EMISSIONS INVENTORY
AND
EMISSIONS PROCESSING
FOR THE CLEAN AIR MERCURY RULE (CAMR)

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF AIR QUALITY PLANNING AND STANDARDS
EMISSIONS, MONITORING AND ANALYSIS DIVISION
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TABLE OF CONTENTS

Acronyms

BEA	**BUREAU OF ECONOMIC ANALYSIS**
BLS	**BUREAU OF LABOR STATISTICS**
CAIR	**CLEAN AIR INTERSTATE RULE**
CHIEF	**CLEARINGHOUSE FOR INVENTORIES AND EMISSIONS FACTORS**
CMAQ	**COMMUNITY MULTISCALE AIR QUALITY MODEL**
CO	**CARBON MONOXIDE**
EGAS	**ECONOMIC GROWTH ANALYSIS SYSTEM**
EGU	**ELECTRIC GENERATING UNITS**
EPA	**ENVIRONMENTAL PROTECTION AGENCY**
GF	**GROWTH FACTOR**
Hg	**ELEMENTAL MERCURY (CMAQ INPUT SPECIES)**
HGIIGAS	**GASEOUS DIVALENT MERCURY (CMAQ INPUT SPECIES)**
IPM	**INTEGRATED PLANNING MODEL**
MACT	**MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY**
MWC	**MUNICIPAL WASTE COMBUSTOR**
mwi	**MEDICAL WASTE INCINERATOR**
NEEDS	**NATIONAL ELECTRIC ENERGY DATABASE SYSTEM**
NEI	**NATIONAL EMISSION INVENTORY**
NESHAP	**NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS**
NH3	**AMMONIA**
NODA	**NOTICE OF DATA AVAILABILITY**
NOX	**NITROGEN OXIDES**
PHGI	**PARTICULATE DIVALENT MERCURY (CMAQ INPUT SPECIES)**
PM2.5	**PARTICULATE MATTER LESS THAN OR EQUAL TO 2.5 MICRONS**
PM10	**PARTICULATE MATTER LESS THAN OR EQUAL TO 10 MICRONS**
POTW	**PUBLICLY-OWNED TREATMENT WORKS**
REMI	**REGIONAL ECONOMIC MODEL, INC.**
RIA	**REGULATORY IMPACT ANALYSIS**

RICE	**RECIPROCATING INTERNAL COMBUSTION ENGINES**
RPO	**REGIONAL PLANNING ORGANIZATION**
SIC	**STANDARD INDUSTRIAL CODE**
SCC	**SOURCE CATEGORY CODE**
SMOKE	**SPARSE MATRIX OPERATOR KERNEL EMISSIONS**
SOCMI	**SYNTHETIC ORGANIC CHEMICAL MANUFACTURING INDUSTRY**
SO2	**SULFUR DIOXIDE**
TSD	**TECHNICAL SUPPORT DOCUMENT**
VOC	**VOLATILE ORGANIC COMPOUNDS**

List of Tables

1 Introduction

This document describes the approach and data used for the emissions inventory and emissions processing for air quality modeling for the Clean Air Mercury Rule (CAMR) rulemaking by the U.S. Environmental Protection Agency (EPA). This work builds from the emissions developed for the Clean Air Interstate Rule (CAIR); therefore, this document describes only those additional activities not documented in the CAIR Technical Support Document (TSD) **[have asked Joann Allman for docket number for this to include here. Won't get it until CAIR is signed]**.

The emissions modeling effort has involved preparation of emissions input data for the Community Multiscale Air Quality (CMAQ) model for the purposes of modeling mercury. For this modeling effort, the CMAQ required hourly, speciated mercury emissions for an annual episode on a 36-km national grid. Emissions of mercury and the following criteria pollutants were required: carbon monoxide (CO), nitrogen oxides (NOX), volatile organic compounds (VOC), sulfur dioxide (SO2), ammonia (NH3), particulate matter less than or equal to 10 microns (PM10), and particulate matter less than or equal to 2.5 microns (PM2.5). These emissions data were required for a 2001 base year, a 2020 future-base, and 2020 control cases.

The general emissions modeling approach we used was to convert annual total emissions inventory data into the hourly, grid-cell, and model species resolution needed by CMAQ using the Sparse Matrix Operator Kernel Emissions (SMOKE) model. SMOKE transforms the emission inventories using emissions modeling steps known as temporal allocation, chemical speciation, and spatial allocation. SMOKE requires emissions inventory files and ancillary data files to perform these steps.

The emissions modeling effort involved the following additional activities beyond what was done for CAIR:

- prepare a 2001 base-year mercury emissions inventory for input into SMOKE,
- prepare ancillary files for SMOKE needed to create the model-ready mercury emissions,
- prepare a 2020 future-base mercury inventory,
- run SMOKE for 2001 mercury and merge 2001 mercury with 2001 criteria emissions, and
- run SMOKE for 2020 mercury and merge 2020 mercury with 2020 criteria emissions.

The data reused from the CAIR modeling are available in the CAIR docket (number OAR-2003-0053-1688)**.** The Hg-specific data described in this document are available in two locations. First, the data are available in the CAMR electronic docket. A docket number is not available at the time that this was written. Additionally, the CAIR and CAMR data are both available on the airmodeling ftp site. Access to this password-protected ftp site can be obtained by contacting Warren Peters at peters.warren@epa.gov. When requesting access to the site, please indicate that you need to know the specific locations on the site of the CAIR and CAMR data. For more information on the contents of the data on that site, please contact Marc Houyoux at houyoux.marc@epa.gov.

The remainder of this document describes the mercury emissions inventories and processing done specifically for these emissions. The CAIR TSD documents the preparation of 2001 base-year and 2020 future-base criteria pollutant emissions inventories, the associated ancillary files for emissions modeling, and features of the SMOKE tool; these are not repeated here. We used the same version of SMOKE (version 2.1) for both CAIR and for CAMR.

Section 2 describes how we prepared the 2001 mercury inventory, Section 3 discusses the speciation profiles used, and Section 4 discusses the creation of the 2020 mercury inventory. Section 5 provides summaries of the base- and future-base mercury emissions. This document does not describe the 2020 future-control emissions, for which only the emissions from the Integrated Planning Model (IPM) for electric generating utilities (EGUs) were different from the future-base only, as available in the CAMR docket item "EPA CAMR_Option 1 parsed for year 2020".

2 2001 Base Year Mercury Inventory

The basis for the 2001 mercury emissions inventory for the U.S. is the 1999 National Emission Inventory (NEI) for Hazardous Air Pollutants (HAPs), July 2003 version. The NEI is provided in four sectors: non-point (formerly known as stationary area), point, on-road mobile and nonroad mobile. The point-source sector of the inventory contains facility estimates along with specific geographic coordinates and stack parameters. The non-point sector contains emissions by Source Category Code (SCC) at the county-level. Note that there are no mercury emissions in either the nonroad or on-road portion of the 1999 NEI for HAPs. We generally used 1999 NEI values for our 2001 modeling base year because this was the most applicable inventory available at the time of our modeling work. Additionally, we included only emissions from the contiguous 48 States, the District of Columbia, and Canada; although Mexico is in the modeling domain, no mercury emissions data were available for Mexico.

The criteria base-year inventory data are available through the CAIR docket and the airmodeling FTP site. The mercury base-year inventory data are available through the airmodeling FTP site. **[Perhaps reference file names, if available for CAMR.]**

The list below describes the emission sectors used in modeling. The headings for this list include the sector abbreviations in parentheses; these abbreviations are used in the modeling scripts and directory names used in the SMOKE modeling.

1. **IPM sector (ptipm):** Point-source facilities that were linked to facilities in the April 2003 version of the 2010 Integrated Planning Model (IPM) database and matched between the 1999 NEI for HAP and the 2001 criteria inventory used for CAIR.
2. **Non-IPM sector (ptnonipm):** All point sources not in the IPM sector and all point-source mercury emissions from Canada**.**
3. **Non-point sector (nonpt):** Non-point (stationary area sources) emissions from the U.S. and Canada. This sector includes only mercury emissions from source categories that did not have facility-specific information available.

Table 1 provides a summary of the base year 2001 inventory emissions across all of the above sectors that we provided as inputs to SMOKE. Note that the inventory contains some pre-

speciated emissions, but the model-ready speciated emissions are not represented by this table. Inventory pollutants like "Mercury and Compounds" are split into model species during emissions modeling steps, resulting in additional speciated mercury emissions. The model-ready speciated emissions are available by state and sector in Section 5.

Table 1: Sector- based mercury emissions totals for 2001, for all states in the continental U.S.

Pollutant Name	CAS	IPM	Non-IPM Point	Non-Point	All Sectors
Mercury and Compounds	199	0.915	29.985	0.375	31.275
Elemental Mercury	200	25.585	0.017		25.603
Gaseous Divalent Mercury	201	20.211	0.027		20.238
Particulate Divalent Mercury	202	1.479	0.002		1.482
Mercury	7439976	0.389	26.129	6.150	32.668
Mercuric Chloride	7487947		0.024		0.024
Total		**48.579**	**56.185**	**6.525**	**111.290**

As will be described in the subsections below, some minor revisions were made to the 1999 NEI where information was available to update the data for 2001. Unless specifically described in this document, we did not change the 1999 NEI values to reflect 2001 because we believe that the uncertainties in these emissions are high and because we are limited by available emissions collection and estimation techniques. We believe the available approaches cannot reliably distinguish between two years for mercury emissions. The details about the inventories we used are included in the subsections below.

2.1 IPM Sector

The IPM sector is based on the point-source 1999 NEI for HAPs, which contains mercury emissions estimates for both electric generating units (EGU) and Non-EGU sources, along with their geographic locations and stack parameters. This sector contains emissions from EGUs as defined by the universe of sources whose future-year emissions are projected using the Integrated Planning Model (IPM).

Only part of the point-source inventory is used in the IPM sector; this part is those facilities that we were able match to the April 2003 version of the 2010 IPM, which uses the facilities included in the 2003 National Electric Energy Database System (NEEDS). This matching was necessary because the IPM estimates future EGU emissions separately from non-EGU emissions, which are obtained from applying growth and control factors. Extracting base-year EGU facilities from the 1999 NEI therefore ensures that these EGU emissions are not double counted in the future-year modeling files.

Separating the EGU from the non-EGU sources based on the facilities in the IPM model also ensures that non-EGU emissions are not inadvertently dropped from future-year modeling files. For example, we found several small facilities with an EGU MACT code (i.e., 1808-1) that were not found in the 2010 IPM database, nor were they determined to have closed by 2010; instead, it

appeared that facilities with non-EGU processes were sometimes assigned to the EGU MACT codes. These few and small "pseudo-EGUs" were retained in the non-EGU file, and were assigned no growth or controls to 2020, thereby preserving their emissions.

Defining the mercury-emitting EGUs in the 1999 NEI HAP inventory involved several steps, described here. First, we identified EGUs in the NEI that would be likely to be included in the IPM model as any record with MACT 1808-1, SCCs beginning with 101 and 201, and/or Standard Industrial Code (SIC) of 4911. Second, we matched the ORIS facility ID for the resulting NEI facilies with the ORIS IDs in the NEEDS database, which matched many NEI facilities to IPM. Third, for the remaining unmatched NEI likely-EGU facilities, we used manual approaches based on locations, facility names, criteria emissions, and mercury emissions in the NEI and the NEEDS. This approach matched all but 8 NEI facilties with MACT of 1808-1 and 18 other facilities with emissions greater than 0.02 tons/year.

In addition to separating the IPM-matched facilities from the NEI point source inventory, we also assigned stack parameters and coordinates to ensure as consistent values as possible were used between the criteria and mercury inventories and between the base-year and future-year cases. This was necessary because the future-year emissions are created by the IPM model and parsed into SMOKE-ready files using an entirely different approach from how the emissions are compiled for the base-year. It was also necessary because the facility and stack IDs in the 1999 NEI for HAPs were not necessarily matched to the IDs in the 2001 CAIR inventory. The approach that we used was as follows.

For the largest 549 SO2-emitting stacks from the 2001 CAIR criteria inventory that we could match to the 1999 NEI for HAPs, we used the stack parameters and locations from the criteria inventory. Since large SO2 emissions indicates large coal-fired, mercury-emitting boilers, this approach ensured that the largest mercury emitters contained the same coordinates and stack parameters. Other stacks were assigned either (a) revised stack parameters and locations based on the IPM post-processing steps, or (b) parameters from the 1999 NEI for HAPs. In this latter case, these facilities could not be matched between the 2001 CAIR criteria inventory and the 1999 NEI for HAPs.

Additionally for the IPM sector, we modified temporal profile assignments to ensure consistent temporal profile application between the base and future-year emissions. This was necessary because the IPM results for mercury were assigned different SCCs than were assigned in the base-year, and these SCCs sometimes have significantly different temporal profiles. The specific changes that we made to the temporal profiles are described in Section 3.3.

2.2 Non-IPM point sources

The non-IPM sector includes the emissions not included in the IPM sector from the 1999 point-source NEI for HAPs.

We made the following few minor revisions to the 1999 NEI emissions inventory prior to the emissions modeling process. These are listed in greater detail in Appendix A.

- We replaced the 1999 Medical Waster Incinerator (MWI) data with the MWI data from the draft 2002 NEI, which better represents this category for 2001. This change resulted in a reduction from 2.8 tons/year of mercury to 0.23 tons/year.
- We corrected the inventory to remove double counting or mischaracterized point sources, which reduced mercury emissions in the inventory by 0.4 tons/year.
- We revised MACT code assignments for industrial boilers to include more processes (SCCs) that belong to the MACT category; this affected projection of future-year emissions, which uses MACT codes.
- We also corrected SIC code assignments.

Additionally, this sector includes year 2000 Canadian mercury emissions from all point sources for elemental mercury, gaseous divalent mercury, and particulate divalent mercury. Newer inventory data from Canada was not available in time for the purposes of our work.

2.3 Non-point sources

The non-point mercury emissions for the 2001 base year are from the 1999 NEI for HAPs. Similarly to point sources, we made a few minor changes to the mercury emissions, as follows:

- We removed non-point fugitive dust and open-burning categories from California and Oregon (the only states who provided mercury emissions from these sources), which reduced Hg by 2.7 tons/year. These emissions were removed because they were not available for all states and we believe that the emissions estimates from these sectors are too uncertain to include in modeling.
- We removed MWI records, which removed 0.004 tons/year of mercury. There were no non-point MWI emissions in the draft 2002 NEI, so the non-point MWI from 1999 were simply deleted and not replaced.

Additionally, this sector includes year 2000 Canadian mercury emissions from all non-point sources for elemental mercury, gaseous divalent mercury, and particulate divalent mercury. Newer inventory data from Canada was not available in time for the purposes of our work.

3 Ancillary Files Used with SMOKE for Processing the Mercury Inventories

During emissions modeling, the ancillary data are combined with the emissions inventory data to convert the inventories into the gridded, hourly resolution, and chemical species needed by CMAQ. In this section, we summarize those ancillary files that we used in the CAMR emissions modeling that were different from the ones used in the CAIR modeling. These files are: (1) the inventory table, which is used to read in the pollutant codes from the NEI and convert to SMOKE inventory pollutants, (2) the chemical speciation data used to convert the raw mercury emissions into the species needed by the CMAQ model, and (3) revised temporal profiles used to ensure consistent temporal allocation between the base and future-year IPM sector emissions. Development of the data used to project the base-year mercury emissions for the non-IPM and non-point sectors to the 2020 base year are discussed in Section 4.

The CAIR SMOKE input ancillary files that we also used in this effort are available in the CAIR docket (number OAR-2003-0053-1688) and at the airmodeling ftp site, in the zip file 2001CAIR_misc_072304.zip, in the "ge_dat" directory. A list of all of the ancillary files and their locations is available in the docket file README_2001.txt. Both the zip file and the README file are also available at the airmodeling ftp site.

The updated SMOKE ancillary files that we used for the CAMR-specific modeling efforts are available at the airmodeling ftp site. **[Perhaps provide specific file names, if available in time]**

3.1 Ancillary file for reading in the NEI Inventory

We developed the SMOKE input file called the "inventory table" to read in the various species of mercury reported in the 1999 NEI and convert them to either the model species needed by CMAQ or to an unspeciated mercury placeholder called "HGSUM" that was speciated through the SMOKE Spcmat program using speciation profiles. The fields shown in Table 2 provide the same information as was included in the inventory table. The "adjustment factor" in this table allows SMOKE to adjust the mass of those inventory compounds containing elements in addition to mercury, to account for only the mercury portion of the compound.

Table 2: Fields in the inventory table used for reading the mercury inventory into SMOKE

SMOKE NAME	NEI CAS	Adjustment Factor	Inventory Pollutant Name	Inventory Pollutant Code
PHGI	202	1	Particulate Divalent Mercury	Particulate Divalent Mercury
HGIIGAS	201	1	Gaseous Divalent Mercury	Gaseous Divalent Mercury
HG	200	1	Elemental Gaseous Mercury	Elemental Gaseous Mercury
HGIIGAS	7487947	0.7388	Gaseous Divalent Mercury	Mercuric chloride
HGSUM	199	1	Mercury Compounds, unspeciated	Mercury & Compounds
HGSUM	22967926	1	Mercury Compounds, unspeciated	MERCURY (ORGANIC)
HGSUM	62384	0.5957	Mercury Compounds, unspeciated	MERCURY ACETATO PHEN
HGSUM	7439976	1	Mercury Compounds, unspeciated	Mercury
HGSUM	12	1	Mercury Compounds, unspeciated	Mercury & Compounds

3.2 Ancillary Files for Chemical speciation

The mercury speciation factors are used by SMOKE to convert any unspeciated mercury (i.e., HGSUM mentioned in Section 3.1) into the CMAQ model species: particulate divalent mercury (PHGI), gaseous divalent mercury (HGIIGAS) and elemental mercury (HG). The quantity of unspeciated emissions for each source sector can be obtained from Table 1 in Section 2 by summing all mercury pollutants in which the NEI Pollutant Code is not 200, 201, 202, or 7487947.

Speciation profiles were assigned to the inventory sources using MACT codes and SCC codes. We preferentially used MACT-based profile assignments over SCC-based profile assignments. The global default speciation profile (applied for records that neither matched to MACT or SCC-based profiles) use 20% PHGI, 30% HGIIGAS, and 50% HG. In addition, we corrected the speciation profile data file provided with SMOKE version 2.1 to use a molecular weight of 200.59 for HGIIGAS. The profile data we used are provided in Appendix B.

3.3 Ancillary files for temporal allocation

For the mercury IPM sector, we modified temporal profile assignments to ensure consistent temporal profile application between the base and future-year emissions. This was necessary because the IPM results for mercury were assigned different SCCs than were present in the base-year, and these SCCs sometimes have significantly different temporal profiles.

We found that a great majority (over 90%) of the base year emissions, as determined by SCCs, were assigned similar temporal profiles that were:

- uniform by month,
- slightly higher weekdays than Saturdays, which in turn were slightly higher than Sundays, and
- a "typical" diurnal profile where the minimum emissions are assigned early in the morning and the greatest are in the early afternoon

Therefore, all IPM-sector mercury emissions in the base and future used monthly temporal profile 262, weekly temporal profile 8, and diurnal temporal profile 33 (both for weekdays and weekends). Temporal profile assignments for the IPM-sector criteria emissions, and all emissions from other sectors (non-point and non-EGU point) are the same as those used in the CAIR described in Section 3.3 of the CAIR TSD.

4 2020 base mercury emissions

This section describes the data used to project the 2001 base-year mercury emissions to 2020 for the non-IPM and non-point sectors. The IPM-sector emissions in 2020 were created by the IPM model and post-processing, described in Chapter 7 of the CAMR Regulatory Impact Analysis (RIA). Emissions projections for mercury includes both emissions reductions (described in Section 4.1) and emissions growth (described in Section 4.2)

The reductions and growth information we used is available on the airmodeling ftp site. **[If available, insert more specific information here]**. The resulting 2020 non-IPM point and non-point inventories are also available on the airmodeling ftp site. **[If available, insert more specific information here].** Additionally, speciated mercury summaries of the 2001 and 2020 emissions by state are available in Section 5.

4.1 Emission Reduction Approach

This section discusses emission reductions applied to the non-IPM and non-point sectors. For these sectors, we applied reductions to the base inventory to account for the MACT and Section-129 source categories for which a regulation is expected to reduce mercury from the 2001 base inventory values.

The MACT code in the inventory identifies records for which either a MACT or Section-129 standard may apply. It is a six-character field in the 1999 NEI for HAPs. To apply reductions using SMOKE, we considered both the MACT code and the source type (either “major” or “area”) because some standards apply only to major sources and not to “area” sources. This was used for all reduction standards except for MWI and municipal waste combustors (MWC), which we describe in more detail in subsequent paragraphs.

We obtained MACT and Section-129 reductions from rule background information and/or from the EPA technical staff who were responsible for the regulations. We sought reduction data for all categories contributing more than 0.025 tons/year of mercury emission; which account for more than 99.9% of all non-IPM point and non-point mercury emissions from MACT/Section-129 categories. Table 3 provides a summary of all non-zero reduction values that we used.

Table 3: MACT/Section-129 reductions of mercury applied to the 2001 inventory for projection to 2020

MACT code	Description	SCC	% Reduction from 2001 inventory	Source types	Reference/Comments
0107	Industrial/Commercial/ Institutional Boilers & Process Heaters		34.88	major and area	Assumed fuel is coal. Applied to major and area sources even though rule applies only to major sources, due to uncertainty in inventory for major sources. Data from Jim Eddinger, EPA, Emission Standards Division
0107-1	Industrial/Commercial/Institutional Boilers & Process Heaters: Coal		34.88	major and area	Applied to major and area sources even though rule applies only to major sources due to uncertainty in inventory for major sources. Data from Jim Eddinger, EPA, Emission Standards Division
0107-4	Industrial/Commercial/Institutional Boilers & Process Heaters: Wood/Waste		16.67	major	Data from Jim Eddinger, EPA, Emission Standards Division
0308	Iron Foundries		80.00	major	Data from Phil Mulrine, EPA, Emission Standards Division
0411	Taconite Iron Ore Processing		0.64	major	Data from Phil Mulrine, EPA, Emission Standards Division
0414	Brick and Structural Clay Products Manufacturing		22.69	major	Data from Mary Johnson, EPA, Emission Standards Division
0801	Hazardous Waste Incineration	503005	78.60	major and area	SCC 503005 is an incinerator; Information from the July 1999 Background Information Document from the Hazardous Waste Incineration Rule
0801-1	Commercial Hazardous Waste Incinerators		83.40	major and area	Information provided by Frank Behan, EPA/OSWER, using information from the July 1999 Background Information Document from Hazardous Waste Incineration Rule
0801-2	On-Site Hazardous Waste Incinerators		76.20	major and area	Information provided by Frank Behan, EPA/OSWER, using information from the July 1999 Background Information Document from Hazardous Waste Incineration Rule
0801-3	Cement Kilns		11.90	major and area	Information from the July 1999 Background Information Document from the Hazardous Waste Incineration Rule
0801-4	Lightweight Aggregate Kilns		47.30	major and area	Information from the July 1999 Background Information Document from the Hazardous Waste Incineration Rule

MACT code	Description	SCC	% Reduction from 2001 inventory	Source types	Reference/Comments
1403	Mercury Cell Chlor-Alkali Plants (formerly called Chlorine Production)		10.4 and facility-specific reductions	major and area	Some site- and process-specific reductions of 100% were applied to account for plant closures; See Appendix C
1626-2	Pulp & Paper Production - Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-alone Semichemical Pulping		34.88	major	Assumed mercury coming from this process in base year inventory is from a coal-fired boiler (0107-1)
1626-3	Pulp and Paper Production - NonMACT Facilities		34.88	major	Assumed mercury coming from this process in base year inventory is from a coal-fired boiler (0107-1)
1801	Medical Waste Incinerators (MWI)		Facility-specific reductions		See Appendix C
1802	Municipal Waste Combustors (MWC)		Facility-specific reductions		See Appendix C

As shown in Table 3 for three MACT/Section-129 standards, we used facility-specific reductions that were provided by the EPA staff that were responsible for the relevant MACT/Section-129 standard. For MWI, the 1999 emissions were completely replaced with facility-specific data for 2002, which we also assumed represent year 2020 emissions. For MWC, the reductions reflect known plant closures, planned retrofits, and information about whether the facility contains large or small MWC (for which different compliance dates apply). Details on the MWC approach are available in Appendix C. For the mercury cell chlor-alkali facilities, we applied facility- and process-specific reductions of 100% to account for information on plant and process closures, details for which are also available in Appendix C.

Finally, additional reductions were also applied to four specific gold mines based on a voluntary program to reduce emissions from these mines, as provided by EPA's Region 9 Office. Details about these reductions are provided in Appendix C.

4.2 Growth Approach

Emissions growth accounts for the expected increase in emissions due to increases in emissions-generating activities that occur in the future. We developed and assigned growth factors for the 2001 inventory based on MACT codes, SIC codes, and SCC codes. Using SMOKE, we applied the growth factors to the inventory using a hierarchical assignment using the MACT, SIC, and SCC. The hierarchy we used in SMOKE for the 2020 mercury projection was as follows:

- MACT-based growth factors are applied first
- SIC-based growth factors are applied second (if the record had no applicable MACT-based growth), and
- SCC-based growth factors are applied third (neither MACT nor SIC growth factors are available).
- If an inventory record did not have a MACT, SCC or SIC code that matched the growth factors, then we applied a default growth factor of 1.0 (no growth).

MACT-based factors were developed for MACT/Section-129 source categories if information was supplied by the EPA developers of MACT/Section-129 standards project leads regarding future-year growth. In all cases but two, we assumed no growth for MACT/Section-129 source categories (a growth factor of 1.0) due to uncertainties in the emission estimates of mercury from those categories. Table 4 shows the MACT-specific growth and no-growth assumptions.

Table 4: MACT-specific growth factors used to project 1999 mercury emissions to 2020.

MACT Code	Description	Growth	Comments
1808-1	Utility Boilers: Coal (sources not projected by IPM)	no growth	Vast majority of 1808-1 emissions are from IPM sources. Assumed that the remaining non-IPM sources get no growth and no reductions.
1403	Mercury Cell Chlor-Alkali Plants (formerly called Chlorine Production)	no growth	No growth assumption applies for mercury only because process is expected to change in the future.
1802	Municipal Waste Combustors	no growth	
1801	Medical Waste Incinerators	no growth	
0105	Stationary Reciprocating Internal Combustion Engines	no growth	Uncertainties in 1999 emission estimates
0107-3	Industrial/Commercial/Institutional Boilers & Process Heaters: Oil	no growth	Uncertainties in 1999 emission estimates
0107-2	Industrial/Commercial/Institutional Boilers & Process Heaters: Natural gas	no growth	Uncertainties in 1999 emission estimates
0108	Stationary Combustion Turbines	no growth	Uncertainties in 1999 emission estimates
1808-3	Utility Boilers: Oil	no growth	Uncertainties in 1999 emission estimates
0418	Asphalt Roofing and Processing	no growth	Uncertainties in 1999 emission estimates
1808-2	Utility Boilers: Natural Gas	no growth	Uncertainties in 1999 emission estimates
0302	Coke Ovens: Charging, Top Side, and Door Leaks	4% decline per year, beginning with 1997	
0802	Municipal Landfills	no growth	
1642	Miscellaneous Coating Manufacturing	no growth	Uncertainties in 1999 emission estimates
0101-1	Engine Test Facilities	no growth	
0201	Primary Aluminum Production	growth > 1	Provided by EPA rule developer for MACT 0201
0415	Clay Ceramics Manufacturing	no growth	

SIC- and SCC-based growth factors were developed based on forecasts from an updated Regional Economic Models, Inc. (REMI) model (version 5.5) and the latest Annual Energy Outlook published by the Department of Energy (DOE). This approach is consistent with the approach used for the CAIR ptnonipm and "other area" growth approaches; except because most of our inventory was based on 1999 emissions, we used available 1999-to-2020 growth factors. The growth factors were applied to the inventory through a set of crosswalks that link the growth factors to the SIC codes and the SCC codes in the 2001 base inventory. Documentation on the

development of the growth factors and the crosswalks is presented in the technical memo which is available in file "Non-EGU Nonpoint Control Development.pdf" in the CAIR docket (docket number OAR-2003-0053-1690) and on the CAIR website (http://www.epa.gov/air/interstateairquality/technical.html#NODA).

Based on an analysis performed for CAIR of the 2010 and 2015 REMI-based growth rates for the non-IPM and "other area" sectors (and described in the CAIR TSD in Section 4.1), we modified 2020 REMI-based growth rates as summarized in Table 5 below.

Table 5: SICs with improved growth rates as compared to REMI 5.5 rates.

SIC	SIC description	2020 GF	Basis of revision
1311	Crude Petroleum and Natural Gas	0.9193	BEA production from 1988-2001 declined by ~0.4% annually.
1321	Natural Gas Liquids	0.9193	
2821	Plastics Material and Synthetic Resins, and Nonvulcanizable Elastomers	1.5032	1.96% annual based on BEA for SIC=32xx.
2822	Synthetic Rubber	1.5032	
2823	Cellulosic Manmade Fibers	1.5032	
2851	Paints, Varnishes, Lacquers, Enamels, and Allied Products	1.5032	
2873	Nitrogenous Fertilizers	1.4848	BLS "employment outlook" projected a 1.90%/yr average increase in output from 2002-2012 for the 4-digit NAICS 3253 (Pesticide, fertilizer, and other agricultural chemical manufacturing).
2874	Phosphatic Fertilizers	1.4848	
2895	Carbon Black	1.5956	2.25% annually is average based on May 2000 HAP EIA.
3011	Tires and Inner Tubes	1.5157	2% annual based on tire industry growth of 28% from 1985->1997 from Rubber Tire Manufacturing MACT.
3211	Flat Glass	1.5032	1.96% annual based on BEA for SIC=32xx.
3221	Glass Containers	1.5032	
3229	Pressed and Blown Glass and Glassware, NEC	1.5032	
3241	Cement, Hydraulic	1.5265	1%/year for 2002&2003, 0.8%/year 2004, 2.5% through 2010and beyond.
3321	Gray and Ductile Iron Foundries	1.4395	BEA industry code 33 (Primary Metal Industries) experienced 1.75% average annual growth from 1987-2002. Bolded rows are those in which CAIR analysis used REMI model results rather than the value based on the BEA industry code
3322	Malleable Iron Foundaries	1.4395	
3324	Steel Investment Foundries	1.4395	
3325	Steel Foundries, NEC	1.4395	
3331	Primary Smelting and Refining of Copper	1.4395	
3334	Primary Production of Aluminum	1.4395	
3339	Primary Smelting and Refining of Nonferrous Metals, Except Copper and Aluminum	1.4395	

SIC	SIC description	2020 GF	Basis of revision
3411	Metal Cans	1.3391	BEA industry code 34 (Fabricated Metal Products) experienced 1.4% average annual growth from 1987-2002.
3441	Fabricated Structural Metal	1.3391	
3471	Electroplating, Plating, Polishing, Anodizing, and Coloring	1.3391	
3479	Coating, Engraving, and Allied Services, NEC	1.3391	
3497	Metal Foil and Leaf	1.3391	
3499	Fabricated Metal Products, NEC	1.3391	
3711	Motor Vehicles and Passenger Car Bodies	1.6455	BEA industry code 371 experienced 2.4% average annual growth from 1987-2002.
3713	Truck and Bus Bodies	1.6455	
3714	Motor Vehicle Parts and Accessories	1.6455	
3715	Truck Trailers	1.6455	

5 Summaries of mercury emissions

Table 6 provides a summary of the 2001 base and 2020 base year emissions by broad categories. Table 7 provides a summary of the 2001 base and 2020 future-base emissions by State and major sectors (ptipm, ptnonipm, and non-point).

Table 6: Summary of 2001 base and 2020 base emissions, continental U.S.

Category Name	2001 Mercury Emissions (Tons)	2020 Mercury Projected Emissions (with CAIR) (Tons)	Percent Change
Electric Generating Units Projected Using The IPM Model (includes all sources in the NEI that were matched to the April 2003 version of the 2010 IPM)	48.6	34.4	-29%
Gold Ores	11.5	2.4	-79%
Industrial, Commercial and Institutional Boilers and Process Heaters (all fuels), excluding 0.74 tons counted in "Electric Generating Units Projected Using The IPM Model"	11.2	11.15	-0.5%
Hazardous Waste Incineration	6.6	3.8	-43%
Mercury Cell Chlor-Alkali Plants	6.5	4.97	-24%
Municipal Waste Combustors	4.8	2.7	-45%
Portland Cement Manufacturing	2.4	3.6	53%
Refuse Systems	2.1	3.0	45%
Pulp and Paper Production	1.7	1.5	-14%
Stationary Reciprocating Internal Combustion Engines	1.3	1.3	0%
Industrial Inorganic Chemicals, NEC	1.2	1.7	40%
Petroleum Refineries - Catalytic Cracking, Catalytic Reforming, & Sulfur Plant Units	1.15	1.4	21%
Residential Heating: Distillate Oil	1.1	1.1	0.7%
Lamp Breakage	1.0	1.7	73%
Lime Manufacturing	1.0	1.4	44%
Sewerage Systems	0.9	1.3	39%
Dental Laboratories	0.7	1.16	66%
Other Categories (includes the sum of all categories having 1999 and 2020 emissions less than 1 ton)	7.5	8.6	16%

Total (all categories)	**111.3**	**87.2**	**-24%**

Table 7: State-sector speciated Hg emissions for 2001 and 2020.

		PGHI		HGIIGAS		Elem HG		Total HG	
State	**Sector**	**2001**	**2020**	**2001**	**2020**	**2001**	**2020**	**2001**	**2020**
Alabama	nonpoint	0.0036	0.0036	0.0056	0.0056	0.0537	0.0826	0.0629	0.0917
	ptipm	0.0859	0.0811	1.1591	0.2226	1.2235	0.4484	2.4686	0.7520
	ptnonipm	0.1385	0.1445	0.1877	0.1879	0.8691	0.8432	1.1952	1.1756
Alabama Total		**0.2280**	**0.2291**	**1.3523**	**0.4161**	**2.1463**	**1.3741**	**3.7267**	**2.0193**
Arizona	nonpoint	0.0035	0.0040	0.0064	0.0083	0.0504	0.0641	0.0604	0.0764
	ptipm	0.0062	0.0072	0.0567	0.1336	0.5648	0.8031	0.6276	0.9439
	ptnonipm	0.0272	0.0349	0.0306	0.0390	0.1740	0.2279	0.2318	0.3018
Arizona Total		**0.0369**	**0.0461**	**0.0937**	**0.1809**	**0.7892**	**1.0951**	**0.9198**	**1.3221**
Arkansas	nonpoint	0.0018	0.0017	0.0030	0.0029	0.0287	0.0457	0.0335	0.0503
	ptipm	0.0009	0.0013	0.1434	0.2514	0.3624	0.6218	0.5067	0.8744
	ptnonipm	0.1614	0.1783	0.2037	0.2222	0.4140	0.4583	0.7792	0.8587
Arkansas Total		**0.1641**	**0.1812**	**0.3501**	**0.4765**	**0.8052**	**1.1258**	**1.3194**	**1.7834**
California	nonpoint	0.4623	0.2669	0.6996	0.4121	1.3957	1.0021	2.5575	1.6812
	ptipm	0.0014	0.0021	0.0016	0.0547	0.0068	0.0663	0.0098	0.1231
	ptnonipm	0.7699	0.8420	1.1219	1.2832	2.6198	3.0592	4.5117	5.1843
California Total		**1.2335**	**1.1110**	**1.8232**	**1.7499**	**4.0224**	**4.1276**	**7.0791**	**6.9885**
Colorado	nonpoint	0.0022	0.0020	0.0033	0.0030	0.0423	0.0565	0.0478	0.0615
	ptipm	0.0035	0.0053	0.0989	0.1076	0.1534	0.1461	0.2558	0.2590
	ptnonipm	0.0271	0.0392	0.0292	0.0421	0.1770	0.2559	0.2332	0.3372
Colorado Total		**0.0328**	**0.0465**	**0.1314**	**0.1527**	**0.3727**	**0.4585**	**0.5369**	**0.6577**
Connecticut	nonpoint	0.0240	0.0247	0.0365	0.0378	0.0913	0.1052	0.1517	0.1678
	ptipm	0.0014	0.0060	0.0032	0.0056	0.0376	0.0241	0.0422	0.0358
	ptnonipm	0.0494	0.0524	0.1174	0.1195	0.0801	0.0899	0.2468	0.2618
Connecticut Total		**0.0748**	**0.0831**	**0.1570**	**0.1629**	**0.2089**	**0.2193**	**0.4407**	**0.4653**
Delaware	nonpoint	0.0014	0.0014	0.0022	0.0022	0.0113	0.0145	0.0150	0.0181
	ptipm	0.0075	0.0021	0.0722	0.0111	0.0295	0.1074	0.1092	0.1206
	ptnonipm	0.0061	0.0067	0.0334	0.0312	0.5520	0.5044	0.5915	0.5423
Delaware Total		**0.0150**	**0.0102**	**0.1079**	**0.0446**	**0.5928**	**0.6263**	**0.7157**	**0.6811**
District of Columbia	nonpoint	0.0005	0.0005	0.0008	0.0008	0.0031	0.0030	0.0044	0.0042
	ptipm		0.0000		0.0001		0.0015		0.0016
	ptnonipm	0.0002	0.0002	0.0004	0.0004	0.0006	0.0006	0.0012	0.0012
District of Columbia Total		**0.0008**	**0.0007**	**0.0012**	**0.0013**	**0.0037**	**0.0050**	**0.0057**	**0.0070**
Florida	nonpoint	0.0279	0.0292	0.0467	0.0531	0.2023	0.2523	0.2768	0.3346
	ptipm	0.0423	0.0232	0.4447	0.1296	0.4879	0.3574	0.9750	0.5102
	ptnonipm	0.4313	0.3305	0.9014	0.6317	0.8293	0.6985	2.1620	1.6607
Florida Total		**0.5014**	**0.3829**	**1.3928**	**0.8144**	**1.5195**	**1.3082**	**3.4138**	**2.5055**
Georgia	nonpoint	0.0101	0.0090	0.0156	0.0144	0.1113	0.1581	0.1370	0.1816
	ptipm	0.0614	0.0040	0.8239	0.2863	0.6061	0.9496	1.4914	1.2399
	ptnonipm	0.1177	0.0861	0.2022	0.1429	0.8665	0.7433	1.1863	0.9723
Georgia Total		**0.1892**	**0.0992**	**1.0417**	**0.4436**	**1.5839**	**1.8510**	**2.8148**	**2.3938**
Idaho	nonpoint	0.0138	0.0107	0.0225	0.0163	0.0471	0.0473	0.0835	0.0743
	ptipm		0.0000		0.0000		0.0000		0.0000
	ptnonipm	0.1051	0.1106	0.1347	0.1321	0.5149	0.6476	0.7548	0.8903
Idaho Total		**0.1189**	**0.1213**	**0.1573**	**0.1485**	**0.5621**	**0.6949**	**0.8383**	**0.9646**

State	Sector	PGHI		HGIIGAS		Elem HG		Total HG	
		2001	2020	2001	2020	2001	2020	2001	2020
Illinois	nonpoint	0.0058	0.0057	0.0098	0.0105	0.1251	0.1826	0.1407	0.1988
	ptipm	0.0358	0.1008	1.0714	0.5336	1.8883	1.0114	2.9954	1.6458
	ptnonipm	0.4316	0.5280	0.5359	0.6586	2.2359	2.8642	3.2034	4.0507
Illinois Total		**0.4732**	**0.6345**	**1.6171**	**1.2027**	**4.2492**	**4.0582**	**6.3395**	**5.8954**
Indiana	nonpoint	0.0061	0.0061	0.0095	0.0099	0.0706	0.1031	0.0861	0.1191
	ptipm	0.1030	0.0848	1.2845	0.3637	1.0693	1.0462	2.4568	1.4947
	ptnonipm	0.3389	0.3156	0.5100	0.4294	0.9891	0.9931	1.8380	1.7381
Indiana Total		**0.4480**	**0.4065**	**1.8039**	**0.8029**	**2.1290**	**2.1424**	**4.3809**	**3.3519**
Iowa	nonpoint	0.0046	0.0046	0.0071	0.0073	0.0398	0.0539	0.0515	0.0658
	ptipm	0.0041	0.0184	0.2565	0.3422	0.7148	0.6320	0.9753	0.9926
	ptnonipm	0.0182	0.0304	0.0273	0.0453	0.0455	0.0762	0.0910	0.1519
Iowa Total		**0.0269**	**0.0534**	**0.2909**	**0.3948**	**0.8000**	**0.7621**	**1.1178**	**1.2104**
Kansas	nonpoint	0.0018	0.0020	0.0029	0.0033	0.0322	0.0464	0.0370	0.0517
	ptipm	0.0084	0.0039	0.0986	0.1275	0.7279	0.9096	0.8349	1.0411
	ptnonipm	0.0692	0.0870	0.0723	0.0921	0.2027	0.2541	0.3443	0.4332
Kansas Total		**0.0794**	**0.0928**	**0.1739**	**0.2229**	**0.9629**	**1.2102**	**1.2162**	**1.5260**
Kentucky	nonpoint	0.0052	0.0050	0.0079	0.0077	0.0438	0.0603	0.0569	0.0729
	ptipm	0.0730	0.0144	0.8701	0.1507	0.7983	0.5217	1.7414	0.6868
	ptnonipm	0.3679	0.1983	0.4217	0.2659	0.9760	0.5259	1.7656	0.9900
Kentucky Total		**0.4461**	**0.2177**	**1.2997**	**0.4242**	**1.8181**	**1.1078**	**3.5639**	**1.7497**
Louisiana	nonpoint	0.0025	0.0023	0.0040	0.0038	0.0407	0.0642	0.0472	0.0703
	ptipm	0.0020	0.0109	0.1332	0.1438	0.3708	0.2411	0.5060	0.3958
	ptnonipm	0.1101	0.0931	0.1970	0.1767	1.4965	1.3450	1.8036	1.6148
Louisiana Total		**0.1146**	**0.1063**	**0.3342**	**0.3243**	**1.9079**	**1.6503**	**2.3568**	**2.0809**
Maine	nonpoint	0.0156	0.0227	0.0465	0.0664	0.2107	0.2033	0.2729	0.2924
	ptipm	0.0001	0.0175	0.0014	0.0275	0.0005	0.0176	0.0020	0.0626
	ptnonipm	0.0213	0.0118	0.0589	0.0262	0.0983	0.0317	0.1784	0.0697
Maine Total		**0.0370**	**0.0520**	**0.1068**	**0.1201**	**0.3095**	**0.2526**	**0.4534**	**0.4247**
Maryland	nonpoint	0.0123	0.0115	0.0190	0.0182	0.0741	0.0864	0.1054	0.1162
	ptipm	0.0513	0.0395	0.5596	0.0520	0.3122	0.2035	0.9231	0.2950
	ptnonipm	0.4531	0.1849	1.4068	0.3527	0.4363	0.4329	2.2962	0.9706
Maryland Total		**0.5167**	**0.2360**	**1.9854**	**0.4229**	**0.8226**	**0.7228**	**3.3246**	**1.3817**
Massachusetts	nonpoint	0.0362	0.0367	0.0550	0.0563	0.1435	0.1614	0.2348	0.2544
	ptipm	0.0098	0.0044	0.0975	0.0231	0.0392	0.2216	0.1465	0.2491
	ptnonipm	0.1058	0.0551	0.3009	0.1526	0.1370	0.0857	0.5437	0.2934
Massachusetts Total		**0.1518**	**0.0963**	**0.4534**	**0.2319**	**0.3197**	**0.4687**	**0.9249**	**0.7969**
Michigan	nonpoint	0.0110	0.0116	0.0179	0.0196	0.1197	0.1691	0.1486	0.2002
	ptipm	0.0668	0.0998	0.7926	0.6131	0.7427	0.6079	1.6021	1.3208
	ptnonipm	0.1481	0.1157	0.2767	0.1681	0.4034	0.3940	0.8283	0.6778
Michigan Total		**0.2259**	**0.2271**	**1.0872**	**0.8008**	**1.2658**	**1.1709**	**2.5789**	**2.1988**
Minnesota	nonpoint	0.0090	0.0098	0.0148	0.0167	0.0747	0.1015	0.0985	0.1281
	ptipm	0.0087	0.0075	0.0883	0.0943	0.5407	0.5775	0.6377	0.6793
	ptnonipm	0.2238	0.2010	0.4788	0.3812	0.6012	0.6541	1.3038	1.2362
Minnesota Total		**0.2416**	**0.2183**	**0.5818**	**0.4922**	**1.2166**	**1.3331**	**2.0400**	**2.0436**

State	Sector	PGHI		HGIIGAS		Elem HG		Total HG	
		2001	2020	2001	2020	2001	2020	2001	2020
Mississippi	nonpoint	0.0018	0.0019	0.0027	0.0029	0.0259	0.0395	0.0304	0.0443
	ptipm	0.0095	0.0004	0.1422	0.0150	0.1879	0.0965	0.3396	0.1120
	ptnonipm	0.1106	0.0929	0.1809	0.1291	0.3021	0.3060	0.5935	0.5280
Mississippi Total		**0.1218**	**0.0952**	**0.3259**	**0.1470**	**0.5159**	**0.4421**	**0.9636**	**0.6843**
Missouri	nonpoint	0.0060	0.0061	0.0094	0.0099	0.0589	0.0820	0.0742	0.0980
	ptipm	0.0064	0.0486	0.4507	0.5856	0.9147	1.1471	1.3717	1.7813
	ptnonipm	0.0873	0.0839	0.0833	0.0802	0.2294	0.2205	0.4000	0.3845
Missouri Total		**0.0996**	**0.1386**	**0.5433**	**0.6757**	**1.2030**	**1.4496**	**1.8459**	**2.2639**
Montana	nonpoint	0.0011	0.0011	0.0019	0.0021	0.0104	0.0140	0.0134	0.0173
	ptipm	0.0064	0.0020	0.0350	0.0314	0.4296	0.2912	0.4710	0.3246
	ptnonipm	0.0147	0.0087	0.0326	0.0142	0.0358	0.0329	0.0831	0.0559
Montana Total		**0.0223**	**0.0118**	**0.0695**	**0.0478**	**0.4757**	**0.3382**	**0.5675**	**0.3978**
Nebraska	nonpoint	0.0013	0.0014	0.0021	0.0024	0.0175	0.0265	0.0210	0.0303
	ptipm	0.0008	0.0015	0.0887	0.1622	0.3271	0.3880	0.4167	0.5517
	ptnonipm	0.0084	0.0040	0.0091	0.0047	0.0530	0.0218	0.0705	0.0304
Nebraska Total		**0.0105**	**0.0068**	**0.1000**	**0.1693**	**0.3977**	**0.4363**	**0.5081**	**0.6124**
Nevada	nonpoint	0.0018	0.0020	0.0032	0.0041	0.0196	0.0269	0.0246	0.0330
	ptipm	0.0081	0.0012	0.0900	0.1664	0.0671	0.1420	0.1652	0.3096
	ptnonipm	0.1798	0.1383	0.2691	0.2072	10.9281	1.8881	11.3770	2.2336
Nevada Total		**0.1897**	**0.1416**	**0.3623**	**0.3777**	**11.0147**	**2.0570**	**11.5668**	**2.5763**
New Hampshire	nonpoint	0.0128	0.0125	0.0195	0.0193	0.0433	0.0461	0.0756	0.0779
	ptipm	0.0022	0.0056	0.0094	0.0311	0.0069	0.0447	0.0185	0.0814
	ptnonipm	0.0316	0.0206	0.0680	0.0358	0.0585	0.0466	0.1581	0.1029
New Hampshire Total		**0.0467**	**0.0387**	**0.0969**	**0.0861**	**0.1087**	**0.1374**	**0.2522**	**0.2622**
New Jersey	nonpoint	0.0446	0.0560	0.0961	0.1304	0.1464	0.1803	0.2872	0.3667
	ptipm	0.0075	0.0049	0.0469	0.0917	0.0484	0.1290	0.1028	0.2257
	ptnonipm	0.1763	0.1896	0.3345	0.3437	0.5100	0.5831	1.0207	1.1164
New Jersey Total		**0.2284**	**0.2506**	**0.4776**	**0.5658**	**0.7048**	**0.8925**	**1.4107**	**1.7088**
New Mexico	nonpoint	0.0012	0.0012	0.0020	0.0023	0.0184	0.0237	0.0216	0.0272
	ptipm	0.0104	0.0056	0.0438	0.0382	1.0366	0.6197	1.0908	0.6635
	ptnonipm	0.0071	0.0080	0.0097	0.0107	0.0289	0.0345	0.0457	0.0531
New Mexico Total		**0.0187**	**0.0148**	**0.0555**	**0.0512**	**1.0839**	**0.6778**	**1.1581**	**0.7438**
New York	nonpoint	0.0649	0.0640	0.0991	0.0988	0.4881	0.6666	0.6522	0.8295
	ptipm	0.0786	0.0158	0.3590	0.1279	0.3502	0.4359	0.7878	0.5796
	ptnonipm	0.2212	0.2151	0.4742	0.4320	0.4135	0.4410	1.1089	1.0880
New York Total		**0.3647**	**0.2949**	**0.9322**	**0.6587**	**1.2519**	**1.5436**	**2.5489**	**2.4971**
North Carolina	nonpoint	0.0100	0.0092	0.0156	0.0147	0.0907	0.1083	0.1162	0.1321
	ptipm	0.1130	0.0136	1.0421	0.2157	0.4982	0.7423	1.6533	0.9716
	ptnonipm	0.1942	0.1227	0.5075	0.2035	0.4506	0.3061	1.1523	0.6324
North Carolina Total		**0.3172**	**0.1455**	**1.5651**	**0.4339**	**1.0395**	**1.1567**	**2.9218**	**1.7361**
North Dakota	nonpoint	0.0016	0.0016	0.0024	0.0025	0.0120	0.0167	0.0160	0.0207
	ptipm	0.0171	0.0063	0.1380	0.1314	0.8669	0.8671	1.0220	1.0048
	ptnonipm	0.0453	0.0129	0.1390	0.0178	0.0583	0.0549	0.2426	0.0856
North Dakota Total		**0.0639**	**0.0208**	**0.2795**	**0.1516**	**0.9372**	**0.9387**	**1.2807**	**1.1111**

State	Sector	PGHI		HGIIGAS		Elem HG		Total HG	
		2001	2020	2001	2020	2001	2020	2001	2020
Ohio	nonpoint	0.0158	0.0168	0.0248	0.0270	0.1294	0.1800	0.1701	0.2238
	ptipm	0.1582	0.0138	1.8115	0.2214	1.5902	0.9755	3.5599	1.2108
	ptnonipm	0.1369	0.1223	0.2240	0.2262	1.1810	1.0647	1.5420	1.4133
Ohio Total		**0.3109**	**0.1529**	**2.0603**	**0.4747**	**2.9007**	**2.2202**	**5.2720**	**2.8478**
Oklahoma	nonpoint	0.0025	0.0022	0.0040	0.0037	0.0362	0.0545	0.0427	0.0604
	ptipm	0.0017	0.0144	0.1894	0.3253	0.6698	0.7707	0.8609	1.1105
	ptnonipm	0.0600	0.0677	0.1046	0.0979	0.1683	0.2175	0.3329	0.3831
Oklahoma Total		**0.0642**	**0.0843**	**0.2979**	**0.4269**	**0.8743**	**1.0427**	**1.2365**	**1.5539**
Oregon	nonpoint	0.0163	0.0150	0.0253	0.0242	0.0728	0.0793	0.1144	0.1185
	ptipm	0.0005	0.0030	0.0284	0.0334	0.0552	0.0126	0.0842	0.0490
	ptnonipm	0.4123	0.5075	0.6114	0.7609	1.3943	1.6943	2.4180	2.9627
Oregon Total		**0.4291**	**0.5255**	**0.6652**	**0.8186**	**1.5223**	**1.7862**	**2.6166**	**3.1302**
Pennsylvania	nonpoint	0.0459	0.0459	0.0703	0.0711	0.1995	0.2290	0.3157	0.3460
	ptipm	0.3231	0.0256	3.0027	0.5597	1.7882	2.8896	5.1140	3.4749
	ptnonipm	0.4232	0.3913	0.7699	0.6087	1.0207	1.1212	2.2138	2.1213
Pennsylvania Total		**0.7922**	**0.4628**	**3.8428**	**1.2396**	**3.0085**	**4.2398**	**7.6435**	**5.9422**
Rhode Island	nonpoint	0.0063	0.0065	0.0096	0.0100	0.0231	0.0263	0.0391	0.0428
	ptipm		0.0000		0.0000		0.0000		0.0000
	ptnonipm	0.0286	0.0271	0.0522	0.0540	0.0621	0.0545	0.1429	0.1357
Rhode Island Total		**0.0349**	**0.0336**	**0.0619**	**0.0641**	**0.0852**	**0.0808**	**0.1820**	**0.1785**
South Carolina	nonpoint	0.0061	0.0050	0.0094	0.0079	0.0453	0.0630	0.0607	0.0759
	ptipm	0.0282	0.0146	0.3065	0.1343	0.2072	0.1384	0.5419	0.2873
	ptnonipm	0.2172	0.1707	0.3620	0.3424	0.4573	0.3179	1.0364	0.8310
South Carolina Total		**0.2514**	**0.1902**	**0.6778**	**0.4846**	**0.7098**	**0.5193**	**1.6390**	**1.1942**
South Dakota	nonpoint	0.0011	0.0011	0.0017	0.0018	0.0101	0.0147	0.0129	0.0176
	ptipm	0.0002	0.0001	0.0180	0.0245	0.0373	0.0549	0.0556	0.0795
	ptnonipm	0.0011	0.0012	0.0017	0.0017	0.0029	0.0029	0.0058	0.0058
South Dakota Total		**0.0025**	**0.0024**	**0.0214**	**0.0280**	**0.0503**	**0.0725**	**0.0742**	**0.1029**
Tennessee	nonpoint	0.0050	0.0052	0.0077	0.0081	0.0585	0.0882	0.0713	0.1014
	ptipm	0.0608	0.0390	0.6869	0.0670	0.3774	0.2835	1.1251	0.3895
	ptnonipm	0.0826	0.0816	0.1880	0.1543	0.8144	0.7882	1.0851	1.0241
Tennessee Total		**0.1485**	**0.1258**	**0.8826**	**0.2294**	**1.2504**	**1.1599**	**2.2815**	**1.5150**
Texas	nonpoint	0.0142	0.0127	0.0225	0.0213	0.2035	0.2516	0.2402	0.2856
	ptipm	0.1222	0.0289	1.5110	0.5198	3.2037	2.4888	4.8370	3.0374
	ptnonipm	0.4588	0.3023	0.5790	0.3863	2.1978	1.5057	3.2356	2.1943
Texas Total		**0.5952**	**0.3438**	**2.1125**	**0.9274**	**5.6050**	**4.2461**	**8.3128**	**5.5173**
Utah	nonpoint	0.0016	0.0015	0.0025	0.0024	0.0252	0.0338	0.0293	0.0376
	ptipm	0.0053	0.0051	0.0594	0.0455	0.0769	0.1391	0.1416	0.1898
	ptnonipm	0.1906	0.0531	0.3195	0.0659	0.4123	0.1662	0.9224	0.2851
Utah Total		**0.1975**	**0.0597**	**0.3814**	**0.1138**	**0.5144**	**0.3391**	**1.0933**	**0.5125**
Vermont	nonpoint	0.0041	0.0042	0.0063	0.0065	0.0160	0.0185	0.0264	0.0292
	ptipm		0.0004		0.0043		0.0016		0.0064
	ptnonipm	0.0001	0.0002	0.0002	0.0003	0.0004	0.0006	0.0008	0.0011
Vermont Total		**0.0043**	**0.0048**	**0.0065**	**0.0112**	**0.0164**	**0.0207**	**0.0272**	**0.0367**

State	Sector	PGHI		HGIIGAS		Elem HG		Total HG	
		2001	2020	2001	2020	2001	2020	2001	2020
Virginia	nonpoint	0.0135	0.0125	0.0207	0.0196	0.0930	0.1177	0.1271	0.1498
	ptipm	0.0383	0.0116	0.4223	0.1948	0.1727	0.2577	0.6333	0.4641
	ptnonipm	0.1313	0.0956	0.2620	0.1826	0.3660	0.2618	0.7592	0.5400
Virginia Total		**0.1830**	**0.1197**	**0.7050**	**0.3970**	**0.6316**	**0.6372**	**1.5196**	**1.1539**
Washington	nonpoint	0.0019	0.0028	0.0042	0.0069	0.0597	0.0901	0.0657	0.0999
	ptipm	0.0036	0.0014	0.0865	0.0111	0.1908	0.2634	0.2809	0.2760
	ptnonipm	0.0481	0.0306	0.0920	0.0474	0.3678	0.0943	0.5079	0.1723
Washington Total		**0.0536**	**0.0349**	**0.1826**	**0.0655**	**0.6183**	**0.4478**	**0.8545**	**0.5482**
West Virginia	nonpoint	0.0023	0.0022	0.0036	0.0034	0.0219	0.0303	0.0279	0.0359
	ptipm	0.1333	0.0072	1.5025	0.1139	0.8310	1.2113	2.4667	1.3324
	ptnonipm	0.0273	0.0199	0.0878	0.0579	0.6062	0.5564	0.7212	0.6342
West Virginia Total		**0.1629**	**0.0294**	**1.5938**	**0.1752**	**1.4591**	**1.7980**	**3.2158**	**2.0026**
Wisconsin	nonpoint	0.0103	0.0114	0.0160	0.0181	0.0776	0.1058	0.1038	0.1353
	ptipm	0.0136	0.0170	0.3660	0.2785	0.7761	0.9683	1.1557	1.2638
	ptnonipm	0.1652	0.1864	0.2881	0.3025	0.9532	0.9851	1.4064	1.4741
Wisconsin Total		**0.1891**	**0.2148**	**0.6700**	**0.5992**	**1.8069**	**2.0592**	**2.6660**	**2.8732**
Wyoming	nonpoint	0.0006	0.0006	0.0010	0.0010	0.0064	0.0085	0.0080	0.0102
	ptipm	0.0117	0.0046	0.0810	0.0645	0.8599	0.8732	0.9526	0.9423
	ptnonipm	0.0146	0.0134	0.0268	0.0163	0.0585	0.0758	0.0999	0.1055
Wyoming Total		**0.0269**	**0.0186**	**0.1088**	**0.0819**	**0.9248**	**0.9575**	**1.0604**	**1.0580**
Grand Total		**10.2863**	**8.2146**	**35.4213**	**19.5331**	**69.1189**	**59.4617**	**114.8265**	**87.2093**

APPENDIX A:
Inventory Revisions for Mercury

The detailed revisions we made to mercury emissions from the 1999 NEI, July 2003 version that are discussed in Section 2 are shown below.

1. Point source corrections

   - Deleted NTI34015 (Elk River FFR) , duplicates Great River Energy Municipal Waste Combustor (0.07248506695 tons)
   - Deleted NTI309 (Hampton/NASA Steam Plant), duplicates NTI42314 (0.0693115 tons)
   - Deleted NTIIL0317827, ILLINOIS STATE POLICE which was misclassified as a municipal waste incinerator and used an emission factor pertaining to MWC (0.0097843 tons)
   - Deleted NTIPA04523-3 (EXELON GENERATION CO/EDDYSTONE) which is a duplicate of NTI8206, EDDYSTONE (emissions = 0.27 tons)

2. **Table A-1:** Non-point source deletions

SCC	Description	States Affected	Emissions (tons)
2311030000	Construction - Roads	CA	0.9714015
2610000000	Open Burning - All types (not specified)	CA	0.0160686
2610000300	Open Burning - Yard Waste: Weed Species Unspecified	CA	0.0097526
2801000003	Agricultural Crop Tilling	CA	1.2816584
2801500000	Agricultural Field Burning - all crops	CA	0.1066325
2805000000	Agricultural Production - Livestock	CA	0.0863428
2810001000	Open Burning - Forest and Wildfires	CA, OR	0.0048924 (CA) + 0.0432892287(OR)
2810015000	Open Burning - Prescribed Burning	CA, OR	0.091182 (CA) + 0.0706430943 (OR)

3. **Table A-2:** MACT and SIC Code revisions

MACT Code Original	MACT Code Revised	SIC Code	SIC Code Revised	SCC
0703	0107			
0704	0107			
0709	0107			
0710	0107			
0711	0107			
0713	0107			
0715	0107			
0716	0107			
1314	0107			

MACT Code Original	MACT Code Revised	SIC Code	SIC Code Revised	SCC
1328	0107			
1621	0107			
1624	0107			
1629	0107			
1635	0107			
	0107	2011		
	0107	2022		
	0107	2026		
	0107	2033		
	0107	2034		
	0107	2045		
	0107	2046		
	0107	2048		
	0107	2051		
	0107	2063		
	0107	2064		
	0107	2066		
	0107	2077		
	0107	2082		
	0107	2099		
	0107	2111		
	0107	2211		
	0107	2221		
	0107	2261		
	0107	2262		
	0107	2269		
	0107	2295		
	0107	2311		
	0107	2399		
	0107	2421		
	0107	2431		
	0107	2435		
	0107	2439		
	0107	2491		
	0107	2493		
	0107	2499		
	0107	2511		
	0107	2512		
Is null	0107	2521		
Is null	0107	2531		
Is null	0107	2542		
Is null	0107	26		
Is null	0107	2611		
Is null	0107	2621		
Is null	0107	2631		
Is null	0107	2652		

MACT Code Original	MACT Code Revised	SIC Code	SIC Code Revised	SCC
Is null	0107	2655		
Is null	0107	2657		
Is null	0107	2672		
Is null	0107	2673		
Is null	0107	2721		
Is null	0107	2731		
Is null	0107	2741		
Is null	0107	2752		
Is null	0107	2759		
Is null	0107	2821		
Is null	0107	2824		
Is null	0107	2893		
Is null	0107	3069		
Is null	0107	3081		
Is null	0107	3083		
Is null	0107	3085		
Is null	0107	3086		
Is null	0107	3088		
Is null	0107	3295		
Is null	0107	3296		
Is null	0107	3297		
Is null	0107	3299		
Is null	0107	3315		
Is null	0107	3316		
Is null	0107	3317		
Is null	0107	3351		
Is null	0107	3353		
Is null	0107	3354		
Is null	0107	3357		
Is null	0107	3398		
Is null	0107	3423		
Is null	0107	3429		
Is null	0107	3432		
Is null	0107	3433		
Is null	0107	3443		
Is null	0107	3444		
Is null	0107	3449		
Is null	0107	3452		
Is null	0107	3462		
Is null	0107	3482		
Is null	0107	3489		
Is null	0107	3511		
Is null	0107	3519		
Is null	0107	3523		
Is null	0107	3524		
Is null	0107	3531		

MACT Code Original	MACT Code Revised	SIC Code	SIC Code Revised	SCC
Is null	0107	3544		
Is null	0107	3545		
Is null	0107	3565		
Is null	0107	3572		
Is null	0107	3579		
Is null	0107	3612		
Is null	0107	3643		
Is null	0107	3644		
Is null	0107	3651		
Is null	0107	3661		
Is null	0107	3663		
Is null	0107	3671		
Is null	0107	3672		
Is null	0107	3674		
Is null	0107	3679		
Is null	0107	3699		
Is null	0107	3731		
Is null	0107	3732		
Is null	0107	3931		
Is null	0107	3944		
Is null	0107	3991		
Is null	0107	3993		
Is null	0107	3995		
Is null	0107	3999		
Is null	0107	4011		
Is null	0107	4222		
Is null	0107	4225		
Is null	0107	4741		
Is null	0107	4813		
Is null	0107	49		
Is null	0107	4911		
Is null	0107	4925		
Is null	0107	4931		
Is null	0107	4939		
Is null	0107	4959		
Is null	0107	4961		
Is null	0107	5072		
Is null	0107	5084		
Is null	0107	5211		
Is null	0107	5261		
Is null	0107	5311		
Is null	0107	5331		
Is null	0107	5511		
Is null	0107	5699		
Is null	0107	5712		
Is null	0107	5813		

MACT Code Original	MACT Code Revised	SIC Code	SIC Code Revised	SCC
Is null	0107	5912		
Is null	0107	5921		
Is null	0107	6021		
Is null	0107	6061		
Is null	0107	6311		
Is null	0107	6411		
Is null	0107	6512		
Is null	0107	6514		
Is null	0107	6531		
Is null	0107	7011		
Is null	0107	7033		
Is null	0107	7216		
Is null	0107	7218		
Is null	0107	7374		
Is null	0107	7521		
Is null	0107	7538		
Is null	0107	7694		
Is null	0107	7699		
Is null	0107	7819		
Is null	0107	7996		
Is null	0107	7997		
Is null	0107	7999		
Is null	0107	8011		
Is null	0107	8052		
Is null	0107	8059		
Is null	0107	8062		
Is null	0107	8063		
Is null	0107	8092		
Is null	0107	8099		
Is null	0107	8211		
Is null	0107	8221		
Is null	0107	8322		
Is null	0107	8422		
Is null	0107	8641		
Is null	0107	8661		
Is null	0107	8699		
Is null	0107	8731		
Is null	0107	8733		
Is null	0107	8734		
Is null	0107	8811		
Is null	0107	8999		
Is null	0107	9111		
Is null	0107	9199		
Is null	0107	9221		
Is null	0107	9223		
Is null	0107	9229		

MACT Code Original	MACT Code Revised	SIC Code	SIC Code Revised	SCC
Is null	0107	9511		
Is null	0107	9512		
Is null	0107	9531		
Is null	0107	9641		
Is null	0107	9711		
Is null	0107	9999		
Is null	0107	8060		
Is null	0107	1500		
		724	0724	
		723	0723	
Is null	0107	Is null		501001
Is null	0107	Is null		20200204
Is null	0107	Is null		39999999

Appendix B:
Mercury Speciation

Table B-1: MACT-code based speciation profiles: (provided by Anne Pope, OAQPS, 3/1/2004)

MACT Code	MACT Code Description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
1808-3	Utility Boilers: Oil	20	30	50
1808-2	Utility Boilers: Natural Gas	20	30	50
1808-1	Utility Boilers: Coal - use one of 45 bins			
1807-2	Other Solid Waste Incineration - Crematories	20	58	22
1626-3	Pulp and Paper Production - NonMACT Facilities	20	30	50
1626-2	Pulp & Paper Production - Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-alone Semichemical Pulping Mills (Subpart MM)	20	30	50
1626-1	Pulp & Paper Production - Pulping and Bleaching Systems at Kraft, Soda, Sulfite, and Semichemical Pulping Mills (Subpart S)	20	30	50
0801-4	Lightweight Aggregate Kilns	22	20	58
0801-3	Cement Kilns	22	20	58
0801-2	On-Site Hazardous Waste Incinerators	22	20	58
0801-1	Commercial Hazardous Waste Incinerators	22	20	58
0107-4	Industrial/Commercial/ Institutional Boilers & Process Heaters: Wood/Waste	20	30	50
0107-3	Industrial/Commercial/ Institutional Boilers & Process Heaters: Oil	20	30	50
0107-2	Industrial/Commercial/ Institutional Boilers & Process Heaters: Natural Gas	20	30	50
0107-1	Industrial/Commercial/ Institutional Boilers & Process Heaters: Coal	20	30	50
0101-2	Rocket Engine Test Firing	20	30	50
0101-1	Engine Test Facilities	20	30	50
1802	Municipal Waste Combustors	20	58	22
1801	Medical Waste Incinerators	20	75	5
1642	Miscellaneous Coating Manufacturing	10	10	80
1641	Miscellaneous Organic Chemical Manufacturing	10	10	80
1640	Miscellaneous Organic Chemical Processes	10	10	80
1636	Friction Products Manufacturing	10	10	80
1635	Ethylene Processes	10	10	80

MACT Code	MACT Code Description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
1634	Leather Tanning & Finishing Opers	10	10	80
1631	Tire Production	10	10	80
1629	Semiconductor Manufacturing	10	10	80
1627	Rocket Engine Test Firing	20	30	50
1626	Pulp & Paper Production	20	30	50
1624	Plywood & Composite Wood Products	10	10	80
1621	Paint Stripping Operations	10	10	80
1619	Industrial Cooling Towers	10	10	80
1610	Decorative Chromium Electroplating	10	10	80
1501	Synthetic Organic Chemical Manufacturing (HON)	10	10	80
1415	Carbon Black Production	10	10	80
1414	Uranium Hexafluoride Production	10	10	80
1409	Hydrogen Fluoride Production	10	10	80
1407	Hydrochloric Acid Production	10	10	80
1406	Fumed Silica Production	10	10	80
1403	Mercury chlor-alkali plants (formerly called Chlorine Production)	0	5	95
1347	Amino/Phenolic Resins Production	10	10	80
1337	Reinforced Plastic Composites Production	10	10	80
1328	Polyethylene Terephthalate Production	10	10	80
1314	Flexible Polyurethane Foam Production	10	10	80
1305	Boat Manufacturing	10	10	80
1302	Acrylonitrile-Butadiene-Styrene Prod	10	10	80
1201	Pharmaceuticals Production	10	10	80
1103	Solvent Extraction for Vegetable Oil Production	10	10	80
0806	Off-Site Waste & Recovery Operations	10	10	80
0805	Site Remediation	10	10	80
0804	Sewage Sludge Incineration	20	58	22
0803	Pubicly Owned Treatment Works (POTW) Emissions	10	10	80
0802	Municipal Landfills	10	10	80
0801	Hazardous Waste Incineration	22	20	58
0716	Wood Furniture (Surface Coating)	10	10	80
0715	Shipbuilding & Ship Repair (Surface Coating)	10	10	80
0714	Printing/Publishing (Surface Coating)	10	10	80
0713	Printing, Coating & Dyeing Of Fabrics	20	30	50
0712	Plastic Parts & Products (Surface Coating)	10	10	80
0711	Paper & Other Webs (Surface Coating)	10	10	80
0710	Miscellaneous Metal Parts & Products (Surface Coating)	10	10	80
0709	Metal Furniture (Surface Coating)	10	10	80
0708	Metal Coil (Surface Coating)	10	10	80
0707	Metal Can (Surface Coating)	10	10	80
0704	Large Appliance (Surface Coating)	10	10	80
0703	Wood Building Products (Surface Coating)	20	30	50
0701	Aerospace Industries	10	10	80
0601	Gasoline Distribution (Stage I)	10	10	80

MACT Code	MACT Code Description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
0504	Natural Gas Transmission & Storage	10	10	80
0503	Petroleum Refineries - Other Sources Not Distinctly Listed	10	10	80
0502	Petroleum Refineries - Cat Cracking, Reforming, & Sulfur Plant Units	10	10	80
0501	Oil & Natural Gas Production	10	10	80
0418	Asphalt Roofing and Processing	10	10	80
0415	Clay Ceramics Manufacturing	10	10	80
0414	Brick and Structural Clay Products Manufacturing	10	10	80
0412	Wool Fiberglass Manufacturing	10	10	80
0411	Taconite Iron Ore Processing	10	10	80
0410	Portland Cement Manufacturing	12	13	75
0408	Lime Manufacturing	10	10	80
0407	Clay Products Manufacturing	10	10	80
0405	Asphalt Roofing Manufacturing	10	10	80
0404	Asphalt Processing	10	10	80
0403	Asphalt Concrete Manufacturing	10	10	80
0310	Steel Pickling - HCL Process	10	10	80
0309	Steel Foundries	10	10	80
0308	Iron Foundries	10	10	80
0305	Integrated Iron & Steel Manufacturing	10	10	80
0304	Ferroalloys Production	10	10	80
0303	Coke Ovens: Pushing, Quenching, & Battery Stacks	10	10	80
0302	Coke Ovens: Charging, Top Side, and Door Leaks	10	10	80
0205	Secondary Lead Smelting	10	10	80
0204	Primary Lead Smelting	10	10	80
0203	Primary Copper Smelting	10	10	80
0202	Secondary Aluminum Production	10	10	80
0201	Primary Aluminum Production	10	10	80
0108	Stationary Combustion Turbines	20	30	50
0107	Industrial/Commercial/ Institutional Boilers & Process Heaters	20	30	50
0105	Stationary Reciprocal Internal Combustion Engines	20	30	50

Table B-2: SCC-code based speciation profiles*

SCC	SCC description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
102	External Combustion Boilers, Industrial,	20	30	50
201	Internal Combustion Engines, Electric Generation,	20	30	50
304004	Industrial Processes, Secondary Metal Production, Lead,	10	10	80
307006	Industrial Processes, Pulp and Paper and Wood Products, Particleboard Manufacture,	10	10	80
385001	Industrial Processes, Cooling Tower, Process Cooling,	10	10	80
390006	Industrial Processes, In-process Fuel Use, Natural Gas	20	30	50
501001	Waste Disposal, Solid Waste Disposal - Government, Municipal Incineration	20	58	22
501005	Waste Disposal, Solid Waste Disposal - Government, Other Incineration,	20	75	5
10100101	External Combustion Boilers, Electric Generation, Anthracite Coal, Pulverized Coal	20	30	50
10100201	External Combustion Boilers, Electric Generation, Bituminous/Subbituminous Coal, Pulverized Coal: Wet Bottom (Bituminous Coal)	20	30	50
10100202	External Combustion Boilers, Electric Generation, Bituminous/Subbituminous Coal, Pulverized Coal: Dry Bottom (Bituminous Coal)	20	30	50
10100204	External Combustion Boilers, Electric Generation, Bituminous/Subbituminous Coal, Spreader Stoker (Bituminous Coal)	20	30	50
10100212	External Combustion Boilers, Electric Generation, Bituminous/Subbituminous Coal, Pulverized Coal: Dry Bottom (Tangential) (Bituminous Coal)	20	30	50
10100218	External Combustion Boilers, Electric Generation, Bituminous/Subbituminous Coal, Atmospheric Fluidized Bed Combustion: Circulating Bed (Bitum. Coal)	20	30	50
10100222	External Combustion Boilers, Electric Generation, Bituminous/Subbituminous Coal, Pulverized Coal: Dry Bottom (Subbituminous Coal)	20	30	50
10100602	External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential	20	30	50
10100801	External Combustion Boilers, Electric Generation, Coke, All Boiler Sizes	20	30	50
10100901	External Combustion Boilers, Electric Generation, Wood/Bark Waste, Bark-fired Boiler	20	30	50
10100902	External Combustion Boilers, Electric Generation, Wood/Bark Waste, Wood/Bark Fired Boiler	20	30	50
10100903	External Combustion Boilers, Electric Generation, Wood/Bark Waste, Wood-fired Boiler - Wet Wood (>=20% moisture)	20	30	50
10101101	External Combustion Boilers, Electric Generation, Bagasse, All Boiler Sizes	20	30	50
10101201	External Combustion Boilers, Electric Generation, Solid Waste, Specify Waste Material in Comments	20	30	50
10101202	External Combustion Boilers, Electric Generation, Solid Waste, Refuse Derived Fuel	20	30	50
20100107	Internal Combustion Engines, Electric Generation, Distillate Oil (Diesel), Reciprocating: Exhaust	20	30	50
20100202	Internal Combustion Engines, Electric Generation, Natural Gas, Reciprocating	20	30	50

SCC	SCC description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
20100802	Internal Combustion Engines, Electric Generation, Landfill Gas, Reciprocating	20	30	50
20100901	Internal Combustion Engines, Electric Generation, Kerosene/Naphtha (Jet Fuel), Turbine	20	30	50
20101001	Internal Combustion Engines, Electric Generation, Geysers/Geothermal, Steam Turbine	20	30	50
20101010	Internal Combustion Engines, Electric Generation, Geysers/Geothermal, Well Drilling: Steam Emissions	20	30	50
20101020	Internal Combustion Engines, Electric Generation, Geysers/Geothermal, Well Pad Fugitives: Blowdown	20	30	50
20101021	Internal Combustion Engines, Electric Generation, Geysers/Geothermal, Well Pad Fugitives: Vents/Leaks	20	30	50
20101031	Internal Combustion Engines, Electric Generation, Geysers/Geothermal, Pipeline Fugitives: Vents/Leaks	20	30	50
20200103	Internal Combustion Engines, Industrial, Distillate Oil (Diesel), Turbine: Cogeneration	20	30	50
20200104	Internal Combustion Engines, Industrial, Distillate Oil (Diesel), Reciprocating: Cogeneration	20	30	50
20200107	Internal Combustion Engines, Industrial, Distillate Oil (Diesel), Reciprocating: Exhaust	20	30	50
20200204	Internal Combustion Engines, Industrial, Natural Gas, Reciprocating: Cogeneration	20	30	50
20200253	Internal Combustion Engines, Industrial, Natural Gas, 4-cycle Rich Burn	20	30	50
20200254	Internal Combustion Engines, Industrial, Natural Gas, 4-cycle Lean Burn	20	30	50
20200301	Internal Combustion Engines, Industrial, Gasoline, Reciprocating	20	30	50
20200402	Internal Combustion Engines, Industrial, Large Bore Engine, Dual Fuel (Oil/Gas)	20	30	50
20200901	Internal Combustion Engines, Industrial, Kerosene/Naphtha (Jet Fuel), Turbine	20	30	50
20300102	Internal Combustion Engines, Commercial/Institutional, Distillate Oil (Diesel), Turbine	20	30	50
20300201	Internal Combustion Engines, Commercial/Institutional, Natural Gas, Reciprocating	20	30	50
20300204	Internal Combustion Engines, Commercial/Institutional, Natural Gas, Cogeneration	20	30	50
20400111	Internal Combustion Engines, Engine Testing, Aircraft Engine Testing, JP-5 Fuel	20	30	50
28888801	Internal Combustion Engines, Fugitive Emissions, Other Not Classified, Specify in Comments	20	30	50
28888802	Internal Combustion Engines, Fugitive Emissions, Other Not Classified, Specify in Comments	20	30	50
30100509	Industrial Processes, Chemical Manufacturing, Carbon Black Production, Furnace Process: Fugitive Emissions	10	10	80
30101802	Industrial Processes, Chemical Manufacturing, Plastics Production, Polypropylene and Copolymers	10	10	80
30101839	Industrial Processes, Chemical Manufacturing, Plastics Production, Resin Thinning Tank ** (Use 6-45-200-21 or 6-45-210-21)	10	10	80

SCC	SCC description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
30102499	Industrial Processes, Chemical Manufacturing, Synthetic Organic Fiber Manufacturing, Other Not Classified	10	10	80
30103399	Industrial Processes, Chemical Manufacturing, Pesticides, Other Not Classified	10	10	80
30104501	Industrial Processes, Chemical Manufacturing, Organic Fertilizer, General: Mixing/Handling	10	10	80
30111201	Industrial Processes, Chemical Manufacturing, Elemental Phosphorous, Calciner	10	10	80
30111299	Industrial Processes, Chemical Manufacturing, Elemental Phosphorous, Other Not Classified	10	10	80
30112599	Industrial Processes, Chemical Manufacturing, Chlorine Derivatives, Other Not Classified	10	10	80
30183001	Industrial Processes, Chemical Manufacturing, General Processes, Storage/Transfer	10	10	80
30187098	Industrial Processes, Chemical Manufacturing, Inorganic Chemical Storage (Fixed Roof Tanks), Specify Liquid: Working Loss	10	10	80
30190013	Industrial Processes, Chemical Manufacturing, Fuel Fired Equipment, Natural Gas: Incinerators	20	30	50
30190014	Industrial Processes, Chemical Manufacturing, Fuel Fired Equipment, Process Gas: Incinerators	20	30	50
30199999	Industrial Processes, Chemical Manufacturing, Other Not Classified, Specify in Comments Field	10	10	80
30200402	Industrial Processes, Food and Agriculture, Cotton Ginning, Seed Cotton Cleaning System ** (use SCCs 3-02-004-20, 21, & 22)	20	30	50
30200407	Industrial Processes, Food and Agriculture, Cotton Ginning, Lint Cleaners	20	30	50
30200410	Industrial Processes, Food and Agriculture, Cotton Ginning, General - Entire Process, Sum of Typical Equip Used	20	30	50
30200499	Industrial Processes, Food and Agriculture, Cotton Ginning, Not Classified **	20	30	50
30200503	Industrial Processes, Food and Agriculture, Feed and Grain Terminal Elevators, Cleaning	10	10	80
30200505	Industrial Processes, Food and Agriculture, Feed and Grain Terminal Elevators, Unloading (Receiving)	10	10	80
30200601	Industrial Processes, Food and Agriculture, Feed and Grain Country Elevators, Shipping/Receiving **	10	10	80
30200602	Industrial Processes, Food and Agriculture, Feed and Grain Country Elevators, Transfer/Convey **	10	10	80
30200603	Industrial Processes, Food and Agriculture, Feed and Grain Country Elevators, Cleaning	10	10	80
30200604	Industrial Processes, Food and Agriculture, Feed and Grain Country Elevators, Drying	10	10	80
30200605	Industrial Processes, Food and Agriculture, Feed and Grain Country Elevators, Unloading (Receiving)	10	10	80
30200606	Industrial Processes, Food and Agriculture, Feed and Grain Country Elevators, Loading (Shipping)	10	10	80
30200607	Industrial Processes, Food and Agriculture, Feed and Grain Country Elevators, Removal from Bins (Tunnel Belt)	10	10	80

SCC	SCC description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
30200608	Industrial Processes, Food and Agriculture, Feed and Grain Country Elevators, Elevator Legs (Headhouse)	10	10	80
30200609	Industrial Processes, Food and Agriculture, Feed and Grain Country Elevators, Tripper (Gallery Belt)	10	10	80
30200611	Industrial Processes, Food and Agriculture, Feed and Grain Country Elevators, Elevator Legs (Headhouse)	10	10	80
30200771	Industrial Processes, Food and Agriculture, Grain Millings, Rice: Grain Receiving	10	10	80
30200772	Industrial Processes, Food and Agriculture, Grain Millings, Rice: Precleaning/Handling	10	10	80
30200773	Industrial Processes, Food and Agriculture, Grain Millings, Rice: Drying	10	10	80
30200774	Industrial Processes, Food and Agriculture, Grain Millings, Rice: Cleaning/Millhouse	10	10	80
30200799	Industrial Processes, Food and Agriculture, Grain Millings, See Comments **	10	10	80
30200899	Industrial Processes, Food and Agriculture, Feed Manufacture, Not Classified **	10	10	80
30201199	Industrial Processes, Food and Agriculture, Wines, Brandy, and Brandy Spirits, Other Not Classified	20	30	50
30201301	Industrial Processes, Food and Agriculture, Meat Smokehouses, Combined Operations **	20	30	50
30201601	Industrial Processes, Food and Agriculture, Sugar Beet Processing, Pulp Dryer : Coal-fired	20	30	50
30201684	Industrial Processes, Food and Agriculture, Sugar Beet Processing, Lime Kiln : Coal-fired	20	30	50
30201799	Industrial Processes, Food and Agriculture, Peanut Processing, Other Not Classified	10	10	80
30202201	Industrial Processes, Food and Agriculture, Cotton Seed Delinting, Acid Delinting of Cotton Seeds	20	30	50
30202601	Industrial Processes, Food and Agriculture, Seed Products and Processing, Seed Handling: General	20	30	50
30203299	Industrial Processes, Food and Agriculture, Bakeries, Other Not Classified	20	30	50
30288801	Industrial Processes, Food and Agriculture, Fugitive Emissions, Specify in Comments Field	20	30	50
30288802	Industrial Processes, Food and Agriculture, Fugitive Emissions, Specify in Comments Field	20	30	50
30299998	Industrial Processes, Food and Agriculture, Other Not Specified, Other Not Classified	20	30	50
30299999	Industrial Processes, Food and Agriculture, Other Not Specified, Other Not Classified	20	30	50
30300201	Industrial Processes, Primary Metal Production, Aluminum Hydroxide Calcining, Overall Process	10	10	80
30300820	Industrial Processes, Primary Metal Production, Iron Production (See 3-03-015 for Integrated Iron & Steel MACT), Sinter Conveyor: Transfer Station	10	10	80
30300821	Industrial Processes, Primary Metal Production, Iron Production (See 3-03-015 for Integrated Iron & Steel MACT), Unload Ore, Pellets, Limestone, into Blast Furnace	10	10	80

SCC	SCC description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
30300904	Industrial Processes, Primary Metal Production, Steel Manufacturing (See 3-03-015 for Integrated Iron & Steel MACT), Electric Arc Furnace: Alloy Steel (Stack)	10	10	80
30300908	Industrial Processes, Primary Metal Production, Steel Manufacturing (See 3-03-015 for Integrated Iron & Steel MACT), Electric Arc Furnace: Carbon Steel (Stack)	10	10	80
30300913	Industrial Processes, Primary Metal Production, Steel Manufacturing (See 3-03-015 for Integrated Iron & Steel MACT), Basic Oxygen Furnace: Open Hood-Stack	10	10	80
30300915	Industrial Processes, Primary Metal Production, Steel Manufacturing (See 3-03-015 for Integrated Iron & Steel MACT), Hot Metal (Iron) Transfer to Steelmaking Furnace	10	10	80
30300920	Industrial Processes, Primary Metal Production, Steel Manufacturing (See 3-03-015 for Integrated Iron & Steel MACT), Hot Metal Desulfurization	10	10	80
30300933	Industrial Processes, Primary Metal Production, Steel Manufacturing (See 3-03-015 for Integrated Iron & Steel MACT), Reheat Furnaces	10	10	80
30300999	Industrial Processes, Primary Metal Production, Steel Manufacturing (See 3-03-015 for Integrated Iron & Steel MACT), Other Not Classified	10	10	80
30301301	Industrial Processes, Primary Metal Production, Gold, General Processes	0	0	100
30302402	Industrial Processes, Primary Metal Production, Metal Mining (General Processes), Secondary Crushing: Low Moisture Ore	10	10	80
30302404	Industrial Processes, Primary Metal Production, Metal Mining (General Processes), Material Handling: Low Moisture Ore	10	10	80
30302411	Industrial Processes, Primary Metal Production, Metal Mining (General Processes), Ore Drying	10	10	80
30303003	Industrial Processes, Primary Metal Production, Zinc Production, Sinter Strand	10	10	80
30400333	Industrial Processes, Secondary Metal Production, Grey Iron Foundries, Shakeout Machine	10	10	80
30400402	Industrial Processes, Secondary Metal Production, Lead, Reverberatory Furnace	10	10	80
30400403	Industrial Processes, Secondary Metal Production, Lead, Blast Furnace (Cupola)	10	10	80
30400414	Industrial Processes, Secondary Metal Production, Lead, Kettle Refining: Fugitive Emissions	10	10	80
30400513	Industrial Processes, Secondary Metal Production, Lead Battery Manufacture, Barton Process: Oxidation Kettle	10	10	80
30400521	Industrial Processes, Secondary Metal Production, Lead Battery Manufacture, Overall Process	10	10	80
30400599	Industrial Processes, Secondary Metal Production, Lead Battery Manufacture, Other Not Classified	10	10	80
30400723	Industrial Processes, Secondary Metal Production, Steel Foundries, Conveyors/Elevators	10	10	80
30405099	Industrial Processes, Secondary Metal Production, Miscellaneous Casting Fabricating, Other Not Classified	10	10	80
30490031	Industrial Processes, Secondary Metal Production, Fuel Fired Equipment, Distillate Oil (No. 2): Furnaces	20	30	50

SCC	SCC description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
30490033	Industrial Processes, Secondary Metal Production, Fuel Fired Equipment, Natural Gas: Furnaces	20	30	50
30499999	Industrial Processes, Secondary Metal Production, Other Not Classified, Specify in Comments Field	20	30	50
30500108	Industrial Processes, Mineral Products, Asphalt Roofing Manufacture, Shingles and Rolls: Coating	10	10	80
30500201	Industrial Processes, Mineral Products, Asphalt Concrete, Rotary Dryer: Conventional Plant (see 3-05-002-50 to -53 for subtypes)	10	10	80
30500202	Industrial Processes, Mineral Products, Asphalt Concrete, Batch Mix Plant: Hot Elevs, Screens, Bins&Mixer (also see -45 thru -47	10	10	80
30500203	Industrial Processes, Mineral Products, Asphalt Concrete, Storage Piles	10	10	80
30500204	Industrial Processes, Mineral Products, Asphalt Concrete, Cold Aggregate Handling	10	10	80
30500205	Industrial Processes, Mineral Products, Asphalt Concrete, Drum Dryer: Drum Mix Plant (see 3-05-002-55 thru -63 for subtypes)	10	10	80
30500206	Industrial Processes, Mineral Products, Asphalt Concrete, Asphalt Heater: Natural Gas	10	10	80
30500208	Industrial Processes, Mineral Products, Asphalt Concrete, Asphalt Heater: Distillate Oil	10	10	80
30500211	Industrial Processes, Mineral Products, Asphalt Concrete, Rotary Dryer Conventional Plant with Cyclone ** use 3-05-002-01 w/CTL	10	10	80
30500251	Industrial Processes, Mineral Products, Asphalt Concrete, Batch Mix Plant: Rotary Dryer, Natural Gas-Fired (also see -45)	10	10	80
30500255	Industrial Processes, Mineral Products, Asphalt Concrete, Drum Mix Plant: Rotary Drum Dryer / Mixer, Natural Gas-Fired	10	10	80
30500258	Industrial Processes, Mineral Products, Asphalt Concrete, Drum Mix Plant: Rotary Drum Dryer / Mixer, #2 Oil-Fired	10	10	80
30500298	Industrial Processes, Mineral Products, Asphalt Concrete, Other Not Classified	10	10	80
30500299	Industrial Processes, Mineral Products, Asphalt Concrete, See Comment **	10	10	80
30500310	Industrial Processes, Mineral Products, Brick Manufacture, Curing and Firing: Sawdust Fired Tunnel Kilns	10	10	80
30500621	Industrial Processes, Mineral Products, Cement Manufacturing (Dry Process), Pulverized Coal Kiln Feed Units	12	13	75
30500622	Industrial Processes, Mineral Products, Cement Manufacturing (Dry Process), Preheater Kiln	12	13	75
30500905	Industrial Processes, Mineral Products, Clay and Fly Ash Sintering, Raw Clay/Shale Transfer/Conveying	10	10	80
30501001	Industrial Processes, Mineral Products, Coal Mining, Cleaning, and Material Handling (See 305310), Fluidized Bed	20	30	50
30501002	Industrial Processes, Mineral Products, Coal Mining, Cleaning, and Material Handling (See 305310), Flash or Suspension	20	30	50
30501008	Industrial Processes, Mineral Products, Coal Mining, Cleaning, and Material Handling (See 305310), Unloading	20	30	50
30501009	Industrial Processes, Mineral Products, Coal Mining, Cleaning, and Material Handling (See 305310), Raw Coal Storage	20	30	50
30501010	Industrial Processes, Mineral Products, Coal Mining, Cleaning, and Material Handling (See 305310), Crushing	20	30	50

SCC	SCC description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
30501011	Industrial Processes, Mineral Products, Coal Mining, Cleaning, and Material Handling (See 305310), Coal Transfer	20	30	50
30501015	Industrial Processes, Mineral Products, Coal Mining, Cleaning, and Material Handling (See 305310), Loading	20	30	50
30501024	Industrial Processes, Mineral Products, Coal Mining, Cleaning, and Material Handling (See 305310), Hauling	20	30	50
30501031	Industrial Processes, Mineral Products, Coal Mining, Cleaning, and Material Handling (See 305310), Scrapers: Travel Mode	20	30	50
30501050	Industrial Processes, Mineral Products, Coal Mining, Cleaning, and Material Handling (See 305310), Vehicle Traffic: Light/Medium Vehicles	20	30	50
30501101	Industrial Processes, Mineral Products, Concrete Batching, General (Non-fugitive)	12	13	75
30501106	Industrial Processes, Mineral Products, Concrete Batching, Transfer: Sand/Aggregate to Elevated Bins	12	13	75
30501107	Industrial Processes, Mineral Products, Concrete Batching, Cement Unloading: Storage Bins	12	13	75
30501108	Industrial Processes, Mineral Products, Concrete Batching, Weight Hopper Loading of Cement/Sand/Aggregate	12	13	75
30501109	Industrial Processes, Mineral Products, Concrete Batching, Mixer Loading of Cement/Sand/Aggregate	12	13	75
30501110	Industrial Processes, Mineral Products, Concrete Batching, Loading of Transit Mix Truck	12	13	75
30501111	Industrial Processes, Mineral Products, Concrete Batching, Loading of Dry-batch Truck	12	13	75
30501114	Industrial Processes, Mineral Products, Concrete Batching, Transferring: Conveyors/Elevators	12	13	75
30501199	Industrial Processes, Mineral Products, Concrete Batching, Other Not Classified	12	13	75
30501299	Industrial Processes, Mineral Products, Fiberglass Manufacturing, Other Not Classified	10	10	80
30501401	Industrial Processes, Mineral Products, Glass Manufacture, Furnace/General**	20	30	50
30501402	Industrial Processes, Mineral Products, Glass Manufacture, Container Glass: Melting Furnace	20	30	50
30501403	Industrial Processes, Mineral Products, Glass Manufacture, Flat Glass: Melting Furnace	20	30	50
30501499	Industrial Processes, Mineral Products, Glass Manufacture, See Comment **	20	30	50
30501501	Industrial Processes, Mineral Products, Gypsum Manufacture, Rotary Ore Dryer	10	10	80
30501504	Industrial Processes, Mineral Products, Gypsum Manufacture, Conveying	10	10	80
30501507	Industrial Processes, Mineral Products, Gypsum Manufacture, Screening: Gypsum Ore	10	10	80
30501509	Industrial Processes, Mineral Products, Gypsum Manufacture, Storage Bins: Gypsum Ore	10	10	80
30501512	Industrial Processes, Mineral Products, Gypsum Manufacture, Flash Calciner	10	10	80

SCC	SCC description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
30501604	Industrial Processes, Mineral Products, Lime Manufacture, Calcining: Rotary Kiln ** (See SCC Codes 3-05-016-18,-19,-20,-21)	10	10	80
30502001	Industrial Processes, Mineral Products, Stone Quarrying - Processing (See also 305320), Primary Crushing	20	30	50
30502002	Industrial Processes, Mineral Products, Stone Quarrying - Processing (See also 305320), Secondary Crushing/Screening	20	30	50
30502004	Industrial Processes, Mineral Products, Stone Quarrying - Processing (See also 305320), Recrushing/Screening	20	30	50
30502006	Industrial Processes, Mineral Products, Stone Quarrying - Processing (See also 305320), Miscellaneous Operations: Screen/Convey/Handling	20	30	50
30502007	Industrial Processes, Mineral Products, Stone Quarrying - Processing (See also 305320), Open Storage	20	30	50
30502009	Industrial Processes, Mineral Products, Stone Quarrying - Processing (See also 305320), Blasting: General	20	30	50
30502010	Industrial Processes, Mineral Products, Stone Quarrying - Processing (See also 305320), Drilling	20	30	50
30502011	Industrial Processes, Mineral Products, Stone Quarrying - Processing (See also 305320), Hauling	20	30	50
30502015	Industrial Processes, Mineral Products, Stone Quarrying - Processing (See also 305320), Vibrating Screens	20	30	50
30502099	Industrial Processes, Mineral Products, Stone Quarrying - Processing (See also 305320), Not Classified **	20	30	50
30502502	Industrial Processes, Mineral Products, Construction Sand and Gravel, Aggregate Storage	10	10	80
30502503	Industrial Processes, Mineral Products, Construction Sand and Gravel, Material Transfer and Conveying	10	10	80
30502504	Industrial Processes, Mineral Products, Construction Sand and Gravel, Hauling	10	10	80
30502505	Industrial Processes, Mineral Products, Construction Sand and Gravel, Pile Forming: Stacker	10	10	80
30502506	Industrial Processes, Mineral Products, Construction Sand and Gravel, Bulk Loading	10	10	80
30502507	Industrial Processes, Mineral Products, Construction Sand and Gravel, Storage Piles	10	10	80
30502510	Industrial Processes, Mineral Products, Construction Sand and Gravel, Crushing	10	10	80
30502511	Industrial Processes, Mineral Products, Construction Sand and Gravel, Screening	10	10	80
30502599	Industrial Processes, Mineral Products, Construction Sand and Gravel, Not Classified **	10	10	80
30502601	Industrial Processes, Mineral Products, Diatomaceous Earth, Handling	10	10	80
30502699	Industrial Processes, Mineral Products, Diatomaceous Earth, Other Not Classified	10	10	80
30502709	Industrial Processes, Mineral Products, Industrial Sand and Gravel, Grinding: Size Reduction to 50 Microns or Smaller	10	10	80
30504020	Industrial Processes, Mineral Products, Mining and Quarrying of Nonmetallic Minerals, Loading	10	10	80
30504021	Industrial Processes, Mineral Products, Mining and Quarrying of Nonmetallic Minerals, Convey/Haul Material	10	10	80

SCC	SCC description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
30504030	Industrial Processes, Mineral Products, Mining and Quarrying of Nonmetallic Minerals, Primary Crusher	10	10	80
30504031	Industrial Processes, Mineral Products, Mining and Quarrying of Nonmetallic Minerals, Secondary Crusher	10	10	80
30504033	Industrial Processes, Mineral Products, Mining and Quarrying of Nonmetallic Minerals, Ore Dryer	10	10	80
30504034	Industrial Processes, Mineral Products, Mining and Quarrying of Nonmetallic Minerals, Screening	10	10	80
30504099	Industrial Processes, Mineral Products, Mining and Quarrying of Nonmetallic Minerals, Other Not Classified	10	10	80
30510001	Industrial Processes, Mineral Products, Bulk Materials Elevators, Unloading	10	10	80
30510102	Industrial Processes, Mineral Products, Bulk Materials Conveyors, Cement	10	10	80
30510199	Industrial Processes, Mineral Products, Bulk Materials Conveyors, Other Not Classified	10	10	80
30510298	Industrial Processes, Mineral Products, Bulk Materials Storage Bins, Mineral: Specify in Comments	10	10	80
30510299	Industrial Processes, Mineral Products, Bulk Materials Storage Bins, Other Not Classified	10	10	80
30510304	Industrial Processes, Mineral Products, Bulk Materials Open Stockpiles, Coke	10	10	80
30510504	Industrial Processes, Mineral Products, Bulk Materials Loading Operation, Coke	10	10	80
30510599	Industrial Processes, Mineral Products, Bulk Materials Loading Operation, Other Not Classified	10	10	80
30532001	Industrial Processes, Mineral Products, Stone Quarrying - Processing (See also 305020 for diff. units), Primary Crushing	20	30	50
30532006	Industrial Processes, Mineral Products, Stone Quarrying - Processing (See also 305020 for diff. units), Miscellaneous Operations: Screen/Convey/Handling	20	30	50
30532007	Industrial Processes, Mineral Products, Stone Quarrying - Processing (See also 305020 for diff. units), Open Storage	20	30	50
30532014	Industrial Processes, Mineral Products, Stone Quarrying - Processing (See also 305020 for diff. units), Shaker Screens	20	30	50
30532032	Industrial Processes, Mineral Products, Stone Quarrying - Processing (See also 305020 for diff. units), Truck Loading: Conveyor	20	30	50
30588801	Industrial Processes, Mineral Products, Fugitive Emissions, Specify in Comments Field	20	30	50
30599999	Industrial Processes, Mineral Products, Other Not Defined, Specify in Comments Field	20	30	50
30600401	Industrial Processes, Petroleum Industry, Blowdown Systems, Blowdown System with Vapor Recovery System with Flaring	10	10	80
30600701	Industrial Processes, Petroleum Industry, Cooling Towers, Cooling Towers	10	10	80
30600816	Industrial Processes, Petroleum Industry, Fugitive Emissions, Flanges: All Streams	10	10	80
30600822	Industrial Processes, Petroleum Industry, Fugitive Emissions, Vessel Relief Valves: All Streams	10	10	80

SCC	SCC description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
30600903	Industrial Processes, Petroleum Industry, Flares, Natural Gas	10	10	80
30600904	Industrial Processes, Petroleum Industry, Flares, Process Gas	10	10	80
30601101	Industrial Processes, Petroleum Industry, Asphalt Blowing, General	10	10	80
30601401	Industrial Processes, Petroleum Industry, Petroleum Coke Calcining, Coke Calciner	10	10	80
30688801	Industrial Processes, Petroleum Industry, Fugitive Emissions, Specify in Comments Field	10	10	80
30700405	Industrial Processes, Pulp and Paper and Wood Products, Pulpboard Manufacture, Paper/Board Forming	20	30	50
30701201	Industrial Processes, Pulp and Paper and Wood Products, Miscellaneous Paper Processes, Cyclones	20	30	50
30703002	Industrial Processes, Pulp and Paper and Wood Products, Miscellaneous Wood Working Operations, Wood Waste Storage Bin Loadout	10	10	80
30788801	Industrial Processes, Pulp and Paper and Wood Products, Fugitive Emissions, Specify in Comments Field	20	30	50
30790021	Industrial Processes, Pulp and Paper and Wood Products, Fuel Fired Equipment, Distillate Oil (No. 2): Flares	20	30	50
30790022	Industrial Processes, Pulp and Paper and Wood Products, Fuel Fired Equipment, Residual Oil: Flares	20	30	50
30900199	Industrial Processes, Fabricated Metal Products, General Processes, Other Not Classified	20	30	50
30900201	Industrial Processes, Fabricated Metal Products, Abrasive Blasting of Metal Parts, General	20	30	50
30900202	Industrial Processes, Fabricated Metal Products, Abrasive Blasting of Metal Parts, Sand Abrasive	20	30	50
30900203	Industrial Processes, Fabricated Metal Products, Abrasive Blasting of Metal Parts, Slag Abrasive	20	30	50
30900205	Industrial Processes, Fabricated Metal Products, Abrasive Blasting of Metal Parts, Steel Grit Abrasive	20	30	50
30901101	Industrial Processes, Fabricated Metal Products, Conversion Coating of Metal Products, Alkaline Cleaning Bath	10	10	80
30901199	Industrial Processes, Fabricated Metal Products, Conversion Coating of Metal Products, Other Not Classified	10	10	80
30902501	Industrial Processes, Fabricated Metal Products, Drum Cleaning/Reclamation, Drum Burning Furnace	10	10	80
30988801	Industrial Processes, Fabricated Metal Products, Fugitive Emissions, Specify in Comments Field	20	30	50
30999999	Industrial Processes, Fabricated Metal Products, Other Not Classified, Other Not Classified	20	30	50
31000299	Industrial Processes, Oil and Gas Production, Natural Gas Production, Other Not Classified	10	10	80
31088801	Industrial Processes, Oil and Gas Production, Fugitive Emissions, Specify in Comments Field	10	10	80
31301200	Industrial Processes, Electrical Equipment, Fluorescent Lamp Recycling, Fluorescent Lamp Recycling: Lamp Crusher	0	0	100
31399999	Industrial Processes, Electrical Equipment, Other Not Classified, Other Not Classified	20	30	50

SCC	SCC description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
31401101	Industrial Processes, Transportation Equipment, Auto Body Shredding, Primary Metal Recovery Line	10	10	80
31499999	Industrial Processes, Transportation Equipment, Other Not Classified, Other Not Classified	10	10	80
31502088	Industrial Processes, Photographic Equipment/Health Care/Laboratories, Health Care - Hospitals, Laboratory Fugitive Emissions	0	0	100
31502101	Industrial Processes, Photographic Equipment/Health Care/Laboratories, Health Care - Crematoriums, Crematory Stack	20	58	22
31502102	Industrial Processes, Photographic Equipment/Health Care/Laboratories, Health Care - Crematoriums, Crematory Stack - Human and Animal Crematories	20	58	22
31502500	Industrial Processes, Photographic Equipment/Health Care/Laboratories, Dental Alloy (Mercury Amalgams) Production, Dental Alloy (Mercury Amalgams) Production: Overall Process	0	0	100
31503001	Industrial Processes, Photographic Equipment/Health Care/Laboratories, Laboratories, Bench Scale Reagents: Research	0	0	100
31503002	Industrial Processes, Photographic Equipment/Health Care/Laboratories, Laboratories, Bench Scale Reagents: Testing	0	0	100
31503101	Industrial Processes, Photographic Equipment/Health Care/Laboratories, X-rays, Medical: General	0	0	100
33000104	Industrial Processes, Textile Products, Miscellaneous, Tenter Frames: Heat Setting	20	30	50
33088801	Industrial Processes, Textile Products, Fugitive Emissions, Specify in Comments Field	20	30	50
33088802	Industrial Processes, Textile Products, Fugitive Emissions, Specify in Comments Field	20	30	50
33088803	Industrial Processes, Textile Products, Fugitive Emissions, Specify in Comments Field	20	30	50
38500101	Industrial Processes, Cooling Tower, Process Cooling, Mechanical Draft	10	10	80
38500110	Industrial Processes, Cooling Tower, Process Cooling, Other Not Specified	10	10	80
39000201	Industrial Processes, In-process Fuel Use, Bituminous Coal, Cement Kiln/Dryer (Bituminous Coal)	20	30	50
39000289	Industrial Processes, In-process Fuel Use, Bituminous Coal, General (Bituminous)	20	30	50
39000403	Industrial Processes, In-process Fuel Use, Residual Oil, Lime Kiln	20	30	50
39000489	Industrial Processes, In-process Fuel Use, Residual Oil, General	20	30	50
39000499	Industrial Processes, In-process Fuel Use, Residual Oil, General	20	30	50
39000589	Industrial Processes, In-process Fuel Use, Distillate Oil, General	20	30	50
39000599	Industrial Processes, In-process Fuel Use, Distillate Oil, General	20	30	50
39000602	Industrial Processes, In-process Fuel Use, Natural Gas, Cement Kiln/Dryer	20	30	50
39000689	Industrial Processes, In-process Fuel Use, Natural Gas, General	20	30	50
39000699	Industrial Processes, In-process Fuel Use, Natural Gas, General	20	30	50
39000797	Industrial Processes, In-process Fuel Use, Process Gas, General	20	30	50
39000889	Industrial Processes, In-process Fuel Use, Coke, General	20	30	50

SCC	SCC description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
39000899	Industrial Processes, In-process Fuel Use, Coke, General: Coke	20	30	50
39000999	Industrial Processes, In-process Fuel Use, Wood, General: Wood	20	30	50
39001299	Industrial Processes, In-process Fuel Use, Solid Waste, General	20	30	50
39001399	Industrial Processes, In-process Fuel Use, Liquid Waste, General	20	30	50
39990014	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Manufacturing Industries, Process Gas: Incinerators	20	30	50
39990024	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Manufacturing Industries, Process Gas: Flares	20	30	50
39999991	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Industrial Processes, Other Not Classified	20	30	50
39999993	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Industrial Processes, Other Not Classified	20	30	50
39999994	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Industrial Processes, Other Not Classified	20	30	50
39999996	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Industrial Processes, Other Not Classified	20	30	50
39999997	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Industrial Processes, Other Not Classified	20	30	50
39999998	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Industrial Processes, Other Not Classified	20	30	50
39999999	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Industrial Processes, See Comment **	20	30	50
40100252	Petroleum and Solvent Evaporation, Organic Solvent Evaporation, Degreasing, 1,1,1-Trichloroethane (Methyl Chloroform): General Degreasing Units	10	10	80
40100295	Petroleum and Solvent Evaporation, Organic Solvent Evaporation, Degreasing, Other Not Classified: General Degreasing Units	10	10	80
40188898	Petroleum and Solvent Evaporation, Organic Solvent Evaporation, Fugitive Emissions, Specify in Comments Field	10	10	80
40200101	Petroleum and Solvent Evaporation, Surface Coating Operations, Surface Coating Application - General, Paint: Solvent-base	10	10	80
40200110	Petroleum and Solvent Evaporation, Surface Coating Operations, Surface Coating Application - General, Paint: Solvent-base	10	10	80
40200998	Petroleum and Solvent Evaporation, Surface Coating Operations, Thinning Solvents - General, General: Specify in Comments	10	10	80
40201001	Petroleum and Solvent Evaporation, Surface Coating Operations, Coating Oven Heater, Natural Gas	20	30	50
40201901	Petroleum and Solvent Evaporation, Surface Coating Operations, Wood Furniture Surface Coating, Coating Operation	20	30	50
40288801	Petroleum and Solvent Evaporation, Surface Coating Operations, Fugitive Emissions, Specify in Comments Field	10	10	80
40290013	Petroleum and Solvent Evaporation, Surface Coating Operations, Fuel Fired Equipment, Natural Gas: Incinerator/Afterburner	20	30	50
40290023	Petroleum and Solvent Evaporation, Surface Coating Operations, Fuel Fired Equipment, Natural Gas: Flares	20	30	50
40299998	Petroleum and Solvent Evaporation, Surface Coating Operations, Miscellaneous, Specify in Comments Field	20	30	50

SCC	SCC description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
40300107	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Dist Fuel **	10	10	80
40301001	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Gasoline RVP 13: Breathing Loss (67000 Bbl. Tank Size)	10	10	80
40301010	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Crude Oil RVP 5: Breathing Loss (67000 Bbl. Tank Size)	10	10	80
40301012	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Crude Oil RVP 5: Working Loss (Tank Diameter Independent)	10	10	80
40301013	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Jet Naphtha (JP-4): Breathing Loss (67000 Bbl. Tank Size)	10	10	80
40500199	Petroleum and Solvent Evaporation, Printing/Publishing, Drying, Dryer	10	10	80
40500212	Petroleum and Solvent Evaporation, Printing/Publishing, General, Printing: Letter Press	10	10	80
40500401	Petroleum and Solvent Evaporation, Printing/Publishing, General, Lithographic: 2752	10	10	80
49000199	Petroleum and Solvent Evaporation, Organic Solvent Evaporation, Solvent Extraction Process, Other Not Classified	20	30	50
49000203	Petroleum and Solvent Evaporation, Organic Solvent Evaporation, Waste Solvent Recovery Operations, Incinerator Stack	20	30	50
49000599	Petroleum and Solvent Evaporation, Organic Solvent Evaporation, Air Stripping Tower, Specify Solvent in Comments	20	30	50
49090013	Petroleum and Solvent Evaporation, Organic Solvent Evaporation, Fuel Fired Equipment, Natural Gas: Incinerators	20	30	50
49099998	Petroleum and Solvent Evaporation, Organic Solvent Evaporation, Miscellaneous Volatile Organic Compound Evaporation, Identify the Process and Solvent in Comments	20	30	50
49099999	Petroleum and Solvent Evaporation, Organic Solvent Evaporation, Miscellaneous Volatile Organic Compound Evaporation, Identify the Process and Solvent in Comments	20	30	50
50100101	Waste Disposal, Solid Waste Disposal - Government, Municipal Incineration, Starved Air: Multiple Chamber	20	58	22
50100102	Waste Disposal, Solid Waste Disposal - Government, Municipal Incineration, Mass Burn: Single Chamber	20	58	22
50100103	Waste Disposal, Solid Waste Disposal - Government, Municipal Incineration, Refuse Derived Fuel	20	58	22
50100105	Waste Disposal, Solid Waste Disposal - Government, Municipal Incineration, Mass Burn Waterwall Combustor	20	58	22
50100108	Waste Disposal, Solid Waste Disposal - Government, Municipal Incineration, Fluidized Bed: Refuse Derived Fuel	20	58	22
50100421	Waste Disposal, Solid Waste Disposal - Government, Landfill Dump, Waste Gas Recovery: Internal Combustion Device	10	10	80
50100505	Waste Disposal, Solid Waste Disposal - Government, Other Incineration, Medical Waste Incinerator, unspecified type, Infectious wastes only	20	75	5
50100506	Waste Disposal, Solid Waste Disposal - Government, Other Incineration, Sludge	20	58	22

SCC	SCC description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
50100515	Waste Disposal, Solid Waste Disposal - Government, Other Incineration, Sludge: Multiple Hearth	20	58	22
50100516	Waste Disposal, Solid Waste Disposal - Government, Other Incineration, Sludge: Fluidized Bed	20	58	22
50100601	Waste Disposal, Solid Waste Disposal - Government, Fire Fighting, Structure: Jet Fuel	20	30	50
50190006	Waste Disposal, Solid Waste Disposal - Government, Auxillary Fuel/No Emissions, Natural Gas	20	30	50
50200101	Waste Disposal, Solid Waste Disposal - Commercial/Institutional, Incineration, Multiple Chamber	20	30	50
50200102	Waste Disposal, Solid Waste Disposal - Commercial/Institutional, Incineration, Single Chamber	20	30	50
50200104	Waste Disposal, Solid Waste Disposal - Commercial/Institutional, Incineration, Conical Design (Tee Pee) Municipal Refuse	20	30	50
50200501	Waste Disposal, Solid Waste Disposal - Commercial/Institutional, Incineration: Special Purpose, Med Waste Controlled Air Incin-aka Starved air, 2-stg, or Modular comb	20	75	5
50200504	Waste Disposal, Solid Waste Disposal - Commercial/Institutional, Incineration: Special Purpose, Medical Waste Incinerator, unspecified type (use 502005-01, -02, -03)	20	75	5
50200505	Waste Disposal, Solid Waste Disposal - Commercial/Institutional, Incineration: Special Purpose, Medical Waste Incinerator, unspecified type, Infectious wastes only	20	75	5
50200515	Waste Disposal, Solid Waste Disposal - Commercial/Institutional, Incineration: Special Purpose, Sewage Sludge Incinerator: Multiple Hearth	20	58	22
50200601	Waste Disposal, Solid Waste Disposal - Commercial/Institutional, Landfill Dump, Waste Gas Flares ** (Use 5-01-004-10)	10	10	80
50200602	Waste Disposal, Solid Waste Disposal - Commercial/Institutional, Landfill Dump, Municipal: Fugitive Emissions ** (Use 5-01-004-02)	10	10	80
50290006	Waste Disposal, Solid Waste Disposal - Commercial/Institutional, Auxillary Fuel/No Emissions, Natural Gas	20	30	50
50300101	Waste Disposal, Solid Waste Disposal - Industrial, Incineration, Multiple Chamber	20	30	50
50300102	Waste Disposal, Solid Waste Disposal - Industrial, Incineration, Single Chamber	20	30	50
50300103	Waste Disposal, Solid Waste Disposal - Industrial, Incineration, Controlled Air	20	30	50
50300104	Waste Disposal, Solid Waste Disposal - Industrial, Incineration, Conical Design (Tee Pee) Municipal Refuse	20	30	50
50300203	Waste Disposal, Solid Waste Disposal - Industrial, Open Burning, Auto Body Components	20	30	50
50300810	Waste Disposal, Solid Waste Disposal - Industrial, Treatment, Storage, Disposal/TSDF, Waste Piles: Fugitive Emissions	20	30	50
50390006	Waste Disposal, Solid Waste Disposal - Industrial, Auxillary Fuel/No Emissions, Natural Gas	20	30	50
50400201	Waste Disposal, Site Remediation, , General Processes Miscellaneous	20	30	50
2104001000	Stationary Source Fuel Combustion, Residential, Anthracite Coal, Total: All Combustor Types	20	30	50

SCC	SCC description	Particulate Divalent %	Gaseous Divalent %	Elemental Gaseous %
2104002000	Stationary Source Fuel Combustion, Residential, Bituminous/Subbituminous Coal, Total: All Combustor Types	20	30	50
2104004000	Stationary Source Fuel Combustion, Residential, Distillate Oil, Total: All Combustor Types	20	30	50
2104006000	Stationary Source Fuel Combustion, Residential, Natural Gas, Total: All Combustor Types	20	30	50
2104006010	Stationary Source Fuel Combustion, Residential, Natural Gas, Residential Furnaces	20	30	50
2104007000	Stationary Source Fuel Combustion, Residential, Liquified Petroleum Gas (LPG), Total: All Combustor Types	20	30	50
2104008000	Stationary Source Fuel Combustion, Residential, Wood, Total: Woodstoves and Fireplaces	20	30	50
2301010010	Industrial Processes, Chemical Manufacturing: SIC 28, Industrial Inorganic Chemical Manufacturing, Sulfur Recovery: Sour Gas	10	10	80
2309000000	Industrial Processes, Fabricated Metals: SIC 34, All Processes, Total	10	10	80
2311010000	Industrial Processes, Construction: SIC 15 - 17, General Building Construction, Total	20	30	50
2311030000	Industrial Processes, Construction: SIC 15 - 17, Road Construction, Total	20	30	50
2461020000	Solvent Utilization, Miscellaneous Non-industrial: Commercial, Asphalt Application: All Processes, Total: All Solvent Types	10	10	80
2601020000	Waste Disposal, Treatment, and Recovery, On-site Incineration, Commercial/Institutional, Total	20	58	22
2610000000	Waste Disposal, Treatment, and Recovery, Open Burning, All Categories, Total	20	30	50
2610000300	Waste Disposal, Treatment, and Recovery, Open Burning, All Categories, Yard Waste - Weed Species Unspecified (incl Grass)	20	30	50
2640000000	Waste Disposal, Treatment, and Recovery, TSDFs, All TSDF Types, Total: All Processes	20	58	22
2650000001	Waste Disposal, Treatment, and Recovery, Scrap and Waste Materials, Scrap and Waste Materials, Crushing	10	10	80
2801000003	Miscellaneous Area Sources, Agriculture Production - Crops, Agriculture - Crops, Tilling	20	30	50
2801500000	Miscellaneous Area Sources, Agriculture Production - Crops, Agricultural Field Burning - whole field set on fire, Total, all crop types	20	30	50
2801520004	Miscellaneous Area Sources, Agriculture Production - Crops, Orchard Heaters, Diesel	20	30	50
2805000000	Miscellaneous Area Sources, Agriculture Production - Livestock, Agriculture - Livestock, Total	20	58	22
2810001000	Miscellaneous Area Sources, Other Combustion, Forest Wildfires, Total	20	30	50
2810015000	Miscellaneous Area Sources, Other Combustion, Prescribed Burning for Forest Management, Total	20	30	50
2810050000	Miscellaneous Area Sources, Other Combustion, Motor Vehicle Fires, Total	20	58	22
2861000000	Miscellaneous Area Sources, Fluorescent Lamp Breakage, Total, Total	0	0	100

* Data provided by Anne Pope, EPA, OAQPS, 3/1/2004

APPENDIX C:
Facility- and process-specific reductions

Item 1: MWC Reductions

Projection approach for Municipal Waste Combustion (MWC) emissions

Projected_Emissions (year 2005 and greater) =
MWC Emissions_1999 * GF * (100 - Percent reduction)/100

This approach was used along with the 1999 NEI for HAPs to estimate 2005 and later annual emissions. We estimated that growth will be small, so we assumed no growth (growth factor of 1.0) for all MWC. The above equation is applied for each inventory record tagged with an MACT code of 1802 (MWC). Different reductions could be applied based on the specific site and the specific HAP emitted. The "Percent reduction" in the equation is based on the impacts of the MWC rules, and the approach and percent reduction values are documented here.

Percent reductions from large and small MWC were generated using two memos from the MWC docket:

1. National Emission Trends for Large Municipal Waste Combustion Units [Years 1990 to 2005], by Jason Huckaby, ERG, June 17, 2002. (Docket Number A-90-45, VIII-B-7)
2. National Emission Trends for Small Municipal Waste Combustion Units [Years 1990 to 2005], by Jason Huckaby, ERG, June 12, 2002. (Docket Number A-98-18, VI-B-2)

Large MWC can be identified in the 1999 NEI for HAPs by the string "LMWC" in the StateFacilityIdentifier field. Small MWC can be identified by the string "SMWC" in the StateFacilityIdentifier field. With the MWCs are properly identified as small or large, the approach below was used to determine the particular emission reductions to be applied.

Large MWC

Based on the first memo, emissions for large MWC (LMWC) varied with time as MWCs completed retrofits or elected to close rather than retrofit. Retrofits for large MWCs were complete by year 2000 with minor change thereafter. The 1999 NEI emissions (which sum to 2.2 tons per year for LMWC) are assumed to include these completions.

Between 2000 and 2005, a retrofit was complete at Lacrosse (French Island) MWC and two LMWC closed, otherwise no other changes occured.

Reductions to be applied to LaCrosse were based on stack testing performed in 2001 (pre controls) and 2003 (post controls) on the two units. Results are shown in Table C-1 below.

Table C-1. Lacrosse percent reductions based on test data*

UNIT 1				
	before	after	Units	Percent Reduction
Hg	21.4	8.2	ug/dscm (7% O2)	61.68%
UNIT 2				
Hg	29.6	10.2	ug/dscm (7% O2)	65.54%

* Source of data is 2001and 2003 MWC compliance data input sheets supplied by Walt Stevenson

Because the percent reductions on the units were similar, we applied an average percent reduction of 64% for mercury for the LaCrosse site.

In examining the facilities in the 1999 NEI for HAPs, it was determined that two LMWC had closed:

1. Nashville Thermal Transfer Corp. (site_id= 47037-LMWC-61), Hg emissions = 0.00967 tons (1999 NEI)
2. Central Wayne (site_ID=26163-LMWC-33), Hg emissions =0.00077 (1999 NEI)

Table C-2 summarizes the LMWC reductions applied to the 1999 NEI for HAPs to project to 2005 and later years as a result of Lacrosse reductions and the two plant closures.

Table C-2: Summary of LMWC reductions.

Site Name	FIPS concatenated with Site ID	Percent Reduction
Lacrosse (French Island)	55063-LMWC-66	64
Nashville Thermal Transfer Corp	47037-LMWC-61	100
Central Wayne	26163-LMWC-33	100
ALL OTHER LMWC SITES		0

Small MWC

Based on the second memo, emissions for small MWC varied with time between 1999 and 2005 as MWCs completed retrofits or elected to close rather than retrofit. Because the compliance date for the SMWC is later than that for the LMWC, most of the SMWC in the 1999 NEI were expected to need to install controls and substantial reductions occur between 2000 and 2005. (Retrofit is required by 2005).

Using the 2000 to 2005 emission trends presented in the memo, the emission reductions shown in Table C-3 were computed across the entire SMWC industry:

Table C-3: Emissions reductions for small MWC

2000 Hg emissions	2.1 tons/year
2005 Hg emissions	0.44 tons/year
Overall Percent reduction across SMWC	79%

A reasonable assumption is to apply the above reductions to all SMWC *except for* the two facilities that were identified that did not need to install additional controls, and *except for* the three SMWC that closed since 1999.

The two facilities that did not need to install controls (and thus get 0 Percent reduction) are: Warren Energy RF (site_id= 34041-SMWC-21, mercury emissions = 0.0023 tons in the 1999

NEI) and Oswego Co. WTE (site_id= 36075-SMWC-24, mercury emissions = 0.00437 tons in the 1999 NEI). These MWC's are already equipped with all MACT controls.

The SMWC that have shut down and thus had their emissions zeroed out are:

(1) Miami (Miami RRF), site_id= 40115-SMWC-26, mercury emissions = 0.0597 tons/year in 1999 NEI

(2) Tacoma (Tacoma) site_id= 53053-SMWC-38, mercury emissions = 0.01756 tons/year in 1999 NEI

(3) Pascagoula (Pascagoula Energy Recovery Facility), site_id= 28059-SMWC-18), mercury emissions = 0.08528 tons/year in 1999 NEI

Table C-4 summarizes the reductions applied to the 1999 NEI emissions for SMWCs to compute 2005 and future year emissions.

Table C-4: Summary of the Percent Reductions to be applied to SMWCs

Site	**FIPS concatenated with Site_id**	**Percent reduction**
Warren Energy RF	34041-SMWC-21	0 (no reduction)
Oswego Co. WTE	36075-SMWC-24	0 (no reduction)
Miami RRF	40115-SMWC-26	100% (closed)
Tacoma	53053-SMWC-38	100% (closed)
Pascagoula Energy Recovery Facility	28059-SMWC-18	100% (closed)
ALL OTHER SMWC		79%

Item 2: Mercury Cell Chlor-Alkali Plant Reductions

Mercury Cell Chlor- Alkali plants are identified in the 1999 NEI for HAPs by MACT code = 1403.

Emissions were projected from this category based on the following:

- the assumption of no emissions growth,
- specific plant and mercury cell chlor-alkali unit closures
- reductions resulting from the rulemaking for this category (National Emission Standards for Hazardous Air Pollutants: Mercury Emissions From Mercury Cell Chlor-Alkali Plants" http://www.epa.gov/ttn/atw/hgcellcl/hgcellclpg.html)

The following provides more details regarding the reductions due to plant closures and rule reductions.

1. PLANT CLOSURES: We applied plant specific reductions of 100% to four plants (all Hg sources from those plants are zeroed out) to account for the closures that have occurred since 1999. To implement this approach, we applied the reduction to the entire facility based on the "Plant Id" (denoted "State Facility Identifier" in the 1999 National Inventory Format) variable.

   Note that for two of the plants (last two rows of the table), Oxy Vinyls and Georgia Pacific, we were instructed to close only the processes associated with MACT=1403. However, we erroneously applied the reduction to all processes across the plants. As can be seen in Table C-5, however, this is a small error since most of the mercury emissions from those plants are due to the mercury chlor-alkali units.

   Table C-5: Mercury emissions reductions from Mercury Cell Chlor-Alkali Plants

Facility Name	1999 NEI Plant ID (State Facility Identifier)	County, State	Plantwide 1999 Hg Emissions (tons)	1999 Hg emissions from MACT=1403 (tons)
HOLTRACHEM MANUF. CO. (LCP CHEMICALS - M	01900053	Penobscot County, ME	0.065	0.065
HOLTRACHEM MFG. CO. LLC	T$3164	Columbus County, NC	0.164	0.164
OXY VINYLS LP	HG0192D	Harris County, Tx	0.6551	0.5005
GEORGIA PACIFIC WEST INC	0004	Whatcom County, WA	0.331	0.255

2. RULE REDUCTIONS: We applied a 10.4% reduction to all other inventory records coded with MACT=1403

The sum of the other inventory records coded with MACT=1403 is 5.549 tons/year (0.179 tons from 1 record in the non-point inventory and 5.37 tons from the multiple plants in the point source inventory.) To reduce these by 10.4%, we performed the calculation (5.549) * (100-10.4)/100, which gives a result of 4.972 tons/year.

Note that we applied the 10.4% reduction to **all** records that have a MACT code of 1403, with the exception of the plant closures described above, even though the email dated 12/15/04 (see below) indicated 4 specific plants with MACT code 1403 in the inventory that are not mercury-chloralkali plants. Note that the mercury emissions from these plants in the 1999 inventory sum to less than 0.03 tons.

Item 3: Gold Mine Reductions

Projection approach for Gold Mine emissions (SIC 1084)

We used the following equation along with the 1999 NEI for HAPs to estimate the emissions in year 2020.

Projected_Emissions = Gold Mine Emissions_1999 * GF * (100-Percent reduction)/100

In this equation:

- GF is the growth factor that accounts for changes in activity due to economic influences between 1999 and the projection year.
- Percent reduction is the amount of reductions due to rules or voluntary activities.

Because we did not have information on economic growth for the gold mining industry, we assumed no growth (growth factor=1).

A featured program highlighting gold mine emission reductions is available in http://www.epa.gov/innovation/feature.htm, entitled **"**Working Together to Protect the Environment: Nevada Mining Partnership Reduces Mercury Air Emissions by 40%". This document discusses a program spearheaded by EPA Region 9 and the State of Nevada Division of Environmental Protection (NDEP) in cooperation with several precious metal mining companies in the state is the Voluntary Mercury Air Emissions Reduction Program (VMRP).

Based on this article, we determined that gold mine emissions would be reduced from 1999 levels. More specific reduction information was provided by EPA Region 9. Reductions were expected to apply to the four gold mines in Nevada that emit the most mercury. Thus, all other gold mine sites (as indicated by having an SIC code of 1041) will have constant emissions in the future (no percent reduction, and growth factor = 1.0).

The four sites to which percent reductions have been computed are summarized in Table C-6, along with information on the types of controls, and estimates of future year emissions provided by Region 9. In summary, it is expected that improved monitoring of the control devices and mercury recovery would assist in bringing down the mercury emissions by 2006 to about 4,000 lb/yr from the four major gold producers.

Table C-6: Information to compute future-year emissions from the gold mining industry.

SiteID (concatenated with FIPS code) and Site Name	Input from Region 9 for future year emissions (Steven Frey, EPA Region 9)	County	Mercury Emissions in the 1999 NEI (tons/yr)	Datasource
32007-0025 JERRITT CANYON (MAIN)	Jerritt has added sodium hypochlorite (bleach) system to existing venturi scrubbers on their 2 roasters. Testing in 9-02 (which is when they started the bleach addition) indicated 90+% reduction in mercury emissions. Jerritt has added sulfur treated carbon absorbers to refinery emission points. Plant claims that their initial stack tests considerably overestimated their emissions (e.g., 1999 emissions likely too high) because some of the mercury was condensing in the stack. Nonetheless, Steven Frey recommended that 1999 emissions remain as is. He recommended that emission reductions be based on the following site-level emission estimates: 2002 emissions: 4738lbs, 2003 emissions: 1738 lbs (which is a 3000 lbs reduction from 2002), 2006 and later: emissions are at 1000 lbs per year.	Elko County	6.7805	State submitted (June 2002 submittal)
32011-0619 PIPELINE MINING OPERATION (Placer Dome)	This is a "heap leach" operation and does not have roasters. Plant uses a proprietary chemical which locks up mercury in ore. Steve Frey recommended that emission reductions be based on the following site-level estimates: 2002 emissions: 685 pounds, 2006 and later emissions: 1000 pounds per year.	Eureka County	2.2840	
32013-0451 TWIN CREEKS/NEWMONT MINING CORP.	Newmont has Mercuric Chloride Scrubbers on their 2 roasters and sulfur treated activated carbon adsorbers on refinery building. Steve Frey recommended that emission reductions be based on the following site-level estimates: for 2002, 524 lbs (TRI report for 2002). He expects 2006 emissions to be 1000 pounds per year and remain there in future years.	Humboldt County	1.3702	
32007-T$12525 BARRICK GOLDSTRIKE MINE	Barrick has Mercuric Chloride scrubbers on their 2 roasters. Sulfur treated activated carbon adsorbers on the refinery emission points. Barrick added some adsorbers to smaller emission sources in the refinery building and recently have added a sulfur treated carbon adsorber to the carbon regeneration exhaust . (Steve Frey indicated that the carbon regeneration that tested high for mercury in 2002.) Site level emissions were 5920 pounds in 2002 (4380 from the one carbon regeneration unit). In 2003, a sulfur treated carbon adsorber was installed to treat the mercury from the regeneration unit. Steven Frey recommended that emission reductions be based on the following site-level estimates: For 2002: 5920 lbs. For 2003: 1920 lbs (a 4000 lb reduction from the carbon adsorber), and for 2006 and later emissions: 1000 pounds per year.	Elko County	0.7055	TRI data

We computed emissions reduction percentages from the information in Table C-6 as follows.

Percent Reduction (year 1999 to year X) =

100%*(Emissions Year 1999 -Emissions Year X)/Emissions Year 1999

Tables C-7 shows the percent reductions we applied to the1999 NEI emissions to estimate emissions for year 2002 and beyond.

Table C-7: Percent reduction by facility from 1999 to 2005 and 2006 and later.

	Year 1999 emissions from 1999 NEI [tons/year]	**Year 2006 and later emissions (converted from lbs in Table C-6) [tons/year[**	**Percent reduction from Year 1999 to Year 2006 and later**
JERRITT CANYON (MAIN)	6.7805	0.5	92.63%
PIPELINE MINING OPERATION (Placer Dome)	2.2840	0.5	78.11%
TWIN CREEKS/NEWMONT MINING CORP.	1.3702	0.5	63.51%
BARRICK GOLDSTRIKE MINE	0.7055	0.5	29.13%