46	117.46
CONTACT POT M	478747	117.29 -	117.29	117.29
QUENCH POT	439708	107.73 -	107.73	107.73
IRON PROD: LIMESTONE HANDLING & TRANSFER	973114	97.31 -	97.31	97.31
IRON/STEEL FOUNDRY: GRAVITY SEPARATORS	125256	93.94 -	93.94	93.94
IRON/STEEL FOUNDRY MOLD MAKING	4382102	153.37 -	153.37	90.86
GLASS MANUFAC: HAMMER MILL	112557	84.42 -	84.42	84.42
SEC ALUMINUM PROD: REVERBERATORY FURNACE	720052	79.21 -	79.21	79.21
GYPSUM MANUFAC. HANDLING	503551	75.53 -	75.53	75.53
CERAMIC CLAY: GRINDING	130433	247.82 -	247.82	69.14
SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	198489	71.46 -	71.46	68.92
PAINT MANUFACTURING: PIGMENT DISPERSION	64211	64.21 -	64 21	64.21
GRAIN DRYING	1129823	62.14 -	62.14	62.14
FOUNDRY SHOT BLAST GRINDER / FINISHING	11172369	55.86 -	55.86	55.76
GRAIN TERMINAL: TUNNEL BELT	774300	54.20 -	54.20	54.20
CHEMICAL MANUFAC CYANAMID KILN	14112	52.92 -	52.92	52.92
GLASS MANUFAC: BATCH PLANT	115188	50.11 -	50.11	50.11
CHEMICAL MANUFAC PELITE EPANDER	418440	47.28 -	47.28	47.28
CONCRETE BATCH MIXER LOAD OF AGGREGATE	2149848	43.00 -	43.00	43.00
STEEL PRODUCTION. SCARFING	8458040	46.52 -	46.52	39.74
SEC ALUMINUM PROD: CRUCIBLE FURNACE	862567	38.82 -	38.82	38.82

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IRON/STEEL FOUNDRY· METAL SEPARATORS	46800	35.10 -	35.10	35.10
CHEMICAL MANUFAC· NA-NH4 SALT PLANT	21300	33.65 -	33.65	33.65
CONCRETE BATCH: TRANSFER OF SAND	1601315	32.03 -	32.03	32.03
IRON/STEEL FOUNDRY: CRUCIBLE FURA CE	184889	9.24 -	55.47	30.08
CERAMIC CLAY: STORAGE	125393	106.58 -	106.58	26.65
CONCRETE BATCH: HOPPER LOAD OF AGGREGATE	2647928	26.48 -	26.48	26.48
GLASS MANUFAC GLASS MELT FURNACE	749333	26.23 -	26.23	26.23
SECONDARY COPPER SMELTING: REV. FUNACE	9445	12.51 -	37.02	24.89
SEC ZINC SMELT. ROTARY SWEAT FURNACE	48270	13.52 -	30.41	21.96
INK MANUFACTURING: TOTAL	21400	21.40 -	21.40	21.40
SEC LEAD SMELTING SWETAING FURNACE	16260	13.01 -	28.45	20.73
SECONDARY ALUMINUM: SCRAP CRUSHER	82576	20.64 -	20.64	20.64
GLASS MANUFAC: HANDLING & STORAGE	269460	20.21 -	20.21	20.21
CEMENT MANUF: RAW GRINDING	396136	19.81 -	19.81	19.81
STEEL FOUNDRY: CORE MAKING	99947	17.49 -	17.49	17.49
CONCRETE BATCH LOAD OF TRANSIT MIX TRUCK	1675790	16.76 -	16.76	16.76
PAINT SPRAY BOOTHS	3170399	15.85 -	15.85	15.85
CARBON BLACK	148796	14.88 -	14.88	14.88
CHEMICAL MANUFAC: OLEUM; SLFONATION	181242	14 50 -	14.50	14.50
FERTILIZER DRYER	143641	14.36 -	14.36	14.36
CHEMICAL MANUFAC· SOAP MFG. MACHINES	37274	13.05 -	13.05	13.05
FLOOR TILE MANUFAC CRUSHER	16468	12.35 -	12.35	12.35
CHEMICAL MANUFAC· MIXER DRY	611288	12.23 -	12.23	12.23
GYPSUM MANUFAC MILLS	232244	11.61 -	11.61	11.61
SECONDARY COPPER WIRE CRUSHER	37440	9.36 -	9.36	9.36
FLOOR TILE MANUFAC MIXING	108056	8.10 -	8.10	8.10
SECONDARY COPPER SMELTING. EL. IND. FURN	294435	7.36 -	20.61	7.64
CHEMICAL MANUFAC. CALCINERS	62976	7.12 -	7.12	7.12
CHEMICAL MANUFAC. SOAP PAD; KETTLES	18861	6.60 -	6.60	6.60
CHEMICAL MANUFAC: MILLS	81530	6.52 -	6.52	6.52
CONCRETE BATCH: LOAD OF DRY BATCH TRUCK	325668	6.51 -	6.51	6.51
CEMENT MANUF. RAW MATERIAL UNLOADING	60000	0.90 -	12.00	6.45
IRON/STEEL FOUNDRY: AUTO SHREDDER	1209652	6.05 -	6.05	6.05
IRON PROD· SHIP/RAILROAD IRON ORE UNLOAD	460000	4.60 -	6.90	5.75
GYPSUM MANUFAC: DRYER	222850	5.57 -	5.57	5.57

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GYPSUM MANUFAC: KETTLES	178400	4.46 -	4.46	4.46
CHEMICAL MANUFAC: FLAKERS	51108	4.09 -	4.09	4.09
SECONDARY COPPER SMELTING CRUCIBLE FURN	15415	2.47 -	4.93	3.78
PAINT MANUFACTURING. PACKAGING	3744	3.74 -	3.74	3.74
SEC LEAD SMELTING: POT (KETTLE) FURNACE	176538	3.53 -	3.53	3.53
PAINT MANUFACTURING: RESIN PLANT	3259	3.26 -	3.26	3.26
IRON/STEEL FOUNDRY. PLATING	529206	2.65 -	2.65	2.65
SEC ZINC SMELT: MUFFLE SWEAT FURNACE	4914	1.33 -	3.93	2.63
GYPSUM MANUFACTURING. MIXERS	55255	1.93 -	1.93	1.93
PAPER BOX MANUFAC. CORRUGATOR	74584	1.86 -	1.86	1.86
GLASS MANUFAC. ANNEALING FURNACE	51438	1.80 -	1.80	1.80
CHEMICAL MANUFAC. MIXER WET	157076	1.57 -	1.57	1.57
RUBBER MANUFAC: GRINDING	30636	0.77 -	0.77	0.77
CHEMICAL MANUFAC: VERMICULITE EXPANDER	6681	0.75 -	0.75	0.75
RUBBER MANUFAC. MILLS	29770	0.74 -	0.74	0.74
SECONDARY COPPER SMELTING: CASTING	82570	0.41 -	0.83	0.62
RUBBER MANUFAC: MIXING	47351	0.47 -	0.47	0.47
CHEMICAL MANUFAC MONOKOTE EXPANDER	4100	0.46 -	0.46	0.46
PAINT MANUFACTURING: SULFONATION	4576	0.46 -	0.46	0.46
SEC ZINC SMELT: KETTLE MELTING FURNACE	177727	0.44 -	0.44	0.44
SEC ZINC SMELT: KETTLE SWEAT FURNACE	1498	0.42 -	0.42	0.42
SEC ZINC SMELT: REVERBERATORY	1100	0.00 -	0.72	0.36
CHEMICAL MANUFAC· CLOROX; PACKING	50000	0.25 -	0.25	0.25
IRON/STEEL FOUNDRY: STEEL SHREDDER	32975	0.16 -	0.16	0.16
SEC ALUMINUM PROD. INDUCTION FURNACE	3363	0.15 -	0.15	0.15
CAN MANUFACTURING· SIDE SEAM; WIPERS	29283	0.15 -	0.15	0.15
FLOOR TILE MANUFAC· ASBESTOS HANDLING	1987	0.15 -	0.15	0.15
LEATHER MANUFACTURING:BUFFING	4320	0.11 -	0.11	0.11
LEATHER MANUFACTURING.SHAVING	4320	0.11 -	0.11	0.11
LEATHER MANUFACTURING DRY BOOTH	10800	0.11 -	0.11	0.11
RUBBER MANUFAC: TRIMMING	20869	0.10 -	0.10	0.10
RUBBER MANUFAC: TIRE BUFFERS	20456	0.10 -	0.10	0.10
GYPSUM MANUFAC: SAWS	1438	0.07 -	0.07	0.07
GYPSUM MANUFAC. PERLITE VENT FURNACE	608	0.07 -	0.07	0.07
LEATHER MANUFACTURING:WET BPOTH	10800	0.05 -	0.05	0.05

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CHEMICAL MANUFAC: CLOROX; CONVEYORS	375	0.04 -	0.04	0.04
GLASS MANUFAC: COOLER	9000	0.04 -	0.04	0.04
RUBBER MANUFAC· HANDLING	343	0 04 -	0.04	0.04
SEC ZINC SMELT: CRUCIBLE FURNACE	12620	0.03 -	0.03	0.03
PAPER BOX MANUFAC· METAL CONVEYOR	6914	0.03 -	0 03	0 03
LEATHER MANUFACTURING· GRINDING	215	0.01 -	0.01	0.01
CAN MANUFACTURING: SIDE SEAM; SOLDER BTH	2755	0.01 -	0.01	0.01
SEC ZINC SMELT·INDUCTION MELTING FURNACE	372	0.00 -	0.00	0.00
IRON/STEEL FOUNDRY: SOAKING PITS	9924385	0.00 -	0.00	0.00
IRON/STEEL FOUNDRY STRIP MILLS	7990455	0 00 -	0.00	0.00
IRON/STEEL FOUNDRY: PICKLING TANKS	992421	0.00 -	0.00	0 00
IRON/STEEL FOUNDRY: DESULF STATION-STEEL	370000	0.00 -	0.00	0.00
MINING· UNDERGROUND VENTS	146429	0.00 -	0.00	0.00
CHEMICAL MANUFAC: REACTORS	712162	0.00 -	0.00	0.00
CHEMICAL MANUFAC· ABSORBERS	4989	0.00 -	0.00	0.00
CHEMICAL MANUFAC: GENERAL VENTING	7498	0.00 -	0.00	0.00
CHEMICAL MANUFAC: SULFURIC ACID	106408	0.00 -	0.00	0.00
CHEMICAL MANUFAC: AMMONIUM NITRATE NEUT.	807245	0.00 -	0.00	0.00
CHEMICAL MANUFAC: AN PRILL COOLER	386566	0 00 -	0.00	0.00
CHEMICAL MANUFAC: CLOROX; CHLORINATION	97760	0.00 -	0.00	0.00
CHEMICAL MANUFAC: PHOSPHORIC ACID PLANT	175463	0.00 -	0.00	0.00
CHEMICAL MANUFAC: ALUMINUM CHLORIDE PROD	3675	0.00 -	0.00	0.00
REFINERY. SULFUR RECOVERY PLANT	11186	0.00 -	0.00	0.00
REFINERY: FCL REGENERATION	218151	0.00 -	0.00	0.00
PAPER BOX MANUFAC. GLUER	23416	0.00 -	0.00	0.00
RUBBER MANUFAC: FARRAL & CALANDER	384	0.00 -	0.00	0.00
CAN MANUFACTURING. SIDE SEAM; NOZZLES	266	0.00 -	0.00	0.00
TONER MANUFACTURING. TOTAL	50	0.00 -	0.00	0.00
SPONGE (TAPE) MFG· PRESSES	3216	0 00 -	0.00	0.00
SPONGE (TAPE) MFG: MILLS	37056	0.00 -	0.00	0.00
SPONGE (TAPE) MFG. GRINDIING	1368	0.00 -	0.00	0.00
SPONGE (TAPE) MFG· FINISHING	374	0.00 -	0.00	0.00
BREWERY: BREWING KETTLES	325454	0.00 -	0.00	0.00
SEASONING STANDS	3600	0.00 -	0.00	0.00
WIRE STRIPPERS	1157	0.00 -	0.00	0.00

4.2 GRAIN HANDLING

As is apparent from reviewing the ranked listing of process categories which are significant contributors to the process fugitive emissions inventory total, three of the largest ten process categories are related to grain processing, terminaling, handling, and loading. These three categories are:

1. Terminal grain elevators
2. Grain processing - Grain handling
3. Grain processing - Wheat mill

Together, these three categories total 30,781 tons/year of process fugitive emissions, which is 15.4 percent of the Region V total for the major non-attainment areas studied here.

In addition, several additional grain related processes appear in the complete ranked listing. For example, of all processes contributing at least 100 ton/year of process fugitive emissions to the total, grain operations contribute 44,831 tons/year, or 22.5 percent of the total in Region V's non-attainment areas. These statistics highlight an apparent need to pursue additional evaluation of grain handling, terminal and processing facilities.

It is recommended that the following aspects of emissions from grain handling be examined further:

1. Emission factors: In two recent work assignments for EPA, Region V addressing grain loading into ships and barges, the nominally accepted emission factors for this process have been seriously called into question by facility operators and control equipment manufacturers. For example, emission factors for uncontrolled ship and barge loading activities quoted in the literature range from 0.11 to 8.0 pounds of emissions per ton of grain loaded (a 73-fold difference). The emission factor will depend on the type of grain, its "cleanliness", the length of the spout, wind conditions, etc. Perhaps the same range of emission factors affect other grain handling operations as well and should be better defined.

2. Control technology: Review of the range of potential process fugitive emissions vs. the "typical process fugitive emissions" used for this summary may indicate grain handling operations (at least those investigated for this study) are very poorly controlled. Other PES investigations indicate that water spraying/moisture application (as is used on some other dry materials) cannot be used with grain (due to potential spoilage). Therefore, alternate technologies should be reviewed. One of the most obvious, and potentially least costly, technologies is that of covered conveyors. Commonly accepted engineering judgment indicates covered conveyors reduce process fugitive emissions by 50 percent. However, the issue of explosive atmospheres may be significant in the application of covered conveyors. Other technologies like air evacuation at transfer points may be able to significantly reduce grain handling process fugitive emissions. The studies which are recommended to be performed include assessments of the applicability of alternate technologies, their potential effectiveness, and their projected costs.

3. Facility investigations: Based on the uncertainties regarding emission factors and applicability of control technologies, it is recommended that on-site facility investigations be performed to obtain first hand information regarding actual facility operations. It may be that many of the facilities are already attempting to control process fugitive emissions with available (or innovative) technology whose effect is not reflected in the inventory presented here. This type of study might also allow distinctions to be made (if they exist) between various types of grain handling facilities (terminals, country elevators, grain processing facilities, etc.). Finally, additional throughput data would be obtained to improve the accuracy of the inventory.

4.3 QUARRYING ACTIVITIES

Two of the top ten processes emitting process fugitive emissions are related to quarrying activities. These activities account for 13.3 percent of the total process fugitive emissions regionwide. Our findings indicate that

no major controls are placed on these activities. The majority of the dust control activities at these sites are not practiced for purposes of dust control, but rather as an integral part of the process (such as sand cleaning). These factors highlight a need for additional study in the area of dust control at quarrying and mining facilities.

It is recommended that the following factors in quarrying and mining activities be examined further:

1. Regulation: Region V should undertake an evaluation of the regulations that pertain to quarrying and mining activities in all the states. These regulations should be reviewed in terms of applicability and the ability to control emissions from these sources.
2. Control practices: A study should be undertaken that would address the types of control practices at these facilities at the present time. Furthermore, future controls should be examined in terms of their ease of applicability, operation, and cost-effectiveness.

Using the above mentioned factors as the basis for decision-making, the existing state regulations may need to be modified.

4.4 IRON PRODUCTION

Two of the top ten process fugitive emissions generating processes pertain to iron production. These account of 18,227 tons or 9.1 percent of the total regionwide process fugitive emissions generated for this study. The two activities are:

1. Iron production: Iron ore handling and transfer
2. Iron production: Sinter operations

If processes contributing 100 tons per year or more to the regional total are considered, iron production related activities account for 31,496 tons per year or 15.8 percent of the total process fugitive emissions. Realizing that iron and steel production facilities are going through difficult economic times, nonetheless they should be scrutinized in terms of fugitive emissions control activities. At a minimum, the following items should be considered:

1. Processes: The processes and listed in Table 4-1 pertaining to iron and steel production should be examined for present controls on these processes, potential future controls, and cost-effectiveness of future controls.

2. Regulations: Additional controls should be considered for integration into the existing regulations. If possible and cost-effective, these controls should be required of the iron and steel producton facilities.

4.5 MATERIAL HANDLING

Similar to the analysis of grain handling (Section 4.2), the general category of materials handling includes four of the ten top process fugitive emission positions (i.e., Grain Processing - Grain Handling, Iron Ore Handling and Transfer, Grain Process - Grain Handling, and Primary Aluminum Material Handling). Together, these four process categories total 35,929 tons/year process fugitive particulate emissions, or 18.0 percent of the total for the total Region V major non-attainment areas. Again, as in the case of the grain operations alone, an even higher percentage of total emissions are assembled as one goes farther down the list.

It is recommended that further evaluation of alternate control technologies be undertaken (especially where technologies cross process or material boundaries in applicability) to evaluate effectiveness, applicability, and costs. An effective (50 percent or greater), relatively inexpensive technology applied to material handling operations throughout the Region's non-attainment areas could make a significant reduction in the Region's process fugitive TSP emission total. Further analysis of the control technologies also implies the need for emission factor and facility evaluations as described earlier.

5.0 REFERENCES

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6.0 GLOSSARY

Facility	-	a particular plant or industrial source.
Fugitive emissions	-	includes dust arising from travel on unpaved roads, wind action on open fields, and agricultural activities.
Industrial source	-	a source of particulate emissions generated by industrial or manufacturing activities.
Major industrial source (also major source)	-	industrial sources with 50 tons/year or greater controlled particulate emissions.
Point source	-	see also "industrial source"; refers to emissions emanating from stacks or polution control equipment.
Potential	-	in general use, "potential" is synonymous with "uncontrolled" or "maximum".
Potential process fugitive emissions (also potential process fugitive emission factor)	-	uncontrolled emissions from process operations not escaping to the atmosphere via a stack or control device. Range usually shown due to variations in test results or estimated methods.
Process	-	Industrial or manufacturing operation which results in the generation of particulate emissions. Usually applied to particular types of equipment.
Process fugitive emissions	-	particulate emissions from industrial operations that escape to the atmosphere without passing through a primary exhaust system (such as a flue or stack) or through an emission control system. Can include manufacturing operations; loading, unloading or transporting of materials; storage piles; and sources operated out of doors (coke ovens, rock crushing, sand-blasting, etc.).
Process fugitive emission factor (E.F.)	-	emissions factor for estimating process fugitive emissions from particular industrial operations. Units are usually in pounds of particulate emissions per ton of process throughput.

Process fugitive emission rate	-	usually the annualized rate (tons/year) of process fugitive emissions resulting from industrial operations. In this report, results from multiplication of the appropriate emission factor and the process throughput corrected to the proper units.
Typical process fugitive emission (also typical process fugitive emission factor)		"typical" implies the expected or most likely emissions (or factor) to be expected from a particular facility, process, or control technique. Can be less than or more than the potential process fugitive emissions (or factor) due to site specific information.

APPENDIX A

INDUSTRIAL PROCESS FUGITIVE EMISSION FACTORS

Industrial Process Fugitive Emission Factors

Process Operation	Potential Process Fugitive Emission Factor (lb/ton)	Typical Process Fugitive Emission Factor (lb/ton)	Emission Factor Reli-ability Rating	Emission Factor Ref. Number	Comments
Coal Storage					
Loading into pile (incoming)	0.07-0.40	0.07	D	7,8,9	Most recent data based on test results
Vehicle traffic	0.14-0.15	0.14	D	7,8,9	
Loading out(outgoing)	0.07-0.40	0.08	D	7,8,9	
Wind erosion	0.013-0.25	0.07	D	7,8,9	
Total (all of above)	0.29-1.20	0.36	D	7,8,9	Total of the above 4
Coke Manufacture					
Coal storage	0.29-1.20	0.36	D	7	Most recent data based
Coal charging	0.85-10.00	0.85	C	5	Average of test data
Door leaks (coking)	0.40-0.90	0.50	D	6	Higher reliability rating
Coke quenching	0.20-6.00	0.20	B	6	17% of emissions were classified as fugitive
Coke quenching U.S. Steel 2 & 3	0.20-6.00	0.43	A	1,2,6	Test data
Coke quenching U.S. Steel 1,5,8 & 9	0.20-6.00	0.64	A	1,2,6	Test data
Coke handling	0.023-0.130	0.08	E	10	Average of range
Coke pushing	0.35-1.00	0.47	B	5	Most recent data

Industrial Process Fugitive Emissions Factors (Continued)

Process Operation	Potential Process Fugitive Emission Factor (lb/ton)	Typical Process Fugitive Emission Factor (lb/ton)	Emission Factor Reli-ability Rating	Emission Factor Ref. Number	Comments
Iron Production					
Unloading - ship/ Railcar - ore	0.02-0.03	0.025	E	10	Average of range
Unloading-ship/ railcar - limestone	0.20	0.20	E	10	
Iron ore storage - total	0.20-0.36	0.28	E	10	Average of range
Iron ore handling/ transfer	2.00	2.00	D	10	
Limestone handling/ transfer	0.20	0.20	D	10	
Blast furnace flue dust handling	0.30	0.30	E	10	
Sinter operation	1.27-3.70	3.70	E	14	Most recent test data
Slag handling	2.02-2.10	2.06	C	10	Average of range
Casting house	0.40-3.93	0.40	C	5	Roof monitor emissions
Steel Production					
Basic oxygen furnace/ roof monitor	0.14-1.20	0.49	B	5	Higher reliability
Open hearth furnace/ roof monitor	0.1-0.39	0.168	C	5	Higher reliability
Electric arc furnace/ roof monitor total	0.18-3.00	1.45	C	5	Most recent data based on test results
Scarfing	0.011	0.011	B	10	

Industrial Process Fugitive Emissions Factors (Continued)

Process Operation	Potential Process Fugitive Emission Factor (lb/ton)	Typical Process Fugitive Emission Factor (lb/ton)	Emission Factor Reli-ability Rating	Emission Factor Ref. Number	Comments
Secondary Aluminum Production					
Sweating furnace	0.72	0.72	E	10	
Reverberatory furn	0.22	0.22	E	10	
Crucible furnace	0.09	0.09	E	10	
Induction furnace	0.09	0.09	E	10	
Chip dryer (rotary)	0.72	0.72	E	10	
Chlorination-fluxing	50.00	50.00	E	11	demag
Scrap crusher	0.50	0.50	E	11	Similar to primary crusher rock quarry
Secondary Lead Production					
Sweating furnace	1.60-3.50	2.55	E	10	Average of range
Reverberatory furnace	2.80-15.70	9.25	E	10	Average of range
Blast (cupola) furn.	12.00	12.00	E	10	
Pot (kettle) furnace	0.04	0.04	E	10	
Casting	0.87	0.7	E	10	
Secondary Zinc Smelting					
Reverberatory furnace	0.00-1.30	0.65	E	10	Average of range
Kettle sweat furnace	0.56	0.56	E	10	
Rotary sweat furnace	0.56-1.26	0.91	E	11	Average of range
Muffle sweat furnace	0.54-1.60	1.07	E	11	
Electric resistance sweat furnace	0.50	0.50	E	10	

Industrial Process Fugitive Emissions Factors (Continued)

Process Operation	Potential Process Fugitive Emission Factor (lb/ton)	Typical Process Fugitive Emission Factor (lb/ton)	Emission Factor Reli-ability Rating	Emission Factor Ref. Number	Comments
Crucible furnace	0.005	0.005	E	10	
Kettle melting furn.	0.005	0.005	E	10	
Reverberatory melting furnace	0.005	0.005	E	10	
Electric induction melting furnace	0.005	0.005	E	10	
Iron and Steel Foundry					
Cupola furnace oper.	0.10-2.00	1.05	E	11	Average of range
Crucible furnace	0.10-0.60	0.35	E	10	Average of range
Electric arc furnace	1.05-3.48	2.00	D	12	Testing data with hooding furnace
Open hearth furnace	0.10-0.90	0.50	E	10	Average of range
Electric induction furnace	2.00	2.00	E	11	
Casting operation - shakeout	1.20-12.80	3.20	D	12	Particle size less than 50 mm; higher reliability rating
Pouring and cooling	0.10-4.13	3.00	D	12	Particle size less than 50 mm
Sand handling	0.30	0.30	C	15	Test data
Foundry cast cleaning	0.16-0.80	0.48	E	11	Average of range
Mold making	0.07	0.07	E	10	
Shot blasters, grinding, etc.	0.01	0.01	D	11	

Industrial Process Fugitive Emissions Factors (Continued)

Process Operation	Potential Process Fugitive Emission Factor (lb/ton)	Typical Process Fugitive Emission Factor (lb/ton)	Emission Factor Reli-ability Rating	Emission Factor Ref. Number	Comments
Core making	0.35	0.35	D	11	
Ball mill	4.25	4.25	D	8	
Molten iron transfer	0.19	0.19	D	4	
Plating	0.01	0.01	E	13	Engineering judgment
Steel shredder	0.01	0.01	E	11	Engineering judgment
Auto shredder	0.01	0.01	E	11	Similar to scarfing
Metal separators	1.50	1.50	E	11	Similar to screens rock quarry
Gravity separators	1.50	1.50	E	11	Similar to screens to rock quarry
Country Grain Elevator					
Grain handling-total	8.20	8.20	D	11	Average of range
Grain handling-except head house	3.50	3.50	D	11	
Grain Terminal					
Grain Receiving	0.10	0.10	B	11	
Grain Loading	0.65	0.65	B	11	
Grain Tunnel belt	0.14	0.14	B	11	
Grain cleaning	0.30	0.30	B	11	
Grain drying	0.11	0.11	B	11	
Headhouse	0.15	0.15	B	11	
Tripper	0.10	0.10	B	11	
Terminal - total	2.17	2.17	B	11	

Industrial Process Fugitive Emissions Factors (Continued)

Process Operation	Potential Process Fugitive Emission Factor (lb/ton)	Typical Process Fugitive Emission Factor (lb/ton)	Emission Factor Reli-ability Rating	Emission Factor Ref. Number	Comments
Grain Processing					
Corn milling-total	1.20	1.20	D	13	
Wheat milling (Millinghouse)	7.00	7.00	D	13	
Receiving	0.10	0.10	D	13	Fugitive emission factors
Drying	0.05	0.05	D	13	are assumed to be 1/10
Handling	0.50	0.50	D	13	of the uncontrolled
Cleaning	0.60	0.60	D	13	emission factor.
Bulk loading	0.50	0.50	D	13	See Ref. 16.
Cement Manufacture					
Total	11.3-18.9	14.50	E	11	Entire process average
Raw material unloading	0.03-0.40	0.215	E	11	Average of range
Crushing	0.40-0.60	0.50	E	11	Average of range
Transfer & conveying	0.20-0.40	0.30	E	11	Average of range
Screening	1.50	1.50	E	11	
Raw grinding	0.10	0.10	E	11	
Unloading-clinker gypsum outfall to storage	5.0-10.0	7.50	E	11	Average of range

Industrial Process Fugitive Emissions Factors (Continued)

Process Operation	Potential Process Fugitive Emission Factor (lb/ton)	Typical Process Fugitive Emission Factor (lb/ton)	Emission Factor Reli-ability Rating	Emission Factor Ref. Number	Comments
Lime Manufacturing					
Total	3.14-3.18	3.16	E	13	Entire process average
Primary crushing	0.50	0.50	E	13	
Rotary kiln	0.80	0.80	E	13	
Concrete Batching					
Total	0.37	0.37	E	13	Entire process
Transfer of sand	0.04	0.04	E	13	
Cement unload to elevated silos	0.24	0.24	E	13	
Weight hoppers loading of cement, sand, and aggregate	0.02	0.02	E	13	
Mixer loading of cement, sand, aggreg.	0.04	0.04	E	13	
Loading of transit mix truck	0.02	0.02	E	13	
Loading of dry batch truck	0.04	0.04	E	13	
Asphalt Batch Plant					
Total	0.62	0.62	E	10	Entire process
Aggregate storage	0.33	0.33	D	10	
Batching Process	0.29	0.29	E	10	

Industrial Process Fugitive Emissions Factors (Continued)

Process Operation	Potential Process Fugitive Emission Factor (lb/ton)	Typical Process Fugitive Emission Factor (lb/ton)	Emission Factor Reli-ability Rating	Emission Factor Ref. Number	Comments
Brick Manufacturing					
Total	0.29	0.29	E	11	
Rock Quarry					
Handling	0.15	0.15	E	11	
Primary crushing	0.50	0.50	E	11	
Secondary crushing/ screening	1.50	1.50	E	11	
Stock piles	0.33	0.33	E	10	
Dryer	2.60	2.60	E	11,13	Similar to asphalt batch plant dryer
Secondary Copper, Brass, Bronze Smelting					
Reverberatory furnace	2.65-7.84	5.27	D	11	
Electric induction furnace	0.05-0.14	0.14	D	11	
Rotary kiln	1.50-7.35	4.43	D	11	
Crucible furnace	0.32-0.64	0.49	D	11	
Casting	0.01-0.02	0.015	D	11	
Reclaimer	13.75	13.75	D	11	
wire crusher	0.50	0.50	E	11	Similar to primary crusher at rock quarry

Industrial Process Fugitive Emissions Factors (Continued)

Process Operation	Potential Process Fugitive Emission Factor (lb/ton)	Typical Process Fugitive Emission Factor (lb/ton)	Emission Factor Reli-ability Rating	Emission Factor Ref. Number	Comments
Mining					
Primary crusher	0.02	0.02	D	11	
Secondary crusher	0.16	0.16	D	11	
Transfer & Conveying	0.20	0.20	D	11	
Ore dryer	0.16	0.16	D	11	Same as handling
Ore concentrators	0.25	0.25	D	11	
Underground vents	0.00	0.00	D	11	Engineering judgment
Stock piles	0.054	0.054	D	10	
Asphalt Roofing					
Total	0.30	0.30	D	11,13	Similar to asphalt bulk plant
Primary Aluminum					
Handling	10.00	10.00	D	11	
Anode baking furnace	3.00	3.00	D	11	
Prebaked reduction cell	8.00	8.00	D	11	
Chemical Manufacturing					
Mixer-dry	0.04	0.04	E	19,21	
Mixer-wet	0.02	0.02	E	19,21	

Industrial Process Fugitive Emissions Factors (Continued)

Process Operation	Potential Process Fugitive Emission Factor (lb/ton)	Typical Process Fugitive Emission Factor (lb/ton)	Emission Factor Reli-ability Rating	Emission Factor Ref. Number	Comments
Dryer	0.20	0.20	E	11,13	
Storage/handling	0.15	0.15	E	11,13	
Mills	0.16	0.16	D	11	
Calciners	0.226	0.226	D	11	
Flakers	0.16	0.16	E	11	
General venting	0.00	0.00	E	11	
Vermicular expander	0.226	0.226	E	11,13	
Monokote expander	0.226	0.226	E	11,13	
Ammonium nitrate neutralization	0.00	0.00	E	21	
Ammonium nitrate crushing	1.50	1.50	E	11,21	
Ammonium nitrate prill cooler	0.00	0.00	E	11,21	
Perlite expander	0.226	0.226	D	11,13	
Clorox-chlorination stands	0.00	0.00	D	11,21,22	
Clorox-packing	0.01	0.01	D	11,21,22	
Clorox-conveyors	0.24	0.24	D	11,21,22	
Oleum-sulfonation	0.16	0.16	E	11	
Soap mfg-machines	0.70	0.70	E	11,13	
Soap mfg-kettles	0.70	0.70	E	11,13	

Industrial Process Fugitive Emissions Factors (Continued)

Process Operation	Potential Process Fugitive Emission Factor (lb/ton)	Typical Process Fugitive Emission Factor (lb/ton)	Emission Factor Reli-ability Rating	Emission Factor Ref. Number	Comments
Detergent mfg	4.50	4.50	E	11,13	
Cyanamid kiln	7.50	7.50	E	11	
Na-NH4 salt plant	3.16	3.16	E	11	
Aluminum chloride production	0.00	0.00	E	11	
Glass Manufacturing					
Glass melt furnace	0.07	0.07	D	11,13	
Annealing furnace	0.07	0.07	D	11,13	
Hammer mill	1.50	1.50	D	11,13	
Handling/storage	0.15	0.15	D	11,13	5 percent of the
Batch plant	0.87	0.87	E	11,13	uncontrolled emissions
Handling	0.16	0.16	E	11,13	
Cooler	0.01	0.01	E	11,13,19,21	
Gypsum Manufacturing					
Handling	0.30	0.30	D	11	
Dryer	0.05	0.05	D	11	
Kettles	0.05	0.05	D	11	
Mills	0.10	0.10	D	11	Assumed to be similar to
Saws	0.10	0.10	D	11	cement manufacturing
Perlite verticle furnace	0.226	0.226	D	11	
Mixers	0.07	0.07	D	11	

Industrial Process Fugitive Emissions Factors (Continued)

Process Operation	Potential Process Fugitive Emission Factor (lb/ton)	Typical Process Fugitive Emission Factor (lb/ton)	Emission Factor Reli-ability Rating	Emission Factor Ref. Number	Comments
Ceramic clay					
Drying	3.50	3.50	C	11,13,19	10 percent of the
Grinding	3.80	3.80	C	11,13,19	uncontrolled emissions
Storage	1.70	1.70	C	11,13,19	
Refinery					
FCU regeneration unit	0.00	0.00	E	11	
Paper Box Manufacturing					
Hoggers	0.35	0.35	D	11	
Cutters	0.35	0.35	D	11	
Metal conveyor	0.01	0.01	D	13	Engineering judgment
Corrugator	0.05	0.05	E		
Gluer	0.00	0.00	E	13	
Rubber Manufacturing					
Trimming	0.01	0.01	D	11,13	Engineering judgment
Mixing	0.02	0.02	E	11,13	Engineering judgment
Time buffers	0.01	0.01	E	11	Engineering judgment
Handling	0.24	0.24	E	11	Engineering judgment
Mills	0.05	0.05	E	11	Engineering judgment
Farral/Calendar	0.02	0.02	E	11	Engineering judgment
Grinding	0.05	0.05	E	11	Engineering judgment

Industrial Process Fugitive Emissions Factors (Continued)

Process Operation	Potential Process Fugitive Emission Factor (lb/ton)	Typical Process Fugitive Emission Factor (lb/ton)	Emission Factor Reli-ability Rating	Emission Factor Ref. Number	Comments
Leather Manufacturing					
Grinding	0.05	0.05	E	13,19,21	Engineering judgment
Buffing	0.05	0.05	E	13,19,21	Engineering judgment
Shaving	0.05	0.05	E	13,19,21	Engineering judgment
Dry booth	0.02	0.02	E	13,19,21	Engineering judgment
Wet booth	0.01	0.01	E	13,19,21	Engineering judgment
Paint Manufacturing					
Sulfonation	0.20	0.20	E	13	
Para cersol neutralization cresol	2.00	2.00	E	13	
Packaging	2.00	2.00	E	13	
Resin plant	2.00	2.00	E	13	
Batch plant	2.00	2.00	E	13	
Mixers	2.00	2.00	E	13	
Pigment dispersion	2.00	2.00	E	13	
Paste mixing	2.00	2.00	E	13	
Can Manufacturing					
Side seam-solder bath	0.01	0.01	E		Engineering judgment
Side seam-wipers	0.01	0.01	E		Engineering judgment
Side seam-nozzles	0.01	0.01	E		Engineering judgment

Industrial Process Fugitive Emissions Factors (Continued)

Process Operation	Potential Process Fugitive Emission Factor (lb/ton)	Typical Process Fugitive Emission Factor (lb/ton)	Emission Factor Reli-ability Rating	Emission Factor Ref. Number	Comments
Floor Tile Manufacturing					
PVC Handling	0.15	0.15	E	11,19	
Mixing	0.15	0.15	E	11,19	
Crusher	1.5	1.50	E	11,19	
Asbestos handling	0.15	0.15	E	11,19	
Ink Manufacturing					
Total	2.00	2.00	E	13	
Toner Manufacturing					
Total	0.01	0.01	E	13	
Tape Manufacturing					
Presses	0.00	0.00	E		Engineering judgment
Mills	0.00	0.00	E		Engineering judgment
Grinding	0.00	0.00	E		Engineering judgment
Finishing	0.00	0.00	E		Engineering Judgment
General - Unclassified					
Wood working - total	1.37	1.37	D	10	Total/Saw mill
Carbon black mfg.	0.20	0.20	B	13	
Paint spray booths	0.01	0.01	E		Engineering judgment
Brewery-brewing kettles	0.00	0.00	D	11,13	

Industrial Process Fugitive Emissions Factors (Continued)

Process Operation	Potential Process Fugitive Emission Factor (lb/ton)	Typical Process Fugitive Emission Factor (lb/ton)	Emission Factor Reli-ability Rating	Emission Factor Ref. Number	Comments
Seasoning stands	0.00	0.00	E		Engineering judgment
Wire strippers	0.00	0.00	E		Engineering judgment
Contact pot-magnesium	0.49	0.49	E	11	
Quench pot - magnesium	0.49	0.49	E	11	
Recirculating furnace magnesium	5.27	5.27	E	11	
Fertilizer dryer	0.20	0.20	E	11	
Negligible Emission Sources					
Soaking pits	0.00	0.00	A		Fuel burning/pt. source
Strip mill	0.00	0.00	A		Fuel burning/pt. source
Pickling tanks	0.00	0.00	A		Fuel burning/pt. source
Desulfurization	0.00	0.00	E		SO2 Emissions only
Reactors	0.00	0.00	E	11,13	Point source
Absorbers	0.00	0.00	D	11	Point source
Vaporizers	0.00	0.00	D	11	Point source
Contact sulfuric acid production	0.00	0.00	E		Engineering judgment
Ammonium nitrate prill tower	0.00	0.00	E	21	Closed tower
Phosphoric acid plant	0.00	0.00	E	21,22	Point Source
Sulfur recovery plant	0.00	0.00	E	13	SO2 Emissions

APPENDIX B

SUMMARY OF ILLINOIS STATE PROCESS FUGITIVE EMISSION INVENTORY

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS FOR ALL FACILITIES

TOTALS FOR THE STATE OF ILLINOIS
****

POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 69563.06 - 102458.87
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 75366.41

TOTALS FOR THE STATE OF ILLINOIS BY COUNTY
****

COUNTY OF COOK
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 69563.06 - 102458.87
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 75366.41

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE

TOTALS FOR THE STATE OF ILLINOIS
****

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
COAL STORAGE: LOADING ONTO PILE	(S)	144.50 - 825.70	144.50
COAL STORAGE: LOADING OUT (OUTGOING)	8308381	290.79 - 1661.68	332.34
COAL STORAGE. WIND EROSION	(S)	20.26 - 389.52	109.07
COAL STORAGE (TOTAL)	11671970	1692.44 - 7003.18	2100.95
COKE MANUF: COAL CHARGING	(S)	382.50 - 4500.00	382.50
COKE MANUF: COKING (DOOR LEAKING)	(S)	180.00 - 405.00	225.00
COKE MANUF: COKE QUENCHING	(S)	90.00 - 2700.00	90.00
COKE MANUF: COKE HANDLING	(S)	109.52 - 619.03	380.94
COKE MANUF: COKE PUSHING	(S)	157.50 - 450.00	211.50
IRON PROD: SHIP/RAILROAD IRON ORE UNLOAD	(S)	4.60 - 6.90	5.75
IRON PROD: IRON ORE STORAGE (TOTAL)	(S)	132.20 - 237.96	185.08
IRON PROD: IRON ORE HANDLING & TRANSFER	(S)	6672.24 - 6672.24	6672.24
IRON PROD: LIMESTONE HANDLING & TRANSFER	(S)	82.11 - 82.11	82.11
IRON PROD: BLAST FURNACE DUST HANDLING	3638234	545.74 - 545.74	545.74
IRON PROD· SINTER OPERATION	(S)	569.42 - 1658.94	1658.94
IRON PROD: SLAG HANDLING	(S)	30.22 - 31.42	30.82
IRON PROD: CASTING HOUSE	2686482	537.30 - 5278.94	537.30
STEEL PRODUCTION: BASIC OXYGEN FURNACE	10369241	725.85 - 6221.54	2540.46
STEEL PRODUCTION: ELECTRIC ARC FURNACE	729948	65.70 - 1094.92	529.21
STEEL PRODUCTION: SCARFING	(S)	5.49 - 5.49	5.49
SEC ALUMINUM PROD: SWEATING FURNACE	412757	148.59 - 148.59	148.59
SEC ALUMINUM PROD: REVERBERATORY FURNACE	89804	9.88 - 9.88	9.88
SEC ALUMINUM PROD: CRUCIBLE FURNACE	810000	36.45 - 36.45	36.45
SEC ALUMINUM PROD: INDUCTION FURNACE	(S)	0.06 - 0.06	0.06
SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	62458	22.48 - 22.48	22.48
SECONDARY ALUMINUM: SCRAP CRUSHER	(S)	14.82 - 14.82	14.82
SEC LEAD SMELTING: SWETAING FURNACE	(S)	3.65 - 7.98	5.81
SEC LEAD SMELTING: REVERBERATORY FURNACE	57410	80.37 - 450.67	265.52
SEC LEAD SMELTING. BLAST/CUPOLA FURNACE	(S)	79.78 - 79.78	79.78
SEC LEAD SMELTING: POT (KETTLE) FURNACE	100465	2.01 - 2.01	2.01
SEC ZINC SMELT: REVERBERATORY	(S)	0.00 - 0.72	0.36
SEC ZINC SMELT: ROTARY SWEAT FURNACE	5265	1.47 - 3.32	2.40
SEC ZINC SMELT: MUFFLE SWEAT FURNACE	(S)	1.33 - 3.93	2.63
SEC ZINC SMELT: CRUCIBLE FURNACE	11022	0.03 - 0.03	0.03

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STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS (CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
SEC ZINC SMELT: KETTLE MELTING FURNACE	170194	0.43 - 0.43	0.43
SEC ZINC SMELT: REVERBERATE MELT FURNACE	(S)	0.04 - 0.04	0.04
SEC ZINC SMELT·INDUCTION MELTING FURNACE	(S)	0.00 - 0.00	0.00
IRON/STEEL FOUNDRY: CUPOLA FURNACE	185557	9.28 - 185.56	67.89
IRON/STEEL FOUNDRY: CRUCIBLE FURA CE	184856	9.24 - 55.46	30.07
IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	214469	112.60 - 373.18	214.47
IRON/STEEL FOUNDRY: INDUCTION FURNACE	227440	227.44 - 227.44	182.61
IRON/STEEL FOUNDRY: CASTING SHAKEOUT	414213	248.53 - 2650.96	578.65
IRON/STEEL FOUNDRY: POURING AND COOLING	47828	2.39 - 98.76	71.74
IRON/STEEL FOUNDRY: SAND HANDLING	1019477	152.92 - 152.92	150.63
IRON/STEEL FOUNDRY:FOUNDRY CAST CLEANING	257875	20.63 - 103.15	61.89
IRON/STEEL FOUNDRY: MOLD MAKING	85591	3.00 - 3.00	3.00
FOUNDRY: SHOT BLAST GRINDER / FINISHING	5294424	26.47 - 26.47	26.38
STEEL FOUNDRY: CORE MAKING	(S)	0.70 - 0.70	0.70
IRON/STEEL FOUNDRY: BALL MILL	34580	73.48 - 73.48	73.48
IRON/STEEL FOUNDRY: MOLTEN IRON TRANSFER	(S)	0.42 - 0.42	0.42
IRON/STEEL FOUNDRY: SOAKING PITS	(S)	0.00 - 0.00	0.00
IRON/STEEL FOUNDRY: STRIP MILLS	3771255	0.00 - 0.00	0.00
IRON/STEEL FOUNDRY: PICKLING TANKS	38806	0.00 - 0.00	0.00
IRON/STEEL FOUNDRY: PLATING	88206	0.44 - 0.44	0.44
IRON/STEEL FOUNDRY: AUTO SHREDDER	787992	3.94 - 3.94	3.94
IRON/STEEL FOUNDRY: METAL SEPARATORS	46800	35.10 - 35.10	35.10
IRON/STEEL FOUNDRY: GRAVITY SEPARATORS	125256	93.94 - 93.94	93.94
IRON/STEEL FOUNDRY: DESULF STATION-STEEL	(S)	0.00 - 0.00	0.00
GRAIN CLEANING	353720	53.06 - 53.06	53.06
GRAIN DRYING	(S)	56.86 - 56.86	56.86
GRAIN TERMINAL: RECEIVING	8426760	421.34 - 421.34	421.34
GRAIN TERMINAL: LOADING	5745164	1867.18 - 1867.18	1867.18
GRAIN TERMINAL: TUNNEL BELT	(S)	49.28 - 49.28	49.28
GRAIN TERMINAL: HEADHOUSE	4597200	344.79 - 344.79	344.79
GRAIN TERMINAL: TRIPPER	(S)	77.95 - 77.95	77.95
TERMINAL GRAIN ELEVATOR	(S)	1249.92 - 1249.92	1249.92
GRAIN ELEVATOR: WHEAT MILL	873572	3057.50 - 3057.50	3057.50
GRAIN PROCESS: CORN MILLING	485815	291.49 - 291.49	291.49

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STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS (CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
GRAIN PROCESS: RECEIVING	5117913	255.90 - 255.90	250.94
GRAIN PROCESS: DRYING	2651339	66.28 - 66.28	66.28
GRAIN PROCESS: HANDLING	20608068	5152.02 - 5152.02	5150.83
GRAIN PROCESS: CLEANING	4591737	1377.52 - 1377.52	1377.52
GRAIN PROCESS: BULK LOADING	1068913	267.23 - 267.23	267.23
CEMENT MANUF: TOTAL	(S)	638.45 - 1067.85	819.25
CEMENT MANUF: RAW MATERIAL UNLOADING	(S)	0.90 - 12.00	6.45
CEMENT MANUF. TRANSFER & CONVEYING	(S)	71.35 - 142.71	107.03
CEMENT MANUF: RAW GRINDING	(S)	3.31 - 3.31	3.31
CEMENT MANUF: UNLOAD- OUTFALL TOSTORAGE	(S)	800.00 - 1600.00	1200.00
LIME MANUF: TOTAL	(S)	5429.06 - 5498.22	5463.64
LIME MANUF: PRIMARY CRUSHING	(S)	41.08 - 41.08	41.08
LIME MANUF: ROTARY KILN	4454143	1781.66 - 1781.66	1781.66
CONCRETE BATCH: TOTAL	7579722	1402.25 - 1402.25	1402.25
CONCRETE BATCH: TRANSFER OF SAND	(S)	30.27 - 30.27	30.27
CONCRETE BATCH: CEMENT UNLOAD TO SILOS	17196973	2063.64 - 2063.64	2063.64
CONCRETE BATCH: HOPPER LOAD OF AGGREGATE	2504378	25.04 - 25.04	25.04
CONCRETE BATCH: MIXER LOAD OF AGGREGATE	1972448	39.45 - 39.45	39.45
CONCRETE BATCH:LOAD OF TRANSIT MIX TRUCK	1675790	16.76 - 16.76	16.76
CONCRETE BATCH: LOAD OF DRY BATCH TRUCK	19418	0.39 - 0.39	0.39
ASPHALT CONCRETE: TOTAL	5061908	1569.19 - 1569.19	1569.19
ASPHALT CONCRETE: BATCHING PROCESS	3628160	526.08 - 526.08	526.08
ASPHALT CONCRETE: AGGREGATE STORAGE	7335271	1210.32 - 1210.32	1210.32
BRICK MANUFACTURING: TOTAL	1525582	221.21 - 221.21	221.21
STONE QUARRY: HANDLING	8129673	609.73 - 609.73	607.20
STONE QUARRY: PRIMARY CRUSHING	23997383	5999.35 - 5999.35	5999.35
STONE QUARRY: SECONDARY CRUSH & SCREEN	14446918	10835.19 - 10835.19	10834.78
STONE QUARRY: STORAGE	3669333	605.44 - 605.44	605.44
SECONDARY COPPER SMELTING: REV. FUNACE	(S)	7.95 - 23.52	15.81
SECONDARY COPPER SMELTING: EL. IND. FURN	(S)	0.01 - 0.02	0.02
SECONDARY COPPER SMELTING: ROTARY FURN.	35041	26.28 - 128.78	77.62
SECONDARY COPPER SMELTING: CRUCIBLE FURN	3558	0.57 - 1.14	0.87
SECONDARY COPPER SMELTING: CASTING	(S)	0.01 - 0.03	0.02
SECONDARY COPPER: RECLIAMEER	(S)	963.60 - 963.60	963.60

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STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS (CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
SECONDARY COPPER: WIRE CRUSHER	(S)	9.36 - 9.36	9.36
MINING: HANDLING	(S)	0.42 - 0.42	0.42
ASPHALT ROOFING: TOTAL	1349222	202.38 - 202.38	202.38
CHEMICAL MANUFAC: MIXER DRY	592604	11.85 - 11.85	11.85
CHEMICAL MANUFAC: MIXER WET	148306	1.48 - 1.48	1.48
CHEMICAL MANUFAC: DRYER	1604736	160.47 - 160.47	160.47
CHEMICAL MANUFAC: HANDLING - STORAGE	41256878	3094.27 - 3094.27	3094.27
CHEMICAL MANUFAC: REACTORS	605872	0.00 - 0.00	0.00
CHEMICAL MANUFAC: MILLS	70789	5.66 - 5.66	5.66
CHEMICAL MANUFAC: CALCINERS	44899	5.07 - 5.07	5.07
CHEMICAL MANUFAC: FLAKERS	36406	2.91 - 2.91	2.91
CHEMICAL MANUFAC: SULFURIC ACID	(S)	0.00 - 0.00	0.00
CHEMICAL MANUFAC: PELITE EPANDER	(S)	46.58 - 46.58	46.58
CHEMICAL MANUFAC: CLOROX; CHLORINATION	(S)	0.00 - 0.00	0.00
CHEMICAL MANUFAC: CLOROX; PACKING	(S)	0.25 - 0.25	0.25
CHEMICAL MANUFAC: CLOROX; CONVEYORS	(S)	0.04 - 0.04	0.04
CHEMICAL MANUFAC: OLEUM; SLFONATION	181242	14.50 - 14.50	14.50
CHEMICAL MANUFAC: PHOSPHORIC ACID PLANT	(S)	0.00 - 0.00	0.00
CHEMICAL MANUFAC: SOAP MFG. MACHINES	37274	13.05 - 13.05	13.05
CHEMICAL MANUFAC: SOAP PAD; KETTLES	(S)	6.60 - 6.60	6.60
CHEMICAL MANUFAC: DETERGENT MANUFAC.	(S)	377.64 - 377.64	377.64
CHEMICAL MANUFAC: CYANAMID KILN	(S)	52.92 - 52.92	52.92
CHEMICAL MANUFAC: NA-NH4 SALT PLANT	(S)	33.65 - 33.65	33.65
CHEMICAL MANUFAC: ALUMINUM CHLORIDE PROD	(S)	0.00 - 0.00	0.00
GLASS MANUFAC: GLASS MELT FURNACE	278781	9.76 - 9.76	9.76
GLASS MANUFAC: BATCH PLANT	(S)	50.11 - 50.11	50.11
GLASS MANUFAC: HANDLING	458633	36.69 - 36.69	36.69
GLASS MANUFAC: COOLER	(S)	0.04 - 0.04	0.04
GYPSUM MANUFAC: HANDLING	80990	12.15 - 12.15	12.15
GYPSUM MANUFACTURING: MIXERS	52687	1.84 - 1.84	1.84
PAPER BOX MANUFAC: HOGGERS	974204	170.49 - 170.49	170.49
PAPER BOX MANUFAC: CUTTERS	1673679	292.89 - 292.89	292.89
PAPER BOX MANUFAC: METAL CONVEYOR	(S)	0.03 - 0.03	0.03
PAPER BOX MANUFAC: CORRUGATOR	(S)	1.86 - 1.86	1.86

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STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS (CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
PAPER BOX MANUFAC: GLUER	23416	0.00 - 0.00	0.00
RUBBER MANUFAC: TRIMMING	19645	0.10 - 0.10	0.10
RUBBER MANUFAC: MIXING	47351	0.47 - 0.47	0.47
RUBBER MANUFAC: TIRE BUFFERS	20456	0.10 - 0.10	0.10
RUBBER MANUFAC: HANDLING	(S)	0.04 - 0.04	0.04
RUBBER MANUFAC: MILLS	12820	0.32 - 0.32	0.32
RUBBER MANUFAC: FARRAL & CALANDER	(S)	0.00 - 0.00	0.00
RUBBER MANUFAC: GRINDING	18156	0.45 - 0.45	0.45
LEATHER MANUFACTURING: GRINDING	(S)	0.01 - 0.01	0.01
LEATHER MANUFACTURING:BUFFING	(S)	0.11 - 0.11	0.11
LEATHER MANUFACTURING:SHAVING	(S)	0.11 - 0.11	0.11
LEATHER MANUFACTURING:DRY BOOTH	(S)	0.11 - 0.11	0.11
LEATHER MANUFACTURING:WET BPOTH	(S)	0.05 - 0.05	0.05
PAINT MANUFACTURING: SULFONATION	(S)	0.46 - 0.46	0.46
PAINT MANUFACTURING: PARA CRESOL NEUT.	(S)	149.84 - 149.84	149.84
PAINT MANUFACTURING: PACKAGING	(S)	3.74 - 3.74	3.74
PAINT MANUFACTURING: RESIN PLANT	(S)	3.26 - 3.26	3.26
PAINT MANUFACTURING: BATCH MILL	(S)	143.38 - 143.38	143.38
PAINT MANUFACTURING: MIXERS	161048	161.05 - 161.05	161.05
PAINT MANUFACTURING: PIGMENT DISPERSION	64211	64.21 - 64.21	64.21
PAINT MANUFACTURING: PASTE MIXING	(S)	226.95 - 226.95	226.95
CAN MANUFACTURING: SIDE SEAM; SOLDER BTH	2755	0.01 - 0.01	0.01
CAN MANUFACTURING: SIDE SEAM; WIPERS	29283	0.15 - 0.15	0.15
CAN MANUFACTURING: SIDE SEAM; NOZZLES	(S)	0.00 - 0.00	0.00
FLOOR TILE MANUFAC: PVC HANDLING	(S)	4.87 - 4.87	4.87
FLOOR TILE MANUFAC: MIXING	(S)	8.10 - 8.10	8.10
FLOOR TILE MANUFAC: CRUSHER	(S)	12.35 - 12.35	12.35
FLOOR TILE MANUFAC: ASBESTOS HANDLING	(S)	0.15 - 0.15	0.15
INK MANUFACTURING: TOTAL	(S)	21.40 - 21.40	21.40
TONER MANUFACTURING: TOTAL	(S)	0.00 - 0.00	0.00
SPONGE (TAPE) MFG: PRESSES	(S)	0.00 - 0.00	0.00
SPONGE (TAPE) MFG: MILLS	37056	0.00 - 0.00	0.00
SPONGE (TAPE) MFG: GRINDIING	(S)	0.00 - 0.00	0.00
SPONGE (TAPE) MFG: FINISHING	(S)	0.00 - 0.00	0.00

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STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS (CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
GENERAL WOOD WORKING	422874	289.67 - 289.67	289.67
CARBON BLACK	23739	2.37 - 2.37	2.37
PAINT SPRAY BOOTHS	264220	1.32 - 1.32	1.32
SEASONING STANDS	(S)	0.00 - 0.00	0.00
WIRE STRIPPERS	1157	0.00 - 0.00	0.00
CONTACT POT M	478747	117.29 - 117.29	117.29
QUENCH POT	439708	107.73 - 107.73	107.73
RECIRCULATING FURNACE	93510	246.40 - 246.40	246.40
FERTILIZER DRYER	(S)	14.36 - 14.36	14.36

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS BY COUNTY

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
COOK				
	COAL STORAGE: LOADING ONTO PILE	(S)	144.50 - 825.70	144.50
	COAL STORAGE: LOADING OUT (OUTGOING)	8308381	290.79 - 1661.68	332.34
	COAL STORAGE: WIND EROSION	(S)	20.26 - 389.52	109.07
	COAL STORAGE (TOTAL)	11671970	1692.44 - 7003.18	2100.95
	COKE MANUF: COAL CHARGING	(S)	382.50 - 4500.00	382.50
	COKE MANUF: COKING (DOOR LEAKING)	(S)	180.00 - 405.00	225.00
	COKE MANUF: COKE QUENCHING	(S)	90.00 - 2700.00	90.00
	COKE MANUF: COKE HANDLING	(S)	109.52 - 619.03	380.94
	COKE MANUF: COKE PUSHING	(S)	157.50 - 450.00	211.50
	IRON PROD: SHIP/RAILROAD IRON ORE UNLOAD	(S)	4.60 - 6.90	5.75
	IRON PROD: IRON ORE STORAGE (TOTAL)	(S)	132.20 - 237.96	185.08
	IRON PROD: IRON ORE HANDLING & TRANSFER	(S)	6672.24 - 6672.24	6672.24
	IRON PROD: LIMESTONE HANDLING & TRANSFER	(S)	82.11 - 82.11	82.11
	IRON PROD: BLAST FURNACE DUST HANDLING	3638234	545.74 - 545.74	545.74
	IRON PROD: SINTER OPERATION	(S)	569.42 - 1658.94	1658.94
	IRON PROD: SLAG HANDLING	(S)	30.22 - 31.42	30.82
	IRON PROD: CASTING HOUSE	2686482	537.30 - 5278.94	537.30
	STEEL PRODUCTION: BASIC OXYGEN FURNACE	10369241	725.85 - 6221.54	2540.46
	STEEL PRODUCTION: ELECTRIC ARC FURNACE	729948	65.70 - 1094.92	529.21
	STEEL PRODUCTION: SCARFING	(S)	5.49 - 5.49	5.49
	SEC ALUMINUM PROD: SWEATING FURNACE	412757	148.59 - 148.59	148.59
	SEC ALUMINUM PROD: REVERBERATORY FURNACE	89804	9.88 - 9.88	9.88
	SEC ALUMINUM PROD. CRUCIBLE FURNACE	810000	36.45 - 36.45	36.45
	SEC ALUMINUM PROD: INDUCTION FURNACE	(S)	0.06 - 0.06	0.06
	SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	62458	22.48 - 22.48	22.48
	SECONDARY ALUMINUM: SCRAP CRUSHER	(S)	14.82 - 14.82	14.82
	SEC LEAD SMELTING: SWETAING FURNACE	(S)	3.65 - 7.98	5.81
	SEC LEAD SMELTING: REVERBERATORY FURNACE	57410	80.37 - 450.67	265.52
	SEC LEAD SMELTING: BLAST/CUPOLA FURNACE	(S)	79.78 - 79.78	79.78
	SEC LEAD SMELTING: POT (KETTLE) FURNACE	100465	2.01 - 2.01	2.01
	SEC ZINC SMELT: REVERBERATORY	(S)	0.00 - 0.72	0.36
	SEC ZINC SMELT: ROTARY SWEAT FURNACE	5265	1.47 - 3.32	2.40
	SEC ZINC SMELT: MUFFLE SWEAT FURNACE	(S)	1.33 - 3.93	2.63
	SEC ZINC SMELT: CRUCIBLE FURNACE	11022	0.03 - 0.03	0.03

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STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS BY COUNTY (CONTINUED)

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
	SEC ZINC SMELT: KETTLE MELTING FURNACE	170194	0.43 - 0.43	0.43
	SEC ZINC SMELT: REVERBERATE MELT FURNACE	(S)	0.04 - 0.04	0.04
	SEC ZINC SMELT:INDUCTION MELTING FURNACE	(S)	0.00 - 0.00	0.00
	IRON/STEEL FOUNDRY: CUPOLA FURNACE	185557	9.28 - 185.56	67.89
	IRON/STEEL FOUNDRY: CRUCIBLE FURA CE	184856	9.24 - 55.46	30.07
	IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	214469	112.60 - 373.18	214.47
	IRON/STEEL FOUNDRY: INDUCTION FURNACE	227440	227.44 - 227.44	182.61
	IRON/STEEL FOUNDRY: CASTING SHAKEOUT	414213	248.53 - 2650.96	578.65
	IRON/STEEL FOUNDRY: POURING AND COOLING	47828	2.39 - 98.76	71.74
	IRON/STEEL FOUNDRY: SAND HANDLING	1019477	152.92 - 152.92	150.63
	IRON/STEEL FOUNDRY:FOUNDRY CAST CLEANING	257875	20.63 - 103.15	61.89
	IRON/STEEL FOUNDRY: MOLD MAKING	85591	3.00 - 3.00	3.00
	FOUNDRY: SHOT BLAST GRINDER / FINISHING	5294424	26.47 - 26.47	26.38
	STEEL FOUNDRY: CORE MAKING	(S)	0.70 - 0.70	0.70
	IRON/STEEL FOUNDRY: BALL MILL	34580	73.48 - 73.48	73.48
	IRON/STEEL FOUNDRY: MOLTEN IRON TRANSFER	(S)	0.42 - 0.42	0.42
	IRON/STEEL FOUNDRY: SOAKING PITS	(S)	0.00 - 0.00	0.00
	IRON/STEEL FOUNDRY: STRIP MILLS	3771255	0.00 - 0.00	0.00
	IRON/STEEL FOUNDRY: PICKLING TANKS	38806	0.00 - 0.00	0.00
	IRON/STEEL FOUNDRY: PLATING	88206	0.44 - 0.44	0.44
	IRON/STEEL FOUNDRY· AUTO SHREDDER	787992	3.94 - 3.94	3.94
	IRON/STEEL FOUNDRY: METAL SEPARATORS	46800	35.10 - 35.10	35.10
	IRON/STEEL FOUNDRY: GRAVITY SEPARATORS	125256	93.94 - 93.94	93.94
	IRON/STEEL FOUNDRY: DESULF STATION-STEEL	(S)	0.00 - 0.00	0.00
	GRAIN CLEANING	353720	53.06 - 53.06	53.06
	GRAIN DRYING	(S)	56.86 - 56.86	56.86
	GRAIN TERMINAL: RECEIVING	8426760	421.34 - 421.34	421.34
	GRAIN TERMINAL: LOADING	5745164	1867.18 - 1867.18	1867.18
	GRAIN TERMINAL: TUNNEL BELT	(S)	49.28 - 49.28	49.28
	GRAIN TERMINAL: HEADHOUSE	4597200	344.79 - 344.79	344.79
	GRAIN TERMINAL: TRIPPER	(S)	77.95 - 77.95	77.95
	TERMINAL GRAIN ELEVATOR	(S)	1249.92 - 1249.92	1249.92
	GRAIN ELEVATOR: WHEAT MILL	873572	3057.50 - 3057.50	3057.50
	GRAIN PROCESS: CORN MILLING	485815	291.49 - 291.49	291.49

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STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS BY COUNTY (CONTINUED)

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
	GRAIN PROCESS: RECEIVING	5117913	255.90 - 255.90	250.94
	GRAIN PROCESS: DRYING	2651339	66.28 - 66.28	66.28
	GRAIN PROCESS: HANDLING	20608068	5152.02 - 5152.02	5150.83
	GRAIN PROCESS: CLEANING	4591737	1377.52 - 1377.52	1377.52
	GRAIN PROCESS: BULK LOADING	1068913	267.23 - 267.23	267.23
	CEMENT MANUF: TOTAL	(S)	638.45 - 1067.85	819.25
	CEMENT MANUF: RAW MATERIAL UNLOADING	(S)	0.90 - 12.00	6.45
	CEMENT MANUF: TRANSFER & CONVEYING	(S)	71.35 - 142.71	107.03
	CEMENT MANUF: RAW GRINDING	(S)	3.31 - 3.31	3.31
	CEMENT MANUF: UNLOAD- OUTFALL TOSTORAGE	(S)	800.00 - 1600.00	1200.00
	LIME MANUF: TOTAL	(S)	5429.06 - 5498.22	5463.64
	LIME MANUF: PRIMARY CRUSHING	(S)	41.08 - 41.08	41.08
	LIME MANUF: ROTARY KILN	4454143	1781.66 - 1781.66	1781.66
	CONCRETE BATCH: TOTAL	7579722	1402.25 - 1402.25	1402.25
	CONCRETE BATCH: TRANSFER OF SAND	(S)	30.27 - 30.27	30.27
	CONCRETE BATCH: CEMENT UNLOAD TO SILOS	17196973	2063.64 - 2063.64	2063.64
	CONCRETE BATCH: HOPPER LOAD OF AGGREGATE	2504378	25.04 - 25.04	25.04
	CONCRETE BATCH: MIXER LOAD OF AGGREGATE	1972448	39.45 - 39.45	39.45
	CONCRETE BATCH:LOAD OF TRANSIT MIX TRUCK	1675790	16.76 - 16.76	16.76
	CONCRETE BATCH: LOAD OF DRY BATCH TRUCK	19418	0.39 - 0.39	0.39
	ASPHALT CONCRETE: TOTAL	5061908	1569.19 - 1569.19	1569.19
	ASPHALT CONCRETE: BATCHING PROCESS	3628160	526.08 - 526.08	526.08
	ASPHALT CONCRETE: AGGREGATE STORAGE	7335271	1210.32 - 1210.32	1210.32
	BRICK MANUFACTURING: TOTAL	1525582	221.21 - 221.21	221.21
	STONE QUARRY: HANDLING	8129673	609.73 - 609.73	607.20
	STONE QUARRY: PRIMARY CRUSHING	23997383	5999.35 - 5999.35	5999.35
	STONE QUARRY: SECONDARY CRUSH & SCREEN	14446918	10835.19 - 10835.19	10834.78
	STONE QUARRY: STORAGE	3669333	605.44 - 605.44	605.44
	SECONDARY COPPER SMELTING: REV. FUNACE	(S)	7.95 - 23.52	15.81
	SECONDARY COPPER SMELTING: EL. IND. FURN	(S)	0.01 - 0.02	0.02
	SECONDARY COPPER SMELTING· ROTARY FURN.	35041	26.28 - 128.78	77.62
	SECONDARY COPPER SMELTING: CRUCIBLE FURN	3558	0.57 - 1.14	0.87
	SECONDARY COPPER SMELTING: CASTING	(S)	0.01 - 0.03	0.02
	SECONDARY COPPER: RECLIAMEER	(S)	963.60 - 963.60	963.60

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STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS BY COUNTY (CONTINUED)

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
	SECONDARY COPPER: WIRE CRUSHER	(S)	9.36 - 9.36	9.36
	MINING: HANDLING	(S)	0.42 - 0.42	0.42
	ASPHALT ROOFING: TOTAL	1349222	202.38 - 202.38	202.38
	CHEMICAL MANUFAC: MIXER DRY	592604	11.85 - 11.85	11.85
	CHEMICAL MANUFAC: MIXER WET	148306	1.48 - 1.48	1.48
	CHEMICAL MANUFAC: DRYER	1604736	160.47 - 160.47	160.47
	CHEMICAL MANUFAC: HANDLING - STORAGE	41256878	3094.27 - 3094.27	3094.27
	CHEMICAL MANUFAC: REACTORS	605872	0.00 - 0.00	0.00
	CHEMICAL MANUFAC: MILLS	70789	5.66 - 5.66	5.66
	CHEMICAL MANUFAC: CALCINERS	44899	5.07 - 5.07	5.07
	CHEMICAL MANUFAC: FLAKERS	36406	2.91 - 2.91	2.91
	CHEMICAL MANUFAC: SULFURIC ACID	(S)	0.00 - 0.00	0.00
	CHEMICAL MANUFAC: PELITE EPANDER	(S)	46.58 - 46.58	46.58
	CHEMICAL MANUFAC: CLOROX; CHLORINATION	(S)	0.00 - 0.00	0.00
	CHEMICAL MANUFAC: CLOROX; PACKING	(S)	0.25 - 0.25	0.25
	CHEMICAL MANUFAC: CLOROX; CONVEYORS	(S)	0.04 - 0.04	0.04
	CHEMICAL MANUFAC: OLEUM; SLFONATION	181242	14.50 - 14.50	14.50
	CHEMICAL MANUFAC: PHOSPHORIC ACID PLANT	(S)	0.00 - 0.00	0.00
	CHEMICAL MANUFAC: SOAP MFG. MACHINES	37274	13.05 - 13.05	13.05
	CHEMICAL MANUFAC: SOAP PAD; KETTLES	(S)	6.60 - 6.60	6.60
	CHEMICAL MANUFAC: DETERGENT MANUFAC.	(S)	377.64 - 377.64	377.64
	CHEMICAL MANUFAC: CYANAMID KILN	(S)	52.92 - 52.92	52.92
	CHEMICAL MANUFAC: NA-NH4 SALT PLANT	(S)	33.65 - 33.65	33.65
	CHEMICAL MANUFAC: ALUMINUM CHLORIDE PROD	(S)	0.00 - 0.00	0.00
	GLASS MANUFAC: GLASS MELT FURNACE	278781	9.76 - 9.76	9.76
	GLASS MANUFAC· BATCH PLANT	(S)	50.11 - 50.11	50.11
	GLASS MANUFAC: HANDLING	458633	36.69 - 36.69	36.69
	GLASS MANUFAC: COOLER	(S)	0.04 - 0.04	0.04
	GYPSUM MANUFAC: HANDLING	80990	12.15 - 12.15	12.15
	GYPSUM MANUFACTURING: MIXERS	52687	1.84 - 1.84	1.84
	PAPER BOX MANUFAC: HOGGERS	974204	170.49 - 170.49	170.49
	PAPER BOX MANUFAC: CUTTERS	1673679	292.89 - 292.89	292.89
	PAPER BOX MANUFAC: METAL CONVEYOR	(S)	0.03 - 0.03	0.03
	PAPER BOX MANUFAC: CORRUGATOR	(S)	1.86 - 1.86	1.86

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STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS BY COUNTY (CONTINUED)

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
	PAPER BOX MANUFAC: GLUER	23416	0.00 - 0.00	0.00
	RUBBER MANUFAC: TRIMMING	19645	0.10 - 0.10	0.10
	RUBBER MANUFAC: MIXING	47351	0.47 - 0.47	0.47
	RUBBER MANUFAC: TIRE BUFFERS	20456	0.10 - 0.10	0.10
	RUBBER MANUFAC: HANDLING	(S)	0.04 - 0.04	0.04
	RUBBER MANUFAC: MILLS	12820	0.32 - 0.32	0.32
	RUBBER MANUFAC: FARRAL & CALANDER	(S)	0.00 - 0.00	0.00
	RUBBER MANUFAC: GRINDING	18156	0.45 - 0.45	0.45
	LEATHER MANUFACTURING: GRINDING	(S)	0.01 - 0.01	0.01
	LEATHER MANUFACTURING:BUFFING	(S)	0.11 - 0.11	0.11
	LEATHER MANUFACTURING:SHAVING	(S)	0.11 - 0.11	0.11
	LEATHER MANUFACTURING.DRY BOOTH	(S)	0.11 - 0.11	0.11
	LEATHER MANUFACTURING.WET BPOTH	(S)	0.05 - 0.05	0.05
	PAINT MANUFACTURING: SULFONATION	(S)	0.46 - 0.46	0.46
	PAINT MANUFACTURING: PARA CRESOL NEUT.	(S)	149.84 - 149.84	149.84
	PAINT MANUFACTURING: PACKAGING	(S)	3.74 - 3.74	3.74
	PAINT MANUFACTURING: RESIN PLANT	(S)	3.26 - 3.26	3.26
	PAINT MANUFACTURING: BATCH MILL	(S)	143.38 - 143.38	143.38
	PAINT MANUFACTURING: MIXERS	161048	161.05 - 161.05	161.05
	PAINT MANUFACTURING. PIGMENT DISPERSION	64211	64.21 - 64.21	64.21
	PAINT MANUFACTURING: PASTE MIXING	(S)	226.95 - 226.95	226.95
	CAN MANUFACTURING: SIDE SEAM; SOLDER BTH	2755	0.01 - 0.01	0.01
	CAN MANUFACTURING: SIDE SEAM; WIPERS	29283	0.15 - 0.15	0.15
	CAN MANUFACTURING: SIDE SEAM; NOZZLES	(S)	0.00 - 0.00	0.00
	FLOOR TILE MANUFAC: PVC HANDLING	(S)	4.87 - 4.87	4.87
	FLOOR TILE MANUFAC: MIXING	(S)	8.10 - 8.10	8.10
	FLOOR TILE MANUFAC: CRUSHER	(S)	12.35 - 12.35	12.35
	FLOOR TILE MANUFAC: ASBESTOS HANDLING	(S)	0.15 - 0.15	0.15
	INK MANUFACTURING: TOTAL	(S)	21.40 - 21.40	21.40
	TONER MANUFACTURING: TOTAL	(S)	0.00 - 0.00	0.00
	SPONGE (TAPE) MFG: PRESSES	(S)	0.00 - 0.00	0.00
	SPONGE (TAPE) MFG: MILLS	37056	0.00 - 0.00	0.00
	SPONGE (TAPE) MFG: GRINDIING	(S)	0.00 - 0.00	0.00
	SPONGE (TAPE) MFG: FINISHING	(S)	0.00 - 0.00	0.00

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STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS BY COUNTY (CONTINUED)

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
	GENERAL WOOD WORKING	422874	289.67 - 289.67	289.67
	CARBON BLACK	23739	2.37 - 2.37	2.37
	PAINT SPRAY BOOTHS	264220	1.32 - 1.32	1.32
	SEASONING STANDS	(S)	0.00 - 0.00	0.00
	WIRE STRIPPERS	1157	0.00 - 0.00	0.00
	CONTACT POT M	478747	117.29 - 117.29	117.29
	QUENCH POT	439708	107.73 - 107.73	107.73
	RECIRCULATING FURNACE	93510	246.40 - 246.40	246.40
	FERTILIZER DRYER	(S)	14.36 - 14.36	14.36

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE

TOTALS FOR THE STATE OF ILLINOIS
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SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
****	**********			*********
1420	9567.46	-	9567.46	9567.46
1440	5563.60	-	5563.60	5563.60
1490	4.13	-	4.13	4.13
1540	3.70	-	3.70	3.70
2030	137.83	-	137.83	137.83
2040	8063.10	-	8427.10	8091.10
2050	161.61	-	161.61	160.42
2060	116.80	-	116.80	116.80
2070	0.04	-	0.04	0.04
2080	288.11	-	288.11	288.11
2090	198.57	-	198.57	198.57
2140	5.43	-	5.43	5.43
2320	8.08	-	8.08	8.08
2380	0.38	-	0.38	0.38
2400	205.27	-	205.27	205.27
2420	2.07	-	2.07	2.07
2430	21.71	-	21.71	21.71
2440	0.41	-	0.41	0.41
2490	37.49	-	37.49	37.49
2500	0.52	-	0.52	0.52
2510	2.05	-	2.05	2.05
2590	1.11	-	1.11	1.11
2640	121.02	-	121.02	121.02
2650	108.27	-	108.27	108.27
2740	6.17	-	6.17	6.17
2750	161.08	-	161.08	161.08
2810	3164.17	-	3168.56	3164.93
2820	63.42	-	63.42	63.42
2830	12.67	-	12.67	12.67
2840	466.28	-	466.28	466.28
2850	566.60	-	566.60	566.60
2890	236.73	-	236.73	236.73
2910	0.00	-	0.00	0.00
2950	3397.43	-	3397.43	3397.43

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS (CONTINUED)

SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
2980	1.15	-	1.15	1.15
2990	1.65	-	1.65	1.65
3010	0.34	-	0.34	0.34
3030	0.01	-	0.01	0.01
3040	1.04	-	1.04	1.04
3060	0.17	-	0.17	0.17
3070	0.44	-	0.44	0.44
3110	0.01	-	0.01	0.01
3120	810.00	-	8055.00	909.00
3210	94.55	-	94.55	94.55
3220	0.03	-	0.03	0.03
3240	3.60	-	3.60	3.60
3250	32.42	-	41.05	36.73
3260	21.08	-	21.08	21.08
3270	4430.01	-	4505.11	4467.56
3280	1430.25	-	1430.25	1430.25
3290	405.18	-	405.18	402.25
3310	9890.76	-	22188.60	12939.87
3320	586.44	-	3480.08	1318.92
3330	6.50	-	31.87	19.21
3340	1428.51	-	2033.26	1595.32
3350	1.97	-	1.97	1.97
3360	298.18	-	529.59	398.15
3390	540.46	-	587.38	566.53
3400	1.30	-	1.30	1.30
3410	0.39	-	0.39	0.39
3420	0.00	-	0.00	0.00
3440	102.52	-	119.53	111.74
3460	1.34	-	1.34	1.34
3470	20.29	-	70.40	28.93
3490	497.03	-	504.94	501.03
3510	0.31	-	0.31	0.31
3520	2.01	-	2.01	2.01
3530	0.62	-	1.27	0.94

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS (CONTINUED)

SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
3550	0.03	-	0.03	0.03
3560	0.58	-	0.82	0.70
3570	20.80	-	20.80	20.80
3590	37.39	-	37.39	37.39
3600	1.54	-	1.54	1.54
3620	0.06	-	0.06	0.06
3630	4.25	-	4.25	4.25
3640	0.23	-	0.23	0.23
3660	5.91	-	13.84	9.01
3690	0.44	-	0.44	0.44
3700	0.08	-	0.08	0.08
3710	43.56	-	473.26	137.02
3720	934.99	-	1734.99	1334.99
3740	2.25	-	4.51	3.38
3770	134.10	-	134.10	134.10
3790	0.01	-	0.01	0.01
3810	0.10	-	0.10	0.10
3840	32.64	-	32.64	32.64
3860	0.00	-	0.00	0.00
3900	2.30	-	2.30	2.30
3940	3.85	-	3.85	3.85
3990	70.18	-	688.52	133.99
4220	5886.93	-	5886.93	5881.97
4460	1687.55	-	2116.96	1868.35
4740	0.00	-	0.00	0.00
4780	113.30	-	343.34	131.00
4910	1656.92	-	7002.87	2035.99
4950	14.36	-	14.36	14.36
5030	5421.81	-	5489.70	5455.76
5040	2.60	-	2.60	2.60
5080	0.05	-	0.05	0.05
5090	32.34	-	32.34	32.34
5130	0.00	-	0.00	0.00
5160	3.51	-	3.51	3.51

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS (CONTINUED)

SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
5420	144.14 - 1235.52	504.50
5990	0.01 - 0.01	0.01
7390	0.37 - 0.37	0.37

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS BY COUNTY

COUNTY	SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
COOK					
	1420	9567.46	-	9567.46	9567.46
	1440	5563.60	-	5563.60	5563.60
	1490	4.13	-	4.13	4.13
	1540	3.70	-	3.70	3.70
	2030	137.83	-	137.83	137.83
	2040	8063.10	-	8427.10	8091.10
	2050	161.61	-	161.61	160.42
	2060	116.80	-	116.80	116.80
	2070	0.04	-	0.04	0.04
	2080	288.11	-	288.11	288.11
	2090	198.57	-	198.57	198.57
	2140	5.43	-	5.43	5.43
	2320	8.08	-	8.08	8.08
	2380	0.38	-	0.38	0.38
	2400	205.27	-	205.27	205.27
	2420	2.07	-	2.07	2.07
	2430	21.71	-	21.71	21.71
	2440	0.41	-	0.41	0.41
	2490	37.49	-	37.49	37.49
	2500	0.52	-	0.52	0.52
	2510	2.05	-	2.05	2.05
	2590	1.11	-	1.11	1.11
	2640	121.02	-	121.02	121.02
	2650	108.27	-	108.27	108.27
	2740	6.17	-	6.17	6.17
	2750	161.08	-	161.08	161.08
	2810	3164.17	-	3168.56	3164.93
	2820	63.42	-	63.42	63.42
	2830	12.67	-	12.67	12.67
	2840	466.28	-	466.28	466.28
	2850	566.60	-	566.60	566.60
	2890	236.73	-	236.73	236.73
	2910	0.00	-	0.00	0.00
	2950	3397.43	-	3397.43	3397.43
	2980	1.15	-	1.15	1.15
	2990	1.65	-	1.65	1.65

3010	0.34	-	0.34	0.34
3030	0.01	-	0.01	0.01
3040	1.04	-	1.04	1.04
3060	0.17	-	0.17	0.17
3070	0.44	-	0.44	0.44
3110	0.01	-	0.01	0.01
3120	810.00	-	8055.00	909.00
3210	94.55	-	94.55	94.55
3220	0.03	-	0.03	0.03

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS BY COUNTY (CONTINUED)

COUNTY	SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
	3240	3.60	-	3.60	3.60
	3250	32.42	-	41.05	36.73
	3260	21.08	-	21.08	21.08
	3270	4430.01	-	4505.11	4467.56
	3280	1430.25	-	1430.25	1430.25
	3290	405.18	-	405.18	402.25
	3310	9890.76	-	22188.60	12939.87
	3320	586.44	-	3480.08	1318.92
	3330	6.50	-	31.87	19.21
	3340	1428.51	-	2033.26	1595.32
	3350	1.97	-	1.97	1.97
	3360	298.18	-	529.59	398.15
	3390	540.46	-	587.38	566.53
	3400	1.30	-	1.30	1.30
	3410	0.39	-	0.39	0.39
	3420	0.00	-	0.00	0.00
	3440	102.52	-	119.53	111.74
	3460	1.34	-	1.34	1.34
	3470	20.29	-	70.40	28.93
	3490	497.03	-	504.94	501.03
	3510	0.31	-	0.31	0.31
	3520	2.01	-	2.01	2.01
	3530	0.62	-	1.27	0.94
	3550	0.03	-	0.03	0.03
	3560	0.58	-	0.82	0.70
	3570	20.80	-	20.80	20.80
	3590	37.39	-	37.39	37.39
	3600	1.54	-	1.54	1.54
	3620	0.06	-	0.06	0.06
	3630	4.25	-	4.25	4.25
	3640	0.23	-	0.23	0.23
	3660	5.91	-	13.84	9.01
	3690	0.44	-	0.44	0.44
	3700	0.08	-	0.08	0.08

STATE OF ILLINOIS
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

TOTALS FOR THE STATE OF ILLINOIS BY COUNTY (CONTINUED)

COUNTY	SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
	3710	43.56 - 473.26	137.02
	3720	934.99 - 1734.99	1334.99
	3740	2.25 - 4.51	3.38
	3770	134.10 - 134.10	134.10
	3790	0.01 - 0.01	0.01
	3810	0.10 - 0.10	0.10
	3840	32.64 - 32.64	32.64
	3860	0.00 - 0.00	0.00
	3900	2.30 - 2.30	2.30
	3940	3.85 - 3.85	3.85
	3990	70.18 - 688.52	133.99
	4220	5886.93 - 5886.93	5881.97
	4460	1687.55 - 2116.96	1868.35
	4740	0.00 - 0.00	0.00
	4780	113.30 - 343.34	131.00
	4910	1656.92 - 7002.87	2035.99
	4950	14.36 - 14.36	14.36
	5030	5421.81 - 5489.70	5455.76
	5040	2.60 - 2.60	2.60
	5080	0.05 - 0.05	0.05
	5090	32.34 - 32.34	32.34
	5130	0.00 - 0.00	0.00
	5160	3.51 - 3.51	3.51
	5420	144.14 - 1235.52	504.50
	5990	0.01 - 0.01	0.01
	7390	0.37 - 0.37	0.37

APPENDIX C

SUMMARY OF INDIANA STATE PROCESS FUGITIVE EMISSION INVENTORY

STATE OF INDIANA
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS FOR ALL FACILITIES

TOTALS FOR THE STATE OF INDIANA
****

POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 14571.30 - 54355.23
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 18448.47

TOTALS FOR THE STATE OF INDIANA BY COUNTY
****

COUNTY OF MARION
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 5042.28 - 14034.34
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 5290.82

COUNTY OF PORTER
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 5269.24 - 34296.89
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 8823.44

COUNTY OF VIGO
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 4259.78 - 6024.00
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 4334.21

STATE OF INDIANA
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE

TOTALS FOR THE STATE OF INDIANA
****

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
COAL STORAGE: LOADING ONTO PILE	2325242	81.38 - 465.05	81.38
COAL STORAGE (TOTAL)	3073130	445.60 - 1843.88	553.16
COKE MANUF: COAL STORAGE	(S)	307.17 - 1271.03	376.24
COKE MANUF: COAL CHARGING	(S)	1190.48 - 14005.63	953.25
COKE MANUF: COKING (DOOR LEAKING)	(S)	560.22 - 1260.51	700.28
COKE MANUF: COKE QUENCHING	(S)	280.11 - 8403.38	280.11
COKE MANUF: COKE HANDLING	(S)	10.16 - 57.44	35.35
COKE MANUF: COKE PUSHING	(S)	490.20 - 1400.56	518.35
IRON PROD: SINTER OPERATION	(S)	1248.27 - 3636.68	3636.68
IRON PROD: CASTING HOUSE	(S)	826.25 - 8117.94	826.25
STEEL PRODUCTION: BASIC OXYGEN FURNACE	(S)	344.48 - 2952.71	1205.69
STEEL PRODUCTION: SCARFING	(S)	13.55 - 13.55	13.55
SEC ALUMINUM PROD: REVERBERATORY FURNACE	(S)	14.30 - 14.30	14.30
SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	(S)	4.83 - 4.83	2.29
SEC ALUMINUM PROD:CHLORINATION - FLUXING	(S)	3110.00 - 3110.00	3110.00
SEC LEAD SMELTING: REVERBERATORY FURNACE	(S)	62.99 - 353.18	208.08
SEC LEAD SMELTING: BLAST/CUPOLA FURNACE	(S)	192.45 - 192.45	192.45
SEC LEAD SMELTING: POT (KETTLE) FURNACE	(S)	0.83 - 0.83	0.83
IRON/STEEL FOUNDRY: CUPOLA FURNACE	(S)	1.41 - 28.20	14.80
IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	(S)	4.69 - 15.54	8.93
IRON/STEEL FOUNDRY: INDUCTION FURNACE	(S)	110.80 - 110.80	110.80
IRON/STEEL FOUNDRY: CASTING SHAKEOUT	299956	179.97 - 1919.72	479.93
IRON/STEEL FOUNDRY: SAND HANDLING	326611	48.99 - 48.99	48.99
IRON/STEEL FOUNDRY:FOUNDRY CAST CLEANING	239440	19.16 - 95.78	57.47
IRON/STEEL FOUNDRY: MOLD MAKING	(S)	49.87 - 49.87	49.87
FOUNDRY: SHOT BLAST GRINDER / FINISHING	2173120	10.87 - 10.87	10.87
STEEL FOUNDRY: CORE MAKING	(S)	3.22 - 3.22	3.22
IRON/STEEL FOUNDRY: MOLTEN IRON TRANSFER	(S)	2.69 - 2.69	2.69
GRAIN ELEVATOR: GRAIN HANDLING (TOTAL)	81094	332.49 - 332.49	332.49
GRAIN DRYING	(S)	3.72 - 3.72	3.72
GRAIN TERMINAL: RECEIVING	(S)	21.46 - 21.46	21.46
GRAIN TERMINAL: LOADING	(S)	172.15 - 172.15	172.15
TERMINAL GRAIN ELEVATOR	(S)	643.16 - 643.16	643.16
GRAIN ELEVATOR: WHEAT MILL	(S)	741.72 - 741.72	741.72

(S)= PROCESS INFORMATION SUPPRESSED TO INSURE CONFIDENTIALITY

STATE OF INDIANA
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF INDIANA (CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
GRAIN PROCESS: RECEIVING	782726	39.14 - 39.14	39.14
GRAIN PROCESS: DRYING	1609535	40.24 - 40.24	40.24
GRAIN PROCESS: HANDLING	4839723	1209.93 - 1209.93	1209.93
GRAIN PROCESS: CLEANING	327044	98.11 - 98.11	98.11
GRAIN PROCESS: BULK LOADING	769455	192.36 - 192.36	192.36
CONCRETE BATCH: CEMENT UNLOAD TO SILOS	(S)	1.20 - 1.20	1.20
ASPHALT CONCRETE: TOTAL	1697975	526.37 - 526.37	526.37
ASPHALT CONCRETE: BATCHING PROCESS	(S)	21.75 - 21.75	21.75
ASPHALT CONCRETE: AGGREGATE STORAGE	(S)	16.50 - 16.50	16.50
BRICK MANUFACTURING: TOTAL	(S)	0.61 - 0.61	0.61
STONE QUARRY: HANDLING	1082000	81.15 - 81.15	81.15
STONE QUARRY: PRIMARY CRUSHING	(S)	62.50 - 62.50	62.50
STONE QUARRY: SECONDARY CRUSH & SCREEN	627000	470.25 - 470.25	470.25
STONE QUARRY: STORAGE	1053000	173.74 - 173.74	173.74
SECONDARY COPPER SMELTING: EL. IND. FURN	(S)	5.15 - 14.41	1.44
CHEMICAL MANUFAC: GENERAL VENTING	(S)	0.00 - 0.00	0.00
CHEMICAL MANUFAC: AMMONIUM NITRATE NEUT.	(S)	0.00 - 0.00	0.00
CHEMICAL MANUFAC: AN PRILL COOLER	(S)	0.00 - 0.00	0.00
GLASS MANUFAC: GLASS MELT FURNACE	(S)	6.78 - 6.78	6.78
GLASS MANUFAC: HAMMER MILL	(S)	72.28 - 72.28	72.28
GLASS MANUFAC: HANDLING & STORAGE	(S)	14.53 - 14.53	14.53
RUBBER MANUFAC: MIXING	(S)	0.00 - 0.00	0.00
RUBBER MANUFAC: MILLS	(S)	0.42 - 0.42	0.42
RUBBER MANUFAC: GRINDING	(S)	0.31 - 0.31	0.31
GENERAL WOOD WORKING	(S)	0.13 - 0.13	0.13
CARBON BLACK	(S)	8.19 - 8.19	8.19
PAINT SPRAY BOOTHS	(S)	0.01 - 0.01	0.01

STATE OF INDIANA
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF INDIANA BY COUNTY

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
MARION				
	COAL STORAGE: LOADING ONTO PILE	2325242	81.38 - 465.05	81.38
	COAL STORAGE (TOTAL)	742371	107.64 - 445.42	133.63
	COKE MANUF: COAL STORAGE	(S)	27.25 - 112.74	28.75
	COKE MANUF: COAL CHARGING	(S)	316.30 - 3721.21	79.08
	COKE MANUF: COKING (DOOR LEAKING)	(S)	148.85 - 334.91	186.06
	COKE MANUF: COKE QUENCHING	(S)	74.42 - 2232.73	74.42
	COKE MANUF: COKE HANDLING	(S)	8.71 - 49.22	30.29
	COKE MANUF: COKE PUSHING	(S)	130.24 - 372.12	34.98
	SEC ALUMINUM PROD: REVERBERATORY FURNACE	(S)	0.61 - 0.61	0.61
	SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	(S)	3.39 - 3.39	0.85
	SEC LEAD SMELTING: REVERBERATORY FURNACE	(S)	62.99 - 353.18	208.08
	SEC LEAD SMELTING: BLAST/CUPOLA FURNACE	(S)	192.45 - 192.45	192.45
	SEC LEAD SMELTING: POT (KETTLE) FURNACE	(S)	0.83 - 0.83	0.83
	IRON/STEEL FOUNDRY: CUPOLA FURNACE	(S)	1.41 - 28.20	14.80
	IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	(S)	4.69 - 15.54	8.93
	IRON/STEEL FOUNDRY: INDUCTION FURNACE	(S)	108.30 - 108.30	108.30
	IRON/STEEL FOUNDRY: CASTING SHAKEOUT	299956	179.97 - 1919.72	479.93
	IRON/STEEL FOUNDRY: SAND HANDLING	325005	48.75 - 48.75	48.75
	IRON/STEEL FOUNDRY:FOUNDRY CAST CLEANING	239440	19.16 - 95.78	57.47
	IRON/STEEL FOUNDRY: MOLD MAKING	(S)	49.87 - 49.87	49.87
	FOUNDRY: SHOT BLAST GRINDER / FINISHING	2173120	10.87 - 10.87	10.87
	STEEL FOUNDRY: CORE MAKING	(S)	3.22 - 3.22	3.22
	IRON/STEEL FOUNDRY: MOLTEN IRON TRANSFER	(S)	2.69 - 2.69	2.69
	GRAIN DRYING	(S)	3.72 - 3.72	3.72
	GRAIN TERMINAL: RECEIVING	(S)	21.46 - 21.46	21.46
	GRAIN TERMINAL: LOADING	(S)	172.15 - 172.15	172.15
	TERMINAL GRAIN ELEVATOR	(S)	178.94 - 178.94	178.94
	GRAIN ELEVATOR: WHEAT MILL	(S)	741.72 - 741.72	741.72
	GRAIN PROCESS: RECEIVING	(S)	26.81 - 26.81	26.81
	GRAIN PROCESS: DRYING	1585185	39.63 - 39.63	39.63
	GRAIN PROCESS: HANDLING	4676170	1169.04 - 1169.04	1169.04
	GRAIN PROCESS: CLEANING	(S)	72.78 - 72.78	72.78
	GRAIN PROCESS: BULK LOADING	(S)	130.72 - 130.72	130.72
	CONCRETE BATCH: CEMENT UNLOAD TO SILOS	(S)	1.20 - 1.20	1.20

(S)= PROCESS INFORMATION SUPPRESSED TO INSURE CONFIDENTIALITY

STATE OF INDIANA
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF INDIANA BY COUNTY (CONTINUED)

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
	ASPHALT CONCRETE: TOTAL	980950	304.09 - 304.09	304.09
	ASPHALT CONCRETE: BATCHING PROCESS	(S)	21.75 - 21.75	21.75
	ASPHALT CONCRETE: AGGREGATE STORAGE	(S)	16.50 - 16.50	16.50
	BRICK MANUFACTURING: TOTAL	(S)	0.61 - 0.61	0.61
	STONE QUARRY: HANDLING	(S)	61.80 - 61.80	61.80
	STONE QUARRY: PRIMARY CRUSHING	(S)	62.50 - 62.50	62.50
	STONE QUARRY: SECONDARY CRUSH & SCREEN	369000	276.75 - 276.75	276.75
	STONE QUARRY: STORAGE	(S)	131.17 - 131.17	131.17
	SECONDARY COPPER SMELTING: EL. IND. FURN	(S)	5.15 - 14.41	1.44
	GLASS MANUFAC: GLASS MELT FURNACE	(S)	3.41 - 3.41	3.41
	GLASS MANUFAC: HANDLING & STORAGE	(S)	7.30 - 7.30	7.30
	RUBBER MANUFAC: MILLS	(S)	0.42 - 0.42	0.42
	RUBBER MANUFAC: GRINDING	(S)	0.31 - 0.31	0.31
	GENERAL WOOD WORKING	(S)	0.13 - 0.13	0.13
	CARBON BLACK	(S)	8.19 - 8.19	8.19
	PAINT SPRAY BOOTHS	(S)	0.01 - 0.01	0.01
PORTER				
	COAL STORAGE (TOTAL)	(S)	102.16 - 422.71	126.81
	COKE MANUF: COAL STORAGE	(S)	279.92 - 1158.29	347.49
	COKE MANUF: COAL CHARGING	(S)	820.46 - 9652.42	820.46
	COKE MANUF: COKING (DOOR LEAKING)	(S)	386.10 - 868.72	482.62
	COKE MANUF: COKE QUENCHING	(S)	193.05 - 5791.45	193.05
	COKE MANUF: COKE PUSHING	(S)	337.83 - 965.24	453.66
	IRON PROD: SINTER OPERATION	(S)	1248.27 - 3636.68	3636.68
	IRON PROD: CASTING HOUSE	(S)	826.25 - 8117.94	826.25
	STEEL PRODUCTION: BASIC OXYGEN FURNACE	(S)	344.48 - 2952.71	1205.69
	STEEL PRODUCTION: SCARFING	(S)	13.55 - 13.55	13.55
	SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	(S)	1.44 - 1.44	1.44
	IRON/STEEL FOUNDRY: INDUCTION FURNACE	(S)	2.50 - 2.50	2.50
	IRON/STEEL FOUNDRY: SAND HANDLING	(S)	0.24 - 0.24	0.24
	GRAIN ELEVATOR: GRAIN HANDLING (TOTAL)	81094	332.49 - 332.49	332.49
	TERMINAL GRAIN ELEVATOR	(S)	234.79 - 234.79	234.79
	ASPHALT CONCRETE: TOTAL	470077	145.72 - 145.72	145.72
	CHEMICAL MANUFAC: GENERAL VENTING	(S)	0.00 - 0.00	0.00
VIGO				
	COAL STORAGE (TOTAL)	1626235	235.80 - 975.74	292.72
	COKE MANUF: COAL CHARGING	(S)	53.72 - 632.00	53.72
	COKE MANUF: COKING (DOOR LEAKING)	(S)	25.28 - 56.88	31.60
	COKE MANUF: COKE QUENCHING	(S)	12.64 - 379.20	12.64

Coke Manuf: Coke Handling	(s)	1.45 -	8.22	5.06
Coke Manuf: Coke Pushing	(s)	22.12 -	63.20	29.70
SEC ALUMINUM PROD: REVERBERATORY FURNACE	(S)	13.68 -	13.68	13.68
SEC ALUMINUM PROD:CHLORINATION - FLUXING	(S)	3110.00 -	3110.00	3110.00
TERMINAL GRAIN ELEVATOR	(S)	229.42 -	229.42	229.42
GRAIN PROCESS: RECEIVING	(S)	12.33 -	12.33	12.33
GRAIN PROCESS: DRYING	(S)	0.61 -	0.61	0.61
GRAIN PROCESS: HANDLING	(S)	40.89 -	40.89	40.89
GRAIN PROCESS: CLEANING	(S)	25.33 -	25.33	25.33
GRAIN PROCESS: BULK LOADING	(S)	61.65 -	61.65	61.65
ASPHALT CONCRETE: TOTAL	(S)	76.55 -	76.55	76.55
STONE QUARRY: HANDLING	(S)	19.35 -	19.35	19.35
STONE QUARRY: SECONDARY CRUSH & SCREEN	(S)	193.50 -	193.50	193.50
STONE QUARRY: STORAGE	(S)	42.57 -	42.57	42.57
CHEMICAL MANUFAC: AMMONIUM NITRATE NEUT.	(S)	0.00 -	0.00	0.00
CHEMICAL MANUFAC: AN PRILL COOLER	(S)	0.00 -	0.00	0.00
GLASS MANUFAC: GLASS MELT FURNACE	(S)	3.37 -	3.37	3.37
GLASS MANUFAC: HAMMER MILL	(S)	72.28 -	72.28	72.28
GLASS MANUFAC: HANDLING & STORAGE	(S)	7.23 -	7.23	7.23
RUBBER MANUFAC: MIXING	(S)	0.00 -	0.00	0.00

STATE OF INDIANA
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE

TOTALS FOR THE STATE OF INDIANA
****

SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
****	**********			*********
130	124.85	-	124.85	124.85
1440	787.64	-	787.64	787.64
2040	2053.75	-	2094.17	2056.86
2070	229.42	-	229.42	229.42
2630	9.36	-	38.75	11.62
2950	564.62	-	564.62	564.62
3010	0.42	-	0.42	0.42
3030	0.31	-	0.31	0.31
3150	286.61	-	286.61	286.61
3260	0.61	-	0.61	0.61
3310	5308.96	-	41308.06	8587.86
3320	3389.87	-	4477.43	3602.69
3340	85.08	-	387.58	224.16
3360	192.84	-	192.84	192.84
3490	2.74	-	2.74	2.74
3530	1.46	-	6.05	1.81
3560	56.25	-	56.25	56.25
3590	0.61	-	0.61	0.61
3660	1.31	-	5.40	1.62
3670	8.19	-	8.19	8.19
3710	246.50	-	1015.46	390.10
3740	0.32	-	1.32	0.40
3990	1.04	-	4.29	1.29
4910	456.91	-	1987.61	552.36
5150	757.68	-	757.68	757.68
8220	3.22	-	13.30	3.99
9100	0.73	-	3.00	0.90

STATE OF INDIANA
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

TOTALS FOR THE STATE OF INDIANA BY COUNTY

COUNTY	SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)		TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
MARION				
	1440	532.22 -	532.22	532.22
	2040	1851.45 -	1891.87	1854.56
	2950	342.34 -	342.34	342.34
	3010	0.42 -	0.42	0.42
	3030	0.31 -	0.31	0.31
	3150	286.61 -	286.61	286.61
	3260	0.61 -	0.61	0.61
	3310	725.51 -	6935.73	452.95
	3320	183.30 -	1270.86	396.12
	3340	83.64 -	386.14	222.72
	3360	192.84 -	192.84	192.84
	3560	56.25 -	56.25	56.25
	3590	0.61 -	0.61	0.61
	3660	1.31 -	5.40	1.62
	3670	8.19 -	8.19	8.19
	3710	246.50 -	1015.46	390.10
	3740	0.32 -	1.32	0.40
	3990	1.04 -	4.29	1.29
	4910	151.32 -	723.10	173.01
	5150	376.74 -	376.74	376.74
	9100	0.73 -	3.00	0.90
PORTER				
	130	124.85 -	124.85	124.85
	2040	61.50 -	61.50	61.50
	2950	145.72 -	145.72	145.72
	3310	4449.90 -	33156.99	7979.44
	3340	1.44 -	1.44	1.44
	3490	2.74 -	2.74	2.74
	4910	102.16 -	422.71	126.81
	5150	380.93 -	380.93	380.93
VIGO				
	1440	255.42 -	255.42	255.42
	2040	140.80 -	140.80	140.80
	2070	229.42 -	229.42	229.42
	2630	9.36 -	38.75	11.62
	2950	76.55 -	76.55	76.55
	3310	133.54 -	1215.34	155.47

3320	3206.56 - 3206.56	3206.56
3530	1.46 - 6.05	1.81
4910	203.43 - 841.80	252.54
8220	3.22 - 13.30	3.99

APPENDIX D

SUMMARY OF MICHIGAN STATE PROCESS FUGITIVE EMISSION INVENTORY

STATE OF MICHIGAN
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS FOR ALL FACILITIES

TOTALS FOR THE STATE OF MICHIGAN
****

POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 22049.29 - 56040.92
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 29638.24

TOTALS FOR THE STATE OF MICHIGAN BY COUNTY
****

COUNTY OF WAYNE
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 22049.29 - 56040.92
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 29638.24

STATE OF MICHIGAN
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE

TOTALS FOR THE STATE OF MICHIGAN

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
COAL STORAGE: LOADING ONTO PILE	(S)	51.71 - 295.50	51.71
COAL STORAGE (TOTAL)	2452843	355.66 - 1471.71	434.23
COKE MANUF: COAL STORAGE	(S)	8.85 - 36.60	2.75
COKE MANUF: COAL CHARGING	(S)	688.92 - 8104.91	593.29
COKE MANUF: COKING (DOOR LEAKING)	(S)	324.20 - 729.44	349.00
COKE MANUF: COKE QUENCHING	3251444	325.14 - 9754.33	302.64
COKE MANUF: COKE HANDLING	(S)	18.64 - 105.36	55.84
COKE MANUF: COKE PUSHING	(S)	283.67 - 810.49	328.06
IRON PROD: IRON ORE HANDLING & TRANSFER	(S)	2778.00 - 2778.00	2778.00
IRON PROD: BLAST FURNACE DUST HANDLING	(S)	895.04 - 895.04	895.04
IRON PROD: SINTER OPERATION	(S)	533.40 - 1554.00	1554.00
IRON PROD: SLAG HANDLING	(S)	589.99 - 613.35	300.84
STEEL PRODUCTION: BASIC OXYGEN FURNACE	(S)	463.64 - 3974.05	1622.74
STEEL PRODUCTION: ELECTRIC ARC FURNACE	(S)	266.23 - 4437.20	2144.65
STEEL PRODUCTION: SCARFING	(S)	10.47 - 10.47	10.47
SEC ALUMINUM PROD: SWEATING FURNACE	(S)	0.22 - 0.22	0.22
SEC ALUMINUM PROD: CRUCIBLE FURNACE	(S)	0.38 - 0.38	0.38
SEC ALUMINUM PROD: INDUCTION FURNACE	(S)	0.01 - 0.01	0.01
SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	(S)	9.00 - 9.00	9.00
SEC ALUMINUM PROD:CHLORINATION - FLUXING	(S)	0.02 - 0.02	0.02
SEC LEAD SMELTING: POT (KETTLE) FURNACE	(S)	0.11 - 0.11	0.11
SEC ZINC SMELT: KETTLE SWEAT FURNACE	(S)	0.42 - 0.42	0.42
SEC ZINC SMELT: ROTARY SWEAT FURNACE	41430	11.60 - 26.10	18.85
SEC ZINC SMELT: CRUCIBLE FURNACE	(S)	0.00 - 0.00	0.00
SEC ZINC SMELT: KETTLE MELTING FURNACE	(S)	0.01 - 0.01	0.01
IRON/STEEL FOUNDRY: CUPOLA FURNACE	(S)	16.12 - 322.30	169.21
IRON/STEEL FOUNDRY: CRUCIBLE FURA CE	(S)	0.00 - 0.01	0.01
IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	96203	50.51 - 167.39	92.20
IRON/STEEL FOUNDRY: INDUCTION FURNACE	10424	10.42 - 10.42	10.42
IRON/STEEL FOUNDRY: CASTING SHAKEOUT	16809	10.09 - 107.58	26.89
IRON/STEEL FOUNDRY: POURING AND COOLING	1923040	96.15 - 3971.08	2884.56
IRON/STEEL FOUNDRY: SAND HANDLING	2614019	392.10 - 392.10	392.10
IRON/STEEL FOUNDRY:FOUNDRY CAST CLEANING	207681	16.61 - 83.07	49.84
IRON/STEEL FOUNDRY: MOLD MAKING	1995784	69.85 - 69.85	19.45

(S)= PROCESS INFORMATION SUPPRESSED TO INSURE CONFIDENTIALITY

STATE OF MICHIGAN
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF MICHIGAN (CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
FOUNDRY: SHOT BLAST GRINDER / FINISHING	1344463	6.72 - 6.72	6.71
IRON/STEEL FOUNDRY: SOAKING PITS	(S)	0.00 - 0.00	0.00
IRON/STEEL FOUNDRY: STRIP MILLS	(S)	0.00 - 0.00	0.00
IRON/STEEL FOUNDRY: PICKLING TANKS	(S)	0.00 - 0.00	0.00
GRAIN ELEVATOR: WHEAT MILL	(S)	476.93 - 476.93	476.93
GRAIN PROCESS: CORN MILLING	(S)	0.43 - 0.43	0.43
GRAIN PROCESS: RECEIVING	(S)	3.38 - 3.38	3.38
GRAIN PROCESS: DRYING	(S)	1.15 - 1.15	1.15
GRAIN PROCESS: HANDLING	395968	98.99 - 98.99	98.99
GRAIN PROCESS: CLEANING	(S)	44.11 - 44.11	44.11
CEMENT MANUF: CRUSHING	(S)	130.00 - 195.00	162.50
CEMENT MANUF: TRANSFER & CONVEYING	3088000	308.80 - 617.60	463.20
CEMENT MANUF: RAW GRINDING	(S)	12.50 - 12.50	12.50
CEMENT MANUF: UNLOAD- OUTFALL TOSTORAGE	(S)	1150.00 - 2300.00	1725.00
CEMENT MANUFACTURE: KILN	(S)	2250.00 - 2250.00	2250.00
LIME MANUF: TOTAL	(S)	434.63 - 440.17	437.40
LIME MANUF· ROTARY KILN	2091991	836.80 - 836.80	836.80
CONCRETE BATCH: TOTAL	1709332	316.23 - 316.23	316.23
CONCRETE BATCH: CEMENT UNLOAD TO SILOS	733981	88.08 - 88.08	88.08
CONCRETE BATCH: HOPPER LOAD OF AGGREGATE	(S)	1.44 - 1.44	1.44
CONCRETE BATCH: MIXER LOAD OF AGGREGATE	(S)	3.42 - 3.42	3.42
CONCRETE BATCH: LOAD OF DRY BATCH TRUCK	(S)	0.13 - 0.13	0.13
ASPHALT CONCRETE. TOTAL	915437	283.79 - 283.79	283.79
STONE QUARRY: HANDLING	6624480	496.84 - 496.84	496.84
STONE QUARRY: PRIMARY CRUSHING	3551775	887.94 - 887.94	887.94
STONE QUARRY: SECONDARY CRUSH & SCREEN	6281318	4710.99 - 4710.99	4710.99
STONE QUARRY: STORAGE	3630306	599.00 - 599.00	599.00
ROCK QUARRY: DRYER	(S)	482.95 - 482.95	482.95
SECONDARY COPPER SMELTING: REV. FUNACE	(S)	4.56 - 13.50	9.08
ASPHALT ROOFING: TOTAL	(S)	29.25 - 29.25	29.25
CHEMICAL MANUFAC: MIXER DRY	18684	0.37 - 0.37	0.37
CHEMICAL MANUFAC: MIXER WET	(S)	0.03 - 0.03	0.03
CHEMICAL MANUFAC: DRYER	18687	1.87 - 1.87	1.87
CHEMICAL MANUFAC: HANDLING - STORAGE	26357	1.98 - 1.98	1.98

(S)= PROCESS INFORMATION SUPPRESSED TO INSURE CONFIDENTIALITY

STATE OF MICHIGAN
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF MICHIGAN (CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
CHEMICAL MANUFAC: REACTORS	(S)	0.00 - 0.00	0.00
CHEMICAL MANUFAC: MILLS	(S)	0.54 - 0.54	0.54
CHEMICAL MANUFAC: CALCINERS	(S)	0.00 - 0.00	0.00
CHEMICAL MANUFAC: ABSORBERS	(S)	0.00 - 0.00	0.00
CHEMICAL MANUFAC: FLAKERS	(S)	0.19 - 0.19	0.19
CHEMICAL MANUFAC: GENERAL VENTING	(S)	0.00 - 0.00	0.00
CHEMICAL MANUFAC: VERMICULITE EXPANDER	(S)	0.75 - 0.75	0.75
CHEMICAL MANUFAC: MONOKOTE EXPANDER	(S)	0.46 - 0.46	0.46
GLASS MANUFAC: GLASS MELT FURNACE	(S)	4.38 - 4.38	4.38
GLASS MANUFAC: ANNEALING FURNACE	(S)	1.77 - 1.77	1.77
GLASS MANUFAC: HAMMER MILL	(S)	0.14 - 0.14	0.14
GLASS MANUFAC: HANDLING & STORAGE	(S)	0.88 - 0.88	0.88
GYPSUM MANUFAC: HANDLING	422561	63.38 - 63.38	63.38
GYPSUM MANUFAC: DRYER	(S)	5.57 - 5.57	5.57
GYPSUM MANUFAC: KETTLES	(S)	4.46 - 4.46	4.46
GYPSUM MANUFAC: MILLS	(S)	11.61 - 11.61	11.61
GYPSUM MANUFAC: SAWS	(S)	0.07 - 0.07	0.07
GYPSUM MANUFAC: PERLITE VENT FURNACE	(S)	0.07 - 0.07	0.07
GENERAL WOOD WORKING	(S)	0.03 - 0.03	0.03
PAINT SPRAY BOOTHS	2897196	14.49 - 14.49	14.49
BREWERY: BREWING KETTLES	(S)	0.00 - 0.00	0.00

STATE OF MICHIGAN
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF MICHIGAN BY COUNTY

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
WAYNE				
	COAL STORAGE: LOADING ONTO PILE	(S)	51.71 - 295.50	51.71
	COAL STORAGE (TOTAL)	2452843	355.66 - 1471.71	434.23
	COKE MANUF: COAL STORAGE	(S)	8.85 - 36.60	2.75
	COKE MANUF: COAL CHARGING	(S)	688.92 - 8104.91	593.29
	COKE MANUF: COKING (DOOR LEAKING)	(S)	324.20 - 729.44	349.00
	COKE MANUF: COKE QUENCHING	3251444	325.14 - 9754.33	302.64
	COKE MANUF: COKE HANDLING	(S)	18.64 - 105.36	55.84
	COKE MANUF: COKE PUSHING	(S)	283.67 - 810.49	328.06
	IRON PROD: IRON ORE HANDLING & TRANSFER	(S)	2778.00 - 2778.00	2778.00
	IRON PROD: BLAST FURNACE DUST HANDLING	(S)	895.04 - 895.04	895.04
	IRON PROD: SINTER OPERATION	(S)	533.40 - 1554.00	1554.00
	IRON PROD: SLAG HANDLING	(S)	589.99 - 613.35	300.84
	STEEL PRODUCTION: BASIC OXYGEN FURNACE	(S)	463.64 - 3974.05	1622.74
	STEEL PRODUCTION: ELECTRIC ARC FURNACE	(S)	266.23 - 4437.20	2144.65
	STEEL PRODUCTION. SCARFING	(S)	10.47 - 10.47	10.47
	SEC ALUMINUM PROD: SWEATING FURNACE	(S)	0.22 - 0.22	0.22
	SEC ALUMINUM PROD: CRUCIBLE FURNACE	(S)	0.38 - 0.38	0.38
	SEC ALUMINUM PROD: INDUCTION FURNACE	(S)	0.01 - 0.01	0.01
	SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	(S)	9.00 - 9.00	9.00
	SEC ALUMINUM PROD:CHLORINATION - FLUXING	(S)	0.02 - 0.02	0.02
	SEC LEAD SMELTING: POT (KETTLE) FURNACE	(S)	0.11 - 0.11	0.11
	SEC ZINC SMELT: KETTLE SWEAT FURNACE	(S)	0.42 - 0.42	0.42
	SEC ZINC SMELT: ROTARY SWEAT FURNACE	41430	11.60 - 26.10	18.85
	SEC ZINC SMELT: CRUCIBLE FURNACE	(S)	0.00 - 0.00	0.00
	SEC ZINC SMELT: KETTLE MELTING FURNACE	(S)	0.01 - 0.01	0.01
	IRON/STEEL FOUNDRY: CUPOLA FURNACE	(S)	16.12 - 322.30	169.21
	IRON/STEEL FOUNDRY: CRUCIBLE FURA CE	(S)	0.00 - 0.01	0.01
	IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	96203	50.51 - 167.39	92.20
	IRON/STEEL FOUNDRY: INDUCTION FURNACE	10424	10.42 - 10.42	10.42
	IRON/STEEL FOUNDRY: CASTING SHAKEOUT	16809	10.09 - 107.58	26.89
	IRON/STEEL FOUNDRY: POURING AND COOLING	1923040	96.15 - 3971.08	2884.56
	IRON/STEEL FOUNDRY: SAND HANDLING	2614019	392.10 - 392.10	392.10
	IRON/STEEL FOUNDRY:FOUNDRY CAST CLEANING	207681	16.61 - 83.07	49.84
	IRON/STEEL FOUNDRY: MOLD MAKING	1995784	69.85 - 69.85	19.45

(S)= PROCESS INFORMATION SUPPRESSED TO INSURE CONFIDENTIALITY

STATE OF MICHIGAN
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF MICHIGAN BY COUNTY (CONTINUED)

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
	FOUNDRY: SHOT BLAST GRINDER / FINISHING	1344463	6.72 - 6.72	6.71
	IRON/STEEL FOUNDRY: SOAKING PITS	(S)	0.00 - 0.00	0.00
	IRON/STEEL FOUNDRY: STRIP MILLS	(S)	0.00 - 0.00	0.00
	IRON/STEEL FOUNDRY· PICKLING TANKS	(S)	0.00 - 0.00	0.00
	GRAIN ELEVATOR: WHEAT MILL	(S)	476.93 - 476.93	476.93
	GRAIN PROCESS: CORN MILLING	(S)	0.43 - 0.43	0.43
	GRAIN PROCESS: RECEIVING	(S)	3.38 - 3.38	3.38
	GRAIN PROCESS: DRYING	(S)	1.15 - 1.15	1.15
	GRAIN PROCESS. HANDLING	395968	98.99 - 98.99	98.99
	GRAIN PROCESS: CLEANING	(S)	44.11 - 44.11	44.11
	CEMENT MANUF: CRUSHING	(S)	130.00 - 195.00	162.50
	CEMENT MANUF: TRANSFER & CONVEYING	3088000	308.80 - 617.60	463.20
	CEMENT MANUF: RAW GRINDING	(S)	12.50 - 12.50	12.50
	CEMENT MANUF: UNLOAD- OUTFALL TOSTORAGE	(S)	1150.00 - 2300.00	1725.00
	CEMENT MANUFACTURE. KILN	(S)	2250.00 - 2250.00	2250.00
	LIME MANUF: TOTAL	(S)	434.63 - 440.17	437.40
	LIME MANUF: ROTARY KILN	2091991	836.80 - 836.80	836.80
	CONCRETE BATCH: TOTAL	1709332	316.23 - 316.23	316.23
	CONCRETE BATCH: CEMENT UNLOAD TO SILOS	733981	88.08 - 88.08	88.08
	CONCRETE BATCH: HOPPER LOAD OF AGGREGATE	(S)	1.44 - 1.44	1.44
	CONCRETE BATCH: MIXER LOAD OF AGGREGATE	(S)	3.42 - 3.42	3.42
	CONCRETE BATCH: LOAD OF DRY BATCH TRUCK	(S)	0.13 - 0.13	0.13
	ASPHALT CONCRETE: TOTAL	915437	283.79 - 283.79	283.79
	STONE QUARRY: HANDLING	6624480	496.84 - 496.84	496.84
	STONE QUARRY: PRIMARY CRUSHING	3551775	887.94 - 887.94	887.94
	STONE QUARRY: SECONDARY CRUSH & SCREEN	6281318	4710.99 - 4710.99	4710.99
	STONE QUARRY: STORAGE	3630306	599.00 - 599.00	599.00
	ROCK QUARRY: DRYER	(S)	482.95 - 482.95	482.95
	SECONDARY COPPER SMELTING: REV. FUNACE	(S)	4.56 - 13.50	9.08
	ASPHALT ROOFING: TOTAL	(S)	29.25 - 29.25	29.25
	CHEMICAL MANUFAC: MIXER DRY	18684	0.37 - 0.37	0.37
	CHEMICAL MANUFAC: MIXER WET	(S)	0.03 - 0.03	0.03
	CHEMICAL MANUFAC: DRYER	18687	1.87 - 1.87	1.87
	CHEMICAL MANUFAC: HANDLING - STORAGE	26357	1.98 - 1.98	1.98

(S)= PROCESS INFORMATION SUPPRESSED TO INSURE CONFIDENTIALITY

STATE OF MICHIGAN
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF MICHIGAN BY COUNTY (CONTINUED)

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
	CHEMICAL MANUFAC: REACTORS	(S)	0.00 - 0.00	0.00
	CHEMICAL MANUFAC: MILLS	(S)	0.54 - 0.54	0.54
	CHEMICAL MANUFAC: CALCINERS	(S)	0.00 - 0.00	0.00
	CHEMICAL MANUFAC: ABSORBERS	(S)	0.00 - 0.00	0.00
	CHEMICAL MANUFAC: FLAKERS	(S)	0.19 - 0.19	0.19
	CHEMICAL MANUFAC: GENERAL VENTING	(S)	0.00 - 0.00	0.00
	CHEMICAL MANUFAC: VERMICULITE EXPANDER	(S)	0.75 - 0.75	0.75
	CHEMICAL MANUFAC: MONOKOTE EXPANDER	(S)	0.46 - 0.46	0.46
	GLASS MANUFAC: GLASS MELT FURNACE	(S)	4.38 - 4.38	4.38
	GLASS MANUFAC: ANNEALING FURNACE	(S)	1.77 - 1.77	1.77
	GLASS MANUFAC. HAMMER MILL	(S)	0.14 - 0.14	0.14
	GLASS MANUFAC: HANDLING & STORAGE	(S)	0.88 - 0.88	0.88
	GYPSUM MANUFAC: HANDLING	422561	63.38 - 63.38	63.38
	GYPSUM MANUFAC: DRYER	(S)	5.57 - 5.57	5.57
	GYPSUM MANUFAC: KETTLES	(S)	4.46 - 4.46	4.46
	GYPSUM MANUFAC: MILLS	(S)	11.61 - 11.61	11.61
	GYPSUM MANUFAC: SAWS	(S)	0.07 - 0.07	0.07
	GYPSUM MANUFAC: PERLITE VENT FURNACE	(S)	0.07 - 0.07	0.07
	GENERAL WOOD WORKING	(S)	0.03 - 0.03	0.03
	PAINT SPRAY BOOTHS	2897196	14.49 - 14.49	14.49
	BREWERY: BREWING KETTLES	(S)	0.00 - 0.00	0.00

STATE OF MICHIGAN
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE

TOTALS FOR THE STATE OF MICHIGAN
****

SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
****	**********			*********
1420	240.00	-	240.00	240.00
1440	939.10	-	939.10	939.10
1460	482.95	-	482.95	482.95
1470	14.85	-	14.85	14.85
1790	0.00	-	0.00	0.00
2040	6.87	-	6.87	6.87
2050	0.08	-	0.08	0.08
2080	617.78	-	617.78	617.78
2110	319.03	-	3155.25	367.50
2650	0.02	-	0.02	0.02
2750	0.25	-	0.25	0.25
2810	780.45	-	780.45	780.45
2820	1.57	-	1.57	1.57
2840	1.77	-	1.77	1.77
2890	1.64	-	1.64	1.64
2950	313.04	-	313.04	313.04
3220	6.70	-	6.70	6.70
3240	3924.12	-	5394.07	4634.07
3250	2.70	-	2.70	2.70
3270	1030.13	-	1035.67	1032.90
3290	4530.15	-	4651.50	4592.51
3310	7185.50	-	33563.38	12743.42
3320	492.37	-	1543.17	1057.51
3330	1.28	-	2.87	2.07
3340	30.18	-	470.01	341.22
3350	59.50	-	59.50	59.50
3360	6.63	-	20.36	12.74
3390	0.01	-	0.01	0.01
3400	0.01	-	0.01	0.01
3410	0.01	-	0.01	0.01
3450	3.96	-	34.59	9.24
3460	18.64	-	63.98	19.21
3490	0.00	-	0.00	0.00
3510	0.74	-	3.07	0.92

STATE OF MICHIGAN
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

TOTALS FOR THE STATE OF MICHIGAN (CONTINUED)

SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
3710	8.19 - 8.82	8.44
4220	0.25 - 0.25	0.25
4910	823.97 - 2085.52	902.26
4950	5.43 - 5.43	5.43
5090	108.68 - 441.15	347.93
5290	90.52 - 90.52	90.52
5330	0.00 - 0.00	0.00
7390	0.19 - 1.98	0.76

STATE OF MICHIGAN
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

TOTALS FOR THE STATE OF MICHIGAN BY COUNTY

COUNTY	SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)		TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
WAYNE				
	1420	240.00 -	240.00	240.00
	1440	939.10 -	939.10	939.10
	1460	482.95 -	482.95	482.95
	1470	14.85 -	14.85	14.85
	1790	0.00 -	0.00	0.00
	2040	6.87 -	6.87	6.87
	2050	0.08 -	0.08	0.08
	2080	617.78 -	617.78	617.78
	2110	319.03 -	3155.25	367.50
	2650	0.02 -	0.02	0.02
	2750	0.25 -	0.25	0.25
	2810	780.45 -	780.45	780.45
	2820	1.57 -	1.57	1.57
	2840	1.77 -	1.77	1.77
	2890	1.64 -	1.64	1.64
	2950	313.04 -	313.04	313.04
	3220	6.70 -	6.70	6.70
	3240	3924.12 -	5394.07	4634.07
	3250	2.70 -	2.70	2.70
	3270	1030.13 -	1035.67	1032.90
	3290	4530.15 -	4651.50	4592.51
	3310	7185.50 -	33563.38	12743.42
	3320	492.37 -	1543.17	1057.51
	3330	1.28 -	2.87	2.07
	3340	30.18 -	470.01	341.22
	3350	59.50 -	59.50	59.50
	3360	6.63 -	20.36	12.74
	3390	0.01 -	0.01	0.01
	3400	0.01 -	0.01	0.01
	3410	0.01 -	0.01	0.01
	3450	3.96 -	34.59	9.24
	3460	18.64 -	63.98	19.21
	3490	0.00 -	0.00	0.00
	3510	0.74 -	3.07	0.92
	3710	8.19 -	8.82	8.44
	4220	0.25 -	0.25	0.25
	4910	823.97 -	2085.52	902.26

4950	5.43	-	5.43	5.43
5090	108.68	-	441.15	347.93
5290	90.52	-	90.52	90.52
5330	0.00	-	0.00	0.00
7390	0.19	-	1.98	0.76

APPENDIX E

SUMMARY OF MINNESOTA STATE PROCESS FUGITIVE EMISSION INVENTORY

STATE OF MINNESOTA
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS FOR ALL FACILITIES

TOTALS FOR THE STATE OF MINNESOTA

POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 37030.55 - 40023.69
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 33764.72

TOTALS FOR THE STATE OF MINNESOTA BY COUNTY

COUNTY OF DEKOTA
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 683.52 - 987.79
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 707.70

COUNTY OF HENNEPIN
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 6319.54 - 7397.56
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 6623.49

COUNTY OF RAMSEY
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 6006.65 - 6715.08
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 5963.25

COUNTY OF ST. LOUIS
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 20062.97 - 20381.70
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 17035.05

COUNTY OF WASHINGTON
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 3957.87 - 4541.57
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 3435.22

STATE OF MINNESOTA
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE

TOTALS FOR THE STATE OF MINNESOTA
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PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
COAL STORAGE: LOADING ONTO PILE	(S)	0.09 - 0.50	0.09
COAL STORAGE: LOADING OUT (OUTGOING)	(S)	0.09 - 0.50	0.10
COAL STORAGE: WIND EROSION	2224490	14.46 - 278.06	77.86
COAL STORAGE (TOTAL)	3449166	500.13 - 2069.50	620.85
IRON PROD: SINTER OPERATION	(S)	63.50 - 185.00	185.00
STEEL PRODUCTION: BASIC OXYGEN FURNACE	(S)	7.37 - 63.15	25.79
SEC LEAD SMELTING: SWETAING FURNACE	(S)	9.36 - 20.47	14.92
SEC LEAD SMELTING: REVERBERATORY FURNACE	(S)	22.40 - 125.60	74.00
SEC LEAD SMELTING: BLAST/CUPOLA FURNACE	(S)	17.70 - 17.70	17.70
SEC LEAD SMELTING: POT (KETTLE) FURNACE	(S)	0.45 - 0.45	0.45
IRON/STEEL FOUNDRY: CUPOLA FURNACE	19600	0.98 - 19.60	10.29
IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	(S)	229.31 - 760.00	436.78
IRON/STEEL FOUNDRY: INDUCTION FURNACE	(S)	0.53 - 0.53	0.53
IRON/STEEL FOUNDRY: CASTING SHAKEOUT	(S)	30.86 - 329.15	82.29
IRON/STEEL FOUNDRY: POURING AND COOLING	(S)	0.50 - 20.65	15.00
IRON/STEEL FOUNDRY: SAND HANDLING	(S)	20.17 - 20.17	20.17
IRON/STEEL FOUNDRY: AUTO SHREDDER	(S)	1.31 - 1.31	1.31
GRAIN CLEANING	3053967	458.10 - 458.10	458.10
GRAIN DRYING	(S)	1.56 - 1.56	1.56
GRAIN TERMINAL: RECEIVING	14026171	701.31 - 701.31	701.31
GRAIN TERMINAL: LOADING	13775920	4477.17 - 4477.17	4477.17
GRAIN TERMINAL: TUNNEL BELT	(S)	4.92 - 4.92	4.92
GRAIN TERMINAL: HEADHOUSE	10777190	808.29 - 808.29	808.29
GRAIN TERMINAL: TRIPPER	5145667	257.28 - 257.28	257.28
TERMINAL GRAIN ELEVATOR	3338437	3622.20 - 3622.20	3622.20
GRAIN ELEVATOR: WHEAT MILL	783653	2742.79 - 2742.79	2742.79
GRAIN PROCESS: CORN MILLING	(S)	158.60 - 158.60	158.60
GRAIN PROCESS: RECEIVING	1407374	70.37 - 70.37	70.37
GRAIN PROCESS: DRYING	108994	2.72 - 2.72	2.72
GRAIN PROCESS: HANDLING	8699385	2174.85 - 2174.85	2174.85
GRAIN PROCESS: CLEANING	788340	236.50 - 236.50	236.50
GRAIN PROCESS: BULK LOADING	1145709	286.43 - 286.43	286.43
LIME MANUF: PRIMARY CRUSHING	(S)	250.00 - 250.00	125.00
CONCRETE BATCH: TOTAL	(S)	16.65 - 16.65	16.65

(S)= PROCESS INFORMATION SUPPRESSED TO INSURE CONFIDENTIALITY

STATE OF MINNESOTA
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF MINNESOTA (CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
ASPHALT CONCRETE: TOTAL	2228212	690.75 - 690.75	690.75
ASPHALT CONCRETE· AGGREGATE STORAGE	96500	15.92 - 15.92	15.92
STONE QUARRY: HANDLING	3650300	273.77 - 273.77	181.90
STONE QUARRY: PRIMARY CRUSHING	(S)	500.00 - 500.00	500.00
STONE QUARRY: SECONDARY CRUSH & SCREEN	(S)	1650.00 - 1650.00	1275.00
STONE QUARRY: STORAGE	(S)	255.75 - 255.75	255.75
MINING. PRIMARY CRUSHING	71689300	716.89 - 716.89	387.58
MINING: SECONDARY CRUSHING - SCREENING	6182568	494.61 - 494.61	494.61
MINING: HANDLING	96329171	9632.92 - 9632.92	7055.48
MINING: ORE DRYER	(S)	262.23 - 262.23	262.23
MINING: ORE CONCENTRATOR	38672436	4834.05 - 4834.05	4665.89
MINING: UNDERGROUND VENTS	(S)	0.00 - 0.00	0.00
MINING: STOCKPILE	5653222	152.64 - 152.64	148.30
ASPHALT ROOFING: TOTAL	73200	10.98 - 10.98	10.98
CHEMICAL MANUFAC· DRYER	(S)	2.00 - 2.00	2.00
CHEMICAL MANUFAC: SULFURIC ACID	(S)	0.00 - 0.00	0.00
CHEMICAL MANUFAC: AMMONIUM NITRATE NEUT.	(S)	0:00 - 0.00	0.00
CHEMICAL MANUFAC: AN PRILL COOLER	(S)	0.00 - 0.00	0.00
GLASS MANUFAC: GLASS MELT FURNACE	(S)	4.26 - 4.26	4.26
CERAMIC CLAY: GRINDING	(S)	238.25 - 238.25	59.56
CERAMIC CLAY: STORAGE	(S)	106.58 - 106.58	26.65
REFINERY: SULFUR RECOVERY PLANT	(S)	0.00 - 0.00	0.00
REFINERY: FCL REGENERATION	(S)	0.00 - 0.00	0.00
PAINT SPRAY BOOTHS	5830	0.03 - 0.03	0.03

STATE OF MINNESOTA
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF MINNESOTA BY COUNTY

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
DEKOTA				
	COAL STORAGE (TOTAL)	(S)	87.00 - 360.00	108.00
	SEC LEAD SMELTING: SWETAING FURNACE	(S)	9.36 - 20.47	14.92
	SEC LEAD SMELTING: BLAST/CUPOLA FURNACE	(S)	17.70 - 17.70	17.70
	SEC LEAD SMELTING: POT (KETTLE) FURNACE	(S)	0.20 - 0.20	0.20
	IRON/STEEL FOUNDRY: POURING AND COOLING	(S)	0.50 - 20.65	15.00
	GRAIN DRYING	(S)	0.46 - 0.46	0.46
	TERMINAL GRAIN ELEVATOR	(S)	287.79 - 287.79	287.79
	GRAIN PROCESS: RECEIVING	(S)	3.17 - 3.17	3.17
	GRAIN PROCESS: DRYING	(S)	0.14 - 0.14	0.14
	GRAIN PROCESS: HANDLING	(S)	7.35 - 7.35	7.35
	CONCRETE BATCH: TOTAL	(S)	16.65 - 16.65	16.65
	ASPHALT CONCRETE: TOTAL	694156	215.19 - 215.19	215.19
	STONE QUARRY: HANDLING	(S)	33.75 - 33.75	16.88
	CHEMICAL MANUFAC: SULFURIC ACID	(S)	0.00 - 0.00	0.00
	CHEMICAL MANUFAC: AMMONIUM NITRATE NEUT.	(S)	0.00 - 0.00	0.00
	CHEMICAL MANUFAC: AN PRILL COOLER	(S)	0.00 - 0.00	0.00
	GLASS MANUFAC: GLASS MELT FURNACE	(S)	4.26 - 4.26	4.26
HENNEPIN				
	COAL STORAGE: LOADING ONTO PILE	(S)	0.09 - 0.50	0.09
	COAL STORAGE: LOADING OUT (OUTGOING)	(S)	0.09 - 0.50	0.10
	COAL STORAGE (TOTAL)	951113	137.91 - 570.67	171.20
	IRON PROD: SINTER OPERATION	(S)	63.50 - 185.00	185.00
	STEEL PRODUCTION: BASIC OXYGEN FURNACE	(S)	7.37 - 63.15	25.79
	SEC LEAD SMELTING: REVERBERATORY FURNACE	(S)	22.40 - 125.60	74.00
	SEC LEAD SMELTING: POT (KETTLE) FURNACE	(S)	0.25 - 0.25	0.25
	IRON/STEEL FOUNDRY: CUPOLA FURNACE	19600	0.98 - 19.60	10.29
	IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	(S)	20.33 - 67.37	38.72
	IRON/STEEL FOUNDRY: CASTING SHAKEOUT	(S)	30.86 - 329.15	82.29
	IRON/STEEL FOUNDRY: SAND HANDLING	(S)	20.17 - 20.17	20.17
	GRAIN CLEANING	1590359	238.55 - 238.55	238.55
	GRAIN DRYING	(S)	1.10 - 1.10	1.10
	GRAIN TERMINAL: RECEIVING	2020015	101.00 - 101.00	101.00
	GRAIN TERMINAL: LOADING	1741760	566.07 - 566.07	566.07
	GRAIN TERMINAL: TUNNEL BELT	(S)	4.92 - 4.92	4.92
	GRAIN TERMINAL: HEADHOUSE	841190	63.09 - 63.09	63.09
	GRAIN TERMINAL: TRIPPER	(S)	20.48 - 20.48	20.48
	TERMINAL GRAIN ELEVATOR	(S)	847.85 - 847.85	847.85
	GRAIN ELEVATOR: WHEAT MILL	618453	2164.59 - 2164.59	2164.59
	GRAIN PROCESS: CORN MILLING	(S)	158.60 - 158.60	158.60

	Grain Process: Receiving	1177726	58.89 -	58.89	58.89
	GRAIN PROCESS: DRYING	(S)	2.10 -	2.10	2.10
	GRAIN PROCESS: HANDLING	3102999	775.75 -	775.75	775.75
	GRAIN PROCESS: CLEANING	788340	236.50 -	236.50	236.50
	GRAIN PROCESS: BULK LOADING	1145709	286.43 -	286.43	286.43
	ASPHALT CONCRETE: TOTAL	904918	280.52 -	280.52	280.52
	ASPHALT CONCRETE: AGGREGATE STORAGE	(S)	0.41 -	0.41	0.41
	STONE QUARRY: PRIMARY CRUSHING	(S)	200.00 -	200.00	200.00
	ASPHALT ROOFING: TOTAL	(S)	6.75 -	6.75	6.75
	CHEMICAL MANUFAC: DRYER	(S)	2.00 -	2.00	2.00
RAMSEY					
	COAL STORAGE: WIND EROSION	(S)	2.97 -	57.13	16.00
	COAL STORAGE (TOTAL)	375030	54.38 -	225.02	67.51
	IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	(S)	208.98 -	692.62	398.06
	IRON/STEEL FOUNDRY: INDUCTION FURNACE	(S)	0.53 -	0.53	0.53
	IRON/STEEL FOUNDRY: AUTO SHREDDER	(S)	1.31 -	1.31	1.31
	GRAIN CLEANING	1319608	197.94 -	197.94	197.94
	GRAIN TERMINAL: RECEIVING	8800156	440.01 -	440.01	440.01
	GRAIN TERMINAL: LOADING	(S)	2510.35 -	2510.35	2510.35
	GRAIN TERMINAL: HEADHOUSE	(S)	579.00 -	579.00	579.00
	GRAIN TERMINAL: TRIPPER	(S)	165.00 -	165.00	165.00
	GRAIN ELEVATOR: WHEAT MILL	(S)	578.20 -	578.20	578.20
	GRAIN PROCESS: RECEIVING	(S)	8.31 -	8.31	8.31
	GRAIN PROCESS: DRYING	(S)	0.48 -	0.48	0.48
	GRAIN PROCESS: HANDLING	(S)	866.75 -	866.75	866.75
	ASPHALT CONCRETE: TOTAL	(S)	43.34 -	43.34	43.34
	STONE QUARRY: HANDLING	(S)	0.02 -	0.02	0.02
	ASPHALT ROOFING: TOTAL	(S)	4.23 -	4.23	4.23
	CERAMIC CLAY: GRINDING	(S)	238.25 -	238.25	59.56
	CERAMIC CLAY: STORAGE	(S)	106.58 -	106.58	26.65
	PAINT SPRAY BOOTHS	(S)	0.01 -	0.01	0.01
ST. LOUIS					
	COAL STORAGE: WIND EROSION	(S)	8.99 -	172.94	48.42
	COAL STORAGE (TOTAL)	340186	49.33 -	204.11	61.23
	GRAIN CLEANING	(S)	21.60 -	21.60	21.60
	GRAIN TERMINAL: RECEIVING	(S)	160.30 -	160.30	160.30
	GRAIN TERMINAL: LOADING	(S)	1400.75 -	1400.75	1400.75
	GRAIN TERMINAL: HEADHOUSE	(S)	166.20 -	166.20	166.20
	GRAIN TERMINAL: TRIPPER	(S)	71.80 -	71.80	71.80
	TERMINAL GRAIN ELEVATOR	(S)	1477.51 -	1477.51	1477.51
	GRAIN PROCESS: HANDLING	(S)	525.00 -	525.00	525.00
	ASPHALT CONCRETE: TOTAL	234340	72.65 -	72.65	72.65
	ASPHALT CONCRETE: AGGREGATE STORAGE	(S)	15.51 -	15.51	15.51
	MINING: PRIMARY CRUSHING	71689300	716.89 -	716.89	387.58
	MINING: SECONDARY CRUSHING - SCREENING	6182568	494.61 -	494.61	494.61
	MINING: HANDLING	96329171	9632.92 -	9632.92	7055.48
	MINING: ORE DRYER	(S)	262.23 -	262.23	262.23
	MINING: ORE CONCENTRATOR	38672436	4834.05 -	4834.05	4665.89
	MINING: UNDERGROUND VENTS	(S)	0.00 -	0.00	0.00
	MINING: STOCKPILE	5653222	152.64 -	152.64	148.30
WASHINGTON					
	COAL STORAGE: WIND EROSION	(S)	2.50 -	48.00	13.44
	COAL STORAGE (TOTAL)	(S)	171.51 -	709.70	212.91
	TERMINAL GRAIN ELEVATOR	(S)	1009.05 -	1009.05	1009.05
	LIME MANUF: PRIMARY CRUSHING	(S)	250.00 -	250.00	125.00
	ASPHALT CONCRETE: TOTAL	(S)	79.05 -	79.05	79.05
	STONE QUARRY: HANDLING	(S)	240.00 -	240.00	165.00
	STONE QUARRY: PRIMARY CRUSHING	(S)	300.00 -	300.00	300.00
	STONE QUARRY: SECONDARY CRUSH & SCREEN	(S)	1650.00 -	1650.00	1275.00
	STONE QUARRY: STORAGE	(S)	255.75 -	255.75	255.75
	REFINERY: SULFUR RECOVERY PLANT	(S)	0.00 -	0.00	0.00
	REFINERY: FCL REGENERATION	(S)	0.00 -	0.00	0.00
	PAINT SPRAY BOOTHS	(S)	0.02 -	0.02	0.02

STATE OF MINNESOTA
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE

TOTALS FOR THE STATE OF MINNESOTA
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SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
****	**********			*********
720	44.36	-	99.23	48.58
1010	16006.49	-	16006.49	12927.24
1440	1521.75	-	1521.75	1504.88
1450	344.83	-	344.83	86.21
2040	3599.76	-	3599.76	3599.76
2080	36.57	-	36.57	36.57
2430	0.00	-	0.00	0.00
2810	4.80	-	13.56	5.48
2950	717.82	-	720.90	718.56
3220	4.26	-	4.26	4.26
3280	16.65	-	16.65	16.65
3290	1271.25	-	1392.75	817.75
3310	202.42	-	668.98	384.82
3320	72.33	-	436.29	151.46
3330	27.76	-	59.03	47.82
3340	22.65	-	125.85	74.25
3390	86.85	-	86.85	86.85
3530	7.91	-	24.99	14.59
3710	0.01	-	0.01	0.01
4220	12322.76	-	12337.46	12323.84
4910	671.02	-	2364.73	843.92
5050	18.72	-	77.39	23.23
5090	0.48	-	0.48	0.48
5150	21.73	-	21.73	21.73
6420	7.37	-	63.15	25.79

STATE OF MINNESOTA
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

TOTALS FOR THE STATE OF MINNESOTA BY COUNTY

COUNTY	SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
DEKOTA					
	1440	33.75	-	33.75	16.88
	2950	215.19	-	215.19	215.19
	3220	4.26	-	4.26	4.26
	3280	16.65	-	16.65	16.65
	3330	27.76	-	59.03	47.82
	4220	277.19	-	277.19	277.19
	4910	87.00	-	360.00	108.00
	5150	21.73	-	21.73	21.73
HENNEPIN					
	720	44.36	-	99.23	48.58
	2040	2971.50	-	2971.50	2971.50
	2080	36.09	-	36.09	36.09
	2810	2.00	-	2.00	2.00
	2950	287.69	-	287.69	287.69
	3290	63.50	-	185.00	185.00
	3320	72.33	-	436.29	151.46
	3340	22.65	-	125.85	74.25
	4220	2496.06	-	2510.76	2497.14
	4910	316.00	-	680.01	344.00
	6420	7.37	-	63.15	25.79
RAMSEY					
	1450	344.83	-	344.83	86.21
	2040	628.26	-	628.26	628.26
	2080	0.48	-	0.48	0.48
	2950	47.57	-	47.57	47.57
	3310	202.42	-	668.98	384.82
	3530	7.91	-	24.99	14.59
	3710	0.01	-	0.01	0.01
	4220	4717.30	-	4717.30	4717.30
	4910	38.65	-	204.77	60.29
	5050	18.72	-	77.39	23.23
	5090	0.48	-	0.48	0.48
ST. LOUIS					
	1010	16006.49	-	16006.49	12927.24
	2950	88.32	-	91.41	89.07
	3390	86.85	-	86.85	86.85
	4220	3823.16	-	3823.16	3823.16
	4910	58.15	-	373.80	108.75

Washington.

1440	1488.00 -	1488.00	1488.00
2430	0.00 -	0.00	0.00
2810	2.80 -	11.56	3.48
2950	79.05 -	79.05	79.05
3290	1207.75 -	1207.75	632.75
4220	1009.05 -	1009.05	1009.05
4910	171.22 -	171.22	222.89

APPENDIX F

SUMMARY OF OHIO STATE PROCESS FUGITIVE EMISSION INVENTORY

STATE OF OHIO
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS FOR ALL FACILITIES

TOTALS FOR THE STATE OF OHIO
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POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 38315.19 - 72485.62
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 38363.37

TOTALS FOR THE STATE OF OHIO BY COUNTY
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COUNTY OF BELMONT
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 351.68 - 1340.88
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 229.28

COUNTY OF CUYAHOGA
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 9042.04 - 26940.55
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 10623.91

COUNTY OF HAMILTON
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 3192.17 - 4875.28
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 3127.87

COUNTY OF JEFFERSON
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 1833.07 - 7270.89
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 1736.03

COUNTY OF LAKE
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 1896.56 - 4588.93
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 1651.10

COUNTY OF LUCAS
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 11381.99 - 16636.92
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 10355.65

COUNTY OF MONROE
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 10617.68 - 10832.18
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 10639.54

STATE OF OHIO
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE

TOTALS FOR THE STATE OF OHIO
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PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
COAL STORAGE (TOTAL)	20654969	2994.97 - 12392.98	2311.20
COKE MANUF: COAL STORAGE	(S)	88.35 - 365.60	109.68
COKE MANUF: COAL CHARGING	(S)	258.96 - 3046.63	258.96
COKE MANUF: COKING (DOOR LEAKING)	1910547	382.11 - 859.75	477.64
COKE MANUF: COKE QUENCHING	1910547	191.05 - 5731.64	191.05
COKE MANUF: COKE HANDLING	(S)	2.42 - 13.67	8.41
COKE MANUF: COKE PUSHING	(S)	106.63 - 304.66	143.19
IRON PROD: IRON ORE STORAGE (TOTAL)	(S)	174.14 - 313.45	243.79
IRON PROD: IRON ORE HANDLING & TRANSFER	(S)	1741.36 - 1741.36	1741.36
IRON PROD: LIMESTONE HANDLING & TRANSFER	(S)	15.20 - 15.20	15.20
IRON PROD: BLAST FURNACE DUST HANDLING	(S)	282.75 - 282.75	282.75
IRON PROD: SLAG HANDLING	1906000	1925.06 - 2001.30	1448.18
IRON PROD: CASTING HOUSE	(S)	760.94 - 7476.22	760.94
STEEL PRODUCTION: BASIC OXYGEN FURNACE	(S)	388.08 - 3326.40	1358.28
STEEL PRODUCTION: ELECTRIC ARC FURNACE	(S)	64.20 - 1069.95	517.14
STEEL PRODUCTION: SCARFING	3094075	17.02 - 17.02	10.24
SEC ALUMINUM PROD: SWEATING FURNACE	(S)	6.05 - 6.05	6.05
SEC ALUMINUM PROD: REVERBERATORY FURNACE	457991	50.38 - 50.38	50.38
SEC ALUMINUM PROD: CRUCIBLE FURNACE	(S)	0.20 - 0.20	0.20
SEC ALUMINUM PROD: INDUCTION FURNACE	(S)	0.08 - 0.08	0.08
SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	71251	25.65 - 25.65	25.65
SEC ALUMINUM PROD:CHLORINATION - FLUXING	(S)	875.00 - 875.00	875.00
SECONDARY ALUMINUM: SCRAP CRUSHER	(S)	5.82 - 5.82	5.82
SEC LEAD SMELTING. REVERBERATORY FURNACE	(S)	5.98 - 33.55	19.77
SEC LEAD SMELTING: BLAST/CUPOLA FURNACE	(S)	141.60 - 141.60	141.60
SEC ZINC SMELT: ROTARY SWEAT FURNACE	(S)	0.44 - 0.99	0.72
IRON/STEEL FOUNDRY: CUPOLA FURNACE	642065	32.10 - 642.07	203.73
IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	123395	64.78 - 214.71	91.95
IRON/STEEL FOUNDRY: CASTING SHAKEOUT	(S)	179.95 - 1919.46	251.93
IRON/STEEL FOUNDRY: POURING AND COOLING	(S)	38.92 - 1607.50	663.53
IRON/STEEL FOUNDRY: SAND HANDLING	6326455	948.97 - 948.97	596.09
IRON/STEEL FOUNDRY:FOUNDRY CAST CLEANING	(S)	50.00 - 250.01	75.00
IRON/STEEL FOUNDRY: MOLD MAKING	(S)	24.22 - 24.22	12.11
FOUNDRY: SHOT BLAST GRINDER / FINISHING	2240644	11.20 - 11.20	11.20

(S)= PROCESS INFORMATION SUPPRESSED TO INSURE CONFIDENTIALITY

STATE OF OHIO
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF OHIO (CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)		TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
STEEL FOUNDRY: CORE MAKING	(S)	8.33 -	8.33	8.33
IRON/STEEL FOUNDRY: BALL MILL	56919	120.95 -	120.95	120.95
IRON/STEEL FOUNDRY: MOLTEN IRON TRANSFER	(S)	299.00 -	299.00	299.00
IRON/STEEL FOUNDRY: PLATING	(S)	2.20 -	2.20	2.20
IRON/STEEL FOUNDRY: STEEL SHREDDER	(S)	0.16 -	0.16	0.16
IRON/STEEL FOUNDRY: AUTO SHREDDER	(S)	0.80 -	0.80	0.80
GRAIN ELEVATOR: GRAIN HANDLING (TOTAL)	(S)	172.20 -	172.20	172.20
TERMINAL GRAIN ELEVATOR	8017276	8698.74 -	8698.74	7560.52
GRAIN ELEVATOR: WHEAT MILL	(S)	689.50 -	689.50	689.50
GRAIN PROCESS: CORN MILLING	164971	98.98 -	98.98	98.98
GRAIN PROCESS: RECEIVING	(S)	3.93 -	3.93	3.93
GRAIN PROCESS: DRYING	140979	3.52 -	3.52	3.52
GRAIN PROCESS. HANDLING	1977553	494.39 -	494.39	494.39
CEMENT MANUF: TRANSFER & CONVEYING	(S)	0.48 -	0.96	0.72
CEMENT MANUF: RAW GRINDING	(S)	4.00 -	4.00	4.00
CEMENT MANUF: UNLOAD- OUTFALL TOSTORAGE	(S)	203.45 -	406.90	305.17
LIME MANUF: TOTAL	(S)	2398.06 -	2428.61	2413.33
LIME MANUF: PRIMARY CRUSHING	(S)	30.22 -	30.22	6.04
LIME MANUF: ROTARY KILN	(S)	12.00 -	12.00	12.00
CONCRETE BATCH: TOTAL	(S)	47.83 -	47.83	47.83
CONCRETE BATCH. TRANSFER OF SAND	(S)	1.76 -	1.76	1.76
CONCRETE BATCH: MIXER LOAD OF AGGREGATE	(S)	0.13 -	0.13	0.13
CONCRETE BATCH: LOAD OF DRY BATCH TRUCK	(S)	6 00 -	6.00	6.00
ASPHALT CONCRETE: TOTAL	3542148	1098.07 -	1098.07	1098.07
ASPHALT CONCRETE: AGGREGATE STORAGE	(S)	37.29 -	37.29	37.29
BRICK MANUFACTURING: TOTAL	(S)	41.64 -	41.64	41.64
STONE QUARRY: HANDLING	(S)	117.29 -	117.29	117.29
STONE QUARRY: PRIMARY CRUSHING	(S)	699.01 -	699.01	699.01
STONE QUARRY: SECONDARY CRUSH & SCREEN	(S)	1161.78 -	1161.78	1161.78
STONE QUARRY: STORAGE	(S)	255.75 -	255.75	255.75
SECONDARY COPPER SMELTING: EL. IND. FURN	(S)	1.94 -	5.43	5.43
SECONDARY COPPER SMELTING: ROTARY FURN.	(S)	17.77 -	87.05	52.47
SECONDARY COPPER SMELTING: CRUCIBLE FURN	(S)	1.34 -	2.69	2.06
SECONDARY COPPER SMELTING: CASTING	(S)	0.40 -	0.80	0.60

(S)= PROCESS INFORMATION SUPPRESSED TO INSURE CONFIDENTIALITY

STATE OF OHIO
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF OHIO (CONTINUED)

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
MINING: PRIMARY CRUSHING	(S)	0.74	-	0.74	0.74
MINING: HANDLING	(S)	52.00	-	52.00	52.00
MINING. ORE DRYER	(S)	2.55	-	2.55	2.55
ASPHALT ROOFING: TOTAL	(S)	10.22	-	10.22	10.22
PRIMARY ALUMINUM: MAERIAL HANDLING	(S)	8326.34	-	8326.34	8326.34
PRIMARY ALUMINUM: ANODE BAKING FURNACE	(S)	285.75	-	285.75	285.75
PRIMARY ALUMINUM: PREBAKED REDUC. CELL	(S)	965.84	-	965.84	965.84
CHEMICAL MANUFAC: MIXER WET	(S)	0.06	-	0.06	0.06
CHEMICAL MANUFAC: DRYER	218642	21.86	-	21.86	21.86
CHEMICAL MANUFAC: HANDLING - STORAGE	69597	5.22	-	5.22	5.22
CHEMICAL MANUFAC: REACTORS	106232	0.00	-	0.00	0.00
CHEMICAL MANUFAC: MILLS	(S)	0.32	-	0.32	0.32
CHEMICAL MANUFAC: CALCINERS	(S)	2.04	-	2.04	2.04
CHEMICAL MANUFAC: FLAKERS	(S)	0.98	-	0.98	0.98
CHEMICAL MANUFAC: PELITE EPANDER	(S)	0.71	-	0.71	0.71
GLASS MANUFAC: GLASS MELT FURNACE	(S)	1.05	-	1.05	1.05
GLASS MANUFAC: ANNEALING FURNACE	(S)	0.03	-	0.03	0.03
GLASS MANUFAC: HAMMER MILL	(S)	12.00	-	12.00	12.00
GLASS MANUFAC: HANDLING & STORAGE	(S)	4.80	-	4.80	4.80
GLASS MANUFAC: HANDLING	(S)	0.23	-	0.23	0.23
GYPSUM MANUFACTURING: MIXERS	(S)	0.09	-	0.09	0.09
CERAMIC CLAY: GRINDING	(S)	9.58	-	9.58	9.58
REFINERY: FCL REGENERATION	(S)	0.00	-	0.00	0.00
RUBBER MANUFAC: TRIMMING	(S)	0.01	-	0.01	0.01
PAINT MANUFACTURING MIXERS	(S)	8.25	-	8.25	8.25
GENERAL WOOD WORKING	(S)	16.68	-	16.68	16.68
CARBON BLACK	(S)	4.31	-	4.31	4.31
PAINT SPRAY BOOTHS	(S)	0.00	-	0.00	0.00

STATE OF OHIO
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF OHIO BY COUNTY

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
BELMONT				
	COAL STORAGE (TOTAL)	(S)	313.67 - 1297.93	188.80
	IRON/STEEL FOUNDRY: CUPOLA FURNACE	(S)	0.26 - 5.19	2.73
	IRON/STEEL FOUNDRY: PLATING	(S)	2.10 - 2.10	2.10
	ASPHALT CONCRETE: TOTAL	(S)	35.65 - 35.65	35.65
CUYAHOGA				
	COAL STORAGE (TOTAL)	287551	41.69 - 172.53	36.58
	COKE MANUF: COKING (DOOR LEAKING)	(S)	260.24 - 585.55	325.31
	COKE MANUF: COKE QUENCHING	(S)	130.12 - 3903.66	130.12
	COKE MANUF: COKE HANDLING	(S)	0.61 - 3.46	2.13
	IRON PROD: IRON ORE STORAGE (TOTAL)	(S)	174.14 - 313.45	243.79
	IRON PROD: IRON ORE HANDLING & TRANSFER	(S)	1741.36 - 1741.36	1741.36
	IRON PROD: LIMESTONE HANDLING & TRANSFER	(S)	15.20 - 15.20	15.20
	IRON PROD: SLAG HANDLING	1906000	1925.06 - 2001.30	1448.18
	IRON PROD. CASTING HOUSE	(S)	700.80 - 6885.36	700.80
	STEEL PRODUCTION: BASIC OXYGEN FURNACE	(S)	249.48 - 2138.40	873.18
	STEEL PRODUCTION: ELECTRIC ARC FURNACE	(S)	64.20 - 1069.95	517.14
	STEEL PRODUCTION: SCARFING	(S)	12.07 - 12.07	5.29
	SEC ALUMINUM PROD: SWEATING FURNACE	(S)	6.05 - 6.05	6.05
	SEC ALUMINUM PROD: REVERBERATORY FURNACE	115461	12.70 - 12.70	12.70
	SEC ALUMINUM PROD: INDUCTION FURNACE	(S)	0.08 - 0.08	0.08
	SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	64420	23.19 - 23.19	23.19
	SECONDARY ALUMINUM· SCRAP CRUSHER	(S)	5.82 - 5.82	5.82
	SEC LEAD SMELTING: REVERBERATORY FURNACE	(S)	5.98 - 33.55	19.77
	SEC LEAD SMELTING: BLAST/CUPOLA FURNACE	(S)	141.60 - 141.60	141.60
	SEC ZINC SMELT: ROTARY SWEAT FURNACE	(S)	0.44 - 0.99	0.72
	IRON/STEEL FOUNDRY: CUPOLA FURNACE	602143	30.11 - 602.14	182.78
	IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	(S)	22.53 - 74.68	42.92
	IRON/STEEL FOUNDRY: CASTING SHAKEOUT	(S)	179.95 - 1919.46	251.93
	IRON/STEEL FOUNDRY: POURING AND COOLING	(S)	38.92 - 1607.50	663.53
	IRON/STEEL FOUNDRY: SAND HANDLING	2654999	398.25 - 398.25	252.22
	IRON/STEEL FOUNDRY:FOUNDRY CAST CLEANING	(S)	50.00 - 250.01	75.00
	IRON/STEEL FOUNDRY: MOLD MAKING	(S)	24.22 - 24.22	12.11
	FOUNDRY: SHOT BLAST GRINDER / FINISHING	2189379	10.95 - 10.95	10.95
	STEEL FOUNDRY: CORE MAKING	(S)	6.58 - 6.58	6.58
	IRON/STEEL FOUNDRY: BALL MILL	52841	112.29 - 112.29	112.29
	IRON/STEEL FOUNDRY: MOLTEN IRON TRANSFER	(S)	299.00 - 299.00	299.00
	IRON/STEEL FOUNDRY: STEEL SHREDDER	(S)	0.16 - 0.16	0.16
	IRON/STEEL FOUNDRY: AUTO SHREDDER	(S)	0.80 - 0.80	0.80
	GRAIN ELEVATOR: WHEAT MILL	(S)	655.20 - 655.20	655.20

STATE OF OHIO
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF OHIO BY COUNTY (CONTINUED)

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
	CEMENT MANUF: TRANSFER & CONVEYING	(S)	0.48 - 0.96	0.72
	CEMENT MANUF: UNLOAD- OUTFALL TOSTORAGE	(S)	125.00 - 250.00	187.50
	LIME MANUF: TOTAL	(S)	952.35 - 964.48	958.42
	LIME MANUF: ROTARY KILN	(S)	12.00 - 12.00	12.00
	CONCRETE BATCH: TOTAL	(S)	1.58 - 1.58	1.58
	ASPHALT CONCRETE: TOTAL	1487000	460.97 - 460.97	460.97
	ASPHALT CONCRETE: AGGREGATE STORAGE	(S)	37.29 - 37.29	37.29
	BRICK MANUFACTURING: TOTAL	(S)	41.46 - 41.46	41.46
	SECONDARY COPPER SMELTING: EL. IND. FURN	(S)	1.94 - 5.43	5.43
	SECONDARY COPPER SMELTING: ROTARY FURN.	(S)	17.77 - 87.05	52.47
	SECONDARY COPPER SMELTING: CASTING	(S)	0.40 - 0.80	0.60
	MINING: ORE DRYER	(S)	2.55 - 2.55	2.55
	CHEMICAL MANUFAC: MIXER WET	(S)	0.06 - 0.06	0.06
	CHEMICAL MANUFAC: DRYER	(S)	8.46 - 8.46	8.46
	CHEMICAL MANUFAC: HANDLING - STORAGE	(S)	0.56 - 0.56	0.56
	CHEMICAL MANUFAC: REACTORS	(S)	0.00 - 0.00	0.00
	CHEMICAL MANUFAC: FLAKERS	(S)	0.98 - 0.98	0.98
	CHEMICAL MANUFAC: PELITE EPANDER	(S)	0.71 - 0.71	0.71
	GLASS MANUFAC: GLASS MELT FURNACE	(S)	1.05 - 1.05	1.05
	GLASS MANUFAC: ANNEALING FURNACE	(S)	0.03 - 0.03	0.03
	GLASS MANUFAC: HAMMER MILL	(S)	12.00 - 12.00	12.00
	GLASS MANUFAC: HANDLING & STORAGE	(S)	4.80 - 4.80	4.80
	GLASS MANUFAC: HANDLING	(S)	0.23 - 0.23	0.23
	GYPSUM MANUFACTURING: MIXERS	(S)	0.09 - 0.09	0.09
	CERAMIC CLAY: GRINDING	(S)	9.58 - 9.58	9.58
	REFINERY: FCL REGENERATION	(S)	0.00 - 0.00	0.00
	PAINT MANUFACTURING: MIXERS	(S)	8.25 - 8.25	8.25
	CARBON BLACK	(S)	1.64 - 1.64	1.64
	PAINT SPRAY BOOTHS	(S)	0.00 - 0.00	0.00
HAMILTON				
	COAL STORAGE (TOTAL)	3458849	501.53 - 2075.31	589.37
	SEC ALUMINUM PROD: CRUCIBLE FURNACE	(S)	0.20 - 0.20	0.20
	IRON/STEEL FOUNDRY: CUPOLA FURNACE	(S)	1.74 - 34.73	18.23
	IRON/STEEL FOUNDRY: SAND HANDLING	3403456	510.52 - 510.52	303.67
	IRON/STEEL FOUNDRY: PLATING	(S)	0.11 - 0.11	0.11
	TERMINAL GRAIN ELEVATOR	(S)	1415.92 - 1415.92	1415.92
	GRAIN PROCESS: HANDLING	(S)	136.85 - 136.85	136.85
	CEMENT MANUF: RAW GRINDING	(S)	4.00 - 4.00	4.00
	CEMENT MANUF: UNLOAD- OUTFALL TOSTORAGE	(S)	75.00 - 150.00	112.50
	CONCRETE BATCH: TOTAL	(S)	46.25 - 46.25	46.25

	Concrete Batch: Transfer of Sand	(S)	1.70 -	1.70	1.76
	CONCRETE BATCH: MIXER LOAD OF AGGREGATE	(S)	0.13 -	0.13	0.13
	CONCRETE BATCH: LOAD OF DRY BATCH TRUCK	(S)	6.00 -	6.00	6.00
	ASPHALT CONCRETE: TOTAL	1449100	449.22 -	449.22	449.22
	SECONDARY COPPER SMELTING: CRUCIBLE FURN	(S)	1.34 -	2.69	2.06
	ASPHALT ROOFING: TOTAL	(S)	10.22 -	10.22	10.22
	CHEMICAL MANUFAC: DRYER	(S)	13.40 -	13.40	13.40
	CHEMICAL MANUFAC: HANDLING - STORAGE	62097	4.66 -	4.66	4.66
	CHEMICAL MANUFAC: REACTORS	(S)	0.00 -	0.00	0.00
	CHEMICAL MANUFAC: MILLS	(S)	0.32 -	0.32	0.32
	CHEMICAL MANUFAC: CALCINERS	(S)	2.04 -	2.04	2.04
	GENERAL WOOD WORKING	(S)	10.96 -	10.96	10.96
JEFFERSON					
	COAL STORAGE (TOTAL)	9504906	1378.21 -	5702.94	941.22
	IRON PROD: BLAST FURNACE DUST HANDLING	(S)	282.75 -	282.75	282.75
	STEEL PRODUCTION: BASIC OXYGEN FURNACE	(S)	138.60 -	1188.00	485.10
	STEEL PRODUCTION: SCARFING	(S)	4.95 -	4.95	4.95
	IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	(S)	27.52 -	91.20	20.97
	FOUNDRY: SHOT BLAST GRINDER / FINISHING	(S)	0.12 -	0.12	0.12
	BRICK MANUFACTURING: TOTAL	(S)	0.18 -	0.18	0.18
	MINING: PRIMARY CRUSHING	(S)	0.74 -	0.74	0.74
LAKE					
	COAL STORAGE (TOTAL)	2937562	425.95 -	1762.54	147.20
	COKE MANUF: COAL STORAGE	(S)	22.77 -	94.20	28.26
	COKE MANUF: COAL CHARGING	(S)	66.73 -	785.00	66.73
	COKE MANUF: COKING (DOOR LEAKING)	(S)	31.40 -	70.65	39.25
	COKE MANUF: COKE QUENCHING	(S)	15.70 -	471.00	15.70
	COKE MANUF: COKE HANDLING	(S)	1.81 -	10.21	6.28
	COKE MANUF: COKE PUSHING	(S)	27.47 -	78.50	36.89
	LIME MANUF: TOTAL	(S)	949.59 -	961.69	955.64
	ASPHALT CONCRETE: TOTAL	(S)	43.40 -	43.40	43.40
	STONE QUARRY: PRIMARY CRUSHING	(S)	311.75 -	311.75	311.75
	RUBBER MANUFAC: TRIMMING	(S)	0.01 -	0.01	0.01
LUCAS					
	COAL STORAGE (TOTAL)	1868987	271.00 -	1121.39	329.94
	COKE MANUF: COAL STORAGE	(S)	65.59 -	271.40	81.42
	COKE MANUF: COAL CHARGING	(S)	192.24 -	2261.63	192.24
	COKE MANUF: COKING (DOOR LEAKING)	(S)	90.47 -	203.55	113.08
	COKE MANUF: COKE QUENCHING	(S)	45.23 -	1356.98	45.23
	COKE MANUF: COKE PUSHING	(S)	79.16 -	226.16	106.30
	IRON PROD: CASTING HOUSE	(S)	60.14 -	590.86	60.14
	SEC ALUMINUM PROD: REVERBERATORY FURNACE	(S)	3.90 -	3.90	3.90
	SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	(S)	2.46 -	2.46	2.46
	IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	(S)	7.35 -	24.36	14.00
	IRON/STEEL FOUNDRY: SAND HANDLING	(S)	40.20 -	40.20	40.20
	FOUNDRY: SHOT BLAST GRINDER / FINISHING	(S)	0.13 -	0.13	0.13
	STEEL FOUNDRY: CORE MAKING	(S)	1.75 -	1.75	1.75
	GRAIN ELEVATOR: GRAIN HANDLING (TOTAL)	(S)	172.20 -	172.20	172.20
	TERMINAL GRAIN ELEVATOR	6712276	7282.82 -	7282.82	6144.60
	GRAIN ELEVATOR: WHEAT MILL	(S)	34.30 -	34.30	34.30
	GRAIN PROCESS: CORN MILLING	164971	98.98 -	98.98	98.98
	GRAIN PROCESS: RECEIVING	(S)	3.93 -	3.93	3.93
	GRAIN PROCESS: DRYING	140979	3.52 -	3.52	3.52
	GRAIN PROCESS: HANDLING	(S)	357.54 -	357.54	357.54
	CEMENT MANUF: UNLOAD- OUTFALL TOSTORAGE	(S)	3.45 -	6.90	5.18
	LIME MANUF: TOTAL	(S)	496.12 -	502.44	499.28
	LIME MANUF: PRIMARY CRUSHING	(S)	30.22 -	30.22	6.04
	ASPHALT CONCRETE: TOTAL	351048	108.82 -	108.82	108.82
	STONE QUARRY: HANDLING	(S)	117.29 -	117.29	117.29
	STONE QUARRY: PRIMARY CRUSHING	(S)	387.26 -	387.26	387.26
	STONE QUARRY: SECONDARY CRUSH & SCREEN	(S)	1161.78 -	1161.78	1161.78
	STONE QUARRY: STORAGE	(S)	255.75 -	255.75	255.75
	GENERAL WOOD WORKING	(S)	5.72 -	5.72	5.72
	CARBON BLACK	(S)	2.67 -	2.67	2.67
MONROE					

Monroe

COAL STORAGE (TOTAL)	(S)	62.91 -	260.34	78.10
SEC ALUMINUM PROD: REVERBERATORY FURNACE	(S)	33.78 -	33.78	33.78
SEC ALUMINUM PROD:CHLORINATION - FLUXING	(S)	875.00 -	875.00	875.00
IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	(S)	7.38 -	24.47	14.06
IRON/STEEL FOUNDRY: BALL MILL	(S)	8.67 -	8.67	8.67
MINING: HANDLING	(S)	52.00 -	52.00	52.00
PRIMARY ALUMINUM: MAERIAL HANDLING	(S)	8326.34 -	8326.34	8326.34
PRIMARY ALUMINUM: ANODE BAKING FURNACE	(S)	285.75 -	285.75	285.75
PRIMARY ALUMINUM: PREBAKED REDUC. CELL	(S)	965.84 -	965.84	965.84

STATE OF OHIO
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE

TOTALS FOR THE STATE OF OHIO
****

SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
****	**********			*********
1210	62.91	-	260.34	78.10
1290	157.85	-	653.18	133.25
1420	2416.93	-	2423.25	2420.09
1440	505.50	-	505.50	298.65
2040	1687.15	-	1687.15	1687.15
2080	1.40	-	5.80	1.74
2090	0.17	-	0.17	0.17
2290	1.91	-	1.91	1.91
2440	0.26	-	0.26	0.26
2460	5.47	-	5.47	5.47
2510	2.00	-	8.26	2.48
2620	2.93	-	12.10	3.63
2630	10.30	-	42.61	12.78
2640	4.15	-	17.18	2.93
2650	4.31	-	17.84	5.35
2660	10.96	-	10.96	10.96
2750	1.72	-	7.10	2.13
2810	22.95	-	43.33	20.48
2820	16.51	-	27.13	17.32
2840	19.65	-	81.31	24.39
2850	8.25	-	8.25	8.25
2890	328.71	-	373.56	316.37
2950	1292.91	-	1299.15	1296.03
2990	0.98	-	0.98	0.98
3060	2.35	-	9.72	2.91
3070	3.00	-	12.40	0.56
3220	34.16	-	37.61	11.71
3230	10.01	-	10.01	10.01
3240	125.00	-	250.00	187.50
3250	0.99	-	3.14	1.16
3270	2056.08	-	2191.34	2108.47
3290	77.30	-	77.78	77.54
3310	6599.81	-	26914.64	7791.24
3320	779.22	-	4894.81	1505.62

STATE OF OHIO
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

TOTALS FOR THE STATE OF OHIO (CONTINUED)

SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
3330	10520.63	-	10529.49	10521.32
3340	334.92	-	436.61	387.58
3350	21.03	-	21.03	21.03
3420	0.03	-	0.03	0.03
3440	0.04	-	0.04	0.04
3450	0.15	-	0.15	0.15
3460	7.09	-	29.07	8.78
3470	1.10	-	4.23	1.34
3490	2.37	-	7.12	3.17
3530	0.00	-	0.00	0.00
3540	2.35	-	29.32	14.37
3620	15.99	-	20.31	16.32
3660	0.33	-	1.38	0.42
3710	29.54	-	100.95	25.81
3720	0.02	-	0.02	0.02
3990	0.26	-	0.26	0.26
4460	6.00	-	6.00	6.00
4910	2597.91	-	10749.96	1920.70
4960	4.71	-	19.47	0.58
5050	328.21	-	328.21	328.21
5150	8145.73	-	8145.73	7007.50
5160	1.76	-	1.76	1.76
5980	27.30	-	105.10	33.28
8060	3.30	-	13.67	4.10
8090	5.61	-	23.21	6.96
8220	4.23	-	17.49	5.25
9990	0.80	-	0.80	0.80

STATE OF OHIO
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

TOTALS FOR THE STATE OF OHIO BY COUNTY

COUNTY	SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
BELMONT					
	1290	157.85	-	653.18	133.25
	2950	35.65	-	35.65	35.65
	3310	5.77	-	17.29	6.66
	3320	0.26	-	5.19	2.73
	4910	152.15	-	629.57	50.99
CUYAHOGA					
	2040	655.20	-	655.20	655.20
	2640	1.16	-	4.80	1.44
	2810	9.15	-	9.15	9.15
	2850	8.25	-	8.25	8.25
	2950	655.82	-	662.06	658.94
	2990	0.98	-	0.98	0.98
	3220	0.49	-	0.49	0.49
	3230	10.01	-	10.01	10.01
	3240	125.00	-	250.00	187.50
	3270	962.04	-	974.17	968.11
	3290	76.83	-	77.31	77.07
	3310	5419.37	-	18857.72	6169.43
	3320	726.27	-	4810.43	1438.81
	3340	328.18	-	429.48	380.64
	3420	0.03	-	0.03	0.03
	3450	0.15	-	0.15	0.15
	3460	7.09	-	29.07	8.78
	3470	1.00	-	4.12	1.24
	3530	0.00	-	0.00	0.00
	3540	0.01	-	0.01	0.01
	3620	15.77	-	19.41	16.05
	3710	18.41	-	54.88	21.22
	3720	0.02	-	0.02	0.02
	3990	0.26	-	0.26	0.26
	4910	16.31	-	67.47	5.06
	8090	3.45	-	14.26	4.28
	9990	0.80	-	0.80	0.80
HAMILTON					
	1440	505.50	-	505.50	298.65
	2040	560.00	-	560.00	560.00
	2080	1.40	-	5.80	1.74
	2510	2.00	-	8.26	2.48
	2630	10.30	-	42.61	12.78

	2[illegible]		[illegible].99	-	12.[illegible]	[illegible].49
	2650		4.31	-	17.84	5.35
	2660		10.96	-	10.96	10.96
	2750		1.71	-	7.09	2.13
	2810		13.79	-	34.18	11.33
	2820		13.12	-	13.12	13.12
	2840		19.65	-	81.31	24.39
	2890		14.29	-	59.14	1.95
	2950		449.22	-	449.22	449.22
	3070		3.00	-	12.40	0.56
	3250		0.13	-	0.13	0.13
	3270		132.97	-	207.97	170.47
	3290		0.47	-	0.47	0.47
	3320		5.05	-	14.53	9.79
	3330		2.82	-	11.67	3.50
	3340		0.38	-	0.77	0.59
	3470		0.11	-	0.11	0.11
	3490		1.61	-	4.00	2.23
	3540		2.34	-	29.31	14.36
	3660		0.33	-	1.38	0.42
	3710		4.61	-	19.06	2.97
	4460		6.00	-	6.00	6.00
	4910		389.03	-	1609.80	482.94
	4960		4.71	-	19.47	0.58
	5150		992.77	-	992.77	992.77
	5160		1.76	-	1.76	1.76
	5980		27.30	-	105.10	33.28
	8060		3.30	-	13.67	4.10
	8220		4.23	-	17.49	5.25
JEFFERSON						
	2620		2.93	-	12.10	3.63
	3250		0.86	-	3.01	1.03
	3310		458.81	-	1585.25	799.79
	3350		0.12	-	0.12	0.12
	4910		1370.34	-	5670.39	931.45
LAKE						
	2750		0.01	-	0.01	0.01
	2820		1.65	-	6.84	2.05
	2890		311.75	-	311.75	311.75
	2950		43.40	-	43.40	43.40
	3060		2.35	-	9.72	2.91
	3270		961.07	-	1009.19	969.89
	3310		165.87	-	1509.55	193.11
	3620		0.22	-	0.90	0.27
	4910		410.25	-	1697.58	127.71
LUCAS						
	1420		2416.93	-	2423.25	2420.09
	2040		471.96	-	471.96	471.96
	2090		0.17	-	0.17	0.17
	2290		1.91	-	1.91	1.91
	2440		0.26	-	0.26	0.26
	2460		5.47	-	5.47	5.47
	2820		1.73	-	7.17	2.15
	2890		2.67	-	2.67	2.67
	2950		108.82	-	108.82	108.82
	3220		33.67	-	37.12	11.22
	3310		533.94	-	4911.69	599.52
	3320		47.64	-	64.65	54.29
	3340		6.36	-	6.36	6.36
	3440		0.04	-	0.04	0.04
	3490		0.75	-	3.12	0.94
	3710		6.52	-	27.00	1.62
	4910		259.83	-	1075.16	322.56
	5050		328.21	-	328.21	328.21

	5150	7152.95 -	7152.95	6014.73
	8090	2.16 -	8.95	2.68
MONROE				
	1210	62.91 -	260.34	78.10
	3310	16.05 -	33.13	22.73
	3330	10517.81 -	10517.81	10517.81
	3350	20.90 -	20.90	20.90

APPENDIX G

SUMMARY OF WISCONSIN STATE PROCESS FUGITIVE EMISSION INVENTORY

STATE OF WISCONSIN
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS FOR ALL FACILITIES

TOTALS FOR THE STATE OF WISCONSIN
****

POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 3350.47 - 11650.36
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 4082.99

TOTALS FOR THE STATE OF WISCONSIN BY COUNTY
****

COUNTY OF MILWAUKEE
POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 3350.47 - 11650.36
TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR): 4082.99

STATE OF WISCONSIN
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE

TOTALS FOR THE STATE OF WISCONSIN
****

PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
COAL STORAGE (TOTAL)	3477032	504.17 - 2086.22	193.52
COKE MANUF: COAL CHARGING	(S)	96.64 - 1136.96	96.64
COKE MANUF: COKING (DOOR LEAKING)	(S)	45.48 - 102.33	56.85
COKE MANUF: COKE QUENCHING	(S)	22.74 - 682.18	22.74
COKE MANUF: COKE HANDLING	(S)	2.62 - 14.78	9.10
COKE MANUF: COKE PUSHING	(S)	39.79 - 113.70	53.44
SEC ALUMINUM PROD: REVERBERATORY FURNACE	(S)	4.65 - 4.65	4.65
SEC ALUMINUM PROD: CRUCIBLE FURNACE	(S)	1.78 - 1.78	1.78
SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	(S)	9.49 - 9.49	9.49
SEC LEAD SMELTING. POT (KETTLE) FURNACE	(S)	0.14 - 0.14	0.14
SEC ZINC SMELT: KETTLE MELTING FURNACE	(S)	0.01 - 0.01	0.01
IRON/STEEL FOUNDRY: CUPOLA FURNACE	128631	6.43 - 128.63	67.53
IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	223093	117.12 - 388.18	223.09
IRON/STEEL FOUNDRY: INDUCTION FURNACE	71109	71.11 - 71.11	71.11
IRON/STEEL FOUNDRY: CASTING SHAKEOUT	725424	435.25 - 4642.71	1160.68
IRON/STEEL FOUNDRY: SAND HANDLING	1124265	168.64 - 168.64	168.64
IRON/STEEL FOUNDRY:FOUNDRY CAST CLEANING	130046	10.40 - 52.02	31.21
IRON/STEEL FOUNDRY: MOLD MAKING	(S)	6.43 - 6.43	6.43
FOUNDRY: SHOT BLAST GRINDER / FINISHING	119718	0.60 - 0.60	0.60
STEEL FOUNDRY: CORE MAKING	29934	5.24 - 5.24	5.24
IRON/STEEL FOUNDRY: BALL MILL	66911	142.19 - 142.19	142.19
TERMINAL GRAIN ELEVATOR	639361	693.71 - 693.71	693.71
GRAIN PROCESS: CORN MILLING	(S)	205.95 - 205.95	205.95
GRAIN PROCESS: DRYING	141254	3.53 - 3.53	3.53
GRAIN PROCESS: HANDLING	696147	174.04 - 174.04	174.04
GRAIN PROCESS: CLEANING	(S)	142.49 - 142.49	142.49
CEMENT MANUF: TOTAL	(S)	344.65 - 576.45	442.25
ASPHALT CONCRETE. TOTAL	304399	94.36 - 94.36	94.36
SECONDARY COPPER SMELTING: EL. IND. FURN	(S)	0.26 - 0.74	0.74
SECONDARY COPPER SMELTING: CRUCIBLE FURN	(S)	0.55 - 1.11	0.85

STATE OF WISCONSIN
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY PROCESS TYPE
(CONTINUED)

TOTALS FOR THE STATE OF WISCONSIN BY COUNTY

COUNTY	PROCESS DESCRIPTION	ANNUAL PROCESS RATE (TONS/YR)	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)	TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
MILWAUKEE				
	COAL STORAGE (TOTAL)	3477032	504.17 - 2086.22	193.52
	COKE MANUF: COAL CHARGING	(S)	96.64 - 1136.96	96.64
	COKE MANUF: COKING (DOOR LEAKING)	(S)	45.48 - 102.33	56.85
	COKE MANUF: COKE QUENCHING	(S)	22.74 - 682.18	22.74
	COKE MANUF: COKE HANDLING	(S)	2.62 - 14.78	9.10
	COKE MANUF: COKE PUSHING	(S)	39.79 - 113.70	53.44
	SEC ALUMINUM PROD: REVERBERATORY FURNACE	(S)	4.65 - 4.65	4.65
	SEC ALUMINUM PROD: CRUCIBLE FURNACE	(S)	1.78 - 1.78	1.78
	SEC ALUMINUM PROD: CHIP DRYER (ROTARY)	(S)	9.49 - 9.49	9.49
	SEC LEAD SMELTING: POT (KETTLE) FURNACE	(S)	0.14 - 0.14	0.14
	SEC ZINC SMELT: KETTLE MELTING FURNACE	(S)	0.01 - 0.01	0.01
	IRON/STEEL FOUNDRY: CUPOLA FURNACE	128631	6.43 - 128.63	67.53
	IRON/STEEL FOUNDRY: ELECTRIC ARC FURNACE	223093	117.12 - 388.18	223.09
	IRON/STEEL FOUNDRY: INDUCTION FURNACE	71109	71.11 - 71.11	71.11
	IRON/STEEL FOUNDRY: CASTING SHAKEOUT	725424	435.25 - 4642.71	1160.68
	IRON/STEEL FOUNDRY: SAND HANDLING	1124265	168.64 - 168.64	168.64
	IRON/STEEL FOUNDRY:FOUNDRY-CAST CLEANING	130046	10.40 - 52.02	31.21
	IRON/STEEL FOUNDRY: MOLD MAKING	(S)	6.43 - 6.43	6.43
	FOUNDRY. SHOT BLAST GRINDER / FINISHING	119718	0.60 - 0.60	0.60
	STEEL FOUNDRY: CORE MAKING	29934	5.24 - 5.24	5.24
	IRON/STEEL FOUNDRY: BALL MILL	66911	142.19 - 142.19	142.19
	TERMINAL GRAIN ELEVATOR	639361	693.71 - 693.71	693.71
	GRAIN PROCESS: CORN MILLING	(S)	205.95 - 205.95	205.95
	GRAIN PROCESS: DRYING	141254	3.53 - 3.53	3.53
	GRAIN PROCESS: HANDLING	696147	174.04 - 174.04	174.04
	GRAIN PROCESS: CLEANING	(S)	142.49 - 142.49	142.49
	CEMENT MANUF: TOTAL	(S)	344.65 - 576.45	442.25
	ASPHALT CONCRETE: TOTAL	304399	94.36 - 94.36	94.36
	SECONDARY COPPER SMELTING: EL. IND. FURN	(S)	0.26 - 0.74	0.74
	SECONDARY COPPER SMELTING: CRUCIBLE FURN	(S)	0.55 - 1.11	0.85

STATE OF WISCONSIN
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE

TOTALS FOR THE STATE OF WISCONSIN
****

SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)			TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
****	**********			*********
2040	509.75	-	509.75	509.75
2060	139.24	-	139.24	139.24
2080	570.72	-	570.72	570.72
2950	94.36	-	94.36	94.36
3240	344.65	-	576.45	442.25
3290	6.13	-	6.13	6.13
3310	240.24	-	2186.38	279.69
3320	731.13	-	4979.82	1560.94
3340	12.69	-	12.69	12.69
3360	0.82	-	1.85	1.59
3510	20.35	-	55.62	26.43
3520	21.06	-	75.35	31.10
3530	1.58	-	7.85	4.72
3560	50.36	-	348.17	114.59
3690	34.19	-	34.19	34.19
4910	464.37	-	1921.52	144.11
4960	6.83	-	28.26	8.48
5090	102.00	-	102.00	102.00

STATE OF WISCONSIN
INDUSTRIAL PROCESS FUGITIVE EMISSION INVENTORY
TOTAL PROCESS FUGITIVE EMISSIONS BY SIC CODE
(CONTINUED)

TOTALS FOR THE STATE OF WISCONSIN BY COUNTY

COUNTY	SIC CODE	POTENTIAL PROCESS FUGITIVE EMISSIONS (TONS/YR)		TYPICAL PROCESS FUGITIVE EMISSIONS (TONS/YR)
MILWAUKEE				
	2040	509.75 -	509.75	509.75
	2060	139.24 -	139.24	139.24
	2080	570.72 -	570.72	570.72
	2950	94.36 -	94.36	94.36
	3240	344.65 -	576.45	442.25
	3290	6.13 -	6.13	6.13
	3310	240.24 -	2186.38	279.69
	3320	731.13 -	4979.82	1560.94
	3340	12.69 -	12.69	12.69
	3360	0.82 -	1.85	1.59
	3510	20.35 -	55.62	26.43
	3520	21.06 -	75.35	31.10
	3530	1.58 -	7.85	4.72
	3560	50.36 -	348.17	114.59
	3690	34.19 -	34.19	34.19
	4910	464.37 -	1921.52	144.11
	4960	6.83 -	28.26	8.48
	5090	102.00 -	102.00	102.00