



## 2006 Area Source Emissions Inventory Methodology

### 050 - INDUSTRIAL FUEL COMBUSTION (DISTILLATE, RESIDUAL, AND LPG) INDUSTRIAL STATIONARY IC ENGINES (DIESEL AND OTHER FUEL)

#### I. Purpose

This document describes the Area Source Methodology used to estimate emissions of carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), fine particulate matter less than 10 microns (PM<sub>10</sub>), volatile organic compounds (VOC), and sulfur oxides (SO<sub>x</sub>) from the industrial combustion of distillate, residual, and liquefied petroleum gas (LPG) fuels in boilers, heaters and furnaces as well as the combustion of diesel and “other” fuels in stationary IC engines in the San Joaquin Valley Air Basin. “Other” fuels are fuel types other than diesel, distillate, residual, LPG/propane or natural gas.

An area source category is a collection of similar emission units within a geographic area (i.e., a County). An area source category collectively represents individual sources that are small and numerous, and that may not have been inventoried as specific point, mobile, or biogenic sources. The California Air Resources Board (CARB) has grouped these individual sources with other like sources into these area source categories. These source categories are grouped in such a way that they can be estimated collectively using one methodology.

#### II. Applicability

The emission calculations from this Area Source Methodology apply to facilities that are identified by the following Category of Emission Source (CES) code(s) and Reconciliation Emission Inventory Code(s) (REIC):

**Table 1. Emission Inventory Codes.**

CES	REIC	Description
66803	050-995-1220-0000	Industrial Distillate Oil Combustion
83071	050-995-1500-0000	Industrial Residual Oil Combustion
66795	050-995-0120-0000	Industrial LPG Combustion
82099	050-040-1200-0000	Industrial Stationary IC Engines-Diesel
82107	050-040-0012-0000	Industrial Stationary IC Engines-Other Fuel

#### III. Point Source Reconciliation

Emissions from the area source inventory and point source inventory are reconciled against each other to prevent double counting. This is done using relationships created by the California Air Resources Board (ARB) between the area source REIC and the point sources' Standard Industry Classification (SIC) code and emissions process Source Category Code (SCC) combinations. This source category consists of only point sources (no area source emissions). The SIC/SCC combinations in our point source inventory that reconcile to this source category are listed in Appendix A.

#### IV. Methodology Description

Distillate fuel, residual fuel, and LPG are all products of the distillation of petroleum. These fuels are commonly used for boilers, heaters, furnaces (aggregated as boilers) and internal combustion (IC) engines. This methodology estimates emissions due to the combustion of these fuel types within the industrial sector. It does not include emissions from diesel/LPG fuel used for transportation, as those are included in the mobile source inventory maintained by CARB. For this methodology, distillate fuel is assumed to be diesel fuel (No. 2 fuel oil) and residual fuel is assumed to be fuel oil No. 6, as these are the most common forms of these fuel types.

The District permits all IC engines rated 50 hp or greater and all boilers rated 5 MMBtu/hr or greater. It is assumed that due to rising fuel costs the consumption of distillate and residual fuels in units below District permit thresholds are not cost-effective.<sup>1</sup> Therefore, all emissions units within REICs 050-995-1220-0000 (Industrial Distillate Oil Combustion) and 050-995-1500-0000 (Industrial Residual Oil Combustion) are assumed to be permitted and included in the District's point source inventory. **The California Air Resources Board (CARB) already estimates emissions from all diesel IC engines in REIC 099-040-1200-0000 (Stationary Engines - Diesel). Therefore, in order to avoid double counting emissions from diesel IC Engines, the District will not estimate emissions for REIC 050-040-1200-0000.**

LPG is typically consumed in the industrial sector when natural gas is not readily available or as a secondary fuel for facilities with interruptible natural gas supplies. REIC 050-995-0120-0000 (Industrial LPG Combustion) includes both boilers and IC engines and, as noted above, all units at and above a certain threshold are permitted by the District.<sup>1</sup> At this time, this source category shall consist of only point sources because there is currently insufficient information to determine how much LPG is consumed within the District in units that fall below the permitting threshold.

REIC 050-040-0012-0000 (Industrial Stationary IC Engines-Other Fuel) is expected to include the combustion of fuels types not already specified in categories such as landfill gas, digester gas, methanol and gasoline. All IC engines under 50 hp that

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<sup>1</sup> Once the District's Permit Exempt Equipment Registration (PEER) rule is fully implemented, units below the District permitting thresholds will be better characterized (see Section XIII for more detail).

use these fuel types are assumed to be portable (not stationary) and therefore excluded from this estimate.<sup>1</sup> All IC engines 50 hp or greater in this category are expected to be permitted and included in the District's point source inventory.

## V. Activity Data

The activity data for each facility associated with these source categories are reported through the District's point source inventory.

## VI. Emission Factors

The emission factors for each combustion process at each facility associated with these source categories are reported through the District's point source inventory and are derived from continuous emission monitor (CEMS) equipment, source tests, or District approved emission factors.

## VII. Emissions Calculations

### A. Assumptions

1. CARB estimates emissions from all diesel-fired IC engines in the District in REIC 099-040-1200-0000 (Stationary Engines - Diesel).
2. All distillate fuel consumed in the District is assumed to be No. 2 diesel fuel with a sulfur content of 0.0015%, and a heating value of 137,000 Btu/gallon.
3. All residual fuel consumed in the District is assumed to be No. 6 residual fuel with a sulfur content of 0.6%.
4. Due to rising fuel costs, the consumption of distillate and residual fuels in units below District permit thresholds (IC engines < 50hp and Boilers < 5 MMBtu/hr) are not cost-effective.
5. All IC engines under 50 horsepower and using fuels that are part of the "other" category (REIC 050-040-0012-0000) are assumed to be portable engines.

### B. Sample Calculation

Not Applicable.

## VIII. Temporal Variation

The temporal data for the facilities associated with these source categories is reported through the District's point sources inventory.

## IX. Spatial Variation

The spatial data for each facility associated with these source categories is reported through the District's point sources inventory.

## X. Growth Factor

Growth factors are developed by either the District's Planning Department or CARB for each EIC. These factors are used to estimate emissions in future years. The growth factors associated with this emissions category may be obtained from the Air Quality Analysis Section of the District's Planning Department.

## XI. Control Level

Control levels are developed by either the District's Planning Department or CARB for each EIC. Control levels are used to estimate emissions reductions in future years due to implementation of District rules. These control levels take into account the effect of control technology, compliance and exemptions at full implementation of the rules.

Emission units within these area source categories may be subject to the following District Rules:

**Table 2. District rules applicable to industrial fuel combustion categories.**

Rule No.	Rule Description
4701	Internal Combustion Engines - Phase 1
4702	Internal Combustion Engines - Phase 2
4703	Stationary Gas Turbines
4305	Boilers, Steam Generators, and Process Heaters - Phase 2
4306	Boilers, Steam Generators, and Process Heaters - Phase 3
4307	Boilers, Steam Generators, and Process Heaters - 2.0 MMBtu/hr to 5.0 MMBtu/hr
4308	Boilers, Steam Generators, and Process Heaters (0.075 MMBtu/hr to 2.0 MMBtu/hr)
4309	Dryers, Dehydrators and Ovens
4311	Flares
4313	Lime Kilns
4351	Boilers, Steam Generators, and Process Heaters - Phase 1

Control levels associated with these emissions categories may be obtained from the Air Quality Analysis section of the District's Planning Department.

## XII. ARB Chemical Speciation

CARB has developed organic gas profiles in order to calculate reactive organic gasses (ROG), volatile organic compounds (VOC) or total organic gas (TOG) given any one of the three values. For each speciation profile, the fraction of TOG that is ROG and VOC is given. The organic gas profile codes can also be used to lookup

associated toxics. CARB’s speciation profiles for industrial distillate oil combustion, industrial residual oil combustion, industrial LPG oil combustion, and industrial stationary IC engines (Diesel and “other” fuel types) are presented in Table 3. Organic gas profile #504 is applied to REICs 050-995-1220-0000 (industrial distillate oil combustion) and 050-995-1500-0000 (industrial residual oil combustion). Organic gas profile #4 is applied to REIC 050-995-0120-0000 (industrial LPG oil combustion). Organic gas profile #818 is applied to REIC 050-040-1200-0000 (industrial stationary IC engines - diesel). Organic gas profile #600 is applied to REIC 050-040-0012-0000 (industrial stationary IC engines - other fuel).

**Table 3. CARB organic gas speciation profiles for Industrial Fuel Combustion**

Profile Description	ARB Organic Gas Profile#	Fractions	
		ROG	VOC
External Combustion Boilers - Distillate or Residual	504	0.834679	0.834679
External Combustion Boiler - Process Gas (LPG)	4	0.660104	0.660104
Farm Equipment - Diesel - Light & Heavy - (ems=actual weight) (Diesel IC Engines)	818	0.83671	0.83671
Species Unknown - All Category Composite (Other Fuels)	600	0.6986	0.6986

CARB has developed particulate matter speciation profiles in order to calculate particulate matter (PM), particulate matter with a diameter less than or equal to 10 microns (PM<sub>10</sub>) or particulate matter with a diameter less than or equal to 2.5 microns (PM<sub>2.5</sub>) given any one of the three values. For each speciation profile, the fraction of PM that is PM<sub>10</sub> and PM<sub>2.5</sub> is given. The particulate matter profile codes can also be used to lookup associated toxics. CARB’s speciation profiles for industrial distillate oil combustion, industrial residual oil combustion, industrial LPG oil combustion, and industrial stationary IC engines (diesel and “other” fuel types) are presented in Table 4. PM profile #112 is applied to REIC 050-995-1220-0000 (industrial distillate oil combustion). PM profile #111 is applied to REIC 050-995-1500-0000 (industrial residual oil combustion). PM profile #120 is applied to REIC 050-995-0120-0000 (industrial LPG oil combustion). PM profile #116 is applied to REIC 050-040-1200-0000 (industrial stationary IC engines - diesel). PM profile #900 is applied to REIC 050-040-0012-0000 (industrial stationary IC engines - other fuel).

**Table 4. CARB particulate matter speciation profiles for Industrial Fuel Combustion**

Profile Description	ARB PM Profile#	Fractions	
		PM <sub>10</sub>	PM <sub>2.5</sub>
Fuel Combustion - Distillate	112	0.976	0.967
Fuel Combustion - Residual	111	0.87	0.76
Gaseous Material Combustion (LPG)	120	1	1
Stationary IC Engine - Diesel	116	0.96	0.937
Unspecified (Other Fuels)	900	0.7	0.42

### **XIII. Assessment Of Methodology**

The District attempted to use two other methodologies prior to this one. The first of these was one created by Sonoma Technology, Inc. (STI, 2002) for the Central California Ozone Study (CCOS). The second was created for the EPA in the 2002 National Emissions Inventory (NEI).

With the STI methodology for LPG combustion, some counties within the District had negative area source process rates after reconciling with our point sources. Since we expect area source emissions in each county of the District, we chose not to use this methodology. The NEI methodology required the LPG point source process rate for the entire state to be subtracted from the total amount of LPG consumed in the state as reported by the Energy Information Administration (EIA, 2005). After discussing this concept with CARB, we concluded that it would not be possible to obtain accurate point source process rates for the entire state due to confidentiality and data reporting issues. Therefore, we could not use this methodology either.

For this methodology, we have assumed that it is not cost-effective to operate distillate or residual fuel-fired IC engines or boilers in the industrial sector that are below the District permitting thresholds. Although it is likely units below the permitting threshold exist, it is expected that the majority of those units would only use distillate or residual fuel as backup fuels, so their consumption should be less than significant when compared to the whole. Furthermore, smaller units capable of using multiple fuel sources are more likely to be powered by electricity or natural gas because they are more cost-effective.

For LPG combustion in the industrial sector, we acknowledge that this methodology will underestimate emissions. As of the writing of this methodology, we have not been able to identify a reliable method of determining LPG consumption at the county level.

We do not expect many stationary units in the "other" fuel category as evidenced by the District's point source inventory. Small units (those below the permitting threshold) are assumed to be portable due to the type of equipment expected to use the fuel types in this category.

The District is in the process of implementing a PEER (Permit Exempt Equipment Registration) program. Upon full implementation of the program, all boilers within the District between 0.75 MMBtu/hr and 5.0 MMBtu/hr are expected to be registered. Smaller IC engines (less than 50 hp) are also expected to be registered. Once the program becomes fully implemented, we expect to have better data with which to characterize the population of boilers and IC engines within the District. At that time, we will re-examine this methodology and make any necessary adjustments.

## XIV. Emissions

Following are the 2006 area source emissions inventories for REICs 050-995-1220-0000, 050-995-1500-0000, 050-995-0120-0000, and 050-040-0012-0000 as estimated by this methodology. Emissions are reported for each county in the District.

**Table 5. Area source emissions for industrial fuel combustion (distillate, residual, and LPG) & stationary ICEs (other fuels), (2006).**

County	Emissions (tons/year)					
	NO <sub>x</sub>	CO	SO <sub>x</sub>	VOC <sup>(1)</sup>	PM <sub>10</sub>	PM <sub>2.5</sub> <sup>(2)</sup>
<b>INDUSTRIAL DISTILLATE OIL COMBUSTION (050-995-1220-0000)</b>						
Fresno	0	0	0	0	0	N/A
Kern	0	0	0	0	0	N/A
Kings	0	0	0	0	0	N/A
Madera	0	0	0	0	0	N/A
Merced	0	0	0	0	0	N/A
San Joaquin	0	0	0	0	0	N/A
Stanislaus	0	0	0	0	0	N/A
Tulare	0	0	0	0	0	N/A
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>N/A</b>
<b>INDUSTRIAL RESIDUAL OIL COMBUSTION (050-995-1500-0000)</b>						
Fresno	0	0	0	0	0	N/A
Kern	0	0	0	0	0	N/A
Kings	0	0	0	0	0	N/A
Madera	0	0	0	0	0	N/A
Merced	0	0	0	0	0	N/A
San Joaquin	0	0	0	0	0	N/A
Stanislaus	0	0	0	0	0	N/A
Tulare	0	0	0	0	0	N/A
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>N/A</b>
<b>INDUSTRIAL LPG COMBUSTION (050-995-0120-0000)</b>						
Fresno	0	0	0	0	0	N/A
Kern	0	0	0	0	0	N/A
Kings	0	0	0	0	0	N/A
Madera	0	0	0	0	0	N/A
Merced	0	0	0	0	0	N/A
San Joaquin	0	0	0	0	0	N/A
Stanislaus	0	0	0	0	0	N/A
Tulare	0	0	0	0	0	N/A
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>N/A</b>
<b>INDUSTRIAL STATIONARY IC ENGINES - OTHER FUEL (050-040-0012-0000)</b>						
Fresno	0	0	0	0	0	N/A
Kern	0	0	0	0	0	N/A
Kings	0	0	0	0	0	N/A
Madera	0	0	0	0	0	N/A
Merced	0	0	0	0	0	N/A
San Joaquin	0	0	0	0	0	N/A
Stanislaus	0	0	0	0	0	N/A
Tulare	0	0	0	0	0	N/A
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>N/A</b>

(1) The District only reports ROG to ARB. As noted in Section XII, ROG is the same as VOC.

(2) At this time, the District does not calculate PM<sub>2.5</sub> emissions. PM<sub>2.5</sub> emissions can be estimated using the speciation profiles found in Section XII.

050 - Industrial Fuel Combustion (Distillate, Residual, and LPG) & Stationary ICEs (Diesel and Other)

Following are the 2006 point source emissions inventories for REICs 050-995-1220-0000, 050-995-1500-0000, 050-995-0120-0000, and 050-040-0012-0000 as reported to the District by permit holders. Emissions are reported for each county in the District.

**Table 6. Point source emissions for industrial fuel combustion (distillate, residual, and LPG) & stationary ICEs (other fuels), (2006)**

County	Emissions (tons/year)					
	NOx	CO	SOx	VOC <sup>(1)</sup>	PM <sub>10</sub>	PM <sub>2.5</sub> <sup>(2)</sup>
<b>INDUSTRIAL DISTILLATE OIL COMBUSTION (050-995-1220-0000)</b>						
Fresno	4.68	0.00	0.06	0.05	0.00	N/A
Kern	0.00	0.00	0.00	0.00	0.00	N/A
Kings	0.00	0.00	0.00	0.00	0.00	N/A
Madera	0.00	0.00	0.00	0.00	0.00	N/A
Merced	0.66	7.77	2.08	0.01	1.10	N/A
San Joaquin	0.83	0.21	5.96	0.01	0.08	N/A
Stanislaus	0.00	0.00	0.00	0.00	0.00	N/A
Tulare	4.35	1.62	11.06	2.89	1.34	N/A
<b>TOTAL</b>	<b>10.52</b>	<b>9.60</b>	<b>19.15</b>	<b>2.96</b>	<b>2.52</b>	<b>N/A</b>
<b>INDUSTRIAL RESIDUAL OIL COMBUSTION (050-995-1500-0000)</b>						
Fresno	1.23	2.13	34.18	0.13	2.00	N/A
Kern	0.03	0.00	0.10	0.00	0.01	N/A
Kings	0.00	0.00	0.00	0.00	0.00	N/A
Madera	0.00	0.00	0.00	0.00	0.00	N/A
Merced	0.00	0.00	0.00	0.00	0.00	N/A
San Joaquin	0.00	0.00	0.00	0.00	0.00	N/A
Stanislaus	0.00	0.00	0.00	0.00	0.00	N/A
Tulare	0.00	0.00	0.00	0.00	0.00	N/A
<b>TOTAL</b>	<b>1.26</b>	<b>2.13</b>	<b>34.28</b>	<b>0.13</b>	<b>2.01</b>	<b>N/A</b>
<b>INDUSTRIAL LPG COMBUSTION (050-995-0120-0000)</b>						
Fresno	6.31	1.22	0.45	0.31	0.00	N/A
Kern	17.38	21.16	10.32	0.59	3.64	N/A
Kings	1.14	0.22	0.17	0.06	0.00	N/A
Madera	3.20	0.87	19.93	0.02	0.07	N/A
Merced	6.82	14.67	2.03	1.46	0.04	N/A
San Joaquin	1.98	5.54	0.36	0.61	0.21	N/A
Stanislaus	1.71	6.66	3.30	0.58	0.01	N/A
Tulare	4.54	1.19	6.25	0.70	1.06	N/A
<b>TOTAL</b>	<b>43.09</b>	<b>51.54</b>	<b>42.81</b>	<b>4.34</b>	<b>5.03</b>	<b>N/A</b>
<b>INDUSTRIAL STATIONARY IC ENGINES - OTHER FUEL (050-040-0012-0000)</b>						
Fresno	0.00	0.00	0.00	0.00	0.00	N/A
Kern	0.00	0.00	0.00	0.00	0.00	N/A
Kings	0.00	0.00	0.00	0.00	0.00	N/A
Madera	0.06	0.03	0.00	0.02	0.00	N/A
Merced	0.00	0.00	0.00	0.00	0.00	N/A
San Joaquin	0.00	0.00	0.00	0.00	0.00	N/A
Stanislaus	0.06	0.12	0.00	0.01	0.00	N/A
Tulare	0.00	0.00	0.00	0.00	0.00	N/A
<b>TOTAL</b>	<b>0.13</b>	<b>0.14</b>	<b>0.00</b>	<b>0.03</b>	<b>0.00</b>	<b>N/A</b>

(1) The District only reports ROG to ARB. As noted in Section XII, ROG is the same as VOC.

(2) At this time, the District does not calculate PM<sub>2.5</sub> emissions. PM<sub>2.5</sub> emissions can be estimated using the speciation profiles found in Section XII.



050 - Industrial Fuel Combustion (Distillate, Residual, and LPG) & Stationary ICEs (Diesel and Other)

Following are the 2006 total unreconciled (point source plus area source) emissions inventories for REICs 050-995-1220-0000, 050-995-1500-0000, 050-995-0120-0000, and 050-040-0012-0000. Emissions are reported for each county in the District.

**Table 7. Total emissions for industrial fuel combustion (distillate, residual, and LPG) & stationary ICEs (other fuels), (2006).**

County	Emissions (tons/year)					
	NO <sub>x</sub>	CO	SO <sub>x</sub>	VOC <sup>(1)</sup>	PM <sub>10</sub>	PM <sub>2.5</sub> <sup>(2)</sup>
<b>INDUSTRIAL DISTILLATE OIL COMBUSTION (050-995-1220-0000)</b>						
Fresno	4.68	0.00	0.06	0.05	0.00	N/A
Kern	0.00	0.00	0.00	0.00	0.00	N/A
Kings	0.00	0.00	0.00	0.00	0.00	N/A
Madera	0.00	0.00	0.00	0.00	0.00	N/A
Merced	0.66	7.77	2.08	0.01	1.10	N/A
San Joaquin	0.83	0.21	5.96	0.01	0.08	N/A
Stanislaus	0.00	0.00	0.00	0.00	0.00	N/A
Tulare	4.35	1.62	11.06	2.89	1.34	N/A
<b>TOTAL</b>	<b>10.52</b>	<b>9.60</b>	<b>19.15</b>	<b>2.96</b>	<b>2.52</b>	<b>N/A</b>
<b>INDUSTRIAL RESIDUAL OIL COMBUSTION (050-995-1500-0000)</b>						
Fresno	1.23	2.13	34.18	0.13	2.00	N/A
Kern	0.03	0.00	0.10	0.00	0.01	N/A
Kings	0.00	0.00	0.00	0.00	0.00	N/A
Madera	0.00	0.00	0.00	0.00	0.00	N/A
Merced	0.00	0.00	0.00	0.00	0.00	N/A
San Joaquin	0.00	0.00	0.00	0.00	0.00	N/A
Stanislaus	0.00	0.00	0.00	0.00	0.00	N/A
Tulare	0.00	0.00	0.00	0.00	0.00	N/A
<b>TOTAL</b>	<b>1.26</b>	<b>2.13</b>	<b>34.28</b>	<b>0.13</b>	<b>2.01</b>	<b>N/A</b>
<b>INDUSTRIAL LPG COMBUSTION (050-995-0120-0000)</b>						
Fresno	6.31	1.22	0.45	0.31	0.00	N/A
Kern	17.38	21.16	10.32	0.59	3.64	N/A
Kings	1.14	0.22	0.17	0.06	0.00	N/A
Madera	3.20	0.87	19.93	0.02	0.07	N/A
Merced	6.82	14.67	2.03	1.46	0.04	N/A
San Joaquin	1.98	5.54	0.36	0.61	0.21	N/A
Stanislaus	1.71	6.66	3.30	0.58	0.01	N/A
Tulare	4.54	1.19	6.25	0.70	1.06	N/A
<b>TOTAL</b>	<b>43.09</b>	<b>51.54</b>	<b>42.81</b>	<b>4.34</b>	<b>5.03</b>	<b>N/A</b>
<b>INDUSTRIAL STATIONARY IC ENGINES - OTHER FUEL (050-040-0012-0000)</b>						
Fresno	0.00	0.00	0.00	0.00	0.00	N/A
Kern	0.00	0.00	0.00	0.00	0.00	N/A
Kings	0.00	0.00	0.00	0.00	0.00	N/A
Madera	0.06	0.03	0.00	0.02	0.00	N/A
Merced	0.00	0.00	0.00	0.00	0.00	N/A
San Joaquin	0.00	0.00	0.00	0.00	0.00	N/A
Stanislaus	0.06	0.12	0.00	0.01	0.00	N/A
Tulare	0.00	0.00	0.00	0.00	0.00	N/A
<b>TOTAL</b>	<b>0.13</b>	<b>0.14</b>	<b>0.00</b>	<b>0.03</b>	<b>0.00</b>	<b>N/A</b>

(1) The District only reports ROG to ARB. As noted in Section XII, ROG is the same as VOC.

(2) At this time, the District does not calculate PM<sub>2.5</sub> emissions. PM<sub>2.5</sub> emissions can be estimated using the speciation profiles found in Section XII.

050 - Industrial Fuel Combustion (Distillate, Residual, and LPG) & Stationary ICEs (Diesel and Other)

Following are the net change in total unreconciled emissions between this update (2006 inventory year) and the CEIDARS value for the previous year (2005 inventory year) for REICs 050-995-1220-0000, 050-995-1500-0000, 050-995-0120-0000, and 050-040-0012-0000. The change in emissions are reported for each county in the District.

**Table 8. Net emissions change for industrial fuel combustion (distillate, residual, and LPG) & stationary ICEs (other fuels), (2006)**

County	Emissions (tons/year)					
	NOx	CO	SOx	VOC <sup>(1)</sup>	PM <sub>10</sub>	PM <sub>2.5</sub> <sup>(2)</sup>
<b>INDUSTRIAL DISTILLATE OIL COMBUSTION (050-995-1220-0000)</b>						
Fresno	-0.32	-0.22	-8.28	0.00	0.00	N/A
Kern	-0.70	-0.12	-4.52	0.00	0.00	N/A
Kings	-37.50	-4.73	-35.30	-0.53	0.00	N/A
Madera	-7.06	-1.85	-15.40	-0.10	-0.57	N/A
Merced	-14.28	1.98	-14.24	-0.17	0.29	N/A
San Joaquin	-0.46	-2.48	1.44	-2.59	-0.23	N/A
Stanislaus	-29.09	-3.40	-34.19	-0.35	-3.00	N/A
Tulare	-43.19	-7.34	-36.92	-14.31	-6.38	N/A
<b>TOTAL</b>	<b>-132.60</b>	<b>-18.16</b>	<b>-147.41</b>	<b>-18.05</b>	<b>-9.89</b>	<b>N/A</b>
<b>INDUSTRIAL RESIDUAL OIL COMBUSTION (050-995-1500-0000)</b>						
Fresno	-638.39	-60.06	-1385.93	-11.59	-100.40	N/A
Kern	-2.05	-0.12	-7.05	0.00	-0.39	N/A
Kings	-34.74	0.00	-58.17	-0.78	-3.00	N/A
Madera	0.00	0.00	0.00	0.00	0.00	N/A
Merced	-93.62	-6.86	-185.45	-0.97	-11.75	N/A
San Joaquin	-205.59	-19.62	-282.77	-4.02	-19.68	N/A
Stanislaus	-10.25	-1.48	-9.30	-0.18	-0.92	N/A
Tulare	-16.70	0.00	-29.14	0.00	0.00	N/A
<b>TOTAL</b>	<b>-1001.34</b>	<b>-88.14</b>	<b>-1957.81</b>	<b>-17.54</b>	<b>-136.14</b>	<b>N/A</b>
<b>INDUSTRIAL LPG COMBUSTION (050-995-0120-0000)</b>						
Fresno	-33.53	-11.01	-3.45	-1.05	-1.84	N/A
Kern	-2.74	7.27	10.29	0.20	3.27	N/A
Kings	-3.13	-0.19	-0.21	-0.01	-0.41	N/A
Madera	0.31	0.08	2.04	0.01	0.01	N/A
Merced	-3.74	1.83	-0.40	0.13	-0.88	N/A
San Joaquin	-18.35	-0.75	0.04	-0.06	-3.02	N/A
Stanislaus	-1.99	1.69	3.26	0.15	-0.30	N/A
Tulare	-11.18	-1.89	4.22	0.25	-1.49	N/A
<b>TOTAL</b>	<b>-74.35</b>	<b>-2.96</b>	<b>15.79</b>	<b>-0.38</b>	<b>-4.66</b>	<b>N/A</b>
<b>INDUSTRIAL STATIONARY IC ENGINES - OTHER FUEL (050-040-0012-0000)</b>						
Fresno	-0.13	-0.10	0.00	-0.37	0.00	N/A
Kern	-0.02	-0.02	0.00	-0.08	0.00	N/A
Kings	-0.12	-0.14	0.00	-0.31	0.00	N/A
Madera	-0.04	-0.07	0.00	-0.14	0.00	N/A
Merced	-0.02	-0.03	0.00	-0.08	0.00	N/A
San Joaquin	0.00	0.00	0.00	0.00	0.00	N/A
Stanislaus	0.00	0.02	0.00	-0.06	0.00	N/A
Tulare	-0.45	-0.42	0.00	-2.06	-0.10	N/A
<b>TOTAL</b>	<b>-0.78</b>	<b>-0.76</b>	<b>0.00</b>	<b>-3.10</b>	<b>-0.10</b>	<b>N/A</b>

(1) The District only reports ROG to ARB. As noted in Section XII, ROG is the same as VOC.

(2) At this time, the District does not calculate PM<sub>2.5</sub> emissions. PM<sub>2.5</sub> emissions can be estimated using the speciation profiles found in Section XII.

## XV. Revision History

2007. This is a new District methodology based on the District's point source inventory.

## XVI. Update Schedule

In an effort to provide inventory information to ARB and other District programs and maximize limited resources, the District has developed an update cycle based on emissions within the source category as shown in Table 9.

**Table 9. Area source update frequency criteria**

Total Emissions (tons/day)	Update Cycle (years)
<=1	4
>1 and <= 2.5	3
>2.5 and <=5	2
>5	1

EICs 050-995-1220-0000, 050-995-1500-0000, 050-995-0120-0000, and 050-040-0012-0000 have emissions of less than one ton per day, therefore, these area source estimates will be updated every four years.

**Table 10. District methodology update frequency**

EIC	Frequency (years)	Source of Emissions (Point Source Inventory / Data Gathering)
050-995-1220-0000	4	Point Source Inventory / Data Gathering
050-995-1500-0000	4	Point Source Inventory / Data Gathering
050-995-0120-0000	4	Point Source Inventory / Data Gathering
050-040-1200-0000	N/A	ARB to Update
050-040-0012-0000	4	Point Source Inventory / Data Gathering

## XVII. References

1. Energy Information Administration. 2005. State Energy Data System (SEDS).  
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5. United States Environmental Protection Agency. 1996b. AP 42 Section 3.3: Gasoline and Diesel Industrial Engines. U.S. GPO, Washington D.C. Accessed on 09/06/07.  
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6. United States Environmental Protection Agency. 2006. Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants. Prepared by E.H. Pechan & Associates, Inc. (July 2006).

## **XVIII. Appendices**

### Appendix A. Emission Inventory Codes

## Appendix A. Emission Inventory Codes.

Table 11. EIC, SCC and SIC codes in the District's 2006 point source inventory that reconciled to REIC 050-995-1220-0000.

EIC	SCC	Point Source Type	SIC
50-005-1220-0000	10200501	EXTCOMB BOILER - INDUSTRIAL - DISTILLATE OIL - NO 1 AND NO 2 OIL	2653, 2875
50-010-1220-0000	30500208	PETROLEUM INDRY - ASPHALT CONCRETE - ASPHALT HEATER - DISTILLATE OIL	2951
	39900501	INDUSTRIAL PROCES - MIS IND-FUEL EQPT - PROCESS HTER/FURNACE - DISTILLATE OIL	3271
50-010-1224-0000	39990001	INDUSTRIAL PROCES - MIS IND-FUEL EQPT - PROCESS HEATERS - DIST OIL(NO.2)	1311
52-005-1220-0000	10200501	EXTCOMB BOILER - INDUSTRIAL - DISTILLATE OIL - NO 1 AND NO 2 OIL	2022, 2023, 2033, 2041, 2048, 2066, 2084
	10300501	EXTCOMB BOILER - COMMERCIAL-INSTUTNL - DISTILLATE OIL - NO 1 AND NO 2 OIL	723, 2077
52-020-1220-0000	10500105	EXTCOMB BOILER - SPACE HEATER - INDUSTRIAL - DISTILLATE OIL	2077

Table 12. EIC, SCC and SIC codes in the District's 2006 point source inventory that reconciled to REIC 050-995-1500-0000.

EIC	SCC	Point Source Type	SIC
50-005-1520-0000	10200404	EXTCOMB BOILER - INDUSTRIAL - RESIDUAL OIL - NO 5 OIL	2869
52-005-1530-0000	10200401	EXTCOMB BOILER - INDUSTRIAL - RESIDUAL OIL - NO 6 OIL	2023, 2033, 2063
52-070-1500-0000	39000403	INDUSTRIAL PROCES - INPROCESS FUEL - RESIDUAL OIL - LIME KILN	2063

050 - Industrial Fuel Combustion (Distillate, Residual, and LPG) & Stationary ICEs (Diesel and Other)

Table 13. EIC, SCC and SIC codes in the District's 2006 point source inventory that reconciled to REIC 050-995-0120-0000.

EIC	SCC	Point Source Type	SIC
40-005-0124-0000	10201002	EXTCOMB BOILER - INDUSTRIAL - LIQ PETROLEUM GAS - PROPANE	2952
50-005-0122-0000	10201001	EXTCOMB BOILER - INDUSTRIAL - LIQ PETROLEUM GAS - BUTANE	3086
50-005-0124-0000	10201002	EXTCOMB BOILER - INDUSTRIAL - LIQ PETROLEUM GAS - PROPANE	2752, 2759, 2819, 3086, 3087, 3295
50-010-0120-0000	30500209	PETROLEUM INDRY - ASPHALT CONCRETE - ASPHALT HEATER - LPG	1442, 2951
	30590005	MINERAL PRODUCTS - FUEL-FIRED EQPMNT - LPG -	3295
50-012-0120-0000	40201004	ORGANIC SOLVENT - SURFACE COATING - OVEN HEATER - LIQ PETROLEUM GAS	3479, 3499, 3715
50-020-0120-0000	10500110	EXTCOMB BOILER - SPACE HEATER - INDUSTRIAL - LIQ PETROLEUM GAS	3599
50-070-0120-0000	39001089	INDUSTRIAL PROCES - INPROCESS FUEL - LPG - NOT CLASSIFIED	3211
50-995-0120-0000	20201012	INTERNL COMBUSTION - INDUSTRIAL - LIQ PETROLEUM GAS - LPG:RECIP	2084
	31000406	OIL & GAS PRODN - FUEL-FIRED EQPMNT - PROCESS HEATERS - PROPANE/BUTANE	1311
52-005-0124-0000	10201002	EXTCOMB BOILER - INDUSTRIAL - LIQ PETROLEUM GAS - PROPANE	2015, 2048, 2084, 2099
52-010-0120-0000	30290005	FOOD/AGRICULTURE - FUEL-FIRED EQPMNT - PROCESS HEATERS - LPG	723, 724, 2034, 2048, 2096
130-995-0120-0000	50390010	SOLID WASTE DISPL - INDUSTRIAL - AUX.FUEL/NO EMSNS - LPG	4953

Table 14. EIC, SCC and SIC codes in the District's 2006 point source inventory that reconciled to REIC 050-040-0012-0000.

EIC	SCC	Point Source Type	SIC
50-040-0124-0000	20201001	INTERNL COMBUSTION - INDUSTRIAL - PROPANE - RECIPROCATING	1442, 1781, 3483
50-040-1100-0000	20200301	INTERNL COMBUSTION - INDUSTRIAL - GASOLINE - RECIPROCATING	3221, 3561
	20201702	INTERNL COMBUSTION - INDUSTRIAL - IC ENGINE - GASOLINE:RECIP	2421
50-045-1412-0000	20200901	INTERNL COMBUSTION - INDUSTRIAL - KERONAPHTHA JET FL - TURBINE	3431
52-040-0124-0000	20201001	INTERNL COMBUSTION - INDUSTRIAL - PROPANE - RECIPROCATING	2048

050 - Industrial Fuel Combustion (Distillate, Residual, and LPG) & Stationary ICEs (Diesel and Other)

Table 15. EIC, SCC and SIC codes in the District's 2006 point source inventory that reconciled to REIC 050-040-1200-0000.

EIC	SCC	Point Source Type	SIC
NA*	NA*		NA*

\*All diesel fired IC engines now reconcile to 099-040-1200-0000