



Appendix E-6

Nonpoint Industrial and Commercial/Institutional (ICI) Fuel Combustion Category
Documentation

**AREA COMBUSTION SOURCE EMISSIONS INVENTORY
IMPROVEMENT METHODOLOGY**

TECHNICAL MEMORANDUM

Contract No. 07-0901-RPO-036

March 20, 2009

Prepared for:

Kathy Pendleton
Texas Commission on Environmental Quality
MC-164
P.O. Box 13087
Austin, TX 78711-3087

Annette Sharp
Central Regional Air Planning Association
10005 S. Pennsylvania, Suite C
Oklahoma City, OK 73159

Prepared by:

E.H. Pechan & Associates, Inc.
3622 Lyckan Parkway, Suite 2005
Durham, NC 27707

CONTENTS

	<u>Page</u>
A. INTRODUCTION	1
B. METHODOLOGY	1
1. Total ICI Energy Consumption.....	3
2. Non-Fuel Energy Consumption	3
3. Nonroad Source Energy Consumption	4
4. Point Source Energy Consumption	11
5. Emission Factors	23
6. Coal Sulfur Content	25
7. County Allocation Data	26
8. Temporal Allocation Data	32
C. CALCULATION TEMPLATES	34
D. REFERENCES	35
ATTACHMENT: PRELIMINARY SUMMARY OF 2002 POINT SOURCE ANNUAL THROUGHPUT DATA.....	37

TABLES

Table 1. ICI Combustion Area Source Classification Codes.....	2
Table 2. Industrial Sector Energy Consumption from Non-Fuel Uses	4
Table 3. Nonroad Sector Subtraction SCCs	5
Table 4. Industrial Fuel Combustion Crosswalk for Point Source Subtractions.....	12
Table 5. Commercial/Institutional Fuel Combustion Crosswalk for Point Source Subtractions.....	20
Table 6. Criteria Pollutant Emission Factors for ICI Combustion Area Source Categories	24
Table 7. Carbon Dioxide Emission Factors for Industrial and Commercial/Institutional Coal Combustion (lb/MMBtu)	25
Table 8. Additional Greenhouse Gas Emission Factors for ICI Combustion Area Source Categories (lb/MMBtu)	25
Table 9. Comparison of County Allocation Approaches for Missouri	30
Table 10. EPA Default Commercial Fuel Combustion Sector Allocation	33

A. INTRODUCTION

The objective of this project is to estimate area source emissions from Industrial and Commercial/Institutional (ICI) fuel combustion for the CENRAP region, which encompasses the States and tribal areas of Arkansas, Iowa, Kansas, Louisiana, Minnesota, Missouri, Nebraska, Oklahoma, and Texas. This project will result in the development of a set of revised 2002 ICI area source emission inventories for sulfur dioxide (SO₂), nitrogen oxides (NO_x), non-methane volatile organic compounds (VOCs), particulate matter (specifically, PM₁₀ and primary/direct PM_{2.5}), ammonia (NH₃), carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). The emission inventories will be developed at the county level and will provide emissions for the following time periods: annual; monthly; and average weekly, weekday, and weekend day emissions for each month.

This technical memorandum is one of two components for documenting the methodology that E.H. Pechan & Associates, Inc. (Pechan) will follow in preparing CENRAP's 2002 ICI area source emissions inventory. The second component is a set of Microsoft[®] Excel workbook templates that Pechan will use to implement the methodology described in this document. This memorandum is organized into four sections: this section (Introduction), Section B (Methodology), which describes the emission estimation methodology, Section C (Calculation Templates), which summarizes the content of the calculation templates, and Section D (References), which identifies the information sources that were consulted in preparing this document.

B. METHODOLOGY

This section documents the emission inventory development methodology that Pechan will use to prepare an ICI combustion area source emission inventory for the CENRAP States. Table 1 identifies the source classification codes (SCCs) for which Pechan plans to prepare ICI combustion area source emission estimates. It is important to note that some of these SCCs may not ultimately appear in each CENRAP State's inventory. If it is determined that all of an individual State's consumption of a particular fuel is already accounted for in the State's nonroad and/or point source inventory, then the SCC for that fuel will not be included in the area source inventory for that State.

The key data inputs in the emissions estimation methodology are:

1. Total Industrial and total Commercial/Institutional energy consumption by fuel type and CENRAP State for the year 2002;
2. Industrial energy consumption used for non-fuel purposes by fuel type and State in 2002;
3. ICI distillate fuel and liquefied petroleum gas (LPG) consumption for nonroad sources by State in year 2002;
4. ICI energy consumption by fuel type for point sources by CENRAP State in year 2002;
5. Emission factors relating emission rates to volume of energy consumed by fuel type for the ICI sectors;
6. Sulfur content of coal consumed in the ICI sectors by State in year 2002;

Table 1. ICI Combustion Area Source Classification Codes

SCC	DESCRIPTION
2102001000	Stationary Source Fuel Combustion; Industrial; Anthracite Coal; Total: All Boiler Types
2102002000	Stationary Source Fuel Combustion; Industrial; Bituminous/Subbituminous Coal; Total: All Boiler Types
2102004000	Stationary Source Fuel Combustion; Industrial; Distillate Oil; Total: Boilers and IC Engines
2102005000	Stationary Source Fuel Combustion; Industrial; Residual Oil; Total: All Boiler Types
2102006000	Stationary Source Fuel Combustion; Industrial; Natural Gas; Total: Boilers and IC Engines
2102007000	Stationary Source Fuel Combustion; Industrial; Liquid Petroleum Gas; Total: All Boiler Types
2102008000	Stationary Source Fuel Combustion; Industrial; Wood; Total: All Boiler Types
2102011000	Stationary Source Fuel Combustion; Industrial; Kerosene; Total: All Boiler Types
2103001000	Stationary Source Fuel Combustion; Commercial/Institutional; Anthracite Coal; Total: All Boiler Types
2103002000	Stationary Source Fuel Combustion; Commercial/Institutional; Bituminous/Subbituminous Coal; Total: All Boiler Types
2103004000	Stationary Source Fuel Combustion; Commercial/Institutional; Distillate Oil; Total: Boilers and IC Engines
2103005000	Stationary Source Fuel Combustion; Commercial/Institutional; Residual Oil; Total: All Boiler Types
2103006000	Stationary Source Fuel Combustion; Commercial/Institutional; Natural Gas; Total: Boilers and IC Engines
2103007000	Stationary Source Fuel Combustion; Commercial/Institutional; Liquid Petroleum Gas; Total: All Combustor Types
2103008000	Stationary Source Fuel Combustion; Commercial/Institutional; Wood; Total: All Boiler Types
2103011000	Stationary Source Fuel Combustion; Commercial/Institutional; Kerosene; Total: All Combustor Types

7. County-level employment in the ICI sectors by State for the year 2002; and
8. Temporal allocation data for estimating the proportion of annual fuel combusted by month, as well as data for estimating the volume of fuel combusted in each month for the following time-frames: average week, average week day; and average weekend day.

The following sections describe the methodology/data source(s) for developing each of these data inputs. The following identifies the planned source(s) of information for each of these data elements. In selecting the information sources for each of these data elements, Pechan evaluated the representativeness and level of confidence criteria identified in the Quality Assurance Project Plan (QAPP) for this project. For example, information sources that provide data specific to the source category/geography/inventory period were selected over those that are less specific.

1. Total ICI Energy Consumption

For total Industrial and total Commercial/Institutional energy consumption by fuel type/State, Pechan will use the same source that EPA uses in developing ICI combustion emission estimates for the National Emissions Inventory (NEI) – the Energy Information Administration (EIA)’s State Energy Data System (SEDS) (EIA, 2009a). The SEDS reports total energy consumption estimates by sector, State, fuel type, and year. To facilitate use with the criteria pollutant and GHG emission factors, Pechan will compile the SEDS energy consumption data in both sets of units provided by the SEDS: physical units and British thermal units (Btus).

2. Non-Fuel Energy Consumption

Some Industrial sector energy is consumed for non-fuel purposes. For example, natural gas is used as a feedstock in chemical manufacturing plants and to make nitrogenous fertilizer, and LPG is used to create intermediate products that are made into plastics. To estimate the volume of fuel that is associated with ICI combustion, it is necessary to subtract the volume of fuel consumption for non-energy uses from the volume of total fuel consumption. The EPA’s State Inventory Tool (SIT) provides national defaults representing the percentage of total Industrial fuel consumption from non-energy uses.¹ These default values have an additional limitation beyond their lack of geographic detail - they represent the EIA’s definition of the Industrial sector, which includes fuel use that is accounted for in other inventory source categories. In particular, the EIA Industrial sector includes fuel consumption from Farm, Mining, Construction, and Commercial sectors that is accounted for in the nonroad inventory. Because of these limitations, Pechan plans to use regional non-fuel use percentages computed from energy consumption data from the EIA’s *2002 Manufacturing Energy Consumption Survey* (MECS) for all fuel types except coal (EIA, 2007). There are two reasons why MECS provides a more representative data set for use in this study: (1) MECS provides data specific to the regions of interest; and (2) MECS focuses solely on the Manufacturing sector. The latter characteristic is particularly important for fuel types which consume significant amounts of non-Manufacturing sector energy that is already included elsewhere (e.g., distillate fuel used by the Construction sector, which is included in the nonroad inventory). The MECS non-fuel consumption data treat

¹ Although the SIT also develops CO₂ emission estimates associated with non-fuel energy use, such estimates are not developed here because they are not associated with industrial fuel combustion.

coal that is used to produce coke as a feedstock. However, available data indicate that none of the CENRAP States produce coke (Pechan, 2006). In addition, the 2002 MECS data treat “synthetic coal” that is ultimately combusted as regular coal, as a non-fuel (feedstock) use. Because of these data limitations, Pechan contacted EIA for assistance in obtaining a reasonable estimate of the percentage of non-coking coal that is used for non-fuel purposes (treating “synthetic coal” as a fuel use). Based on the EIA’s estimate that 5-10 percent of 2002 non-coke coal was used for non-fuel purposes, Pechan plans to assume that 7 percent of CENRAP Industrial sector coal consumption is for non-fuel purposes (Lorenz, 2009).

Table 2 presents the available non-fuel use percentages by type of energy. It was not possible to develop percentages by region for each fuel type because some regional MECS data are withheld. For this study, Pechan plans to use the most geographic-specific data reported in Table 2. States are encouraged to provide available State-specific estimates to replace the defaults below.

Table 2. Industrial Sector Energy Consumption from Non-Fuel Uses

Energy Type	2002 MECS % Energy Consumption from Non-Fuel Use			
	Midwest	South	Midwest+South	National
Residual	not available	not available	25%	17%
Distillate	not available	not available	9%	7%
Natural Gas	6%	15%	12%	10%
LPG/NGL	88%	98%	97%	97%
Coal	not available	not available	not available	7%

Sources: EIA, 2007 and Lorenz, 2009.
 Midwest region includes Iowa, Kansas, Minnesota, Missouri, and Nebraska.
 South region includes Arkansas, Louisiana, Oklahoma, and Texas.

3. Nonroad Source Energy Consumption

To avoid double-counting with the nonroad inventory, it is necessary to subtract 2002 year diesel and LPG consumption estimates for Industrial, Farm, Logging, Mining, and Construction sector nonroad equipment. For the Commercial sector SEDS data, it is necessary to subtract 2002 year diesel and LPG consumption for Commercial sector nonroad equipment. Pechan plans to run the NONROAD model for 2002 for the CENRAP States to obtain State-level diesel and LPG consumption estimates to perform these subtractions. Table 3 identifies the SCCs for which Pechan will compile NONROAD fuel consumption estimates.

Table 3. Nonroad Sector Subtraction SCCs

SCC	Description_2	Description_3	Description_4
Industrial Sector-Distillate			
2270000000	Off-highway Vehicle Diesel	Compression Ignition Equipment except Rail and Marine	Total
2270001000	Off-highway Vehicle Diesel	Recreational Equipment	Total
2270001010	Off-highway Vehicle Diesel	Recreational Equipment	Motorcycles: Off-road
2270001020	Off-highway Vehicle Diesel	Recreational Equipment	Snowmobiles
2270001030	Off-highway Vehicle Diesel	Recreational Equipment	All Terrain Vehicles
2270001040	Off-highway Vehicle Diesel	Recreational Equipment	Minibikes
2270001050	Off-highway Vehicle Diesel	Recreational Equipment	Golf Carts
2270001060	Off-highway Vehicle Diesel	Recreational Equipment	Specialty Vehicles/Carts
2270002000	Off-highway Vehicle Diesel	Construction and Mining Equipment	Total
2270002003	Off-highway Vehicle Diesel	Construction and Mining Equipment	Pavers
2270002006	Off-highway Vehicle Diesel	Construction and Mining Equipment	Tampers/Rammers
2270002009	Off-highway Vehicle Diesel	Construction and Mining Equipment	Plate Compactors
2270002012	Off-highway Vehicle Diesel	Construction and Mining Equipment	Concrete Pavers
2270002015	Off-highway Vehicle Diesel	Construction and Mining Equipment	Rollers
2270002018	Off-highway Vehicle Diesel	Construction and Mining Equipment	Scrapers
2270002021	Off-highway Vehicle Diesel	Construction and Mining Equipment	Paving Equipment
2270002024	Off-highway Vehicle Diesel	Construction and Mining Equipment	Surfacing Equipment
2270002027	Off-highway Vehicle Diesel	Construction and Mining Equipment	Signal Boards/Light Plants
2270002030	Off-highway Vehicle Diesel	Construction and Mining Equipment	Trenchers
2270002033	Off-highway Vehicle Diesel	Construction and Mining Equipment	Bore/Drill Rigs
2270002036	Off-highway Vehicle Diesel	Construction and Mining Equipment	Excavators
2270002039	Off-highway Vehicle Diesel	Construction and Mining Equipment	Concrete/Industrial Saws
2270002042	Off-highway Vehicle Diesel	Construction and Mining Equipment	Cement and Mortar Mixers
2270002045	Off-highway Vehicle Diesel	Construction and Mining Equipment	Cranes
2270002048	Off-highway Vehicle Diesel	Construction and Mining Equipment	Graders

SCC	Description_2	Description_3	Description_4
2270002051	Off-highway Vehicle Diesel	Construction and Mining Equipment	Off-Highway Trucks
2270002054	Off-highway Vehicle Diesel	Construction and Mining Equipment	Crushing/Processing Equipment
2270002057	Off-highway Vehicle Diesel	Construction and Mining Equipment	Rough Terrain Forklifts
2270002060	Off-highway Vehicle Diesel	Construction and Mining Equipment	Rubber Tired Loaders
2270002063	Off-highway Vehicle Diesel	Construction and Mining Equipment	Rubber Tire Tractor/Dozers
2270002066	Off-highway Vehicle Diesel	Construction and Mining Equipment	Tractors/Loaders/Backhoes
2270002069	Off-highway Vehicle Diesel	Construction and Mining Equipment	Crawler Tractor/Dozers
2270002072	Off-highway Vehicle Diesel	Construction and Mining Equipment	Skid Steer Loaders
2270002075	Off-highway Vehicle Diesel	Construction and Mining Equipment	Off-Highway Tractors
2270002078	Off-highway Vehicle Diesel	Construction and Mining Equipment	Dumpers/Tenders
2270002081	Off-highway Vehicle Diesel	Construction and Mining Equipment	Other Construction Equipment
2270003000	Off-highway Vehicle Diesel	Industrial Equipment	Total
2270003010	Off-highway Vehicle Diesel	Industrial Equipment	Aerial Lifts
2270003020	Off-highway Vehicle Diesel	Industrial Equipment	Forklifts
2270003030	Off-highway Vehicle Diesel	Industrial Equipment	Sweepers/Scrubbers
2270003040	Off-highway Vehicle Diesel	Industrial Equipment	Other General Industrial Equipment
2270003050	Off-highway Vehicle Diesel	Industrial Equipment	Other Material Handling Equipment
2270003060	Off-highway Vehicle Diesel	Industrial Equipment	AC/Refrigeration
2270003070	Off-highway Vehicle Diesel	Industrial Equipment	Terminal Tractors
2270005000	Off-highway Vehicle Diesel	Agricultural Equipment	Total
2270005010	Off-highway Vehicle Diesel	Agricultural Equipment	2-Wheel Tractors
2270005015	Off-highway Vehicle Diesel	Agricultural Equipment	Agricultural Tractors
2270005020	Off-highway Vehicle Diesel	Agricultural Equipment	Combines
2270005025	Off-highway Vehicle Diesel	Agricultural Equipment	Balers
2270005030	Off-highway Vehicle Diesel	Agricultural Equipment	Agricultural Mowers
2270005035	Off-highway Vehicle Diesel	Agricultural Equipment	Sprayers
2270005040	Off-highway Vehicle Diesel	Agricultural Equipment	Tillers > 6 HP
2270005045	Off-highway Vehicle Diesel	Agricultural Equipment	Swathers
2270005050	Off-highway Vehicle Diesel	Agricultural Equipment	Hydro-power Units

SCC	Description_2	Description_3	Description_4
2270005055	Off-highway Vehicle Diesel	Agricultural Equipment	Other Agricultural Equipment
2270005060	Off-highway Vehicle Diesel	Agricultural Equipment	Irrigation Sets
2270007000	Off-highway Vehicle Diesel	Logging Equipment	Total
2270007005	Off-highway Vehicle Diesel	Logging Equipment	Chain Saws > 6 HP
2270007010	Off-highway Vehicle Diesel	Logging Equipment	Shredders > 6HP
2270007015	Off-highway Vehicle Diesel	Logging Equipment	Forest Eqp – Fellers/Bunch/Skidder
2270007020	Off-highway Vehicle Diesel	Logging Equipment	Fellers/Bunchers ** (see 22-70-007-015)
2270009000	Off-highway Vehicle Diesel	Underground Mining Equipment	All
2270009010	Off-highway Vehicle Diesel	Underground Mining Equipment	Other Underground Mining Equipment
2270010000	Off-highway Vehicle Diesel	Industrial Equipment	All
2270010010	Off-highway Vehicle Diesel	Industrial Equipment	Other Oil Field Equipment
Industrial Sector-LPG			
2267002000	LPG	Construction and Mining Equipment	All
2267002003	LPG	Construction and Mining Equipment	Pavers
2267002006	LPG	Construction and Mining Equipment	Tampers/Rammers
2267002009	LPG	Construction and Mining Equipment	Plate Compactors
2267002015	LPG	Construction and Mining Equipment	Rollers
2267002018	LPG	Construction and Mining Equipment	Scrapers
2267002021	LPG	Construction and Mining Equipment	Paving Equipment
2267002024	LPG	Construction and Mining Equipment	Surfacing Equipment
2267002027	LPG	Construction and Mining Equipment	Signal Boards/Light Plants
2267002030	LPG	Construction and Mining Equipment	Trenchers
2267002033	LPG	Construction and Mining Equipment	Bore/Drill Rigs
2267002036	LPG	Construction and Mining Equipment	Excavators
2267002039	LPG	Construction and Mining Equipment	Concrete/Industrial Saws
2267002042	LPG	Construction and Mining Equipment	Cement and Mortar Mixers
2267002045	LPG	Construction and Mining Equipment	Cranes
2267002048	LPG	Construction and Mining Equipment	Graders
2267002051	LPG	Construction and Mining Equipment	Off-highway Trucks

SCC	Description_2	Description_3	Description_4
2267002054	LPG	Construction and Mining Equipment	Crushing/Processing Equipment
2267002057	LPG	Construction and Mining Equipment	Rough Terrain Forklifts
2267002060	LPG	Construction and Mining Equipment	Rubber Tire Loaders
2267002063	LPG	Construction and Mining Equipment	Rubber Tire Tractors/Dozers
2267002066	LPG	Construction and Mining Equipment	Tractors/Loaders/Backhoes
2267002069	LPG	Construction and Mining Equipment	Crawler Tractor/Dozers
2267002072	LPG	Construction and Mining Equipment	Skid Steer Loaders
2267002075	LPG	Construction and Mining Equipment	Off-Highway Tractors
2267002078	LPG	Construction and Mining Equipment	Dumpers/Tenders
2267002081	LPG	Construction and Mining Equipment	Other Construction Equipment
2267003000	LPG	Industrial Equipment	All
2267003010	LPG	Industrial Equipment	Aerial Lifts
2267003020	LPG	Industrial Equipment	Forklifts
2267003030	LPG	Industrial Equipment	Sweepers/Scrubbers
2267003040	LPG	Industrial Equipment	Other General Industrial Equipment
2267003050	LPG	Industrial Equipment	Other Material Handling Equipment
2267003060	LPG	Industrial Equipment	AC/Refrigeration
2267003070	LPG	Industrial Equipment	Terminal Tractors
2267005000	LPG	Agricultural Equipment	All
2267005010	LPG	Agricultural Equipment	2-Wheel Tractors
2267005015	LPG	Agricultural Equipment	Agricultural Tractors
2267005020	LPG	Agricultural Equipment	Combines
2267005025	LPG	Agricultural Equipment	Balers
2267005030	LPG	Agricultural Equipment	Agricultural Mowers
2267005035	LPG	Agricultural Equipment	Sprayers
2267005040	LPG	Agricultural Equipment	Tillers >6 HP
2267005045	LPG	Agricultural Equipment	Swathers
2267005050	LPG	Agricultural Equipment	Hydro-power Units
2267005055	LPG	Agricultural Equipment	Other Agricultural Equipment

SCC	Description_2	Description_3	Description_4
2267005060	LPG	Agricultural Equipment	Irrigation Sets
2267007000	LPG	Logging Equipment	All
2267007005	LPG	Logging Equipment	Chain Saws > 6 HP
2267007010	LPG	Logging Equipment	Shredders > 6 HP
2267007015	LPG	Logging Equipment	Forest Eqp – Feller/Bunch/Skidder
2267009000	LPG	Underground Mining Equipment	All
2267009010	LPG	Underground Mining Equipment	Other Underground Mining Equipment
2267010000	LPG	Industrial Equipment	All
2267010010	LPG	Industrial Equipment	Other Oil Field Equipment
Commercial Sector-Distillate			
2270004000	Off-highway Vehicle Diesel	Lawn and Garden Equipment	All
2270004011	Off-highway Vehicle Diesel	Lawn and Garden Equipment	Lawn Mowers (Commercial)
2270004016	Off-highway Vehicle Diesel	Lawn and Garden Equipment	Rotary Tillers < 6HP (Commercial)
2270004021	Off-highway Vehicle Diesel	Lawn and Garden Equipment	Chain Saws < 6 HP (Commercial)
2270004026	Off-highway Vehicle Diesel	Lawn and Garden Equipment	Trimmers/Edgers/Brush Cutters (Commercial)
2270004031	Off-highway Vehicle Diesel	Lawn and Garden Equipment	Leafblowers/Vacuums (Commercial)
2270004036	Off-highway Vehicle Diesel	Lawn and Garden Equipment	Snowblowers (Commercial)
2270004041	Off-highway Vehicle Diesel	Lawn and Garden Equipment	Rear Engine Riding Mowers (Commercial)
2270004046	Off-highway Vehicle Diesel	Lawn and Garden Equipment	Front Mowers (Commercial)
2270004051	Off-highway Vehicle Diesel	Lawn and Garden Equipment	Shredders < 6 HP (Commercial)
2270004056	Off-highway Vehicle Diesel	Lawn and Garden Equipment	Lawn and Garden Tractors (Commercial)
2270004061	Off-highway Vehicle Diesel	Lawn and Garden Equipment	Wood Splitters (Commercial)
2270004066	Off-highway Vehicle Diesel	Lawn and Garden Equipment	Chippers/Stump Grinders (Commercial)
2270004070	Off-highway Vehicle Diesel	Lawn and Garden Equipment	Commercial Turf Equipment ** (use 22-70-004-71)
2270004071	Off-highway Vehicle Diesel	Lawn and Garden Equipment	Turf Equipment (Commercial)
2270004076	Off-highway Vehicle Diesel	Lawn and Garden Equipment	Other Lawn and Garden Equipment (Commercial)
2270006000	Off-highway Vehicle Diesel	Commercial Equipment	Total
2270006005	Off-highway Vehicle Diesel	Commercial Equipment	Generator Sets
2270006010	Off-highway Vehicle Diesel	Commercial Equipment	Pumps

SCC	Description_2	Description_3	Description_4
2270006015	Off-highway Vehicle Diesel	Commercial Equipment	Air Compressors
2270006020	Off-highway Vehicle Diesel	Commercial Equipment	Gas Compressors
2270006025	Off-highway Vehicle Diesel	Commercial Equipment	Welders
2270006030	Off-highway Vehicle Diesel	Commercial Equipment	Pressure Washers
2270008000	Off-highway Vehicle Diesel	Airport Ground Support Equipment	Total
2270008005	Off-highway Vehicle Diesel	Airport Ground Support Equipment	Airport Ground Support Equipment
2270008010	Off-highway Vehicle Diesel	Airport Ground Support Equipment	Terminal Tractors
Commercial Sector-LPG			
22670004011	LPG	Lawn and Garden Equipment	Lawn Mowers (Commercial)
22670004016	LPG	Lawn and Garden Equipment	Rotary Tillers < 6 HP (Commercial)
22670004021	LPG	Lawn and Garden Equipment	Chain Saws < 6 HP (Commercial)
22670004026	LPG	Lawn and Garden Equipment	Trimmers/Edgers/Brush Cutters (Commercial)
22670004031	LPG	Lawn and Garden Equipment	Leafblowers/Vacuums (Commercial)
22670004036	LPG	Lawn and Garden Equipment	Snowblowers (Commercial)
22670004041	LPG	Lawn and Garden Equipment	Rear Engine Riding Mowers (Commercial)
22670004046	LPG	Lawn and Garden Equipment	Front Mowers (Commercial)
22670004051	LPG	Lawn and Garden Equipment	Shredders < 6 HP (Commercial)
22670004056	LPG	Lawn and Garden Equipment	Lawn and Garden Tractors (Commercial)
22670004061	LPG	Lawn and Garden Equipment	Wood Splitters (Commercial)
22670004066	LPG	Lawn and Garden Equipment	Chippers/Stump Grinders (Commercial)
22670004071	LPG	Lawn and Garden Equipment	Turf Equipment (Commercial)
22670004076	LPG	Lawn and Garden Equipment	Other Lawn and Garden Equipment (Commercial)
22670006000	LPG	Commercial Equipment	All
22670006005	LPG	Commercial Equipment	Generator Sets
22670006010	LPG	Commercial Equipment	Pumps
22670006015	LPG	Commercial Equipment	Air Compressors
22670006020	LPG	Commercial Equipment	Gas Compressors
22670006025	LPG	Commercial Equipment	Welders
22670006030	LPG	Commercial Equipment	Pressure Washers

4. Point Source Energy Consumption

To ensure that energy consumption is not double-counted in the point source inventory, it will also be necessary to subtract point source inventory fuel use from the fuel consumption estimates developed from the aforementioned data sources. To assist in the point source subtractions, Pechan has developed two crosswalks: one between each Industrial fuel combustion area SCC and associated point SCCs (Table 4), and an analogous crosswalk for Commercial/Institutional fuel combustion (Table 5). Pechan requests CENRAP comments on the point SCCs included in these crosswalks.

In addition, a summary analysis was performed on the throughput data reported in the 2002 point source inventory compiled for CENRAP (Pechan/CEP, 2005). The Attachment to this memorandum provides a summary of the 2002 annual point source throughput data associated with the ICI area source categories (reflecting use of the Table 4 and 5 crosswalks). As indicated by this summary, there appear to be numerous potential reporting errors in the CENRAP point source inventory throughput information. These errors include throughput reported using inappropriate units (e.g., reporting natural gas throughput in tons and distillate fuel throughput in million cubic feet), and throughput reported using an inappropriate material code (e.g., reporting a distillate fuel combustion category's throughput as water). There are also records with emissions that report throughput as zero and throughput data reported without any unit identifiers. Pechan requests guidance from CENRAP States as to revisions to the throughput information to ensure the validity of the data that are used in the point source subtractions. For States/source categories with suspect values for which revisions are not available, Pechan will estimate throughput by dividing point source emissions by the carbon monoxide (CO) emission factors listed in the next section. The CO-based approach will also be used for all States that do not report any throughput data for ICI point source fuel combustion categories (i.e., Louisiana and Texas).

To ensure that the methodology results in accurate estimates of point source throughput, Pechan will supply States with the SEDS energy consumption estimates by fuel type and the point source energy consumption by fuel type computed using the throughput or CO emissions-based approach. Pechan will wait for State approval of these estimates before final use in the point source subtraction procedure.

Table 4. Industrial Fuel Combustion Crosswalk for Point Source Subtractions

Point SCC	SCC1 DESC	SCC3 DESC	SCC6 DESC	SCC8 DESC
2102001000 & 2102002000 – Industrial; Anthracite Coal; Total: All Boiler Types and Bituminous/Subbituminous Coal; Total: All Boiler Types				
10200101	External Combustion Boilers	Industrial	Anthracite Coal	Pulverized Coal
10200104	External Combustion Boilers	Industrial	Anthracite Coal	Traveling Grate (Overfeed) Stoker
10200107	External Combustion Boilers	Industrial	Anthracite Coal	Hand-fired
10200117	External Combustion Boilers	Industrial	Anthracite Coal	Fluidized Bed Boiler Burning Anthracite-Culm Fuel
39000189	Industrial Processes	In-process Fuel Use	Anthracite Coal	General
39000199	Industrial Processes	In-process Fuel Use	Anthracite Coal	General
10200201	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Pulverized Coal: Wet Bottom
10200202	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Pulverized Coal: Dry Bottom
10200203	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Cyclone Furnace
10200204	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Spreader Stoker
10200205	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Overfeed Stoker
10200206	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Underfeed Stoker
10200210	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Overfeed Stoker **
10200212	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Pulverized Coal: Dry Bottom (Tangential)
10200213	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Wet Slurry
10200217	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Atmospheric Fluidized Bed Combustion: Bubbling Bed (Bituminous Coal)
10200218	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Atmospheric Fluidized Bed Combustion: Circulating Bed (Bitum. Coal)
10200219	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Cogeneration (Bituminous Coal)
10200221	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Pulverized Coal: Wet Bottom (Subbituminous Coal)
10200222	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Pulverized Coal: Dry Bottom (Subbituminous Coal)
10200223	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Cyclone Furnace (Subbituminous Coal)
10200224	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Spreader Stoker (Subbituminous Coal)
10200225	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Traveling Grate (Overfeed) Stoker (Subbituminous Coal)
10200226	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Pulverized Coal: Dry Bottom Tangential (Subbituminous Coal)
10200229	External Combustion Boilers	Industrial	Bituminous/Subbituminous Coal	Cogeneration (Subbituminous Coal)
10500102	External Combustion Boilers	Space Heaters	Industrial	Coal **
39000201	Industrial Processes	In-process Fuel Use	Bituminous Coal	Cement Kiln/Dryer (Bituminous Coal)
39000203	Industrial Processes	In-process Fuel Use	Bituminous Coal	Lime Kiln (Bituminous)
39000288	Industrial Processes	In-process Fuel Use	Bituminous Coal	General (Subbituminous)
39000289	Industrial Processes	In-process Fuel Use	Bituminous Coal	General (Bituminous)
39000299	Industrial Processes	In-process Fuel Use	Bituminous Coal	General (Bituminous)
50390002	Waste Disposal	Solid Waste Disposal - Industrial	Auxiliary Fuel/No Emissions	Coal

Point SCC	SCC1 DESC	SCC3 DESC	SCC6 DESC	SCC8 DESC
2102004000 – Industrial; Distillate Oil; Total: Boilers and IC Engines				
10200501	External Combustion Boilers	Industrial	Distillate Oil	Grades 1 and 2 Oil
10200502	External Combustion Boilers	Industrial	Distillate Oil	10-100 Million Btu/hr **
10200503	External Combustion Boilers	Industrial	Distillate Oil	< 10 Million Btu/hr **
10200504	External Combustion Boilers	Industrial	Distillate Oil	Grade 4 Oil
10200505	External Combustion Boilers	Industrial	Distillate Oil	Cogeneration
10201403	External Combustion Boilers	Industrial	CO Boiler	Distillate Oil
10500105	External Combustion Boilers	Space Heaters	Industrial	Distillate Oil
20200101	Internal Combustion Engines	Industrial	Distillate Oil (Diesel)	Turbine
20200102	Internal Combustion Engines	Industrial	Distillate Oil (Diesel)	Reciprocating
20200103	Internal Combustion Engines	Industrial	Distillate Oil (Diesel)	Turbine: Cogeneration
20200104	Internal Combustion Engines	Industrial	Distillate Oil (Diesel)	Reciprocating: Cogeneration
20200105	Internal Combustion Engines	Industrial	Distillate Oil (Diesel)	Reciprocating: Crankcase Blowby
20200106	Internal Combustion Engines	Industrial	Distillate Oil (Diesel)	Reciprocating: Evaporative Losses (Fuel Storage and Delivery System)
20200107	Internal Combustion Engines	Industrial	Distillate Oil (Diesel)	Reciprocating: Exhaust
20200108	Internal Combustion Engines	Industrial	Distillate Oil (Diesel)	Turbine: Evaporative Losses (Fuel Storage and Delivery System)
20200109	Internal Combustion Engines	Industrial	Distillate Oil (Diesel)	Turbine: Exhaust
20200401	Internal Combustion Engines	Industrial	Large Bore Engine	Diesel
20200405	Internal Combustion Engines	Industrial	Large Bore Engine	Crankcase Blowby
20200406	Internal Combustion Engines	Industrial	Large Bore Engine	Evaporative Losses (Fuel Storage and Delivery System)
20200407	Internal Combustion Engines	Industrial	Large Bore Engine	Exhaust
27000320	Internal Combustion Engines	Off-highway Diesel Engines	Industrial Equipment	Industrial Fork Lift: Diesel
30190001	Industrial Processes	Chemical Manufacturing	Fuel Fired Equipment	Distillate Oil (No. 2): Process Heaters
30190011	Industrial Processes	Chemical Manufacturing	Fuel Fired Equipment	Distillate Oil (No. 2): Incinerators
30190021	Industrial Processes	Chemical Manufacturing	Fuel Fired Equipment	Distillate Oil (No. 2): Flares
30290001	Industrial Processes	Food and Agriculture	Fuel Fired Equipment	Distillate Oil (No. 2): Process Heaters
30390001	Industrial Processes	Primary Metal Production	Fuel Fired Equipment	Distillate Oil (No. 2): Process Heaters
30390011	Industrial Processes	Primary Metal Production	Fuel Fired Equipment	Distillate Oil (No. 2): Incinerators
30390021	Industrial Processes	Primary Metal Production	Fuel Fired Equipment	Distillate Oil (No. 2): Flares
30400406	Industrial Processes	Secondary Metal Production	Lead	Pot Furnace Heater: Distillate Oil
30490001	Industrial Processes	Secondary Metal Production	Fuel Fired Equipment	Distillate Oil (No. 2): Process Heaters
30490011	Industrial Processes	Secondary Metal Production	Fuel Fired Equipment	Distillate Oil (No. 2): Incinerators
30490021	Industrial Processes	Secondary Metal Production	Fuel Fired Equipment	Distillate Oil (No. 2): Flares
30490031	Industrial Processes	Secondary Metal Production	Fuel Fired Equipment	Distillate Oil (No. 2): Furnaces
30500208	Industrial Processes	Mineral Products	Asphalt Concrete	Asphalt Heater: Distillate Oil
30505022	Industrial Processes	Mineral Products	Asphalt Processing (Blowing)	Asphalt Heater: Distillate Oil
30590001	Industrial Processes	Mineral Products	Fuel Fired Equipment	Distillate Oil (No. 2): Process Heaters
30590011	Industrial Processes	Mineral Products	Fuel Fired Equipment	Distillate Oil (No. 2): Incinerators
30590021	Industrial Processes	Mineral Products	Fuel Fired Equipment	Distillate Oil (No. 2): Flares

Point SCC	SCC1 DESC	SCC3 DESC	SCC6 DESC	SCC8 DESC
30600901	Industrial Processes	Petroleum Industry	Flares	Distillate Oil
30609901	Industrial Processes	Petroleum Industry	Incinerators	Distillate Oil (No. 2)
30790001	Industrial Processes	Pulp and Paper and Wood Products	Fuel Fired Equipment	Distillate Oil (No. 2): Process Heaters
30790011	Industrial Processes	Pulp and Paper and Wood Products	Fuel Fired Equipment	Distillate Oil (No. 2): Incinerators
30790021	Industrial Processes	Pulp and Paper and Wood Products	Fuel Fired Equipment	Distillate Oil (No. 2): Flares
30890001	Industrial Processes	Rubber and Miscellaneous Plastics Products	Fuel Fired Equipment	Distillate Oil (No. 2): Process Heaters
30890011	Industrial Processes	Rubber and Miscellaneous Plastics Products	Fuel Fired Equipment	Distillate Oil (No. 2): Incinerators
30890021	Industrial Processes	Rubber and Miscellaneous Plastics Products	Fuel Fired Equipment	Distillate Oil (No. 2): Flares
30990001	Industrial Processes	Fabricated Metal Products	Fuel Fired Equipment	Distillate Oil (No. 2): Process Heaters
30990011	Industrial Processes	Fabricated Metal Products	Fuel Fired Equipment	Distillate Oil (No. 2): Incinerators
31000401	Industrial Processes	Oil and Gas Production	Process Heaters	Distillate Oil (No. 2)
31000411	Industrial Processes	Oil and Gas Production	Process Heaters	Distillate Oil (No. 2): Steam Generators
31390001	Industrial Processes	Electrical Equipment	Process Heaters	Distillate Oil (No. 2)
39000501	Industrial Processes	In-process Fuel Use	Distillate Oil	Asphalt Dryer **
39000502	Industrial Processes	In-process Fuel Use	Distillate Oil	Cement Kiln/Dryer
39000503	Industrial Processes	In-process Fuel Use	Distillate Oil	Lime Kiln
39000589	Industrial Processes	In-process Fuel Use	Distillate Oil	General
39000598	Industrial Processes	In-process Fuel Use	Distillate Oil	Grade 4 Oil: General
39000599	Industrial Processes	In-process Fuel Use	Distillate Oil	General
39900501	Industrial Processes	Miscellaneous Manufacturing Industries	Process Heater/Furnace	Distillate Oil
39990001	Industrial Processes	Miscellaneous Manufacturing Industries	Miscellaneous Manufacturing Industries	Distillate Oil (No. 2): Process Heaters
39990011	Industrial Processes	Miscellaneous Manufacturing Industries	Miscellaneous Manufacturing Industries	Distillate Oil (No. 2): Incinerators
39990021	Industrial Processes	Miscellaneous Manufacturing Industries	Miscellaneous Manufacturing Industries	Distillate Oil (No. 2 Oil): Flares
40201002	Petroleum and Solvent Evaporation	Surface Coating Operations	Coating Oven Heater	Distillate Oil
40290011	Petroleum and Solvent Evaporation	Surface Coating Operations	Fuel Fired Equipment	Distillate Oil: Incinerator/Afterburner
49090011	Petroleum and Solvent Evaporation	Organic Solvent Evaporation	Fuel Fired Equipment	Distillate Oil (No. 2): Incinerators
49090021	Petroleum and Solvent Evaporation	Organic Solvent Evaporation	Fuel Fired Equipment	Distillate Oil (No. 2): Flares
50390005	Waste Disposal	Solid Waste Disposal - Industrial	Auxiliary Fuel/No Emissions	Distillate Oil
2102005000 – Industrial; Residual Oil; Total: All Boiler Types				
10200401	External Combustion Boilers	Industrial	Residual Oil	Grade 6 Oil

Point SCC	SCC1 DESC	SCC3 DESC	SCC6 DESC	SCC8 DESC
10200402	External Combustion Boilers	Industrial	Residual Oil	10-100 Million Btu/hr **
10200403	External Combustion Boilers	Industrial	Residual Oil	< 10 Million Btu/hr **
10200404	External Combustion Boilers	Industrial	Residual Oil	Grade 5 Oil
10200405	External Combustion Boilers	Industrial	Residual Oil	Cogeneration
10201404	External Combustion Boilers	Industrial	CO Boiler	Residual Oil
20200501	Internal Combustion Engines	Industrial	Residual/Crude Oil	Reciprocating
20200505	Internal Combustion Engines	Industrial	Residual/Crude Oil	Reciprocating: Crankcase Blowby
20200506	Internal Combustion Engines	Industrial	Residual/Crude Oil	Reciprocating: Evaporative Losses (Fuel Storage and Delivery System)
20200507	Internal Combustion Engines	Industrial	Residual/Crude Oil	Reciprocating: Exhaust
30190002	Industrial Processes	Chemical Manufacturing	Fuel Fired Equipment	Residual Oil: Process Heaters
30190012	Industrial Processes	Chemical Manufacturing	Fuel Fired Equipment	Residual Oil: Incinerators
30190022	Industrial Processes	Chemical Manufacturing	Fuel Fired Equipment	Residual Oil: Flares
30290002	Industrial Processes	Food and Agriculture	Fuel Fired Equipment	Residual Oil: Process Heaters
30390002	Industrial Processes	Primary Metal Production	Fuel Fired Equipment	Residual Oil: Process Heaters
30390012	Industrial Processes	Primary Metal Production	Fuel Fired Equipment	Residual Oil: Incinerators
30390022	Industrial Processes	Primary Metal Production	Fuel Fired Equipment	Residual Oil: Flares
30490002	Industrial Processes	Secondary Metal Production	Fuel Fired Equipment	Residual Oil: Process Heaters
30490012	Industrial Processes	Secondary Metal Production	Fuel Fired Equipment	Residual Oil: Incinerators
30490022	Industrial Processes	Secondary Metal Production	Fuel Fired Equipment	Residual Oil: Flares
30490032	Industrial Processes	Secondary Metal Production	Fuel Fired Equipment	Residual Oil: Furnaces
30500207	Industrial Processes	Mineral Products	Asphalt Concrete	Asphalt Heater: Residual Oil
30505021	Industrial Processes	Mineral Products	Asphalt Processing (Blowing)	Asphalt Heater: Residual Oil
30590002	Industrial Processes	Mineral Products	Fuel Fired Equipment	Residual Oil: Process Heaters
30590012	Industrial Processes	Mineral Products	Fuel Fired Equipment	Residual Oil: Incinerators
30600111	Industrial Processes	Petroleum Industry	Process Heaters	Oil-fired (No. 6 Oil) > 100 Million Btu Capacity
30600902	Industrial Processes	Petroleum Industry	Flares	Residual Oil
30609902	Industrial Processes	Petroleum Industry	Incinerators	Residual Oil
30790002	Industrial Processes	Pulp and Paper and Wood Products	Fuel Fired Equipment	Residual Oil: Process Heaters
30790012	Industrial Processes	Pulp and Paper and Wood Products	Fuel Fired Equipment	Residual Oil: Incinerators
30790022	Industrial Processes	Pulp and Paper and Wood Products	Fuel Fired Equipment	Residual Oil: Flares
30890002	Industrial Processes	Rubber and Miscellaneous Plastics Products	Fuel Fired Equipment	Residual Oil: Process Heaters
30890012	Industrial Processes	Rubber and Miscellaneous Plastics Products	Fuel Fired Equipment	Residual Oil: Incinerators
30890022	Industrial Processes	Rubber and Miscellaneous Plastics Products	Fuel Fired Equipment	Residual Oil: Flares
30990002	Industrial Processes	Fabricated Metal Products	Fuel Fired Equipment	Residual Oil: Process Heaters
30990012	Industrial Processes	Fabricated Metal Products	Fuel Fired Equipment	Residual Oil: Incinerators
31000402	Industrial Processes	Oil and Gas Production	Process Heaters	Residual Oil

Point SCC	SCC1 DESC	SCC3 DESC	SCC6 DESC	SCC8 DESC
31000412	Industrial Processes	Oil and Gas Production	Process Heaters	Residual Oil: Steam Generators
31390002	Industrial Processes	Electrical Equipment	Process Heaters	Residual Oil
39000402	Industrial Processes	In-process Fuel Use	Residual Oil	Cement Kiln/Dryer
39000403	Industrial Processes	In-process Fuel Use	Residual Oil	Lime Kiln
39000489	Industrial Processes	In-process Fuel Use	Residual Oil	General
39000499	Industrial Processes	In-process Fuel Use	Residual Oil	General
39990002	Industrial Processes	Miscellaneous Manufacturing Industries	Miscellaneous Manufacturing Industries	Residual Oil: Process Heaters
39990012	Industrial Processes	Miscellaneous Manufacturing Industries	Miscellaneous Manufacturing Industries	Residual Oil: Incinerators
39990022	Industrial Processes	Miscellaneous Manufacturing Industries	Miscellaneous Manufacturing Industries	Residual Oil: Flares
40201003	Petroleum and Solvent Evaporation	Surface Coating Operations	Coating Oven Heater	Residual Oil
40290012	Petroleum and Solvent Evaporation	Surface Coating Operations	Fuel Fired Equipment	Residual Oil: Incinerator/Afterburner
49090012	Petroleum and Solvent Evaporation	Organic Solvent Evaporation	Fuel Fired Equipment	Residual Oil: Incinerators
49090022	Petroleum and Solvent Evaporation	Organic Solvent Evaporation	Fuel Fired Equipment	Residual Oil: Flares
2102006000 – Industrial; Natural Gas; Total: Boilers and IC Engines				
10200601	External Combustion Boilers	Industrial	Natural Gas	> 100 Million Btu/hr
10200602	External Combustion Boilers	Industrial	Natural Gas	10-100 Million Btu/hr
10200603	External Combustion Boilers	Industrial	Natural Gas	< 10 Million Btu/hr
10200604	External Combustion Boilers	Industrial	Natural Gas	Cogeneration
10201401	External Combustion Boilers	Industrial	CO Boiler	Natural Gas
10500106	External Combustion Boilers	Space Heaters	Industrial	Natural Gas
20200201	Internal Combustion Engines	Industrial	Natural Gas	Turbine
20200202	Internal Combustion Engines	Industrial	Natural Gas	Reciprocating
20200203	Internal Combustion Engines	Industrial	Natural Gas	Turbine: Cogeneration
20200204	Internal Combustion Engines	Industrial	Natural Gas	Reciprocating: Cogeneration
20200205	Internal Combustion Engines	Industrial	Natural Gas	Reciprocating: Crankcase Blowby
20200206	Internal Combustion Engines	Industrial	Natural Gas	Reciprocating: Evaporative Losses (Fuel Delivery System)
20200207	Internal Combustion Engines	Industrial	Natural Gas	Reciprocating: Exhaust
20200208	Internal Combustion Engines	Industrial	Natural Gas	Turbine: Evaporative Losses (Fuel Delivery System)
20200209	Internal Combustion Engines	Industrial	Natural Gas	Turbine: Exhaust
20200252	Internal Combustion Engines	Industrial	Natural Gas	2-cycle Lean Burn
20200253	Internal Combustion Engines	Industrial	Natural Gas	4-cycle Rich Burn
20200254	Internal Combustion Engines	Industrial	Natural Gas	4-cycle Lean Burn
20200255	Internal Combustion Engines	Industrial	Natural Gas	2-cycle Clean Burn
20200256	Internal Combustion Engines	Industrial	Natural Gas	4-cycle Clean Burn
30190003	Industrial Processes	Chemical Manufacturing	Fuel Fired Equipment	Natural Gas: Process Heaters

Point SCC	SCC1 DESC	SCC3 DESC	SCC6 DESC	SCC8 DESC
30190013	Industrial Processes	Chemical Manufacturing	Fuel Fired Equipment	Natural Gas: Incinerators
30190023	Industrial Processes	Chemical Manufacturing	Fuel Fired Equipment	Natural Gas: Flares
30290003	Industrial Processes	Food and Agriculture	Fuel Fired Equipment	Natural Gas: Process Heaters
30291001	Industrial Processes	Food and Agriculture	Fuel Fired Equipment	Broiling Food: Natural Gas
30390003	Industrial Processes	Primary Metal Production	Fuel Fired Equipment	Natural Gas: Process Heaters
30390013	Industrial Processes	Primary Metal Production	Fuel Fired Equipment	Natural Gas: Incinerators
30390023	Industrial Processes	Primary Metal Production	Fuel Fired Equipment	Natural Gas: Flares
30400407	Industrial Processes	Secondary Metal Production	Lead	Pot Furnace Heater: Natural Gas
30490003	Industrial Processes	Secondary Metal Production	Fuel Fired Equipment	Natural Gas: Process Heaters
30490013	Industrial Processes	Secondary Metal Production	Fuel Fired Equipment	Natural Gas: Incinerators
30490023	Industrial Processes	Secondary Metal Production	Fuel Fired Equipment	Natural Gas: Flares
30490033	Industrial Processes	Secondary Metal Production	Fuel Fired Equipment	Natural Gas: Furnaces
30500206	Industrial Processes	Mineral Products	Asphalt Concrete	Asphalt Heater: Natural Gas
30505020	Industrial Processes	Mineral Products	Asphalt Processing (Blowing)	Asphalt Heater: Natural Gas
30590003	Industrial Processes	Mineral Products	Fuel Fired Equipment	Natural Gas: Process Heaters
30590013	Industrial Processes	Mineral Products	Fuel Fired Equipment	Natural Gas: Incinerators
30590023	Industrial Processes	Mineral Products	Fuel Fired Equipment	Natural Gas: Flares
30790003	Industrial Processes	Pulp and Paper and Wood Products	Fuel Fired Equipment	Natural Gas: Process Heaters
30790013	Industrial Processes	Pulp and Paper and Wood Products	Fuel Fired Equipment	Natural Gas: Incinerators
30790023	Industrial Processes	Pulp and Paper and Wood Products	Fuel Fired Equipment	Natural Gas: Flares
30890003	Industrial Processes	Rubber and Miscellaneous Plastics Products	Fuel Fired Equipment	Natural Gas: Process Heaters
30890013	Industrial Processes	Rubber and Miscellaneous Plastics Products	Fuel Fired Equipment	Natural Gas: Incinerators
30890023	Industrial Processes	Rubber and Miscellaneous Plastics Products	Fuel Fired Equipment	Natural Gas: Flares
30990003	Industrial Processes	Fabricated Metal Products	Fuel Fired Equipment	Natural Gas: Process Heaters
30990013	Industrial Processes	Fabricated Metal Products	Fuel Fired Equipment	Natural Gas: Incinerators
30990023	Industrial Processes	Fabricated Metal Products	Fuel Fired Equipment	Natural Gas: Flares
31000404	Industrial Processes	Oil and Gas Production	Process Heaters	Natural Gas
31000414	Industrial Processes	Oil and Gas Production	Process Heaters	Natural Gas: Steam Generators
31390003	Industrial Processes	Electrical Equipment	Process Heaters	Natural Gas
39000602	Industrial Processes	In-process Fuel Use	Natural Gas	Cement Kiln/Dryer
39000603	Industrial Processes	In-process Fuel Use	Natural Gas	Lime Kiln
39000605	Industrial Processes	In-process Fuel Use	Natural Gas	Metal Melting **
39000689	Industrial Processes	In-process Fuel Use	Natural Gas	General
39000699	Industrial Processes	In-process Fuel Use	Natural Gas	General
39900601	Industrial Processes	Miscellaneous Manufacturing Industries	Process Heater/Furnace	Natural Gas
39990003	Industrial Processes	Miscellaneous Manufacturing	Miscellaneous Manufacturing	Natural Gas: Process Heaters

Point SCC	SCC1 DESC	SCC3 DESC	SCC6 DESC	SCC8 DESC
		Industries	Industries	
39990013	Industrial Processes	Miscellaneous Manufacturing Industries	Miscellaneous Manufacturing Industries	Natural Gas: Incinerators
39990023	Industrial Processes	Miscellaneous Manufacturing Industries	Miscellaneous Manufacturing Industries	Natural Gas: Flares
40201001	Petroleum and Solvent Evaporation	Surface Coating Operations	Coating Oven Heater	Natural Gas
40290013	Petroleum and Solvent Evaporation	Surface Coating Operations	Fuel Fired Equipment	Natural Gas: Incinerator/Afterburner
40290023	Petroleum and Solvent Evaporation	Surface Coating Operations	Fuel Fired Equipment	Natural Gas: Flares
49090013	Petroleum and Solvent Evaporation	Organic Solvent Evaporation	Fuel Fired Equipment	Natural Gas: Incinerators
49090023	Petroleum and Solvent Evaporation	Organic Solvent Evaporation	Fuel Fired Equipment	Natural Gas: Flares
50390006	Waste Disposal	Solid Waste Disposal - Industrial	Auxiliary Fuel/No Emissions	Natural Gas
2102007000 – Industrial; Liquified Petroleum Gas (LPG); Total: All Boiler Types				
10201001	External Combustion Boilers	Industrial	Liquified Petroleum Gas (LPG)	Butane
10201002	External Combustion Boilers	Industrial	Liquified Petroleum Gas (LPG)	Propane
10201003	External Combustion Boilers	Industrial	Liquified Petroleum Gas (LPG)	Butane/Propane Mixture: Specify Percent Butane in Comments
10500110	External Combustion Boilers	Space Heaters	Industrial	Liquified Petroleum Gas (LPG)
20201001	Internal Combustion Engines	Industrial	Liquified Petroleum Gas (LPG)	Propane: Reciprocating
20201002	Internal Combustion Engines	Industrial	Liquified Petroleum Gas (LPG)	Butane: Reciprocating
20201005	Internal Combustion Engines	Industrial	Liquified Petroleum Gas (LPG)	Reciprocating: Crankcase Blowby
20201006	Internal Combustion Engines	Industrial	Liquified Petroleum Gas (LPG)	Reciprocating: Evaporative Losses (Fuel Storage and Delivery System)
20201007	Internal Combustion Engines	Industrial	Liquified Petroleum Gas (LPG)	Reciprocating: Exhaust
20201008	Internal Combustion Engines	Industrial	Liquified Petroleum Gas (LPG)	Turbine: Evaporative Losses (Fuel Storage and Delivery System)
20201009	Internal Combustion Engines	Industrial	Liquified Petroleum Gas (LPG)	Turbine: Exhaust
20201011	Internal Combustion Engines	Industrial	Liquified Petroleum Gas (LPG)	Turbine
20201012	Internal Combustion Engines	Industrial	Liquified Petroleum Gas (LPG)	Reciprocating Engine
20201013	Internal Combustion Engines	Industrial	Liquified Petroleum Gas (LPG)	Turbine: Cogeneration
20201014	Internal Combustion Engines	Industrial	Liquified Petroleum Gas (LPG)	Reciprocating Engine: Cogeneration
27300320	Internal Combustion Engines	Off-highway LPG-fueled Engines	Industrial Equipment	Industrial Fork Lift: Liquified Petroleum Gas (LPG)
30290005	Industrial Processes	Food and Agriculture	Fuel Fired Equipment	Liquified Petroleum Gas (LPG): Process Heaters
30490035	Industrial Processes	Secondary Metal Production	Fuel Fired Equipment	Propane: Furnaces
30500209	Industrial Processes	Mineral Products	Asphalt Concrete	Asphalt Heater: LPG
30505023	Industrial Processes	Mineral Products	Asphalt Processing (Blowing)	Asphalt Heater: LP Gas
30590005	Industrial Processes	Mineral Products	Fuel Fired Equipment	Liquified Petroleum Gas (LPG): Process Heaters
30600107	Industrial Processes	Petroleum Industry	Process Heaters	LPG-fired
30600905	Industrial Processes	Petroleum Industry	Flares	Liquified Petroleum Gas

Point SCC	SCC1 DESC	SCC3 DESC	SCC6 DESC	SCC8 DESC
30609905	Industrial Processes	Petroleum Industry	Incinerators	Liquified Petroleum Gas
30890004	Industrial Processes	Rubber and Miscellaneous Plastics Products	Fuel Fired Equipment	Liquified Petroleum Gas (LPG); Process Heaters
31000406	Industrial Processes	Oil and Gas Production	Process Heaters	Propane/Butane
39001089	Industrial Processes	In-process Fuel Use	Liquified Petroleum Gas	General
39001099	Industrial Processes	In-process Fuel Use	Liquified Petroleum Gas	General
39901001	Industrial Processes	Miscellaneous Manufacturing Industries	Process Heater/Furnace	LPG
40201004	Petroleum and Solvent Evaporation	Surface Coating Operations	Coating Oven Heater	Liquified Petroleum Gas (LPG)
50390010	Waste Disposal	Solid Waste Disposal - Industrial	Auxiliary Fuel/No Emissions	Liquified Petroleum Gas (LPG)
2102008000 – Industrial; Wood; Total: All Boiler Types				
10200902	External Combustion Boilers	Industrial	Wood/Bark Waste	Wood/Bark-fired Boiler
10200903	External Combustion Boilers	Industrial	Wood/Bark Waste	Wood-fired Boiler - Wet Wood (>=20% moisture)
10200905	External Combustion Boilers	Industrial	Wood/Bark Waste	Wood/Bark-fired Boiler (< 50,000 Lb Steam) **
10200906	External Combustion Boilers	Industrial	Wood/Bark Waste	Wood-fired Boiler (< 50,000 Lb Steam) **
10200907	External Combustion Boilers	Industrial	Wood/Bark Waste	Wood Cogeneration
10200908	External Combustion Boilers	Industrial	Wood/Bark Waste	Wood-fired Boiler - Dry Wood (<20% moisture)
10200910	External Combustion Boilers	Industrial	Wood/Bark Waste	Fuel cell/Dutch oven boilers **
10200911	External Combustion Boilers	Industrial	Wood/Bark Waste	Stoker boilers **
10200912	External Combustion Boilers	Industrial	Wood/Bark Waste	Fluidized bed combustion boiler
39000989	Industrial Processes	In-process Fuel Use	Wood	General
39000999	Industrial Processes	In-process Fuel Use	Wood	General: Wood
2102011000 – Industrial; Kerosene; Total: All Boiler Types				
20200901	Internal Combustion Engines	Industrial	Kerosene/Naphtha (Jet Fuel)	Turbine
20200902	Internal Combustion Engines	Industrial	Kerosene/Naphtha (Jet Fuel)	Reciprocating
20200905	Internal Combustion Engines	Industrial	Kerosene/Naphtha (Jet Fuel)	Reciprocating: Crankcase Blowby
20200906	Internal Combustion Engines	Industrial	Kerosene/Naphtha (Jet Fuel)	Reciprocating: Evaporative Losses (Fuel Storage and Delivery System)
20200907	Internal Combustion Engines	Industrial	Kerosene/Naphtha (Jet Fuel)	Reciprocating: Exhaust
20200908	Internal Combustion Engines	Industrial	Kerosene/Naphtha (Jet Fuel)	Turbine: Evaporative Losses (Fuel Storage and Delivery System)
20200909	Internal Combustion Engines	Industrial	Kerosene/Naphtha (Jet Fuel)	Turbine: Exhaust

Table 5. Commercial/Institutional Fuel Combustion Crosswalk for Point Source Subtractions

Point SCC	SCC1 DESC	SCC3 DESC	SCC6 DESC	SCC8 DESC
2103001000 & 2103002000 -- Commercial/Institutional; Anthracite Coal; Total: All Boiler Types and Bituminous/Subbituminous Coal; Total: All Boiler Types				
10300101	External Combustion Boilers	Commercial/Institutional	Anthracite Coal	Pulverized Coal
10300102	External Combustion Boilers	Commercial/Institutional	Anthracite Coal	Traveling Grate (Overfeed) Stoker
10300103	External Combustion Boilers	Commercial/Institutional	Anthracite Coal	Hand-fired
10300203	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Cyclone Furnace (Bituminous Coal)
10300205	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Pulverized Coal: Wet Bottom (Bituminous Coal)
10300206	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Pulverized Coal: Dry Bottom (Bituminous Coal)
10300207	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Overfeed Stoker (Bituminous Coal)
10300208	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Underfeed Stoker (Bituminous Coal)
10300209	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Spreader Stoker (Bituminous Coal)
10300211	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Overfeed Stoker **
10300214	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Hand-fired (Bituminous Coal)
10300216	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Pulverized Coal: Dry Bottom (Tangential) (Bituminous Coal)
10300217	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Atmospheric Fluidized Bed Combustion: Bubbling Bed (Bituminous Coal)
10300218	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Atmospheric Fluidized Bed Combustion: Circulating Bed (Bitum. Coal)
10300221	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Pulverized Coal: Wet Bottom (Subbituminous Coal)
10300222	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Pulverized Coal: Dry Bottom (Subbituminous Coal)
10300223	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Cyclone Furnace (Subbituminous Coal)
10300224	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Spreader Stoker (Subbituminous Coal)
10300225	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Traveling Grate (Overfeed) Stoker (Subbituminous Coal)
10300226	External Combustion Boilers	Commercial/Institutional	Bituminous/Subbituminous Coal	Pulverized Coal: Dry Bottom Tangential (Subbituminous Coal)
10500202	External Combustion Boilers	Space Heaters	Commercial/Institutional	Coal **
50190002	Waste Disposal	Solid Waste Disposal - Government	Auxiliary Fuel/No Emissions	Coal
50290002	Waste Disposal	Solid Waste Disposal - Commercial/Institutional	Auxiliary Fuel/No Emissions	Coal
2103004000 -- Commercial/Institutional; Distillate Oil; Total: Boilers and IC Engines				
10300501	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil
10300502	External Combustion Boilers	Commercial/Institutional	Distillate Oil	10-100 Million Btu/hr **
10300503	External Combustion Boilers	Commercial/Institutional	Distillate Oil	< 10 Million Btu/hr **
10300504	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grade 4 Oil
10500205	External Combustion Boilers	Space Heaters	Commercial/Institutional	Distillate Oil
20300101	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating
20300102	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Turbine

Point SCC	SCC1 DESC	SCC3 DESC	SCC6 DESC	SCC8 DESC
20300105	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating: Crankcase Blowby
20300106	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating: Evaporative Losses (Fuel Storage and Delivery System)
20300107	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating: Exhaust
20300108	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Turbine: Evaporative Losses (Fuel Storage and Delivery System)
20300109	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Turbine: Exhaust
50190005	Waste Disposal	Solid Waste Disposal - Government	Auxiliary Fuel/No Emissions	Distillate Oil
50290005	Waste Disposal	Solid Waste Disposal - Commercial/Institutional	Auxiliary Fuel/No Emissions	Distillate Oil
2103005000 -- Commercial/Institutional; Residual Oil; Total: All Boiler Types				
10300401	External Combustion Boilers	Commercial/Institutional	Residual Oil	Grade 6 Oil
10300402	External Combustion Boilers	Commercial/Institutional	Residual Oil	10-100 Million Btu/hr **
10300403	External Combustion Boilers	Commercial/Institutional	Residual Oil	< 10 Million Btu/hr **
10300404	External Combustion Boilers	Commercial/Institutional	Residual Oil	Grade 5 Oil
2103006000 -- Commercial/Institutional; Natural Gas; Total: Boilers and IC Engines				
10300601	External Combustion Boilers	Commercial/Institutional	Natural Gas	> 100 Million Btu/hr
10300602	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr
10300603	External Combustion Boilers	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr
10500206	External Combustion Boilers	Space Heaters	Commercial/Institutional	Natural Gas
20300201	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating
20300202	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Turbine
20300203	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Turbine: Cogeneration
20300204	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Cogeneration
20300205	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating: Crankcase Blowby
20300206	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating: Evaporative Losses (Fuel Delivery System)
20300207	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating: Exhaust
20300208	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Turbine: Evaporative Losses (Fuel Delivery System)
20300209	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Turbine: Exhaust
50190006	Waste Disposal	Solid Waste Disposal - Government	Auxiliary Fuel/No Emissions	Natural Gas
50290006	Waste Disposal	Solid Waste Disposal - Commercial/Institutional	Auxiliary Fuel/No Emissions	Natural Gas
2103007000 -- Commercial/Institutional; Liquid Petroleum Gas; Total: All Combustor Types				
10301001	External Combustion Boilers	Commercial/Institutional	Liquified Petroleum Gas (LPG)	Butane
10301002	External Combustion Boilers	Commercial/Institutional	Liquified Petroleum Gas (LPG)	Propane
10301003	External Combustion Boilers	Commercial/Institutional	Liquified Petroleum Gas (LPG)	Butane/Propane Mixture: Specify Percent Butane in Comments
10500210	External Combustion Boilers	Space Heaters	Commercial/Institutional	Liquified Petroleum Gas (LPG)
20301001	Internal Combustion Engines	Commercial/Institutional	Liquified Petroleum Gas (LPG)	Propane: Reciprocating
20301002	Internal Combustion Engines	Commercial/Institutional	Liquified Petroleum Gas (LPG)	Butane: Reciprocating

Point SCC	SCC1 DESC	SCC3 DESC	SCC6 DESC	SCC8 DESC
20301005	Internal Combustion Engines	Commercial/Institutional	Liquified Petroleum Gas (LPG)	Reciprocating: Crankcase Blowby
20301006	Internal Combustion Engines	Commercial/Institutional	Liquified Petroleum Gas (LPG)	Reciprocating: Evaporative Losses (Fuel Storage and Delivery System)
20301007	Internal Combustion Engines	Commercial/Institutional	Liquified Petroleum Gas (LPG)	Reciprocating: Exhaust
50190010	Waste Disposal	Solid Waste Disposal - Government	Auxiliary Fuel/No Emissions	Liquified Petroleum Gas (LPG)
50290010	Waste Disposal	Solid Waste Disposal - Commercial/Institutional	Auxiliary Fuel/No Emissions	Liquified Petroleum Gas (LPG)
2103008000 -- Commercial/Institutional; Wood; Total: All Boiler Types				
10300902	External Combustion Boilers	Commercial/Institutional	Wood/Bark Waste	Wood/Bark-fired Boiler
10300903	External Combustion Boilers	Commercial/Institutional	Wood/Bark Waste	Wood-fired Boiler - Wet Wood (>=20% moisture)
10300908	External Combustion Boilers	Commercial/Institutional	Wood/Bark Waste	Wood-fired Boiler - Dry Wood (<20% moisture)
10300910	External Combustion Boilers	Commercial/Institutional	Wood/Bark Waste	Fuel cell/Dutch oven boilers **
10300911	External Combustion Boilers	Commercial/Institutional	Wood/Bark Waste	Stoker boilers **
10300912	External Combustion Boilers	Commercial/Institutional	Wood/Bark Waste	Fluidized bed combustion boilers
10500209	External Combustion Boilers	Space Heaters	Commercial/Institutional	Wood
2103011000 -- Commercial/Institutional; Kerosene; Total: All Combustor Types				
20300901	Internal Combustion Engines	Commercial/Institutional	Kerosene/Naphtha (Jet Fuel)	Turbine: JP-4
20300908	Internal Combustion Engines	Commercial/Institutional	Kerosene/Naphtha (Jet Fuel)	Turbine: Evaporative Losses (Fuel Storage and Delivery System)
20300909	Internal Combustion Engines	Commercial/Institutional	Kerosene/Naphtha (Jet Fuel)	Turbine: Exhaust
50100603	Waste Disposal	Solid Waste Disposal - Government	Fire Fighting	Structure: Kerosene

5. Emission Factors

Table 6 presents the criteria pollutant emission factors that will be applied to fuel consumption estimates to calculate ICI combustion area source emissions. Except as noted below, all criteria air pollutant emission factors were from an EPA database of emission factors that will be used in preparing the 2008 nonpoint source NEI (Huntley, 2009).² Wood combustion emission factors were compiled from *AP-42* (EPA, 2003). Because there are no NH₃ emission factors for ICI fuel combustion available in the 2008 NEI emission factor database, *AP-42*, or EPA's WebFIRE, Pechan will use emission factors reported in an NH₃ emissions Emission Inventory Improvement Program (EIIP) guidance document (Pechan, 2004). Pechan compared the 2008 NEI emission factors with those used to develop the last area source NEI (2002), as well as those listed by the Eastern Regional Technical Advisory Committee (ERTAC) for potential use by States in developing their area source inventories (ERTAC, 2009). With a few notable exceptions, the 2008 NEI emission factors are the same as those used for the 2002 NEI.³ The PM emission factors for natural gas and LPG combustion are the major exceptions. Because the 2002 emission factors were deemed too high because of artifact formation in the test method (method 202) during stack testing, EPA developed a set of SCC-specific adjustment factors to apply to the 2002 NEI to better reflect PM emissions from these fuels.⁴ In preparation for the 2008 NEI, EPA developed revised natural gas and LPG PM emission factors by applying these adjustment factors to the 2002 NEI emission factors.

Pechan does not plan to use the ERTAC emission factors that differ from the 2008 NEI factors because of the lack of documentation as to the source of the ERTAC factors. For PM emissions from ICI bituminous coal combustion, ERTAC specifically notes that their proposed emission factors reflect combustion in an uncontrolled overfeed stoker. The EPA PM emission factors for these categories, which were obtained from *AP-42*, reflect coal-fired boilers with controls (specifically, multiple cyclones with or without fly ash reinjection). Because an analysis of an EPA boiler database indicates that most small coal-fired boilers have PM controls (with cyclones as the most common type of control), EPA's PM emission factors will be used in preparing the CENRAP emission inventory (ERG, 2002).

For greenhouse gases (GHGs), Pechan will use the emission factors from EPA's State Greenhouse Gas Inventory Tool, which incorporates the EIIP's GHG emissions inventory guidelines for States (EPA, 2009). Table 7 displays the State-specific CO₂ emission factors for each ICI combustion area source category, and Table 8 presents the N₂O and CH₄ emission factors by source category. Because SIT assumes that CO₂ emissions from U.S. biomass combustion need not be inventoried, the SIT does not provide CO₂ emission factors for ICI wood combustion.⁵ Therefore, Pechan will use the wood combustion CO₂ emission factors reported in *AP-42* (EPA, 2003).

² All criteria pollutant emission factors were rounded to two decimal places.

³ The 2002 NEI documentation provides citations to the *AP-42* source for each emission factor (Pechan, 2006).

⁴ These factors reduce PM emissions by more than 90 percent.

⁵ As stated in the EIIP fossil fuel combustion CO₂ emissions guidance: "...biomass fuels are generally grown on a sustainable basis. ... In cases where biomass fuels are not grown sustainably, GHG emissions are captured as a land use change."

Table 6. Criteria Pollutant Emission Factors for ICI Combustion Area Source Categories

SCC	Description	Emission Factor Units	VOC	NO _x	CO	SO ₂	PM2.5-FIL	PM10-FIL	PM-CON	NH ₃
2102001000	Industrial Anthracite Coal	lb/ton	0.3	9	0.6	39 * S%	0.48 * A%	1.1 * A%	0.08	0.03
2102002000	Industrial Bitum/Subbitum Coal	lb/ton	0.05	11	5	38 * S%	1.4	12	1.04	0.03
2102004000	Industrial Distillate Oil	lb/1000 gal	0.2	20	5	142 * S%	0.25	1	1.3	0.8
2102005000	Industrial Residual Oil	lb/1000 gal	0.28	55	5	157 * S%	4.67 * (1.12 * S% + 0.37)	7.17 * (1.12 * S% + 0.37)	1.5	0.8
2102006000	Industrial Natural Gas	lb/MMcf	5.5	100	84	0.6	0.11	0.13	0.32	3.2
2102007000	Industrial LPG ¹	lb/1000 bbl	20.09	365.32	306.87	2.19	0.39	0.47	1.18	1.79
2102008000	Industrial Wood ²	lb/MMBtu	0.017	0.22	0.6	0.025	0.43	0.5	0.017	0.086 ³
2102011000	Industrial Kerosene	lb/1000 gal	0.19	19.29	4.82	142 * S%	0.24	0.96	1.25	0.771
2103001000	Comm/Inst Anthracite Coal	lb/ton	0.3	9	0.6	39 * S%	0.48 * A%	1.1 * A%	0.08	0.03
2103002000	Comm/Inst Bitum/Subbitum Coal	lb/ton	0.05	11	5	38 * S%	1.4	12	1.04	0.03
2103004000	Comm/Inst Distillate Oil	lb/1000 gal	0.34	20	5	142 * S%	0.83	1.08	1.3	0.8
2103005000	Comm/Inst Residual Oil	lb/1000 gal	1.13	55	5	157 * S%	1.92 * (1.12 * S% + 0.37)	5.17 * (1.12 * S% + 0.37)	1.5	0.8
2103006000	Comm/Inst Natural Gas	lb/MMcf	5.5	100	84	0.6	0.11	0.13	0.32	0.49
2103007000	Comm/Inst LPG	lb/1000 bbl	20.09	365.32	306.87	2.19	0.39	0.47	1.18	1.79
2103008000	Comm/Inst Wood ¹	lb/MMBtu	0.017	0.22	0.6	0.025	0.43	0.5	0.017	0.086 ³
2103011000	Comm/Inst Kerosene	lb/1000 gal	0.33	19.29	4.82	142 * S%	0.8	1.04	1.25	0.771

Source: Unless otherwise noted, 2008 nonpoint source NEI (Huntley, 2009).

Notes: ¹ Emission factors from Commercial/Institutional LPG.

² Emission factors from AP-42, Section 1.6 (Wood Residue Combustion in Boilers).

³ Emission factor from Pechan, 2004; reported in lb/tons.

In addition to above, PM2.5-PRI and PM10-PRI will be computed as the sum of condensable PM emissions and PM25-FIL/PM10-FIL emissions.

lb = ton

gal = gallon

MMcf = million cubic feet

MMBtu = million British thermal units

bbl = barrels

S = sulfur content

A = ash content

Table 7. Carbon Dioxide Emission Factors for Industrial and Commercial/Institutional Coal Combustion (lb/MMBtu)

State	Industrial CO ₂	Commercial/Institutional CO ₂
Arkansas	205.70	227.41
Iowa	207.72	204.42
Kansas	203.02	204.89
Louisiana	204.78	227.41
Minnesota	209.70	208.27
Missouri	203.98	204.53
Nebraska	209.66	212.70
Oklahoma	205.99	205.92
Texas	210.39	206.25

Source: EPA State Greenhouse Gas Inventory Tool (EPA, 2009).

Table 8. Additional Greenhouse Gas Emission Factors for ICI Combustion Area Source Categories (lb/MMBtu)

SCC	Description	CO ₂	CH ₄	N ₂ O
2102001000	Industrial Anthracite Coal	see above	0.02210	0.00331
2102002000	Industrial Bitum/Subbitum Coal	see above	0.02210	0.00331
2102004000	Industrial Distillate Oil	161.11	0.00663	0.00133
2102005000	Industrial Residual Oil	173.54	0.00663	0.00133
2102006000	Industrial Natural Gas	116.86	0.00209	0.00021
2103007000	Industrial LPG	137.32	0.00663	0.00133
2102008000	Industrial Wood ¹	195	0.06280	0.00837
2102011000	Industrial Kerosene	159.28	0.00663	0.00133
2103001000	Comm/Inst Anthracite Coal	see above	0.02210	0.00331
2103002000	Comm/Inst Bitum/Subbitum Coal	see above	0.02210	0.00331
2103004000	Comm/Inst Distillate Oil	161.11	0.02210	0.00133
2103005000	Comm/Inst Residual Oil	173.54	0.02210	0.00133
2103006000	Comm/Inst Natural Gas	116.86	0.01047	0.00021
2103007000	Comm/Inst LPG	139.00	0.02210	0.00133
2103008000	Comm/Inst Wood ¹	195	0.62802	0.00837
2103011000	Comm/Inst Kerosene	159.28	0.02210	0.00133

Source: Unless otherwise noted, EPA State Greenhouse Gas Inventory Tool (EPA, 2009).

¹ CO₂ emission factors from AP-42, Section 1.6 - Wood Residue Combustion in Boilers.

6. Coal Sulfur Content

Under a forthcoming task (Task 4), Pechan will evaluate the reliability of various data sources for coal sulfur content before identifying the source(s) that will be used to estimate emissions in this project. Pechan will review potential coal sulfur content data sources, including:

(1) information reported in the point source inventories of each State;⁶ (2) the USGS' U.S. Coal Quality Database (this is the ICI coal sulfur content source used in the 2002 NEI); (3) plant-level data from the Federal Energy Regulatory Commission's (FERC) Form 423;⁷ and (4) State-level data reported in EIA's "Monthly Report of Cost and Quality of Fuels for Electric Plants." Pechan will evaluate these and any other identified alternative data sources for use in this project to ensure that the data are as representative as possible with respect to consuming sector, geography, and time-frame. Any data sets that are deemed equally representative will next be evaluated with respect to level of confidence (i.e., a data source for which estimated coal content is based on more data points than other data sources will be deemed to have higher confidence, and therefore, the preferred data source). Pechan will prepare a memorandum identifying the coal content data sources that were reviewed and a priority ranking of preferred sources based on an evaluation of the aforementioned criteria. The memorandum will identify the preferred approach for characterizing the sulfur content of coal consumption for each ICI area source combustion source category, which will be incorporated into the Excel calculation templates.

7. County Allocation Data

After computing State-level emissions using the data described above, the project requires allocating these emissions to individual counties. There are two allocation approaches that CENRAP is evaluating for this step. The first, which has been used in past inventory efforts including the 2002 NEI, is based on each county's proportion of total State employment for the energy-consuming sectors for each source category. The second is based on estimates of total energy consumption for each sector. For both approaches, the initial step is to identify the economic sectors associated with Industrial fuel combustion, and the economic sectors associated with Commercial/Institutional fuel combustion.

Commercial/Institutional

For area source Commercial/Institutional fuel combustion, the 2002 NEI used employment data in North American Industrial Classification System (NAICS) codes 42, 44-45, 51-54, 56, 61-62, 71-72, and 81 to allocate EIA State Commercial sector energy consumption data to counties.⁸ These NAICS codes suggest that fuel combustion emissions for the following sectors are covered elsewhere in the NEI: Agriculture, Forestry, Fishing and Hunting; Mining; Construction; Manufacturing; Transportation and Warehousing; Management of Companies and Enterprises; and Public Administration. Meanwhile the EIIP area source method abstracts for Commercial/Institutional fuel combustion categories identify Standard Industrial Classification (SIC) codes 50-99 as representing the Commercial/Institutional sector. These SIC codes indicate that the following is the comprehensive list of non-Commercial sectors: Agriculture, Forestry, Fishing and Hunting; Mining; Construction; Manufacturing; and Transportation, Communications, Electric, Gas, and Sanitary Services.

⁶ Iowa has stated that they did not report coal sulfur content information in their 2002 point source inventory.

⁷ Note that these data include Commercial and Industrial combined heat and power producers whose total fossil-fueled nameplate generating capacity is 50 or more megawatts.

⁸ These NAICS codes are also listed in ERTAC's area source methodology worksheet (ERTAC, 2009).

Documentation for the SEDS is not entirely clear on the NAICS codes associated with the Commercial sector, defining the Commercial sector as “an energy-consuming sector that consists of service-providing facilities and equipment of: businesses; Federal, State, and local governments; and other private and public organizations, such as religious, social, or fraternal groups. The Commercial sector includes institutional living quarters. It also includes sewage treatment facilities.” In an attempt to further clarify the NAICS codes associated with this sector, Pechan performed additional research into the original data sources that are used to create the SEDS.

Because data for the SEDS originates with data collected from EIA fuel sector-specific surveys of energy suppliers,⁹ Pechan reviewed these survey forms/instructions for further details on what SEDS considers Commercial sector use of each fuel. This review found that the surveys/guidance do not always provide further clarity. In addition, the EIA has admitted that energy suppliers may use their own account classifications as well as EIA guidance in determining whether a particular account belongs in the Residential, Commercial, Industrial, or Transportation sector. The only source of NAICS-code based EIA definitions of the Commercial energy sector is a “rough crosswalk” between Commercial building types and NAICS codes developed for EIA’s Commercial Building Energy Consumption Survey (CBECS). With the exception of NAICS code 814 (Private Households), this crosswalk links all NAICS codes between 42 and 92 with Commercial building energy consumption, suggesting that both the EIIP guidance and NEI definitions of the Commercial fuel combustion source category are missing some sectors, while also including one sector that should not be included (Private Households). In lieu of additional information, data for the CBECS-identified NAICS codes (42 through 92 with exception of 814) will be used to allocate SEDS energy consumption data to individual counties.

Industrial

Although there are no EIIP guidance documents for area source Industrial fuel combustion, the 2002 NEI used the Manufacturing sector NAICS codes (31-33) to represent this category. Unlike the Commercial sector, the SEDS documentation provides a clear listing of the NAICS codes associated with SEDS Industrial energy consumption data: “the industrial sector encompasses the following types of activity: Manufacturing (NAICS codes 31–33); Agriculture, Forestry, Fishing and Hunting (NAICS code 11); Mining, including Oil and Gas Extraction (NAICS code 21); and Construction (NAICS code 23).” As noted earlier, this indicates that a portion of Industrial sector consumption is already accounted for in other emission inventory sectors. It is expected that non-Manufacturing sector Industrial fuel consumption will largely be eliminated via the nonroad subtractions described earlier. Therefore, Pechan will not expand the list of NAICS codes used to represent the area source Industrial fuel combustion category beyond the Manufacturing sector NAICS codes (31-33).

Standard Employment-Based Approach

⁹ For natural gas, for example – EIA-176 “Annual Report of Natural and Supplemental Gas Supply and Disposition.”

In keeping with EIIP guidance and past EPA practice, employment data can be used to allocate State-level emission estimates to counties. Each year the Census Bureau releases *County Business Patterns* (CBP), a county level data set of employment by NAICS code (Census, 2009). The CBP county-level employment estimates for 2002 can be compiled for the appropriate NAICS codes noted above. Due to concerns with releasing confidential business information, the CBP withholds values for a given county/NAICS code if it would be possible to identify individual businesses from these values. In such cases, the CBP reports a letter code, representing a particular employment size range. To estimate data for withheld counties/NAICS codes, Pechan used the following procedure.

1. County-level employment for counties with reported values are totaled by State for the applicable NAICS code.
2. Value from step 1 is subtracted from the State employment value for the NAICS code.
3. Each of the withheld counties is assigned an initial employment estimate reflecting the midpoint of the CBP range code (e.g., code A, which reflects 1-19 employees, is assigned an estimate of 10 employees).
4. The initial employment estimates from step 3 are then summed to the State level.
5. The value from step 2 is divided by the value from step 4 to yield an adjustment factor to apply to the initial employment estimates to yield employment values that will sum to the State employment total for the applicable NAICS code.
6. The final county-level employment values are estimated by multiplying the initial employment estimates from step 3 by the step 5 adjustment factors.

Example: NAICS 31-33 (Manufacturing)

fipsstate	fipscty	naics	empflag	emp
23	001	31----		6,774
23	003	31----		3,124
23	005	31----		10,333
23	007	31----		1,786
23	009	31----		1,954
23	011	31----		2,535
23	013	31----		1,418
23	015	31----	F	0
23	017	31----		2,888
23	019	31----		4,522
23	021	31----		948
23	023	31----	I	0
23	025	31----		4,322
23	027	31----		1,434
23	029	31----		1,014
23	031	31----		9,749

1. The total of employees not including counties 015 and 023 is 52,801.
2. The State-level CBP reports 59,322 employees in NAICS 31----the difference is 6,521.
3. County 015 is given a midpoint of 1,750 (since range code F is 1,000-2,499) and County 023 is given a midpoint of 17,500.

4. State total for these two counties is 19,250.
5. $6,521/19,250 = 0.33875$.
6. The final employment estimate for county 015 is $1,750 * 0.33875 = 593$. The county 023 final employment estimate is computed as $17,500 * 0.33875 = 5,928$.

Energy Intensity-Adjusted Approach

Employment-based county allocation methods lead to overrepresentation of energy consumption in counties with sectors that have high employment but low energy intensities (measured on a Btu per employee basis), and vice-versa. Therefore, Pechan recommended that CENRAP consider utilizing energy use per employee values by NAICS code to refine the employment-based county allocation approach. Because State/NAICS code-level energy use data are not available, this approach relies on 2002 national energy consumption data by NAICS code as reported by EIA in *Annual Energy Outlook* (EIA, 2005). Energy intensity values are computed by dividing these Btu-based energy consumption estimates by 2002 national employment data by NAICS code. The resulting intensity values are then multiplied by county/NAICS code-level employment estimates to estimate total county energy consumption by NAICS code. These values are then summed for the appropriate Industrial and Commercial/Institutional fuel combustion NAICS codes. The resulting county-level total Industrial and total Commercial/Institutional energy consumption estimates can then be used to apportion State-level Industrial fuel combustion emissions and State-level Commercial/Institutional fuel combustion emissions to each county.

Table 9 displays a comparison of the county-level allocation percentages computed for Missouri from the two methods. This table is sorted in descending order based on each county's Industrial fuel combustion employment-based allocation percentage. The cells shaded in green indicate that the energy intensity-adjusted approach reflects a greater than 50 percent higher allocation of activity/emissions to the given county versus the employment-based approach. Similarly, cells shaded in tan indicate that the energy-based approach reflects an allocation that is more than 50 percent lower than that resulting from the employment-based approach. The table shows that the Industrial sector allocations differ more substantially between the two methods in Missouri. Focusing on the Industrial sector allocation percentages for Jackson county, for example, overall Manufacturing sector employment is approximately 10 percent of the Missouri total. However, a much higher percentage of Missouri total Industrial sector energy consumption is estimated for this county (~17 percent). A closer look at the underlying data indicates that this county has a relatively high proportion of total State employment in the Chemicals and Paper industries that are the third and fifth highest energy-intensive manufacturing sector industries. Pechan will provide the information in Table 9 for all CENRAP States when it submits the Task 3 State-level fuel consumption estimates, which are due by April 17.

Table 9. Comparison of County Allocation Approaches for Missouri

County	Industrial			Commercial/Institutional		
	Employment	Energy	Ratio	Employment	Energy	Ratio
St. Louis	17.3%	14.9%	0.9	25.2%	21.8%	0.9
Jackson	10.3%	16.5%	1.6	16.2%	15.2%	0.9
City of St. Louis	8.3%	8.9%	1.1	11.9%	11.4%	1.0
Greene	5.2%	4.5%	0.9	6.0%	6.1%	1.0
St. Charles	4.6%	2.3%	0.5	4.0%	4.1%	1.0
Clay	4.6%	3.4%	0.7	3.3%	3.6%	1.1
Jasper	3.4%	2.5%	0.7	2.0%	2.0%	1.0
Franklin	3.2%	2.5%	0.8	1.0%	1.1%	1.1
Buchanan	2.3%	5.1%	2.2	1.5%	1.5%	1.0
Barry	2.0%	1.3%	0.6	0.4%	0.4%	1.0
Boone	1.7%	0.7%	0.4	2.8%	2.7%	0.9
Pettis	1.6%	1.6%	1.0	0.6%	0.7%	1.2
Cape Girardeau	1.6%	5.5%	3.4	1.6%	1.5%	1.0
Laclede	1.6%	0.4%	0.3	0.3%	0.4%	1.1
Jefferson	1.4%	2.4%	1.7	1.5%	1.8%	1.2
Newton	1.4%	1.2%	0.9	0.5%	0.6%	1.2
Howell	1.2%	0.3%	0.3	0.5%	0.6%	1.2
Cole	1.1%	0.5%	0.4	1.6%	1.5%	0.9
Butler	1.1%	0.4%	0.4	0.6%	0.6%	1.1
Perry	0.9%	0.5%	0.5	0.2%	0.2%	1.0
McDonald	0.9%	0.7%	0.7	0.1%	0.1%	1.3
Marion	0.8%	1.5%	1.8	0.4%	0.5%	1.1
St. Francois	0.8%	1.0%	1.3	0.7%	0.8%	1.0
New Madrid	0.8%	1.7%	2.1	0.1%	0.2%	1.6
Scott	0.8%	0.5%	0.6	0.6%	0.7%	1.1
Stoddard	0.8%	0.4%	0.5	0.3%	0.4%	1.3
Christian	0.7%	0.3%	0.4	0.4%	0.5%	1.2
Nodaway	0.6%	0.6%	1.0	0.3%	0.3%	1.1
Platte	0.6%	0.3%	0.5	1.8%	1.6%	0.9
Audrain	0.6%	0.3%	0.5	0.3%	0.3%	1.1
Phelps	0.6%	0.3%	0.4	0.6%	0.7%	1.3
Linn	0.6%	0.2%	0.4	0.1%	0.2%	1.1
Henry	0.5%	0.3%	0.5	0.2%	0.3%	1.3
Johnson	0.5%	0.3%	0.5	0.4%	0.5%	1.3
Crawford	0.5%	0.2%	0.4	0.2%	0.2%	1.3
Warren	0.5%	0.5%	0.9	0.2%	0.2%	1.1
Ste. Genevieve	0.5%	0.4%	0.8	0.1%	0.2%	1.2
Sullivan	0.5%	0.6%	1.2	0.0%	0.1%	1.4
Barton	0.5%	0.3%	0.6	0.1%	0.2%	1.4
Cass	0.5%	0.5%	1.1	0.7%	0.8%	1.2
Gasconade	0.5%	0.2%	0.5	0.1%	0.2%	1.3
Saline	0.5%	0.4%	0.8	0.3%	0.3%	1.2

County	Industrial			Commercial/Institutional		
	Employment	Energy	Ratio	Employment	Energy	Ratio
Lawrence	0.5%	0.2%	0.5	0.2%	0.4%	1.5
Randolph	0.5%	0.2%	0.5	0.3%	0.4%	1.1
Grundy	0.4%	0.3%	0.7	0.1%	0.2%	1.5
Adair	0.4%	0.2%	0.6	0.3%	0.4%	1.1
Lincoln	0.3%	0.1%	0.4	0.3%	0.4%	1.3
Vernon	0.3%	0.2%	0.4	0.2%	0.3%	1.4
Camden	0.3%	0.1%	0.4	0.6%	0.6%	1.1
Dunklin	0.3%	0.3%	0.8	0.3%	0.4%	1.2
Lafayette	0.3%	0.3%	0.9	0.3%	0.4%	1.2
Osage	0.3%	0.1%	0.4	0.1%	0.1%	1.4
Texas	0.3%	0.2%	0.5	0.2%	0.2%	1.5
Monroe	0.3%	0.1%	0.4	0.1%	0.1%	1.9
Miller	0.3%	0.1%	0.2	0.2%	0.3%	1.2
Webster	0.3%	0.6%	2.2	0.2%	0.2%	1.3
Moniteau	0.3%	0.2%	0.8	0.1%	0.1%	1.3
Callaway	0.3%	0.1%	0.4	0.4%	0.5%	1.2
Pemiscot	0.3%	0.3%	1.2	0.2%	0.2%	1.3
Polk	0.3%	0.1%	0.4	0.3%	0.4%	1.3
Dent	0.2%	0.6%	2.6	0.1%	0.2%	1.2
Livingston	0.2%	0.2%	0.9	0.2%	0.2%	1.2
Washington	0.2%	0.3%	1.3	0.1%	0.2%	1.6
Montgomery	0.2%	0.2%	0.9	0.1%	0.1%	1.4
Pike	0.2%	2.3%	10.5	0.2%	0.2%	1.4
Ripley	0.2%	0.1%	0.6	0.1%	0.1%	1.4
Wright	0.2%	0.1%	0.3	0.1%	0.2%	1.3
Morgan	0.2%	0.1%	0.3	0.1%	0.1%	1.3
Douglas	0.2%	0.1%	0.3	0.1%	0.1%	1.6
Ray	0.2%	0.4%	2.3	0.1%	0.2%	1.4
Cooper	0.2%	0.1%	0.5	0.2%	0.2%	1.3
Taney	0.2%	0.3%	1.5	0.9%	0.9%	1.0
Shannon	0.2%	0.1%	0.5	0.0%	0.0%	1.4
Macon	0.2%	0.3%	1.8	0.1%	0.2%	1.9
Ralls	0.2%	1.6%	10.4	0.1%	0.1%	1.6
Madison	0.2%	0.1%	0.6	0.1%	0.1%	1.3
Wayne	0.1%	0.1%	0.6	0.1%	0.1%	1.3
Dallas	0.1%	0.1%	0.8	0.1%	0.1%	1.0
Carroll	0.1%	0.1%	0.4	0.1%	0.1%	1.4
Bates	0.1%	0.1%	1.3	0.1%	0.2%	1.4
Lewis	0.1%	0.1%	0.5	0.1%	0.1%	1.5
Shelby	0.1%	0.1%	0.7	0.0%	0.1%	2.0
Benton	0.1%	0.1%	1.2	0.1%	0.1%	1.4
Reynolds	0.1%	0.1%	0.8	0.0%	0.1%	1.6
Oregon	0.1%	0.1%	0.8	0.1%	0.1%	1.4
Iron	0.1%	0.0%	0.4	0.1%	0.1%	1.4

County	Industrial			Commercial/Institutional		
	Employment	Energy	Ratio	Employment	Energy	Ratio
Mississippi	0.1%	0.0%	0.3	0.1%	0.1%	1.2
Gentry	0.1%	0.0%	0.3	0.1%	0.1%	1.3
Howard	0.1%	0.2%	2.1	0.1%	0.1%	1.4
Stone	0.1%	0.0%	0.3	0.2%	0.2%	1.2
Carter	0.1%	0.2%	2.7	0.0%	0.0%	1.4
Dade	0.1%	0.0%	0.5	0.1%	0.1%	1.6
Clinton	0.1%	0.0%	0.5	0.2%	0.2%	1.1
Pulaski	0.1%	0.0%	0.2	0.3%	0.4%	1.2
Cedar	0.1%	0.0%	0.5	0.1%	0.1%	1.4
Maries	0.1%	0.5%	8.7	0.1%	0.1%	1.4
Ozark	0.1%	0.0%	0.6	0.0%	0.1%	1.7
Daviess	0.0%	0.0%	0.2	0.0%	0.1%	1.6
Bollinger	0.0%	0.1%	2.3	0.1%	0.1%	1.5
Scotland	0.0%	0.0%	0.5	0.0%	0.1%	2.5
Holt	0.0%	0.2%	4.8	0.0%	0.1%	1.7
Clark	0.0%	0.0%	0.4	0.0%	0.1%	1.8
DeKalb	0.0%	0.2%	4.6	0.1%	0.1%	1.3
Putnam	0.0%	0.0%	1.7	0.0%	0.1%	2.0
Harrison	0.0%	0.0%	0.5	0.1%	0.1%	1.4
Chariton	0.0%	0.0%	0.5	0.1%	0.1%	1.5
Andrew	0.0%	0.0%	0.5	0.1%	0.1%	1.7
Atchison	0.0%	0.0%	0.5	0.1%	0.1%	1.3
Knox	0.0%	0.0%	0.5	0.0%	0.1%	1.8
Hickory	0.0%	0.0%	0.4	0.0%	0.1%	1.7
Worth	0.0%	0.0%	0.4	0.0%	0.0%	2.0
Caldwell	0.0%	0.0%	0.4	0.0%	0.1%	2.1
St. Clair	0.0%	0.0%	0.3	0.1%	0.1%	1.5
Mercer	0.0%	0.0%	0.5	0.0%	0.0%	1.5
Schuyler	0.0%	0.0%	0.2	0.0%	0.0%	2.1

8. Temporal Allocation Data

The EPA provides national default temporal allocation data via the “temporal allocation” section of their Emissions Modeling Clearinghouse (EMCH). For all Industrial sector fuel types, the EPA default is for an equal distribution of annual activity across months. For the Commercial sector, the EPA default is for an equal distribution of annual activity across months for LPG and kerosene, but the EPA default distribution for all other fuel types is as displayed in Table 10.

Table 10. EPA Default Commercial Fuel Combustion Sector Allocation

Month	% Allocation
January	11.7
February	11.7
March	8.3
April	8.3
May	8.3
June	5
July	5
August	5
September	8.3
October	8.3
November	8.3
December	11.7

Note: Excludes LPG and kerosene (equal distribution assumed throughout year).

Pechan researched the availability of more representative (sector, geographic, and/or time-specific) energy consumption data than that used to develop the EMCH’s temporal allocation factors. The following summarizes the available information:

- Natural Gas – State-level volume delivered data are available by month and sector (Industrial versus Commercial) for 2002;
- Coal – national consumption data are available by month and sector (Industrial versus Commercial) for 2002; and
- Petroleum products (i.e., distillate, residual, LPG, kerosene) – regional level product supplied data are available by month for 2002.

Pechan was unable to identify a source reporting sub-annual consumption estimates for wood.

Pechan plans to use EIA’s State-level natural gas deliveries data for 2002 to allocate the annual SEDS data to each month (EIA, 2009b). Given the limitations of the available coal and petroleum product data, and the lack of data for wood, Pechan plans to apply EPA’s monthly default profiles to allocate annual activity/emissions for these fuel types. Because Pechan was unable to identify any source of sub-monthly estimates of ICI energy consumption, the EPA default allocation profiles will be used to develop average weekday, average weekend day, and average weekly emission estimates for each month.

C. CALCULATION TEMPLATES

This section summarizes the draft templates that Pechan has produced to develop the ICI combustion area source emission estimates for CENRAP. CENRAP should not review the actual data in these draft templates at this time because some entries are currently missing or represent “dummy” placeholder values. Pechan will provide completed templates for CENRAP review by April 17 as required under Task 5.

Template 1 – Adjust SEDS Fuel Consumption – this workbook, which reflects the discussion in sections B.1 through B.4, performs the following tasks:

- Computes Industrial sector State-level non-fuel energy consumption estimates by fuel type by applying MECS-based non-fuel percentages to the SEDS total Industrial sector energy consumption estimates;
- Subtracts Industrial and Commercial sector State-level distillate and LPG consumption estimates from a (forthcoming) NONROAD model run for 2002.
- Converts the result of the steps above from their original units to the emission factor units;
- Performs the point source subtractions using 2002 CENRAP point source inventory data and the ICI area source combustion SCC to point source SCC crosswalk;

Template 2 – Apply Emission Factors – this workbook accompanies the discussion in Sections B.5 and B.6 of criteria pollutant and GHG emission factors and associated coal sulfur content assumptions. Reflecting the fact that some emission factors differ by type of coal, this template also estimates the proportion of Industrial and Commercial/Institutional coal that is anthracite versus bituminous/subbituminous in each State. This template will ultimately report the estimated sulfur content of coal consumed in each State.

Template 3 – County Allocations – this workbook, which reflects the Section B.7 discussion, contains the data used to compute both sets of county allocation data (i.e., the county employment data and the total county energy consumption data). This template currently develops actual allocation data for Missouri counties. Ultimately, this template will only include county data for the allocation method that CENRAP chooses to implement in this project. This template also calculates county-level emissions from the Template 2 State-level emission estimates.

Template 4 – Temporal Allocation – this workbook, which reflects the discussion in Section B.8, provides the data that will be used to allocate annual county emissions to monthly, average weekly, average weekday, and average weekend day time periods. It will ultimately perform the necessary calculations to estimate emissions in each period.

D. REFERENCES

- Census, 2009: U.S. Census Bureau, *County Business Patterns*, accessed from <http://www.census.gov/epcd/cbp/index.html>, U.S. Department of Commerce, March 2009.
- EIA, 2009a: Energy Information Administration, “State Energy Data System (SEDS): Consumption, Price, and Expenditure Estimates,” U.S. Department of Energy, accessed from <http://www.eia.doe.gov/emeu/states/seds.html>, March 2009.
- EIA, 2009b: Energy Information Administration, “Natural Gas Navigator – Natural Gas Consumption by End Use,” U.S. Department of Energy, accessed from http://tonto.eia.doe.gov/dnav/ng/ng_cons_sum_dcunusm.htm, March 2009.
- EIA, 2007: Energy Information Administration, “2002 Energy Consumption by Manufacturers–Data Tables,” *2002 Manufacturing Energy Consumption Survey*, U.S. Department of Energy, accessed from <http://www.eia.doe.gov/emeu/mecs/mecs2002/data02/shelltables.html>, issued January 2007.
- EIA, 2005: Energy Information Administration, *Annual Energy Outlook 2005 with Projections to 2025*, U.S. Department of Energy, accessed from <http://www.eia.doe.gov/oiaf/archive/aeo05/index.html>, issued January 2005.
- EPA, 2009: U.S. Environmental Protection Agency, “Emission Inventory Improvement Program, Technical Report Series Volume 8, Estimating Greenhouse Gas Emissions,” accessed from <http://www.epa.gov/ttn/chief/eiip/techreport/volume08/index.html>, March 2009.
- EPA, 2003: U.S. Environmental Protection Agency, *AP 42, Compilation of Air Pollutant Emission Factors, Fifth Edition*, “Volume I, Chapter 1: External Combustion Sources, Section 1.6-Wood Residue in Combustion Boilers,” accessed from <http://www.epa.gov/ttn/chief/ap42/ch01/final/c01s06.pdf>, September 2003.
- ERG, Inc., 2002: Eastern Research Group, “Development of Model Units for the Industrial/Commercial/Institutional Boilers and Process Heaters National Emission Standards for Hazardous Air Pollutants,” prepared for U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, October 2002.
- ERTAC, 2009: Eastern Regional Technical Advisory Committee, “Area Source Comparability, Comparability Spreadsheet with Week 1 Modifications,” accessed from <http://www.ertac.us/>, March 2009.
- Huntley, 2009: Huntley, Roy, U.S. Environmental Protection Agency, “SCCs & emission factors to be used in 2008 NEI to Bollman March 13 2009.mdb [*electronic file*],” March 13, 2009.

Lorenz, 2009: Lorenz, Thomas, Energy Information Administration, personal communication with Andy Bollman, E.H. Pechan & Associates, Inc., March 19, 2009.

Pechan/CEP, 2005: E.H. Pechan & Associates, Inc. and Carolina Environmental Program, "Consolidation of Emissions Inventories (Schedule 9; Work Item 3), Final," prepared for the Central Regional Air Planning Association, April 28, 2005.

Pechan, 2006: E.H. Pechan & Associates, Inc., "Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants," prepared for U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, July 2006.

Pechan, 2004: E.H. Pechan & Associates, Inc. "Estimating Ammonia Emissions from Anthropogenic Nonagricultural Sources - Draft Final Report," prepared for the Emission Inventory Improvement Program, April 2004.

**ATTACHMENT: PRELIMINARY SUMMARY OF
2002 POINT SOURCE ANNUAL THROUGHPUT DATA**

The following table reports 2002 annual point source throughput data associated with the ICI area source categories. The table is sorted in descending order by CENRAP State and area SCC. Cells that are shaded in light blue indicate potentially suspect entries.

Area_SCC	SCC_2	Area SCC_3	StateName	Throughput	ThroughputUnits	Material Code	Material
2102001000	Industrial	Anthracite Coal	ARKANSAS	1,167,890	TON	640	Anthracite
2102002000	Industrial	Bituminous/Subbituminous Coal	ARKANSAS	3,153,027	TON	663	Bituminous Coal
2102004000	Industrial	Distillate Oil	ARKANSAS	8,255,280	E3GAL	44	Diesel
2102004000	Industrial	Distillate Oil	ARKANSAS	0	E3GAL	57	Distillate Oil (Diesel)
2102004000	Industrial	Distillate Oil	ARKANSAS		E3GAL	58	Distillate Oil (No. 2)
2102004000	Industrial	Distillate Oil	ARKANSAS	2,136,217	E3GAL	823	Distillate Oil (No. 1 & 2)
2102004000	Industrial	Distillate Oil	ARKANSAS	6,408,642	E3GAL	825	Distillate Oil (No. 4)
2102005000	Industrial	Residual Oil	ARKANSAS	224,941	E3GAL	279	Residual Oil
2102005000	Industrial	Residual Oil	ARKANSAS	13,587,658	E3GAL	923	Residual Oil (No. 6)
2102005000	Industrial	Residual Oil	ARKANSAS		E3GAL	924	Residual/Crude Oil
2102006000	Industrial	Natural Gas	ARKANSAS	184,838,095	E6FT3	209	Natural Gas
2102006000	Industrial	Natural Gas	ARKANSAS				
2102007000	Industrial	Liquified Petroleum Gas (LPG)	ARKANSAS		E3GAL	178	Liquified Petroleum Gas (LPG)
2102008000	Industrial	Wood	ARKANSAS	56,092,213	TON	15	Wood
2102008000	Industrial	Wood	ARKANSAS	21,798,710	TON	943	Wood/Bark
2103004000	Commercial/Institutional	Distillate Oil	ARKANSAS		E3GAL	57	Distillate Oil (Diesel)
2103006000	Commercial/Institutional	Natural Gas	ARKANSAS	23,912,086	E6FT3	209	Natural Gas
2103008000	Commercial/Institutional	Wood	ARKANSAS	7,655,765	TON	15	Wood
2102001000	Industrial	Anthracite Coal	IOWA	24	E3GAL	255	Propane
2102001000	Industrial	Anthracite Coal	IOWA	98,368	TON	645	Ash
2102002000	Industrial	Bituminous/Subbituminous Coal	IOWA	30,950,000	LB	561	Sludge
2102002000	Industrial	Bituminous/Subbituminous Coal	IOWA	87,110	TON	323	Subbituminous Coal
2102002000	Industrial	Bituminous/Subbituminous Coal	IOWA	3,741,706	TON	717	Coal
2102004000	Industrial	Distillate Oil	IOWA	1,039	E3GAL	44	Diesel
2102004000	Industrial	Distillate Oil	IOWA	0	E3GAL	56	Distillate Oil
2102004000	Industrial	Distillate Oil	IOWA	926	E3GAL	58	Distillate Oil (No. 2)
2102004000	Industrial	Distillate Oil	IOWA	2	E3GAL	255	Propane
2102004000	Industrial	Distillate Oil	IOWA	42	E3GAL	823	Distillate Oil (No. 1 & 2)
2102004000	Industrial	Distillate Oil	IOWA	0	E3LB	44	Diesel
2102004000	Industrial	Distillate Oil	IOWA	5,599	E6BTU	44	Diesel
2102004000	Industrial	Distillate Oil	IOWA	0	E6BTU	56	Distillate Oil
2102004000	Industrial	Distillate Oil	IOWA	0	E6BTU	209	Natural Gas
2102004000	Industrial	Distillate Oil	IOWA	42	E6BTU	823	Distillate Oil (No. 1 & 2)
2102004000	Industrial	Distillate Oil	IOWA	90	E6FT3	209	Natural Gas

Area_SCC	SCC_2	Area_SCC_3	StateName	Throughput	ThroughputUnits	Material Code	Material
2102004000	Industrial	Distillate Oil	IOWA	8	E6GAL	58	Distillate Oil (No. 2)
2102004000	Industrial	Distillate Oil	IOWA	2	E6GAL	823	Distillate Oil (No. 1 & 2)
2102004000	Industrial	Distillate Oil	IOWA	341,800,000	FT3	209	Natural Gas
2102004000	Industrial	Distillate Oil	IOWA	4,758	GAL	5	Water
2102004000	Industrial	Distillate Oil	IOWA	35,967	GAL	44	Diesel
2102004000	Industrial	Distillate Oil	IOWA	613	GAL	56	Distillate Oil
2102004000	Industrial	Distillate Oil	IOWA	459	GAL	58	Distillate Oil (No. 2)
2102004000	Industrial	Distillate Oil	IOWA	330	GAL	209	Natural Gas
2102004000	Industrial	Distillate Oil	IOWA	10,262	GAL	255	Propane
2102004000	Industrial	Distillate Oil	IOWA	339	GAL	823	Distillate Oil (No. 1 & 2)
2102004000	Industrial	Distillate Oil	IOWA	14,123	HP-HR	58	Distillate Oil (No. 2)
2102004000	Industrial	Distillate Oil	IOWA	2,681	HR	44	Diesel
2102004000	Industrial	Distillate Oil	IOWA	29	HR	209	Natural Gas
2102004000	Industrial	Distillate Oil	IOWA	138	HR	268	Raw Material
2102004000	Industrial	Distillate Oil	IOWA	0	KL	44	Diesel
2102004000	Industrial	Distillate Oil	IOWA	0	TON	44	Diesel
2102004000	Industrial	Distillate Oil	IOWA	0	TON	58	Distillate Oil (No. 2)
2102004000	Industrial	Distillate Oil	IOWA	1,628	TON	268	Raw Material
2102004000	Industrial	Distillate Oil	IOWA				
2102005000	Industrial	Residual Oil	IOWA	14	E3GAL	44	Diesel
2102005000	Industrial	Residual Oil	IOWA	0	E3GAL	923	Residual Oil (No. 6)
2102005000	Industrial	Residual Oil	IOWA	438	E3GAL		
2102005000	Industrial	Residual Oil	IOWA	0	GAL	127	Gasoline
2102005000	Industrial	Residual Oil	IOWA	978,215	GAL	279	Residual Oil
2102005000	Industrial	Residual Oil	IOWA	6,000	GAL	823	Distillate Oil (No. 1 & 2)
2102005000	Industrial	Residual Oil	IOWA	188,565	GAL	923	Residual Oil (No. 6)
2102005000	Industrial	Residual Oil	IOWA				
2102006000	Industrial	Natural Gas	IOWA	6,690	E3FT3	209	Natural Gas
2102006000	Industrial	Natural Gas	IOWA	11	E3GAL	58	Distillate Oil (No. 2)
2102006000	Industrial	Natural Gas	IOWA	18,353,512	E6BTU	209	Natural Gas
2102006000	Industrial	Natural Gas	IOWA	248,378	E6BTU	268	Raw Material
2102006000	Industrial	Natural Gas	IOWA	69,899	E6FT3	127	Gasoline
2102006000	Industrial	Natural Gas	IOWA	2,851,074	E6FT3	209	Natural Gas
2102006000	Industrial	Natural Gas	IOWA	0	E6FT3	225	Paint
2102006000	Industrial	Natural Gas	IOWA	21	E6FT3	268	Raw Material

Area_SCC	SCC_2	Area SCC_3	StateName	Throughput	ThroughputUnits	Material Code	Material
2102006000	Industrial	Natural Gas	IOWA	119	E6FT3	315	Starch
2102006000	Industrial	Natural Gas	IOWA	0	E6LB	268	Raw Material
2102006000	Industrial	Natural Gas	IOWA	0	E6LB	281	Resin
2102006000	Industrial	Natural Gas	IOWA	1,818,653,437	FT3	209	Natural Gas
2102006000	Industrial	Natural Gas	IOWA	1,335,666,448	FT3S	209	Natural Gas
2102006000	Industrial	Natural Gas	IOWA	1,320	GAL	189	Material
2102006000	Industrial	Natural Gas	IOWA	73,408	GAL	225	Paint
2102006000	Industrial	Natural Gas	IOWA	46	GAL	255	Propane
2102006000	Industrial	Natural Gas	IOWA	0	GAL	268	Raw Material
2102006000	Industrial	Natural Gas	IOWA	4	GAL	952	Solvents: All
2102006000	Industrial	Natural Gas	IOWA	0	GAL	973	ABS Polymer
2102006000	Industrial	Natural Gas	IOWA	30,621	HR	516	Metal
2102006000	Industrial	Natural Gas	IOWA	7,000	LB	189	Material
2102006000	Industrial	Natural Gas	IOWA	0	LB	225	Paint
2102006000	Industrial	Natural Gas	IOWA	13,848	LB	268	Raw Material
2102006000	Industrial	Natural Gas	IOWA	0	LB	281	Resin
2102006000	Industrial	Natural Gas	IOWA	317	LB	516	Metal
2102006000	Industrial	Natural Gas	IOWA	344,238	TON	209	Natural Gas
2102006000	Industrial	Natural Gas	IOWA	14	TON	225	Paint
2102006000	Industrial	Natural Gas	IOWA	40,230	TON	268	Raw Material
2102006000	Industrial	Natural Gas	IOWA	0	TON	289	Sand
2102006000	Industrial	Natural Gas	IOWA	54	TON	303	Soil
2102006000	Industrial	Natural Gas	IOWA	162	TON	315	Starch
2102006000	Industrial	Natural Gas	IOWA	0	TON	561	Sludge
2102006000	Industrial	Natural Gas	IOWA	0	TON	580	Sulfur Dioxide
2102006000	Industrial	Natural Gas	IOWA			209	Natural Gas
2102006000	Industrial	Natural Gas	IOWA				
2102007000	Industrial	Liquified Petroleum Gas (LPG)	IOWA	0	E3GAL	178	Liquified Petroleum Gas (LPG)
2102007000	Industrial	Liquified Petroleum Gas (LPG)	IOWA	0	E3GAL	255	Propane
2102007000	Industrial	Liquified Petroleum Gas (LPG)	IOWA	2,977	E6BTU	209	Natural Gas
2102007000	Industrial	Liquified Petroleum Gas (LPG)	IOWA	0	E6BTU	255	Propane
2102007000	Industrial	Liquified Petroleum Gas (LPG)	IOWA	0	E6FT3	209	Natural Gas
2102007000	Industrial	Liquified Petroleum Gas (LPG)	IOWA	0	E6LB	268	Raw Material
2102007000	Industrial	Liquified Petroleum Gas (LPG)	IOWA	3	E6LB	281	Resin
2102007000	Industrial	Liquified Petroleum Gas (LPG)	IOWA	7,399	GAL	255	Propane

Area_SCC	SCC_2	Area SCC_3	StateName	Throughput	ThroughputUnits	Material Code	Material
2102007000	Industrial	Liquified Petroleum Gas (LPG)	IOWA				
2102008000	Industrial	Wood	IOWA	13,154	HR	124	Fuel
2102008000	Industrial	Wood	IOWA	6,497	TON	268	Raw Material
2102008000	Industrial	Wood	IOWA	0	TON-YR	717	Coal
2102011000	Industrial	Kerosene	IOWA	0	E3GAL	162	Kerosene
2102011000	Industrial	Kerosene	IOWA	13,717	TON	189	Material
2103002000	Commercial/Institutional	Bituminous/Subbituminous Coal	IOWA	142,485	TON	717	Coal
2103004000	Commercial/Institutional	Distillate Oil	IOWA	26	E3GAL	44	Diesel
2103004000	Commercial/Institutional	Distillate Oil	IOWA	0	E3GAL	56	Distillate Oil
2103004000	Commercial/Institutional	Distillate Oil	IOWA	0	E3GAL	58	Distillate Oil (No. 2)
2103004000	Commercial/Institutional	Distillate Oil	IOWA	18	E3GAL	268	Raw Material
2103004000	Commercial/Institutional	Distillate Oil	IOWA	162	E3GAL	823	Distillate Oil (No. 1 & 2)
2103004000	Commercial/Institutional	Distillate Oil	IOWA	1,033	GAL	44	Diesel
2103004000	Commercial/Institutional	Distillate Oil	IOWA	34,758	GAL	58	Distillate Oil (No. 2)
2103004000	Commercial/Institutional	Distillate Oil	IOWA	0	TON	44	Diesel
2103004000	Commercial/Institutional	Distillate Oil	IOWA				
2103005000	Commercial/Institutional	Residual Oil	IOWA	1	E3GAL	58	Distillate Oil (No. 2)
2103005000	Commercial/Institutional	Residual Oil	IOWA	21	E3GAL		
2103005000	Commercial/Institutional	Residual Oil	IOWA	332,184	GAL	279	Residual Oil
2103005000	Commercial/Institutional	Residual Oil	IOWA	4,340	GAL	923	Residual Oil (No. 6)
2103006000	Commercial/Institutional	Natural Gas	IOWA	51,606	BTU	209	Natural Gas
2103006000	Commercial/Institutional	Natural Gas	IOWA	719,333	E3FT3	209	Natural Gas
2103006000	Commercial/Institutional	Natural Gas	IOWA	1	E3GAL	58	Distillate Oil (No. 2)
2103006000	Commercial/Institutional	Natural Gas	IOWA	6	E3GAL	209	Natural Gas
2103006000	Commercial/Institutional	Natural Gas	IOWA	0	E6BTU	209	Natural Gas
2103006000	Commercial/Institutional	Natural Gas	IOWA	28	E6FT3	127	Gasoline
2103006000	Commercial/Institutional	Natural Gas	IOWA	28	E6FT3	189	Material
2103006000	Commercial/Institutional	Natural Gas	IOWA	465,334	E6FT3	209	Natural Gas
2103006000	Commercial/Institutional	Natural Gas	IOWA	16	E6FT3	268	Raw Material
2103006000	Commercial/Institutional	Natural Gas	IOWA	0	E6GAL	823	Distillate Oil (No. 1 & 2)
2103006000	Commercial/Institutional	Natural Gas	IOWA	8,169,622	FT3	209	Natural Gas
2103006000	Commercial/Institutional	Natural Gas	IOWA	576	GAL	58	Distillate Oil (No. 2)
2103006000	Commercial/Institutional	Natural Gas	IOWA	0	GAL	209	Natural Gas
2103006000	Commercial/Institutional	Natural Gas	IOWA	831	GAL	255	Propane
2103006000	Commercial/Institutional	Natural Gas	IOWA	24	HR	44	Diesel

Area_SCC	SCC_2	Area_SCC_3	StateName	Throughput	ThroughputUnits	Material Code	Material
2103006000	Commercial/Institutional	Natural Gas	IOWA	13,632	TON	209	Natural Gas
2103006000	Commercial/Institutional	Natural Gas	IOWA	0	TON	225	Paint
2103006000	Commercial/Institutional	Natural Gas	IOWA	16,178	TON	724	Coke
2103006000	Commercial/Institutional	Natural Gas	IOWA				
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	IOWA	0	E3GAL	178	Liquified Petroleum Gas (LPG)
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	IOWA	0	E3GAL	255	Propane
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	IOWA	0	E3GAL	268	Raw Material
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	IOWA	15	E6FT3	209	Natural Gas
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	IOWA	0	E6GAL	268	Raw Material
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	IOWA	88,575	GAL	255	Propane
2103008000	Commercial/Institutional	Wood	IOWA	7,142	TON	15	Wood
2102004000	Industrial	Distillate Oil	KANSAS	1,148	E3GAL	44	Diesel
2102004000	Industrial	Distillate Oil	KANSAS	92,275	E3GAL	56	Distillate Oil
2102004000	Industrial	Distillate Oil	KANSAS	83	E3GAL	823	Distillate Oil (No. 1 & 2)
2102004000	Industrial	Distillate Oil	KANSAS	2,437	E3HP-HR	945	Work
2102004000	Industrial	Distillate Oil	KANSAS	22,979	E6BTU	44	Diesel
2102004000	Industrial	Distillate Oil	KANSAS	488	E6BTU	58	Distillate Oil (No. 2)
2102004000	Industrial	Distillate Oil	KANSAS	1,082,040	HP-HR	945	Work
2102004000	Industrial	Distillate Oil	KANSAS	233	HR	209	Natural Gas
2102004000	Industrial	Distillate Oil	KANSAS	716	HR	945	Work
2102004000	Industrial	Distillate Oil	KANSAS	10,248,064	KW-HR	828	Electricity
2102004000	Industrial	Distillate Oil	KANSAS	0			
2102005000	Industrial	Residual Oil	KANSAS	380	E3GAL	922	Residual Oil (No. 5)
2102005000	Industrial	Residual Oil	KANSAS	3,402	E3GAL	923	Residual Oil (No. 6)
2102005000	Industrial	Residual Oil	KANSAS	48	E6BTU	923	Residual Oil (No. 6)
2102006000	Industrial	Natural Gas	KANSAS	287	E3FT3	209	Natural Gas
2102006000	Industrial	Natural Gas	KANSAS	19	E3GAL	189	Material
2102006000	Industrial	Natural Gas	KANSAS	2,594,753	E3HP-HR	945	Work
2102006000	Industrial	Natural Gas	KANSAS	17,010,214	E6BTU	209	Natural Gas
2102006000	Industrial	Natural Gas	KANSAS	282,631	E6FT3	209	Natural Gas
2102006000	Industrial	Natural Gas	KANSAS	39	EACH	189	Material
2102006000	Industrial	Natural Gas	KANSAS	288,425,458	HP-HR	945	Work
2102006000	Industrial	Natural Gas	KANSAS	100	HR	127	Gasoline
2102006000	Industrial	Natural Gas	KANSAS	856,039	HR	209	Natural Gas
2102006000	Industrial	Natural Gas	KANSAS	100,217	HR	945	Work

Area_SCC	SCC_2	Area_SCC_3	StateName	Throughput	ThroughputUnits	Material Code	Material
2102006000	Industrial	Natural Gas	KANSAS	269	LB	209	Natural Gas
2102006000	Industrial	Natural Gas	KANSAS	10,000	LB	635	Ammonia
2102006000	Industrial	Natural Gas	KANSAS	7	TON	209	Natural Gas
2102006000	Industrial	Natural Gas	KANSAS	25	TON	305	Solvent
2102006000	Industrial	Natural Gas	KANSAS	0			
2102007000	Industrial	Liquified Petroleum Gas (LPG)	KANSAS	5	E3GAL	178	Liquified Petroleum Gas (LPG)
2102007000	Industrial	Liquified Petroleum Gas (LPG)	KANSAS	54	E3GAL	178	Liquified Petroleum Gas (LPG)
2102007000	Industrial	Liquified Petroleum Gas (LPG)	KANSAS	0	E3GAL	189	Material
2102007000	Industrial	Liquified Petroleum Gas (LPG)	KANSAS	99	E3GAL	255	Propane
2103004000	Commercial/Institutional	Distillate Oil	KANSAS	22	E3GAL	44	Diesel
2103004000	Commercial/Institutional	Distillate Oil	KANSAS	29	E3GAL	823	Distillate Oil (No. 1 & 2)
2103004000	Commercial/Institutional	Distillate Oil	KANSAS	0			
2103006000	Commercial/Institutional	Natural Gas	KANSAS	3,150	E6FT3	209	Natural Gas
2103006000	Commercial/Institutional	Natural Gas	KANSAS	0	EACH	189	Material
2103006000	Commercial/Institutional	Natural Gas	KANSAS	107,768	HR	209	Natural Gas
2103006000	Commercial/Institutional	Natural Gas	KANSAS	7,200	HR	945	Work
2103006000	Commercial/Institutional	Natural Gas	KANSAS	0			
2102002000	Industrial	Bituminous/Subbituminous Coal	LOUISIANA				
2102004000	Industrial	Distillate Oil	LOUISIANA				
2102005000	Industrial	Residual Oil	LOUISIANA				
2102006000	Industrial	Natural Gas	LOUISIANA				
2102007000	Industrial	Liquified Petroleum Gas (LPG)	LOUISIANA				
2102008000	Industrial	Wood	LOUISIANA				
2103004000	Commercial/Institutional	Distillate Oil	LOUISIANA				
2103005000	Commercial/Institutional	Residual Oil	LOUISIANA				
2103006000	Commercial/Institutional	Natural Gas	LOUISIANA				
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	LOUISIANA				
2102002000	Industrial	Bituminous/Subbituminous Coal	MINNESOTA	6,138,274	E6BTU	142	Heat
2102002000	Industrial	Bituminous/Subbituminous Coal	MINNESOTA	10,584	HR	830	Equipment
2102002000	Industrial	Bituminous/Subbituminous Coal	MINNESOTA	582,249	TON	323	Subbituminous Coal
2102002000	Industrial	Bituminous/Subbituminous Coal	MINNESOTA	81,870	TON	663	Bituminous Coal
2102004000	Industrial	Distillate Oil	MINNESOTA	232	E3GAL	44	Diesel
2102004000	Industrial	Distillate Oil	MINNESOTA	4,003	E3GAL	57	Distillate Oil (Diesel)
2102004000	Industrial	Distillate Oil	MINNESOTA	1,071	E3GAL	823	Distillate Oil (No. 1 & 2)
2102004000	Industrial	Distillate Oil	MINNESOTA	535	E3GAL	825	Distillate Oil (No. 4)

Area_SCC	SCC_2	Area_SCC_3	StateName	Throughput	ThroughputUnits	Material Code	Material
2102004000	Industrial	Distillate Oil	MINNESOTA	586	E6BTU	142	Heat
2102004000	Industrial	Distillate Oil	MINNESOTA	1,353,017	GAL	57	Distillate Oil (Diesel)
2102004000	Industrial	Distillate Oil	MINNESOTA	342,565	GAL	823	Distillate Oil (No. 1 & 2)
2102004000	Industrial	Distillate Oil	MINNESOTA				
2102005000	Industrial	Residual Oil	MINNESOTA	362	E3GAL	279	Residual Oil
2102005000	Industrial	Residual Oil	MINNESOTA	370	E3GAL	922	Residual Oil (No. 5)
2102005000	Industrial	Residual Oil	MINNESOTA	21,526	E3GAL	923	Residual Oil (No. 6)
2102005000	Industrial	Residual Oil	MINNESOTA	34,637	E6BTU	142	Heat
2102006000	Industrial	Natural Gas	MINNESOTA	6,400,498	E6BTU	142	Heat
2102006000	Industrial	Natural Gas	MINNESOTA	39,046	E6FT3	209	Natural Gas
2102006000	Industrial	Natural Gas	MINNESOTA	7,395,200	FT3	209	Natural Gas
2102006000	Industrial	Natural Gas	MINNESOTA	19,936,121,225	GAL	209	Natural Gas
2102006000	Industrial	Natural Gas	MINNESOTA	155,328	HR	830	Equipment
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MINNESOTA	94,000	BTU	142	Heat
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MINNESOTA	1,212	E3GAL	255	Propane
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MINNESOTA	209	E3GAL	675	Butane
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MINNESOTA	274	E6BTU	142	Heat
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MINNESOTA	266,584	GAL	255	Propane
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MINNESOTA	626	HR	830	Equipment
2102008000	Industrial	Wood	MINNESOTA	4,675,962	E6BTU	142	Heat
2102008000	Industrial	Wood	MINNESOTA	16,467	HR	830	Equipment
2102008000	Industrial	Wood	MINNESOTA	120,057	TON	15	Wood
2102008000	Industrial	Wood	MINNESOTA	89,216	TON	943	Wood/Bark
2102011000	Industrial	Kerosene	MINNESOTA	12	E3GAL	159	Jet Fuel
2103001000	Commercial/Institutional	Anthracite Coal	MINNESOTA				
2103002000	Commercial/Institutional	Bituminous/Subbituminous Coal	MINNESOTA	2,648	E6BTU	142	Heat
2103002000	Commercial/Institutional	Bituminous/Subbituminous Coal	MINNESOTA	184,324	TON	323	Subbituminous Coal
2103002000	Commercial/Institutional	Bituminous/Subbituminous Coal	MINNESOTA	51,658	TON	663	Bituminous Coal
2103004000	Commercial/Institutional	Distillate Oil	MINNESOTA	1,197	E3GAL	57	Distillate Oil (Diesel)
2103004000	Commercial/Institutional	Distillate Oil	MINNESOTA	1,334	E3GAL	823	Distillate Oil (No. 1 & 2)
2103004000	Commercial/Institutional	Distillate Oil	MINNESOTA	29	E3GAL	825	Distillate Oil (No. 4)
2103005000	Commercial/Institutional	Residual Oil	MINNESOTA	1,695	E3GAL	922	Residual Oil (No. 5)
2103005000	Commercial/Institutional	Residual Oil	MINNESOTA	3,303	E3GAL	923	Residual Oil (No. 6)
2103006000	Commercial/Institutional	Natural Gas	MINNESOTA	8,623,850	E6BTU	142	Heat
2103006000	Commercial/Institutional	Natural Gas	MINNESOTA	19,921	E6FT3	209	Natural Gas

Area_SCC	SCC_2	Area_SCC_3	StateName	Throughput	ThroughputUnits	Material Code	Material
2103006000	Commercial/Institutional	Natural Gas	MINNESOTA	174,979	HR	830	Equipment
2103006000	Commercial/Institutional	Natural Gas	MINNESOTA				
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	MINNESOTA	3,033	E3GAL	255	Propane
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	MINNESOTA	4,614	E6BTU	142	Heat
2103008000	Commercial/Institutional	Wood	MINNESOTA	1,096	TON	15	Wood
2103008000	Commercial/Institutional	Wood	MINNESOTA	246,551	TON	943	Wood/Bark
2102002000	Industrial	Bituminous/Subbituminous Coal	MISSOURI	20,843	TON	174	Lime
2102002000	Industrial	Bituminous/Subbituminous Coal	MISSOURI	0	TON	189	Material
2102002000	Industrial	Bituminous/Subbituminous Coal	MISSOURI	271,022	TON	663	Bituminous Coal
2102002000	Industrial	Bituminous/Subbituminous Coal	MISSOURI				
2102004000	Industrial	Distillate Oil	MISSOURI	0	E2LB	253	Product
2102004000	Industrial	Distillate Oil	MISSOURI	77,335	E3GAL	44	Diesel
2102004000	Industrial	Distillate Oil	MISSOURI	1,146	E3GAL	56	Distillate Oil
2102004000	Industrial	Distillate Oil	MISSOURI	3,922	E3GAL	57	Distillate Oil (Diesel)
2102004000	Industrial	Distillate Oil	MISSOURI	1,462,931	E3GAL	58	Distillate Oil (No. 2)
2102004000	Industrial	Distillate Oil	MISSOURI	0	E3GAL	352	Toluene
2102004000	Industrial	Distillate Oil	MISSOURI	641	E3GAL	823	Distillate Oil (No. 1 & 2)
2102004000	Industrial	Distillate Oil	MISSOURI	0	E3GAL	825	Distillate Oil (No. 4)
2102004000	Industrial	Distillate Oil	MISSOURI	0	E3GAL	868	Liquid
2102004000	Industrial	Distillate Oil	MISSOURI	0	E3GAL	908	Petroleum Distillate
2102004000	Industrial	Distillate Oil	MISSOURI	27	E3GAL-YR	58	Distillate Oil (No. 2)
2102004000	Industrial	Distillate Oil	MISSOURI	0	E3GAL-YR	127	Gasoline
2102004000	Industrial	Distillate Oil	MISSOURI	10	E3GAL-YR	192	Methanol
2102004000	Industrial	Distillate Oil	MISSOURI	20	E6FT3	209	Natural Gas
2102004000	Industrial	Distillate Oil	MISSOURI	1	E6GAL	4	Wastewater
2102004000	Industrial	Distillate Oil	MISSOURI	0	EACH	364	Unit
2102004000	Industrial	Distillate Oil	MISSOURI	235	MILE	368	Vehicle
2102004000	Industrial	Distillate Oil	MISSOURI	24	TON	133	Grain
2102004000	Industrial	Distillate Oil	MISSOURI	0	TON	174	Lime
2102004000	Industrial	Distillate Oil	MISSOURI	1,462,933	TON	189	Material
2102004000	Industrial	Distillate Oil	MISSOURI	1	TON	189	Material
2102004000	Industrial	Distillate Oil	MISSOURI	13	TON	253	Product
2102004000	Industrial	Distillate Oil	MISSOURI	226	TON	268	Raw Material
2102004000	Industrial	Distillate Oil	MISSOURI	0	TON	311	Soybean Meal
2102004000	Industrial	Distillate Oil	MISSOURI	5	TON	849	Hot Mix Asphalt

Area_SCC	SCC_2	Area SCC_3	StateName	Throughput	ThroughputUnits	Material Code	Material
2102004000	Industrial	Distillate Oil	MISSOURI				
2102005000	Industrial	Residual Oil	MISSOURI	345	E3GAL	279	Residual Oil
2102005000	Industrial	Residual Oil	MISSOURI	9	E3GAL	922	Residual Oil (No. 5)
2102005000	Industrial	Residual Oil	MISSOURI	1,512	E3GAL	923	Residual Oil (No. 6)
2102005000	Industrial	Residual Oil	MISSOURI	2	E3GAL	924	Residual/Crude Oil
2102005000	Industrial	Residual Oil	MISSOURI	30	TON	174	Lime
2102005000	Industrial	Residual Oil	MISSOURI	0	TON	189	Material
2102005000	Industrial	Residual Oil	MISSOURI	0	TON	849	Hot Mix Asphalt
2102005000	Industrial	Residual Oil	MISSOURI				
2102006000	Industrial	Natural Gas	MISSOURI	84	ACRE-YR	320	Storage Area
2102006000	Industrial	Natural Gas	MISSOURI	0	BALE	740	Cotton
2102006000	Industrial	Natural Gas	MISSOURI	25	E2LB	253	Product
2102006000	Industrial	Natural Gas	MISSOURI	16	E3EACH	654	Batteries
2102006000	Industrial	Natural Gas	MISSOURI	0	E3FT3	189	Material
2102006000	Industrial	Natural Gas	MISSOURI	15	E3GAL	44	Diesel
2102006000	Industrial	Natural Gas	MISSOURI	63	E3GAL	56	Distillate Oil
2102006000	Industrial	Natural Gas	MISSOURI	233	E3GAL	57	Distillate Oil (Diesel)
2102006000	Industrial	Natural Gas	MISSOURI	56	E3GAL	58	Distillate Oil (No. 2)
2102006000	Industrial	Natural Gas	MISSOURI	21	E3GAL	178	Liquified Petroleum Gas (LPG)
2102006000	Industrial	Natural Gas	MISSOURI	24	E3GAL	189	Material
2102006000	Industrial	Natural Gas	MISSOURI	133	E3GAL	255	Propane
2102006000	Industrial	Natural Gas	MISSOURI	123	E3GAL	823	Distillate Oil (No. 1 & 2)
2102006000	Industrial	Natural Gas	MISSOURI	0	E3GAL-YR	58	Distillate Oil (No. 2)
2102006000	Industrial	Natural Gas	MISSOURI	79	E3GAL-YR	127	Gasoline
2102006000	Industrial	Natural Gas	MISSOURI	2	E3GAL-YR	374	Crude Oil
2102006000	Industrial	Natural Gas	MISSOURI	11	E3GAL-YR	865	Jet Kerosene
2102006000	Industrial	Natural Gas	MISSOURI	190	E3GAL-YR	868	Liquid
2102006000	Industrial	Natural Gas	MISSOURI	5,202	E3GAL-YR	908	Petroleum Distillate
2102006000	Industrial	Natural Gas	MISSOURI	254,692	E6FT3	209	Natural Gas
2102006000	Industrial	Natural Gas	MISSOURI	0	EACH	364	Unit
2102006000	Industrial	Natural Gas	MISSOURI	206	EACH	368	Vehicle
2102006000	Industrial	Natural Gas	MISSOURI	97	EACH	712	Circuit Boards
2102006000	Industrial	Natural Gas	MISSOURI	26	GAL	151	Ink
2102006000	Industrial	Natural Gas	MISSOURI	12	GAL	189	Material
2102006000	Industrial	Natural Gas	MISSOURI	9	GAL	305	Solvent

Area_SCC	SCC_2	Area_SCC_3	StateName	Throughput	ThroughputUnits	Material Code	Material
2102006000	Industrial	Natural Gas	MISSOURI	375	GAL	720	Coating
2102006000	Industrial	Natural Gas	MISSOURI	5	MILE	368	Vehicle
2102006000	Industrial	Natural Gas	MISSOURI	32	TON	93	Ethylene Oxide
2102006000	Industrial	Natural Gas	MISSOURI	59	TON	133	Grain
2102006000	Industrial	Natural Gas	MISSOURI	153	TON	174	Lime
2102006000	Industrial	Natural Gas	MISSOURI	1,780	TON	189	Material
2102006000	Industrial	Natural Gas	MISSOURI	456	TON	189	Material
2102006000	Industrial	Natural Gas	MISSOURI	15	TON	224	P2O5
2102006000	Industrial	Natural Gas	MISSOURI	121	TON	253	Product
2102006000	Industrial	Natural Gas	MISSOURI	73	TON	268	Raw Material
2102006000	Industrial	Natural Gas	MISSOURI	2	TON	289	Sand
2102006000	Industrial	Natural Gas	MISSOURI	293	TON	305	Solvent
2102006000	Industrial	Natural Gas	MISSOURI	348	TON	306	Solvent in Coating
2102006000	Industrial	Natural Gas	MISSOURI	65	TON	311	Soybean Meal
2102006000	Industrial	Natural Gas	MISSOURI	0	TON	315	Starch
2102006000	Industrial	Natural Gas	MISSOURI	6	TON	516	Metal
2102006000	Industrial	Natural Gas	MISSOURI	116	TON	516	Metal
2102006000	Industrial	Natural Gas	MISSOURI	0	TON	673	Brick
2102006000	Industrial	Natural Gas	MISSOURI	1	TON	699	Charge
2102006000	Industrial	Natural Gas	MISSOURI	13	TON	723	Coating Mix
2102006000	Industrial	Natural Gas	MISSOURI				
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	4,610	E3GAL	178	Liquified Petroleum Gas (LPG)
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	12,560	E3GAL	255	Propane
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	9	E3GAL-YR	374	Crude Oil
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	122	E3GAL-YR	908	Petroleum Distillate
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	2	E3LB	77	Electrode
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	9	GAL	305	Solvent
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	39	GAL	720	Coating
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	186	MILE	368	Vehicle
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	0	TON	15	Wood
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	0	TON	133	Grain
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	37	TON	189	Material
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	29	TON	268	Raw Material
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	10	TON	291	Sawdust
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	0	TON	306	Solvent in Coating

Area_SCC	SCC_2	Area_SCC_3	StateName	Throughput	ThroughputUnits	Material Code	Material
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	0	TON	723	Coating Mix
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI	0	TON	849	Hot Mix Asphalt
2102007000	Industrial	Liquified Petroleum Gas (LPG)	MISSOURI				
2102008000	Industrial	Wood	MISSOURI	13,640	MILE	368	Vehicle
2102008000	Industrial	Wood	MISSOURI	435,597	TON	15	Wood
2102008000	Industrial	Wood	MISSOURI	366	TON	18	Wood Waste
2102008000	Industrial	Wood	MISSOURI	133,848	TON	943	Wood/Bark
2102011000	Industrial	Kerosene	MISSOURI	115	E3GAL	159	Jet Fuel
2102011000	Industrial	Kerosene	MISSOURI	0	GAL	305	Solvent
2102011000	Industrial	Kerosene	MISSOURI	0	MILE	368	Vehicle
2102011000	Industrial	Kerosene	MISSOURI				
2103002000	Commercial/Institutional	Bituminous/Subbituminous Coal	MISSOURI	20,339	TON	663	Bituminous Coal
2103002000	Commercial/Institutional	Bituminous/Subbituminous Coal	MISSOURI				
2103004000	Commercial/Institutional	Distillate Oil	MISSOURI	0	E3GAL	44	Diesel
2103004000	Commercial/Institutional	Distillate Oil	MISSOURI	423	E3GAL	56	Distillate Oil
2103004000	Commercial/Institutional	Distillate Oil	MISSOURI	1,295	E3GAL	57	Distillate Oil (Diesel)
2103004000	Commercial/Institutional	Distillate Oil	MISSOURI	8	E3GAL	127	Gasoline
2103004000	Commercial/Institutional	Distillate Oil	MISSOURI	26,744	E3GAL	823	Distillate Oil (No. 1 & 2)
2103004000	Commercial/Institutional	Distillate Oil	MISSOURI	6	E3GAL	825	Distillate Oil (No. 4)
2103004000	Commercial/Institutional	Distillate Oil	MISSOURI	12	E6FT3	209	Natural Gas
2103004000	Commercial/Institutional	Distillate Oil	MISSOURI	0	MILE	368	Vehicle
2103004000	Commercial/Institutional	Distillate Oil	MISSOURI	1	TON	180	Logs
2103004000	Commercial/Institutional	Distillate Oil	MISSOURI	0	TON	253	Product
2103004000	Commercial/Institutional	Distillate Oil	MISSOURI	1	TON	291	Sawdust
2103004000	Commercial/Institutional	Distillate Oil	MISSOURI	0	TON	306	Solvent in Coating
2103004000	Commercial/Institutional	Distillate Oil	MISSOURI				
2103005000	Commercial/Institutional	Residual Oil	MISSOURI	719	E3GAL	279	Residual Oil
2103005000	Commercial/Institutional	Residual Oil	MISSOURI	11	E3GAL	922	Residual Oil (No. 5)
2103005000	Commercial/Institutional	Residual Oil	MISSOURI	32	E3GAL	923	Residual Oil (No. 6)
2103005000	Commercial/Institutional	Residual Oil	MISSOURI	4	E3GAL-YR	58	Distillate Oil (No. 2)
2103005000	Commercial/Institutional	Residual Oil	MISSOURI	2	E6FT3	209	Natural Gas
2103005000	Commercial/Institutional	Residual Oil	MISSOURI				
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	8	ACRE-YR	320	Storage Area
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	125	E3GAL	57	Distillate Oil (Diesel)
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	60	E3GAL	58	Distillate Oil (No. 2)

Area_SCC	SCC_2	Area_SCC_3	StateName	Throughput	ThroughputUnits	Material Code	Material
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	1	E3GAL	127	Gasoline
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	1	E3GAL	305	Solvent
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	282	E3GAL-YR	58	Distillate Oil (No. 2)
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	69	E3GAL-YR	127	Gasoline
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	40,033	E6FT3	209	Natural Gas
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	62	GAL	189	Material
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	141	GAL	720	Coating
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	95	MILE	368	Vehicle
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	30	TON	65	Dried Sludge
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	5	TON	129	Glaze
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	29	TON	133	Grain
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	17	TON	151	Ink
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	0	TON	180	Logs
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	41	TON	189	Material
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	6	TON	224	P2O5
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	16	TON	253	Product
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	355	TON	306	Solvent in Coating
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	39	TON	308	Solvent in Ink
2103006000	Commercial/Institutional	Natural Gas	MISSOURI	8	TON	874	Medical Waste
2103006000	Commercial/Institutional	Natural Gas	MISSOURI				
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	MISSOURI	25	E3GAL	178	Liquified Petroleum Gas (LPG)
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	MISSOURI	24,781	E3GAL	255	Propane
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	MISSOURI	9	E6FT3	209	Natural Gas
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	MISSOURI	1	TON	253	Product
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	MISSOURI				
2103008000	Commercial/Institutional	Wood	MISSOURI	25,448	TON	15	Wood
2103008000	Commercial/Institutional	Wood	MISSOURI	128	TON	943	Wood/Bark
2102002000	Industrial	Bituminous/Subbituminous Coal	NEBRASKA	45,820	TON		
2102004000	Industrial	Distillate Oil	NEBRASKA	137,269	E3GAL		
2102004000	Industrial	Distillate Oil	NEBRASKA				
2102005000	Industrial	Residual Oil	NEBRASKA	268	E3GAL		
2102006000	Industrial	Natural Gas	NEBRASKA	319,058	E3FT3		
2102006000	Industrial	Natural Gas	NEBRASKA	7,733,748	E6FT3		
2102006000	Industrial	Natural Gas	NEBRASKA	232	MASS	1	Waste Material
2102006000	Industrial	Natural Gas	NEBRASKA				

Area_SCC	SCC_2	Area_SCC_3	StateName	Throughput	ThroughputUnits	Material Code	Material
2102007000	Industrial	Liquified Petroleum Gas (LPG)	NEBRASKA	48	E3GAL		
2102008000	Industrial	Wood	NEBRASKA	1,141	TON		
2103004000	Commercial/Institutional	Distillate Oil	NEBRASKA	0	E3GAL		
2103006000	Commercial/Institutional	Natural Gas	NEBRASKA	168,142	E6FT3		
2103006000	Commercial/Institutional	Natural Gas	NEBRASKA	22	MASS	1	Waste Material
2103006000	Commercial/Institutional	Natural Gas	NEBRASKA				
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	NEBRASKA	4,866	E3GAL		
2103008000	Commercial/Institutional	Wood	NEBRASKA	9,398	TON		
2102001000	Industrial	Anthracite Coal	OKLAHOMA	645			
2102002000	Industrial	Bituminous/Subbituminous Coal	OKLAHOMA	2,181,492			
2102004000	Industrial	Distillate Oil	OKLAHOMA	25,021			
2102005000	Industrial	Residual Oil	OKLAHOMA	1,463			
2102006000	Industrial	Natural Gas	OKLAHOMA	10,908,513			
2102007000	Industrial	Liquified Petroleum Gas (LPG)	OKLAHOMA	0			
2102008000	Industrial	Wood	OKLAHOMA	114,619			
2103004000	Commercial/Institutional	Distillate Oil	OKLAHOMA	21			
2103006000	Commercial/Institutional	Natural Gas	OKLAHOMA	228,899			
2102002000	Industrial	Bituminous/Subbituminous Coal	TEXAS				
2102004000	Industrial	Distillate Oil	TEXAS				
2102005000	Industrial	Residual Oil	TEXAS				
2102006000	Industrial	Natural Gas	TEXAS				
2102007000	Industrial	Liquified Petroleum Gas (LPG)	TEXAS				
2102008000	Industrial	Wood	TEXAS				
2102011000	Industrial	Kerosene	TEXAS				
2103004000	Commercial/Institutional	Distillate Oil	TEXAS				
2103006000	Commercial/Institutional	Natural Gas	TEXAS				
2103007000	Commercial/Institutional	Liquified Petroleum Gas (LPG)	TEXAS				
2103008000	Commercial/Institutional	Wood	TEXAS				
2103011000	Commercial/Institutional	Kerosene	TEXAS				