OZONE MAINTENANCE PLAN SIP REVISION FOR A PORTION OF GREENUP COUNTY LOCATED WITHIN THE KENTUCKY PORTION OF THE HUNTINGTON-ASHLAND 8-HOUR OZONE ATTAINMENT 1-HOUR OZONE MAINTENANCE AREA

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INTRODUCTION

On April 30, 2004 (69 FR 23858), the Environmental Protection Agency (EPA) designated and classified areas for the 8-hour Ozone National Ambient Air Quality Standard (NAAQS). For most areas, these designations became effective June 15, 2004. EPA published the final phase 1 rule for implementation of the 8-hour ozone NAAQS on April 30, 2004 (69 FR 23951).

Section 51.905 (c) and (d), established in that rulemaking, set forth requirements for anti-backsliding purposes for areas designated attainment for the 8-hour standard. These provisions require areas to submit a 10-year maintenance plan under section 110(a)(1) of the Clean Air Act (CAA) if they also were a nonattainment area, or an attainment/unclassifiable area with a section 175A maintenance plan, under the previous 1-hour ozone standard.

The Kentucky portion of the Huntington-Ashland Area, which includes Boyd County and a portion of Greenup County, was redesignated to attainment in June 1995 for the 1-hour National Ambient Air Quality Standard (NAAQS) for ozone. This revision to Kentucky's State Implementation Plan (SIP) is based on six (6) years of ozone monitoring data that indicates maintenance of the 8-hour ozone standard, the implementation of certain permanent and enforceable reductions in ozone precursor emissions in the area, and a maintenance plan that continues to show an emissions level that runs through 2020. Kentucky has submitted, and U.S. EPA has approved, a request for redesignation to attainment for the 8-Hour Ozone Standard for Boyd County, therefore this maintenance plan revision only addresses the former maintenance

area of the portion of Greenup County.

BACKGROUND

In accordance with the Clean Air Act Amendments (CAAA) of 1990, Boyd County and a portion of Greenup County of the Huntington-Ashland Metropolitan Statistical Area was designated as marginal nonattainment for the 1-hour ozone standard effective on January 6, 1992[1] (November 6, 1991 FR notice). In a June 29, 1995, *Federal Register* notice, the U.S. EPA approved the redesignation of the Kentucky portion of the Huntington-Ashland Area from marginal nonattainment to attainment for the 1-hour ozone standard effective on June 29 1995[2]. On April 30, 2004 (69 FR 23858), the Environmental Protection Agency (EPA) designated and classified areas for the 8-hour ground-level ozone National Ambient Air Quality Standard (NAAQS). These areas are required to submit a 10-year maintenance plan under section 110(a)(1) of the CAA if they also were a nonattainment area, or an attainment/unclassifiable area with a section 175A maintenance plan, under the 1-hour ozone standard.

MAINTENANCE OF AIR QUALITY STANDARD

The ambient air quality data for all ozone monitors in the Kentucky counties in the Kentucky portion of the Huntington-Ashland Maintenance Area (i.e., a portion of Greenup County) indicate continued maintenance of the 8-hour ozone standard. Table 1 is a summary of the days in which the 8-hour ozone standard was exceeded in the portion of Greenup County, and Table 2 shows the design values for the Greenup County monitor.

TABLE 1

SUMMARY OF HUNTINGTON ASHLAND MAINTENANCE AREA'S 8-HOUR OZONE EXCEEDANCES

COUNTY	'00	'01	'02	'03	'04	'05	'06	'07
GREENUP*	1	6	2	1	0	0	1	2

*Portion of county.

TABLE 2

ASHLAND AREA MONITOR DESIGN VALUES

MONITOR	'00	'01	'02	'03	'04	'05	'06	'07
GREENUP	0.090	0.086	0.083	0.083	0.078	0.076	0.076	0.078

This same monitoring information for this area is contained in the U.S. EPA's Aerometric Information Retrieval System (AIRS) database *(See Appendix A for ozone monitoring information for this area)*. The ambient ozone monitoring data was collected at sites that were selected with assistance from the U.S. EPA and are considered to be representative of the area of highest concentration. The collected data were quality-assured in accordance with 40 CFR Part 58 and recorded in the U.S. EPA's AIRS database. It is anticipated that this monitor will remain at its current locations for the duration of the maintenance plan period (2002-2020). Maps indicating the location of the monitors in the Kentucky portion of the Huntington-Ashland Area counties are included in Appendix B.

PERMANENT AND ENFORCEABLE EMISSION REDUCTIONS

POST-1990 EMISSION REDUCTION PROGRAMS

The continued improvement and maintenance of air quality since 1998 in the Huntington-Ashland maintenance area, as verified by the lack of violations of the 8-hour ozone standard, is due to the implementation of permanent and enforceable emission reductions.

Emission reductions (in tons per day, or tpd) are described from various programs and initiatives.

The following categories of sources have shown or are expected to show emission reductions in VOC, carbon monoxide (CO), and oxides of nitrogen (NO_x) emissions due to regulatory measures implemented since the passage of the 1990 Clean Air Act Amendments or since the area was designated attainment.

For this SIP revision, Kentucky chose to use 2002 as the year for developing a new comprehensive ozone precursor emissions inventory from which projected emissions could be developed for 2005, 2008, 2011, 2014, 2017 and 2020. Maintenance is demonstrated by comparing the attainment year emissions to the emissions in the years listed above. The attainment year mobile emissions were recalculated using MOBILE 6.2 in order to allow an accurate comparison to mobile emissions in the years listed above. All relative planning scenarios for the mobile modeling were held constant. The following information outlines emission reduction measures that have occurred from 1990 through 2002, and those implemented after 2002 and projected to 2020.

Highway Mobile Source Reductions

Federal Motor Vehicle Control Program (FMVCP)

Permanent and enforceable emission reductions have been and continue to be achieved each year through this program. In recent years, stricter federal requirements have been imposed on automobile manufacturers for improved fuel-efficiency and extended warranties for emission control devices. Documentation of these emission reductions is contained in the highway mobile modeling runs (*See Appendix H*).

Fleet Turnover of Automobiles

Permanent and enforceable emission reductions have occurred in the Kentucky portion of the Huntington-Ashland Maintenance Area as a result of fleet turnover of automobiles. As older, less efficient automobiles are replaced by newer, more efficient models, the emissions decrease on a per mile basis. Quantification of these reductions is contained in the highway mobile modeling runs.

Lower Reid Vapor Pressure

Previous mobile modeling runs used a value of 9.0 pounds per square inch Reid Vapor Pressure for Greenup County based on a 1992 National Institute for Petroleum and Energy Research (NIPER) study. Recent guidance from U.S. EPA (Region 4 and the National Vehicle and Fuel Emissions Laboratory in Ann Arbor) indicated that a RVP of 8.6 should be used, based on information from EPA's National Inventory Model (NIM). A comparison of the emissions using the two values for RVP showed no difference in NOx emissions and only a .03 tpd difference in VOC emissions. The higher emissions were from the use of 9.0 RVP in the model. This can be considered a worst-case scenario and these numbers will continue to be used in the analysis. Even with these higher emission numbers the area maintains the standard. ***(See Appendix H).***

Tier 2 Motor Vehicle Emissions and Fuel Standards

Permanent and enforceable reductions have occurred through this program. The overall Tier 2 program focuses on reducing the passenger car and light truck emissions most responsible for causing ozone. In 2004, the Tier 2 standards began to phase in for the first time a single set of federal tailpipe emission standards that apply to all passenger cars, light trucks, and larger passenger vehicles (including sport utility vehicles, minivans, vans, and pickup trucks) operated

on any fuel. In 2007, when the new standards will be fully phased in, U.S. EPA projects that nationwide NOx reductions from cars and trucks will be 856,471 tons per year (tpy). U.S. EPA further projects a NO_x reduction of 1,236,000 tpy by 2010, and reductions reaching an estimated 2,220,000 tpy in 2020. Quantification of these reductions for Kentucky is contained in the highway mobile model runs (*Appendix H*).

Heavy-Duty Gasoline and Diesel Highway Vehicles Standards

New USEPA standards designed to reduce NOx and VOC emissions from heavy-duty gasoline and diesel highway vehicles began to take effect in 2004. A second phase of standards and testing procedures, which began in 2007, will reduce particulate matter from heavy-duty highway engines, and will also reduce highway diesel fuel sulfur content to 15 ppm since the sulfur damages emission control devices. The total program is expected to achieve a 90% reduction in particulate matter (PM) emissions and a 95% reduction in NOx emissions for these new engines using low sulfur diesel, compared to existing engines using higher-content sulfur diesel.

Large Nonroad Diesel Engines Rule

In May 2004, the USEPA promulgated new rules for large nonroad diesel engines, such as those used in construction, agricultural, and industrial equipment, to be phased in between 2008 and 2014. The nonroad diesel rules also reduce the allowable sulfur in nonroad diesel fuel by over 99%. Nonroad diesel fuel currently averages about 3,400 ppm sulfur. The rule limits nonroad diesel sulfur content to 500 ppm in 2006 and 15 ppm in 2010. The combined engine and fuel rules would reduce NOx and PM emissions from large nonroad diesel engines by over 90%, compared to current nonroad engines using higher-content sulfur diesel.

Nonroad Spark-Ignition Engines and Recreational Engines Standard

The new standard, which became effective in January 2003, regulates NOx, HC and CO for groups of previously unregulated nonroad engines. The standard applies to all new engines sold in the United States and imported after these standards began and applies to large spark-ignition engines (forklifts and airport ground service equipment), recreational vehicles (off-highway motorcycles and all-terrain-vehicles), and recreational marine diesel engines. The regulation varies based upon the type of engine or vehicle.

The large spark-ignition engines contribute to ozone formation and ambient CO and PM levels in urban areas. Tier 1 of this standard was implemented in 2004 and Tier 2 is scheduled to start in 2007. Like the large spark-ignition, recreational vehicles contribute to ozone formation and ambient CO and PM levels. For the off-highway motorcycles and all-terrain-vehicles, model year 2006, the new exhaust emissions standard was phased-in by 50% and for model years 2007 and later at 100%. Recreational marine diesel engines over 37 kilowatts are used in yachts, cruisers, and other types of pleasure craft. Recreational marine engines contribute to ozone formation and PM levels, especially in marinas. Depending on the size of the engine, the standard began phasing-in in 2006.

When all of the nonroad spark-ignition engines and recreational engines standards are fully implemented, an overall 72% reduction in HC, 80% reduction in NOx, and 56% reduction in CO emissions are expected by 2020. These controls will help reduce ambient concentrations of ozone, CO, and fine PM. (Appendix E).

Point Source Emission Reductions

Kentucky has determined that creditable emission reductions in VOC emissions have occurred since the early 1990s. The Kentucky portion of the Huntington-Ashland Area achieved the

following point source emission reductions between 1993 and 2000. Documentation for these applicable facilities is provided as follows:

Marathon Ashland Marine Repair Terminal – 21-019-00016

In response to a 1998 violation of the 1-hour ozone standard in the West Virginia portion of the Huntington-Ashland Area, Kentucky implemented a point source contingency measure. Kentucky in a June 28, 2001, letter reported to EPA the Marathon Ashland Petroleum Marine Repair Terminal's 90% control of its barge cleaning VOC emissions as a contingency measure to address the 1998 violation. Emission reductions for this source are reflected in the emissions provided in this document.

Reasonably Available Control Measures (RACM)

401 KAR 50:012, Section 1(2) requires that all major air contaminant sources shall as a minimum apply control procedures that are reasonable, available, and practical." See Appendix K for the full text of 401 KAR 50:012.

Maximum Available Control Technology (MACT)

The Clean Air Act requires U.S. EPA to review and update its lists of categories of industries that emit one or more of 188 listed toxic air pollutants, or Hazardous Air Pollutants (HAPS). For listed categories of major industrial sources, the law requires U.S. EPA to develop standards requiring those industries to achieve emission reduction equivalent to putting into place what is known as "maximum achievable control technology" (MACT). Many of the HAPS under these industrial categories of controls are also VOCs, and compliance with these new MACT standards as they are being promulgated will decrease VOC emissions from the affected industries. Additionally, U.S. EPA is now promulgating residual risk requirements for some point and area

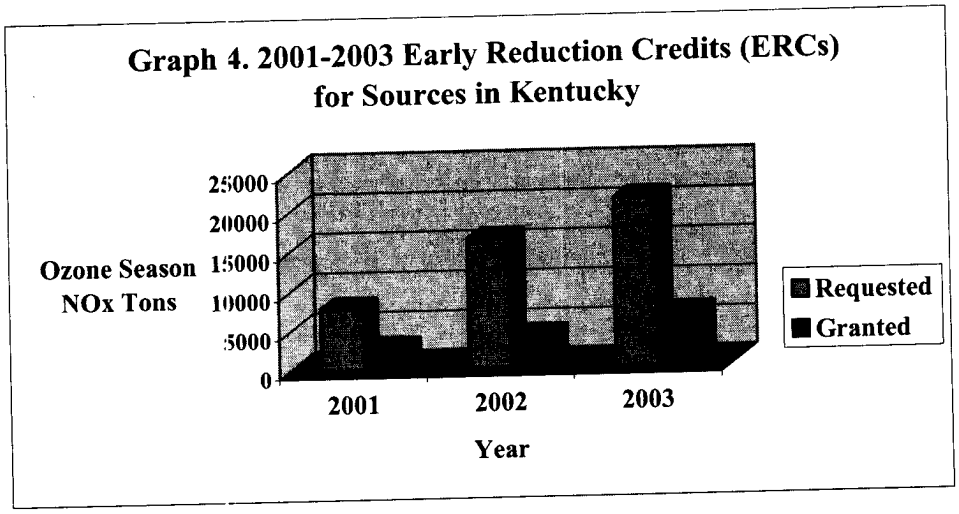
source categories. These requirements will further reduce VOC emissions.

Additional Reductions - NOx SIP Call Reductions

Although Kentucky is not claiming credit for these source reductions regarding the attainment status of the county, it is important to note ongoing and significant emission trends of any ozone precursors (ie., NO_x) that occurred during the current 2002-2006 years of ozone monitoring data.

The NOx emission reductions achieved from the NOx SIP Call throughout the entire region and the state of Kentucky, effective May 2004, will continue to contribute to the area's continued maintenance of the 8-hour ozone standard and future compliance with the ozone NAAQS.

In accordance with Kentucky regulation 401 KAR 51:180, the Division had determined from Kentucky's compliance supplement pool that electric-generating units (EGUs) had 13,469 tons available for Early Reduction Credits (ERCs). Of the 13,469 tons for EGUs, 20% (2,694) was available for emission reductions achieved in 2001, 30% (4,041) was available for emission reductions achieved in 2002, and the remaining 50% (6,734) was available for emission reductions in 2003. Per 401 KAR 51:180, the ERCs were used for compliance with NOx emission standards in 401 KAR 51:160 during the 2004 and 2005 control period. However, overall the sources in each year, requested allowances for a much larger number of ozone season NOx tons reductions. Referring to the graph below, you can compare the annual source reductions to the allowances actually available under the NOx SIP Call. These reductions benefited the nonattainment area and demonstrate on-going NOx emission reductions throughout the state.



Clean Air Interstate Rule

On May 12, 2005, the USEPA promulgated *"Rule To Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule); Revisions to Acid Rain Program; Revisions to the NOX SIP Call"*, referred to as CAIR. This rule established the requirement for states to adopt rules limiting the emissions of NOx and sulfur dioxide (SO2) and a model rule for the states to use in developing their programs. The purpose of CAIR is to reduce interstate transport of precursors of fine particulate and ozone.

CAIR applies to (1) any stationary, fossil-fuel-fired boiler or stationary, fossil-fuel-fired combustion turbine serving at any time, since the start-up of a unit's combustion chamber, a generator with nameplate capacity of more than 25 MWe producing electricity for sale and (2) for a unit that qualifies as a cogeneration unit during the 12-month period starting on the date that the unit first produces electricity and continues to qualify as a cogeneration unit, a cogeneration unit serving at any time a generator with nameplate capacity of more than 25 MWe and supplying in any calendar year more than one-third of the unit's potential electric output capacity or 219,000 MWh, whichever is greater, to any utility power distribution system for sale

This rule provides annual state caps for NOx and SO2 in two phases, with the Phase I caps for NOx and SO2 starting in 2009 and 2010, respectively. Phase II caps become effective in 2015. The USEPA is allowing the caps to be met through a cap and trade program if a state so chooses to participate in the program. Kentucky chose to continue the non-EGUs previously included in the NOx SIP seasonal program in the seasonal CAIR program.

In response to the USEPA's CAIR, Kentucky developed rules to implement CAIR. Under the rule, Kentucky has caps as follows:

- Annual NOx: 83,205 tons for 2009-2014 and
  69,337 tons for 2015 and each year thereafter;

- Ozone season NOx: 36,109 tons for 2009-2014 and
  30,651 tons for 2015 and each year thereafter;

- Annual SO2: 188,773 tons for 2010-2014 and
  132,141 tons for 2015 and each year thereafter.

The State's NOx allocations have been distributed based on allocation methodologies in 401 KAR 52:210 and 220. USEPA will determine the SO2 allocations, which are based on the acid rain program.

The Kentucky CAIR regulations became effective June 13, 2007.

Area Source Reductions

Several control programs have been implemented to substantially reduce area source emissions from the following source categories.

Aerosol Coatings, Architectural and Industrial Maintenance Coatings, and Commercial/Consumer Products

In 1998 the U.S. EPA offered a guidance document promulgating federal regulations to reduce the VOC emissions from the application of Architectural and Industrial Maintenance Coatings (e.g. traffic paints and coatings for bridges), Auto Body Refinishing, and Commercial Consumer Products. At that time a 20% reduction was allowed, and these are the reductions included in the projections in this submittal. On May 30, 2007, the EPA published a memorandum to provide guidance concerning credit that States can take for reductions associated with three Federal rules being promulgated this calendar year under authority of section 183 (e) of the Clean Air Act (see Appendix J). These rules will establish or amend VOC content limits for (1) aerosol coatings (new rule), architectural and industrial maintenance (AIM) coatings (amendments), and (3) household and institutional consumer products (amendments). EPA estimates that the amended Federal AIM rule will achieve a reduction of 31% from the post-1998 Federal rule baseline. The amount of reduction from the Commercial/Consumer Product emission reduction credit was calculated at 29%. The compliance date for the three Federal rules will be January 1, 2009. This will reduce the VOC emissions in the area further documentation of continued maintenance of the standard in the area.

Non-Highway Mobile Source Reductions

Certain federal rules have been implemented since the early 1990s that have resulted in permanent and enforceable emission reductions from nonroad sources (e.g., small engines, construction equipment). The reductions were determined using the U.S. EPA's Nonroad model and are reflected in the emissions provided in this document.

Until the mid-1990s, emissions from non-highway engines were largely uncontrolled. The non-

highway category includes outdoor power equipment, recreational vehicles (ie., scooters, mopeds, all-terrain bikes, snowmobiles, etc.), marine vessels, personal watercraft, farm and construction machinery, lawn and garden equipment, locomotives, and many other applications. Certain federal rules have been implemented since the early 1990's that have resulted in permanent and enforceable emission reductions from these nonroad sources.

Implemented during the 2002-2005 timeframe were:

Small spark-ignition engines – This set of emissions standards for handheld applications (such as leaf blowers and chainsaws) phases in 2002 – 2007 and will result in an additional 70 percent reduction in hydrocarbons and NO_x.

Large spark-ignition engines – In 2004, these emission standards began phasing in to reduce NOx and CO for many applications of industrial equipment, including forklifts, airport service equipment, generators, compressors, and welders.

Locomotives – The Tier 1 emissions standards apply to locomotives and locomotive engines manufactured from 2002 through 2004, and will reduce NO_x emissions by two thirds as new engines are placed in service.

Land-based diesel engines – More stringent standards to reduce NO_x emissions apply to all engine sizes and are being phased in between 2001 – 2006. Included in this change is construction equipment such as backhoes, agricultural equipment such as tractors, material handling equipment such as heavy forklifts, industrial equipment such as airport service vehicles, and utility equipment such as generators and pumps. In addition, the nonroad diesel rules also reduce the allowable sulfur in nonroad diesel fuel by over 99%. Nonroad diesel fuel currently averages about 3,400 ppm sulfur. The rule limits nonroad diesel sulfur content to 500 ppm in

2006 and 15 ppm in 2010. The combined engine and fuel rules would reduce NOx and PM emissions from large nonroad diesel engines by over 90%, compared to current nonroad engines using higher-content sulfur diesel.

These reductions were determined using the U.S. EPA's nonroad model and are reflected in the emissions provided in this document (*Appendix G*).

TABLE 3
FORMER ASHLAND 1-HOUR OZONE MAINTENANCE AREA FOR A PORTION OF GREENUP COUNTY ONLY
VOC EMISSIONS FOR 1993, 2002, & 2005
(TONS PER DAY)

SOURCE CATEGORY	1993 ATTAINMENT YEAR	2002 NEW PLAN	2005 LAST YEAR OLD PLAN
POINT	0.47	0.13	0.39
AREA	1.03	1.25	1.12
HIGHWAY MOBILE	2.17*	1.09	1.67
NON-HWY MOBILE	0.60	0.67	0.56
TOTAL EMISSIONS	**4.27**	**3.14**	**3.74**

*Recalculated using MOBILE 6.2

Table 3 summarizes VOC emissions in tons per day (tpd), for 1993, 2002, and 2005 and also includes any growth in emissions that may have occurred since the 1993 attainment year. The mobile emissions numbers were generated using MOBILE 6.2. In addition, included in the Table 3 emissions are any permanent and enforceable emission reductions achieved in the area.

MAINTENANCE PLAN

The maintenance plan includes an emissions inventory for the year 2002, projected inventories through 2020, a commitment to maintain the existing monitoring system, and contingency measures that will become effective should the area fail to continue to maintain the 8-hour ozone standard.

2002 MAINTENANCE AREA EMISSIONS INVENTORY

As the part of this SIP revision, a new ozone precursor emissions inventory for 2002 was developed for the Kentucky portion of the former 1-Hour Ozone Maintenance Huntington-Ashland Area (i.e., a portion of Greenup County). A copy of the 2002 maintenance area emissions inventory methodology and documentation is included as Appendix C. This 2002 emissions inventory reflects any emission controls applicable for the area. The 2002 emissions inventory was developed in accordance with EPA guidance as follows:

(1) utilizing where feasible EPA's Emissions Inventory Improvement Program and EPA National Emission Inventory (NEI) guidance. As recommended in NEI development guidance, where applicable the FAA's Emission and Dispersion and Modeling System model was utilized to calculate commercial aircraft emissions for 2002, 2005, 2008, 2011, 2014, 2017 and 2020. EPA's Nonroad Model (Core Model Version 2005a, February, 2006) was used to determine certain other nonroad (i.e., other Non-Highway) mobile source category emissions for 2002, 2005, 2008, 2011, 2014, 2017 and 2020, MOBILE 6.2 was utilized to determine highway mobile source emissions for 2002, 2005, 2008, 2011, 2014, 2017 and 2020, and the U.S. EPA's 1997 biogenic emission estimates for Kentucky counties were included in the 2002 emissions inventory per EPA guidance;

(2) utilizing where applicable previous EPA emission inventory; and

(3) utilizing inventory guidance obtained directly from EPA Region 4 personnel (e.g., phone calls, e-mails).

EMISSION PROJECTION METHODOLOGY

The 2002 Maintenance Area Emissions Inventory for a portion of Greenup County was used to project emissions into the future. Kentucky believes this inventory to be a comprehensive inventory of actual emissions for the area with the best basis for which to make any future projections.

Tables detailing the category projection inventory that predicts emissions for VOC, CO, and NO_x for years 2005, 2008, 2011, 2014, 2017 and 2020 are included for the Kentucky portion of the Huntington-Ashland Area (a portion of Greenup County) in Appendix D. Biogenic emissions have been excluded from these tables. Biogenic emissions for 2002 can be found in Appendix C. Based on advice from EPA, biogenic emissions are expected to remain stable throughout the projection period.

Tables 4-6 show the projection of emissions through 2020. The Kentucky portion of the Huntington-Ashland Area's projected 2020 total VOC and NO_x emissions are lower than the 2002 base year total VOC and NO_x emissions, thus demonstrating continued maintenance of the 8-hour ozone standard. Table 5 is not used to set budgets, but is included for informational purposes only.

TABLE 4
FORMER ASHLAND 1-HOUR OZONE MAINTENANCE AREA FOR A PORTION OF GREENUP COUNTY ONLY
1993, 2002, AND PROJECTED VOC EMISSIONS
(TONS PER DAY)
1993-2020

COUNTY	1993	2002	2005	2008	2011	2014	2017	2020
POINT	0.47	0.13	0.13	0.14	0.14	0.15	0.15	0.17
AREA	1.03	1.25	1.25	1.25	1.25	1.25	1.25	1.25
HIGHWAY	2.17**	1.09	0.87	0.75	0.64	0.54	0.48	0.42
NON-HWY	0.60	0.67	0.61	0.55	0.50	0.49	0.48	0.49
GREENUP TOTAL*	**4.27****	**3.14**	**2.86**	**2.69**	**2.53**	**2.43**	**2.36**	**2.33**

*Portion of county.

**Recalculated using MOBILE 6.2.

TABLE 5
FORMER ASHLAND 1-HOUR OZONE MAINTENANCE AREA FOR A PORTION OF GREENUP COUNTY ONLY
1993, 2002, AND PROJECTED CO EMISSIONS
(TONS PER DAY)
1993-2020

COUNTY	1993	2002	2005	2008	2011	2014	2017	2020
POINT	0.00	0.04	0.04	0.04	0.04	0.04	0.05	0.05
AREA	0.57	0.83	0.83	0.83	0.83	0.83	0.83	0.83
HIGHWAY	19.71**	11.55	8.71	7.41	6.67	6.05	5.75	5.60
NON-HWY	4.56	5.05	5.26	5.39	5.52	5.67	5.84	6.04
GREENUP TOTAL*	**24.84****	**17.47**	**14.84**	**13.67**	**13.06**	**12.59**	**12.47**	**12.52**

*Portion of county.

**Recalculated using MOBILE 6.2.

TABLE 6
FORMER ASHLAND 1-HOUR OZONE MAINTENANCE AREA FOR A PORTION OF GREENUP COUNTY ONLY
1993, 2002, AND PROJECTED NO_X EMISSIONS
(TONS PER DAY)
1993-2020

COUNTY	1993	2002	2005	2008	2011	2014	2017	2020
POINT	0.00	0.07	0.07	0.07	0.08	0.08	0.08	0.08
AREA	0.04	0.06	0.06	0.06	0.06	0.06	0.06	0.06
HIGHWAY	1.83**	1.56	1.33	1.12	0.90	0.68	0.53	0.44
NON-HWY	0.77	0.73	0.72	0.70	0.68	0.65	0.62	0.61
GREENUP TOTAL*	**2.64****	**2.42**	**2.18**	**1.95**	**1.72**	**1.47**	**1.29**	**1.19**

*Portion of county.

**Recalculated using MOBILE 6.2.

The emissions inventory is broken down into four components: point, area, highway mobile, and non-highway mobile sources. Using 2002 as the new base emissions year, the subsequent years were chosen at three-year or longer intervals that project maintenance for at least a 10-year period pending approval of the revision to the SIP. Necessary calculations for the projections were made using EXCEL software. A description of how growth factors for each emission category were obtained and used follows. The documentation showing how emissions were grown is included in Appendices E through H.

Point Source Projections

For this inventory purpose, point sources are defined as stationary sources that emit 10 tons or more per year (tpy) of VOC, or 100 tpy or more of NO_x or CO. Emissions are calculated from data collected annually from point sources. Point source information is stored in an existing Kentucky TEMPO database and certain information from this database has been provided for the

U.S. EPA's NEI.

Utilizing Standard Industrial Codes (SIC), all point source emission projections were based on growth factors calculated using Bureau of Economic Analysis (BEA) projection data for employment, as suggested by the U.S. EPA and utilized for previous point source projections. The point source data provided SIC codes used to determine a short title description that matched the corresponding description found in the BEA data. The application of growth factors for each projection was then used for point sources. Appendix E provides information on how point source projections were determined

Area Source Projections

Area sources can be defined as those sources that are generally too small and/or too numerous to be handled individually in the point source inventory. Emissions are estimated by multiplying an emission factor by a known indicator of collective activity such as number of employees or population.

For area source emission projections, population growth factors for each chosen year were calculated using an exponential formula in the EXCEL software. The application of these growth factors for each projection was then used for area sources. Information used to calculate growth factors, including population information used to project area sources was provided by the University of Louisville Urban Data Center[3] and can be found in Appendix F.

Non-Highway Mobile Source Projections

The non-highway mobile category is broken down into three groups that include 2 and 4-cycle gasoline engines and diesel engines (other non-highway engines), railroad locomotives, and

aircraft. Emissions are estimated by multiplying the base year inventory by a known indicator of collective activity such as fuel consumed or landing/takeoff operations. For locomotive and aircraft emission projections, population growth factors for each chosen year were calculated using the before mentioned formula. The application of these growth factors for each projection was then used for each of these non-highway categories. For other non-highway categories (e.g., industrial equipment, tractors, leaf blowers), the U.S. EPA's nonroad model was used to determine the future year projections. Nonroad model and non-highway projection information can be found in Appendix G. Updated minimum and maximum summer temperatures and ambient temperatures were utilized for input into the nonroad model. EPA Volume IV mobile source guidance was followed in determining the updated temperature data. Please see Appendix C for specific temperature documentation.

Highway Mobile Source Projections

To calculate highway mobile source emissions, the Division obtained data on Daily Vehicle Miles Traveled (DVMT) and speeds for 2002, 2005, 2008, 2011, 2014, 2017 and 2020 from the Kentucky Transportation Cabinet. The Division ran EPA's MOBILE 6.2 model, the latest highway mobile source emission factor estimation modeling software approved by EPA, to derive appropriate projection year emission factors that were multiplied by the corresponding DVMT to determine the projected highway mobile source emissions. The 1990 mobile emissions were recalculated using the updated MOBILE 6.2 emissions model in order to standardize the comparison of the 1990 numbers with the 2002 and 2020 mobile emissions developed using this model. These data and documentation on how these projections were performed can be found in

Appendix H, including MOBILE 6.2 input and output files used to compute the highway mobile source 2002 emissions and subsequent emission projections. Updated minimum and maximum summer temperatures were used for the highway mobile source calculations (*See Appendix C for specific temperature information*).

TOTAL OF ALL EMISSIONS

It is important to recognize the differences between the 1993 tpd for VOC and NO_x and the projected tpd for VOC and NO_x for the year 2020. Table 7 shows that the area's projected 2020 VOC and NO_x emissions are less than the 1993 attainment year VOC and NO_x emissions. Additionally, the Division for Air Quality anticipates NO_x emission reductions from internal combustion engines per Phase II of the NO_x SIP Call. If applicable, Phase II controls could lower the NO_x emissions in the area. This demonstrates continued maintenance of the 8-hour ozone standard.

TABLE 7
FORMER ASHLAND 1-HOUR OZONE MAINTENANCE AREA FOR A PORTION OF GREENUP COUNTY ONLY
1993 – 2002 – 2020 EMISSIONS COMPARISONS
(TONS PER DAY)

SOURCE CATEGORY	1993			2002			2020		
	VOC	CO	NO_x	VOC	CO	NO_x	VOC	CO	NO_x
POINT	0.47	0.00	0.00	0.13	0.04	0.07	0.17	0.05	0.08
AREA	1.03	0.57	0.04	1.25	0.83	0.06	1.25	0.83	0.06
HIGHWAY MOBILE	2.17*	19.71*	1.83*	1.09	11.55	1.56	0.42	5.60	0.44
NON-HWY MOBILE	0.60	4.56	0.77	0.67	5.05	0.73	0.49	6.04	0.61
TOTAL EMISSIONS	**4.27***	**24.84***	**2.64***	**3.14**	**17.47**	**2.42**	**2.33**	**12.52**	**1.19**

*Recalculated using MOBILE 6.2.

PLAN TO MAINTAIN AIR QUALITY

The Commonwealth of Kentucky and U.S. EPA have instituted programs that will remain enforceable and are hereby submitted as a plan to maintain air quality, which meets the NAAQS for the 8-hour ozone standard. Sources are prohibited from reducing emission controls following the redesignation of the area.

- All new major VOC or NOx sources locating in Kentucky shall as a minimum apply control procedures that are reasonable, available, and practical;
- All major modifications to existing major VOC or NOx sources are subject to RACT requirements as well as the BACT requirement of the DAQ PSD regulations;
- Federal Motor Vehicle Control Standards apply in Kentucky;
- Prevention of Significant Deterioration requirements;
- Federal Controls on certain nonroad engines (e.g. diesel and other fuel requirements, industrial diesel equipment, locomotives) after 2000;
- Federal controls on the VOC content for Architectural and Maintenance Paints, Auto Body Shops, and Consumer Products;
- The state open burning regulation to further limit types of burning in the former 1-Hour Maintenance area-Huntington-Ashland Area.

In addition to these measures, further reductions will be achieved throughout the continued implementation of new federal regulations to further control the emission of Hazardous Air Pollutants that are VOCs (40 *Code of Federal Regulations* 63, NESHAPS). Also, on March 10, 2005, the U.S. EPA finalized the Clean Air Interstate Rule (CAIR). NOx emissions from power plants will be cut by 1.7 million tons by 2009 and emissions will be reduced by 1.3 million tons in 2015 in 28 eastern states and the District of Columbia. These reductions cannot be quantified at this time, but will be reflected in future assessments.

EXISTING MONITORING NETWORK

In addition to the maintenance plan discussed above, the existing ozone monitoring network located within the Kentucky portion of the Huntington-Ashland Area has been approved by the U.S. EPA. The monitoring network will continue to remain operational in accordance with 40 CFR Part 58.

CONTINGENCY MEASURES

Future reviews of actual emissions for this former maintenance area will be performed using the latest emission factors, models, and methodologies in accordance with the Consolidated Emissions Reporting Rule (CERR). For these periodic inventories, the Commonwealth will review the assumptions made for the purpose of the maintenance demonstration concerning projected growth of activity levels. If any of these assumptions appear to have changed substantially, the Commonwealth will re-project emissions.

In the event that exceedances of the 8-hour ozone standard are measured in any portion of the maintenance area, or if periodic emission inventory updates reveal excessive or unanticipated growth greater than 10% in ozone precursor emissions, the state will evaluate existing control measures to see if any further emission reduction measures should be implemented at that time.

In the event of a monitored violation of the 8-hour ozone standard in the Kentucky portion of the Huntington-Ashland Area, the Commonwealth commits to adopt, within nine months, one or more of the following contingency measures to re-attain the standard. All regulatory programs will be implemented within 18 months.

- Implementation of a program to require additional emission reductions on stationary sources;
- Requirement for Stage I Vapor Recovery;

- Requirement for Stage II Vapor Recovery;
- Basic Vehicle Emissions Testing Program;
- Open burning ban during summer ozone season;
- Restriction of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or high-occupancy vehicles;
- Trip-reduction ordinances;
- Employer based transportation management plans, including incentives;
- Programs to limit or restrict vehicle use in downtown areas, or other areas of emission concentration, particularly during periods of peak use;
- Programs for new construction and major reconstructions of paths or tracks for use by pedestrians or by non-motorized vehicles when economically feasible and in the public interest.

The Commonwealth also reserves the right to implement other contingency measures if new control programs should be developed and deemed more advantageous for the area.

PUBLIC PARTICIPATION

Kentucky will conduct a public hearing to receive comments on this proposed SIP revision for the Kentucky portion of the Huntington-Ashland Area on January 15, 2008, at the Kentucky Division for Air Quality's Central Office located at 803 Schenkel Lane, in Frankfort, Kentucky. A copy of the public hearing notice is included in Appendix I.

REFERENCES

1. November 6, 1991, *Federal Register* Notice. Final designation of the Kentucky portion of the Huntington-Ashland Area (i.e., Boyd County and a portion of Greenup County) for the Ozone Standard.

2. June 29, 1995, *Federal Register* Notice. Approval of Redesignation to Attainment of the Kentucky portion of the Huntington-Ashland Area – Effective June 29, 1995.

3. University of Louisville – State Data Center - Population Projections for Kentucky.

APPENDIX A

Ambient Air Quality Monitoring Information

Ashland Ozone Maintenance Area

PROPOSED UPDATED MAINTENANCE EMISSIONS BUDGET

ASHLAND OZONE MAINTENANCE AREA
A PORTION OF GREENUP COUNTY

UNITES STATES ENVIRON AL PROTECTION AGENCY

User ID: NOQ

QUICKLOOK CRITERIA PARAMETERS

Report Request ID: 446631

Report Code: AMP450

Jul. 6, 2007

GEOGRAPHIC SELECTIONS

Tribal	State	County	Site	Parameter	POC	City	AQCR	UAR	MSA	CMSA	EPA Region	Method	Duration	Begin Date	End Date
	21	089													

PROTOCOL SELECTIONS

Parameter Classification	Parameter	Method	Duration
CRITERIA	44201		

SELECTED OPTIONS

Option Type	Option Value
EVENTS PROCESSING	EXCLUDE REGIONALLY CONCURRED EVENTS
MERGE PDF FILES	YES

SORT ORDER

Order	Column
1	PARAMETER_CODE
2	STATE_CODE
3	COUNTY_CODE
4	SITE_ID
5	POC
6	DATES
7	EDT_ID

GLOBAL DATES

Start Date	End Date
1996	2006

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

Jul. 6, 2007

EXCEPTIONAL DATA TYPES

EDT	DESCRIPTION
0	NO EVENTS
1	EVENTS EXCLUDED
2	EVENTS INCLUDED
3	EXCEPTIONAL EVENTS EXCLUDED
4	NATURAL EVENTS EXCLUDED
5	EVENTS WITH CONCURRENCE EXCLUDED
6	EXCEPTIONAL EVENTS WITH CONCURRENCE EXCLUDED
7	NATURAL EVENTS WITH CONCURRENCE EXCLUDED

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRO' TAL PROTECTION AGENCY
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QUICK LOOK REPORT (AMP450)

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Ozone (44201)
1-HOUR

Kentucky

Parts per million (007)

SITE ID	POC	REP ORG	CITY	COUNTY	ADDRESS	YEAR	METH	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 1-HR	2ND MAX 1-HR	3RD MAX 1-HR	4TH MAX 1-HR	DAY MAX>/= 0.125	EST DAYS>/= .125	MISS DAYS< 0.125	CERT	EDT
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	1996	053	198	214	.110	.097	.095	.092	0	0.0	1	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	1997	053	212	214	.118	.114	.110	.103	0	0.0	2	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	1998	053	208	214	.134	.133	.118	.114	2	2.0	2	Y	5
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	1999	053	214	245	.124	.122	.114	.111	0	0.0	0	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	2000	053	241	245	.099	.089	.088	.087	0	0.0	2	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	2001	053	241	245	.119	.113	.102	.101	0	0.0	4	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	2002	053	244	245	.119	.104	.103	.100	0	0.0	1	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	2003	053	244	245	.099	.094	.092	.089	0	0.0	1	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	2004	053	245	245	.087	.086	.083	.080	0	0.0	0	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	2005	000	245	245	.093	.092	.091	.090	0	0.0	0	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	2006	087	190	245	.110	.104	.093	.089	0	0.0	0		0

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

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Ozone (44201) Kentucky Parts per million (007)

8-HOUR

SITE ID	POC	REP ORG	CITY	COUNTY	ADDRESS	YEAR	METH	%OBS	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 8-HR	2ND MAX 8-HR	3RD MAX 8-HR	4TH MAX 8-HR	DAY MAX>/= 0.085	CERT	EDT
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	1996	053	93	198	214	.094	.084	.080	.077	1	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	1997	053	99	212	214	.091	.087	.083	.078	2	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	1998	053	97	207	214	.118	.108	.099	.098	12	Y	5
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	1999	053	87	214	245	.106	.101	.096	.095	11	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	2000	053	98	239	245	.085	.080	.077	.077	1	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	2001	053	99	242	245	.092	.090	.089	.088	6	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	2002	053	99	243	245	.100	.086	.084	.084	2	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	2003	053	100	244	245	.094	.084	.080	.078	1	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	2004	053	100	245	245	.075	.073	.073	.073	0	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	2005	000	100	245	245	.084	.080	.078	.078	0	Y	0
21-089-0007	1	0584	Worthington	Greenup	SCOTT & CENTER STREETS, WORTHINGTON	2006	087	77	189	245	.093	.081	.077	.077	1		0

Note: The * indicates that the mean does not satisfy summary criteria.

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METHODS USED IN THIS REPORT

PARAMETER	METHOD CODE	COLLECTION METHOD	ANALYSIS METHOD
ALL	000	MULTIPLE METHODS	MULTIPLE METHODS
44201	053	INSTRUMENTAL	ULTRA VIOLET
44201	087	INSTRUMENTAL	ULTRA VIOLET ABSORPTION

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

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REPORTING ORGANIZATIONS USED IN THIS REPORT

REPORTING ORGANIZATION CODE	AGENCY DESCRIPTION
0584	Kentucky Division For Air Quality

Note: The * indicates that the mean does not satisfy summary criteria.

APPENDIX B

Map of Area Ozone Monitors

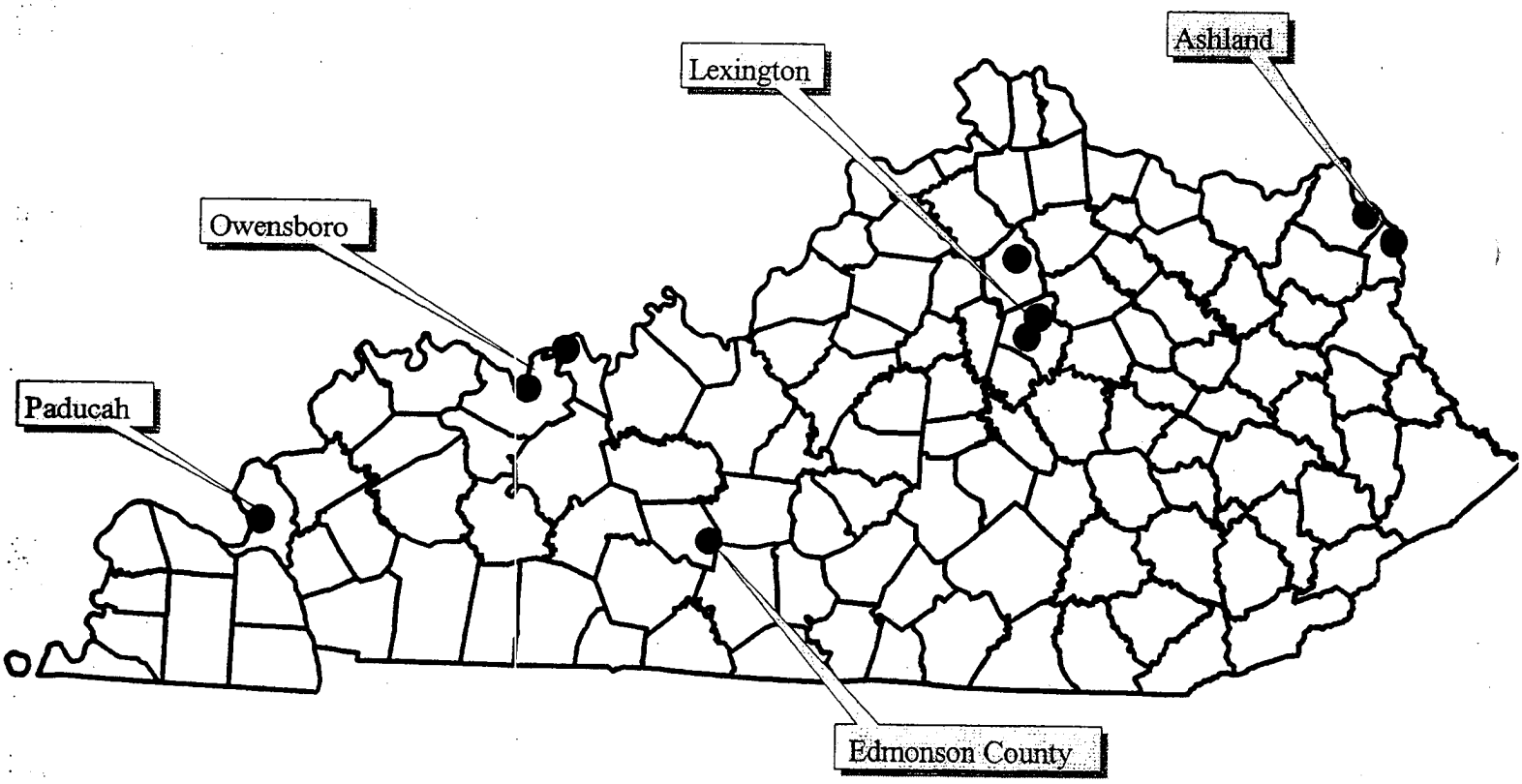
Ashland Ozone Maintenance Area

PROPOSED UPDATED MAINTENANCE EMISSIONS BUDGET

ASHLAND OZONE MAINTENANCE AREA
A PORTION OF GREENUP COUNTY

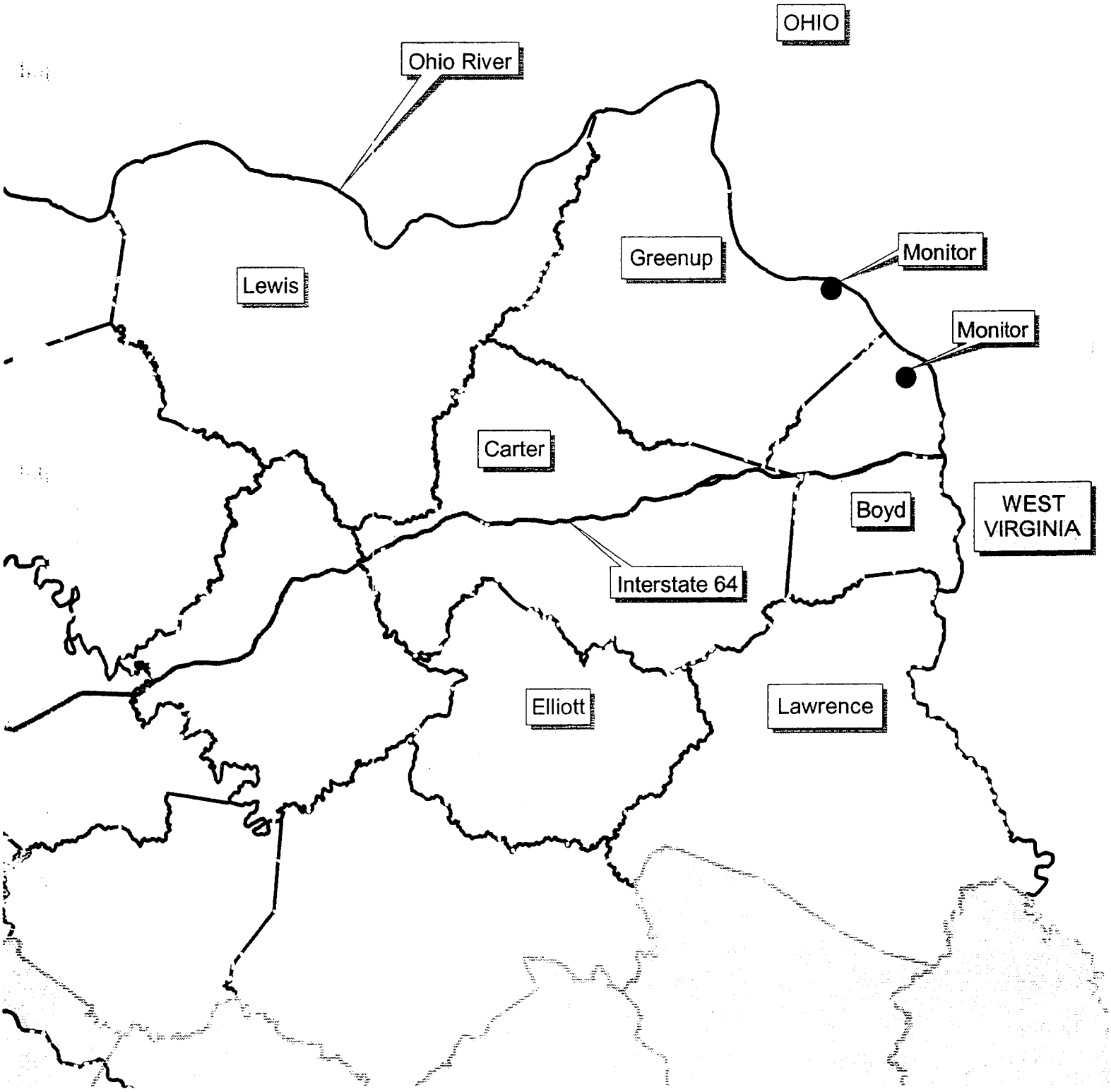
STATEWIDE MAP

Ozone Monitors in the Commonwealth of Kentucky
(Areas Requiring Updated Maintenance Budgets In 2003)



LOCALIZED MAP

Ozone Monitor Locations - Ashland



APPENDIX C

2002 Emissions Inventory Methodology & Documentation

Ashland Ozone Maintenance Area

PROPOSED UPDATED MAINTENANCE EMISSIONS BUDGET

ASHLAND OZONE MAINTENANCE AREA
A PORTION OF GREENUP COUNTY

2002 OZONE PRECURSOR EMISSIONS INVENTORY METHODOLOGY FOR THE DEVELOPMENT OF UPDATED OZONE MAINTENANCE AREA PLANS FOR KENTUCKY OZONE MAINTENANCE AREAS

AS REQUIRED BY THE CLEAN AIR ACT

FOR THE PORTION OF GREENUP COUNTY IN THE KENTUCKY PORTION OF THE FORMER HUNTINGTON-ASHLAND ONE HOUR OZONE MAINTENANCE AREA

Prepared by

THE KENTUCKY DIVISION FOR AIR QUALITY

John S. Lyons
Director

Submitted by

THE KENTUCKY ENVIRONMENTAL AND PUBLIC PROTECTION CABINET

Teresa J. Hill
Secretary

July 2007

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Appendix A Point Source Emissions Inventory Information

Appendix B Area Source Emissions Inventory Information

Appendix C Non-Highway Mobile Source Emissions Inventory Information

Appendix D Highway Mobile Source Emissions Inventory Information

Appendix E Biogenic Emissions Inventory Information

1.0 BACKGROUND AND EMISSIONS SUMMARY

1.1 BACKGROUND

In accordance with the Clean Air Act Amendments (CAAA) of 1990, a November 6, 1991, *Federal Register* notice designated Boyd County and a portion of Greenup County of the Huntington-Ashland Metropolitan Statistical Area as marginal nonattainment for the 1-hour ozone standard effective on January 6, 1992. In a June 29, 1995, *Federal Register* notice, the U.S. EPA approved the redesignation of the Huntington-Ashland Area from marginal nonattainment to attainment for the 1-hour ozone standard effective on June 29, 1995. On April 30, 2004 (69 FR 23858), the Environmental Protection Agency (EPA) designated and classified areas for the 8-hour ground-level ozone National Ambient Air Quality Standard (NAAQS). These areas are required to submit a 10-year maintenance plan under section 110(a)(1) of the CAA if they also were a nonattainment area, or an attainment/unclassifiable area with a section 175A maintenance plan, under the 1-hour ozone standard.

This document presents Kentucky's 2002 ozone precursor emissions inventory for the Greenup County portion of the Huntington-Ashland ozone maintenance area, which includes Boyd County and a portion of Greenup County. Kentucky has previously submitted a request for redesignation to attainment for the 8-Hour Ozone Standard for Boyd County, therefore this maintenance plan revision addresses only the Greenup County portion of former maintenance area. This inventory was developed based on EPA guidance, direct consultation with EPA personnel, and previous emission inventory development experience. The inventory includes reactive volatile organic compounds (VOC), oxides of nitrogen (NO_x), and carbon monoxide (CO) emissions for area, point, non-highway mobile, highway mobile and biogenic sources.

The point source inventory was developed using the Division's existing emissions inventory database (i.e., TEMPO). The existing TEMPO database was updated using questionnaires and annual surveys completed by the sources.

Maintenance area population information is provided in Table 1-1. The data provided in Table 1-1 is vital to many emission calculation procedures used to develop the emissions inventory, particularly for area and nonroad mobile sources. These data are frequently referenced throughout this document.

TABLE 1-1
2002 POPULATION

Greenup County, Kentucky Portion of Huntington-Ashland Maintenance Area

COUNTY	AREA APPORTIONMENT FACTOR	TOTAL POPULATION	POPULATION APPORTIONMENT FACTOR	APPORTIONED COUNTY POPULATION
Greenup*	0.140	36,761	0.634	23,306

* Denotes only a portion of the county

1.2 EMISSIONS SUMMARY

In preparing this inventory, several other agencies contributed information to the Division necessary for completing emission calculations. The Kentucky Transportation Cabinet[1] provided information essential for completing the mobile emissions portion of this document. The Kentucky Economic Development Cabinet[2] and the State Data Center[3] provided valuable population information used primarily in the preparation of the area source inventory.

Within the maintenance area, VOC, NO_x, and CO emissions were calculated for point, area, nonroad mobile, onroad mobile and biogenic sources.

The Division's existing point source emissions inventory database (TEMPO) was used to produce point source information. This database is updated annually for Title V major and minor sources and on a varying schedule for other sources. A copy of the point source inventory survey is included as Appendix A.

Area source emissions were generally calculated based on current population, employment, and commodity data. Population related information was provided by the State Data Center[3] and the Kentucky Economic Development Cabinet.[2]

Highway vehicle emissions were estimated by using Mobile6.2 generated emission factors and daily vehicle miles traveled (DVMT) estimates. DVMTs and speed information were obtained from the Kentucky Transportation Cabinet[1].

The VOC emissions calculated in this document are for those VOC emissions determined by EPA to be photochemically reactive. All identified nonreactive VOC emissions were addressed. Specifically, perchloroethylene emissions from dry cleaning and surface cleaning have been removed

from the area source emissions found in this document.

A summary of the VOC, CO, and NO_x emissions in tons per summer day for the maintenance area is provided in Table 1-2. This document includes emissions data with pre-existing controls in place. These emission control measures include auto body refinishing, consumer solvent use, architectural surface coating, traffic markings, and open burning; fuel and engine control measures related to on-road and non-road mobile sources including Phase II of the RFG program, along with requirements on vehicle refueling and reduced evaporative emissions; and engine control measures include the National Low Emission Vehicle program, along with requirements on nonroad diesel engines, small nonroad engines (lawnmowers and garden equipment), and outboard marine engines.

Point source emissions are described in Section 2 with supporting information in Appendix A. Section 3 documents the area source inventory process with supporting information in Appendix B. Non-highway mobile emissions are discussed in Section 4 with supporting information in Appendix C. Mobile source emissions are discussed in Section 5 with supporting information in Appendix D. Biogenic emissions are documented in Section 6 and Appendix E.

TABLE 1-2
SUMMARY OF 2002 EMISSIONS
(Tons Per Summer Day)

Greenup County, Kentucky Portion of the Huntington-Ashland Maintenance Area

	MOBILE			AREA			POINT			NON-HIGHWAY MOBILE			BIOGENIC			TOTAL EMISSIONS##		
COUNTY	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx
GREENUP*	1.09	11.55	1.56	1.25	0.83	0.06	0.13	0.04	0.07	0.67	5.05	0.73	7.12	0.59	0.04	10.26	18.06	2.46

* Denotes only a portion of the county.
Certain applicable federal VOC emission control measures are reflected in the 2002 emission

1.3 REFERENCES FOR SECTION 1

1. Kentucky Transportation Cabinet, Daily Vehicle Miles Traveled, 2002. Frankfort, Kentucky.

2. Kentucky Economic Development Cabinet, 2002 Kentucky Deskbook of Economic Statistics, Frankfort, Kentucky.

3. University of Louisville, State Data Center, 2002 Population Statistics, Louisville, Kentucky.

TABLE 1-3 LIST OF CONTACT PERSONS FOR THE KENTUCKY 2002 EMISSIONS INVENTORY

Kentucky Division for Air Quality 803 Schenkel Lane Frankfort, Kentucky 40601	Lead agency contact, overall inventory coordination and supervision	John Gowins (502) 573-3382
Kentucky Division for Air Quality 803 Schenkel Lane Frankfort, Kentucky 40601	On-Highway mobile and area source emissions and data activity levels	Joe Forgacs (502) 573-3382

2.0 POINT SOURCES

2.1 INTRODUCTION AND SCOPE

This section documents the development of the 2002 point source emissions inventory for the Greenup County, Kentucky portion of the Huntington-Ashland Area, which includes Boyd County and a portion of Greenup County. For the purpose of this inventory, point sources are defined as stationary commercial or industrial operations that emit 10 tons or more per year of volatile organic compounds (VOC) or 100 tons or more of nitrogen oxides (NO_x) or carbon monoxide (CO). Due to the lower cut-off size for VOC sources, the majority of point sources in the maintenance area have VOC emissions; therefore, most of this section is dedicated to these sources. This point source inventory consists of actual emissions for the 2002t.

Emissions from point sources are presented using two emission rate formats: annual (TYR) and daily (TSD) rates. Although not specifically required, annual emission rates are provided in order to assist the review agency and the public in performing comparison checks against the existing TEMPO[5] database. In addition, the annual emission rate identifies point sources impacting on the area.

The remainder of this chapter is divided three parts. Section 2.2 describes the approach used in developing and compiling the point source listing for the ozone maintenance areas. Section 2.3 presents an overall summary of the point source VOC, NO_x, and CO emissions. Section 2.4 lists the references used in preparing this section.

2.2 METHODOLOGY AND APPROACH

This section describes the methodology and approach used in developing information for the 2002 point source inventory. The purpose for including this section is to provide sufficient detail to the review agency and the public to assist them in determining the adequacy of this inventory based on the most recent guidance. In addition, specific elements of the methodology and approach are being described in order to minimize the need for later clarifications.

The development activities for the 2002 point source emission inventory were initiated in the spring of 2004. The approach used in compiling the point source listing and emissions data was based on guidance issued by the U.S. Environmental Protection Agency.[1,2]

As mentioned previously, the Kentucky Division for Air Quality (DAQ) was the agency

responsible for development of the 2002 emissions inventory for the maintenance areas in Kentucky. Data collection activities began in the spring of 2004. Since Kentucky already had an existing emissions database of air pollution sources in the state, a thorough review of this database formed the starting point for overall inventory development. A brief description of the methodology and approach used to accomplish these tasks is presented in the following subsections.

2.2.1 Review of Existing Database

The review of the Division's TEMPO[5] database allowed personnel to identify which sources in a given geographical area would need to be updated for this inventory effort. Also, a review of each source in the existing system provided information on whether specific sources had been updated during the normal yearly update or if they would need to be updated separately.

2.2.2 Source Survey

Point source emission surveys were mailed to appropriate point sources (*Please see related survey information in Appendix A*). The surveys were designed to have the facilities update specific information as outlined in EPA guidance. In some instances follow-up telephone calls were made to clarify responses given by sources.

2.2.3 Data Evaluation

The next step in developing the point source inventory was to evaluate the collected data. All information received from the sources was checked by emission inventory personnel to ensure that the responses were within reasonable levels.

Another aspect of data evaluation was the application of rule effectiveness for sources subject to regulatory emission limitations and a seasonal adjustment factor for facilities not operating on a uniform schedule. A factor of 80 percent was applied to the control device efficiency to adjust the resulting emission estimates to account for rule effectiveness. The rule effectiveness factor, pursuant to EPA Region 4 guidance,[3] was applied to VOC, CO, and NO_x annual emissions totals and is therefore also reflected in daily emissions. Seasonal adjustment was applied only to daily emission totals.

2.2.4 Data Compilation

One of the final steps in developing the point source inventory involves submitting the data in an acceptable format. Division personnel routinely submit point source data to EPA's National Emissions Inventory (NEI) database.

2.2.5 Emission Calculations

Point source emissions were calculated using the following equations and variables. Appendix A contains point source emissions information utilized to calculate the point source emissions (*Please see emissions information in Appendix A*). Information requested by a source to be confidential in accordance with applicable laws is omitted from the A.

1. Control Efficiency Adjusted for Rule Effectiveness

CTEFFN	=	(1 - ((CTEFF)(RE))
CTEFFN	=	Actual Control Efficiency Adjusted for Rule Effectiveness
CTEFF	=	Actual Control Efficiency
RE	=	Rule Effectiveness = .80

2. Actual Process Rate for Typical Summer Day

CPROD
NPROD = ((FUELP) (ATHJ) / 100) / ((DWK) (WKYR) (.25))
VPROD

CPROD, NPROD, and VPROD = Actual Process Rate for Typical Summer Day for CO, NOx, and VOC, respectively

FUELP	=	(Actual) Annual Process Rate = Total Throughput
ATHJ	=	Summer Seasonal Activity
DWK	=	Number of Days Per Week Source is in Operation
WKYR	=	Number of Weeks Per Year Source is in Operation

3. Actual Emissions for Typical Summer Day

CATND
NATND = ((_PROD) (EF) (CTEFFN)) / 2000
VATND

CATND, NATND, and VATND = Typical Summer Day Emissions for CO, NOx, and VOC, respectively

_PROD	=	CPROD, NPROD, or VPROD as Appropriate
EF	=	Emission Factor

4. Annual Actual Emissions

CATNY
NATNY = ((FUELP) (EF) (CTEFFN)) / 2000
VATNY

CATNY, NATNY, and VATNY	=	Annual Emissions for CO, NOx, and VOC, respectively
FUELP	=	(Actual) Annual Process Rate = Annual Throughput
EF	=	Emission Factor

2.3 SUMMARY OF POINT SOURCE EMISSIONS

2.3.1 Kentucky Portion of Huntington-Ashland Ozone Maintenance Area

This inventory includes VOC, CO, and NO_x point source emissions for the Greenup County, Kentucky portion of the Huntington-Ashland ozone maintenance area. County level point source emission totals are provided in Table 2-1. Additionally, information in Appendix A catalogues point source emissions by facility, by county, and provides a county total. These tables lists the facilities; the facility identification numbers; SIC codes[4], and the 2002 annual emissions, adjusted for rule effectiveness, in tons per year; and the 2002 daily emissions with seasonal adjustments, in tons per summer day.

Table 2-1 Greenup County, Kentucky Portion of the Huntington- Ashland Area 2002 Point Source Emissions				2002 Emissions (in tpd)			2002 Emissions (in tpy)		
			SIC	VOC	CO	NOx	VOC	CO	NOx
COUNTY	FACILITY NAME	Plant I.D. #	Code	tpd	tpd	tpd	tpy	tpy	tpy
Greenup*	CSX TRANSPORTATION INC	21-089-00004	4011	0.02	0.01	0.01	7.36	2.74	3.26
Greenup*	PACTIV CORPORATION	21-089-00014	3086	0.00	0.00	0.00	0.05	0.17	0.84
Greenup*	PCI INC	21-089-00032	2865	0.11	0.03	0.06	37.79	7.30	16.97
			GREENUP* PORTION TOTAL	**0.13**	**0.04**	**0.07**	**45.20**	**10.21**	**21.07**

*Denotes only a portion of county.

2.4 REFERENCES FOR SECTION 2

1. U.S. Environmental Protection Agency. *Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations.* EPA-454/R-05-001. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. August 2005, which references *Emission Inventory Requirements for Post-1987 Ozone State Implementation Plans.* EPA-450/4-88-019. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. December 1988.

2. U.S. Environmental Protection Agency. *Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations.* EPA-454/R-05-001. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. August 2005, which references *Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone, Volume I: General Guidance for Stationary Sources.* EPA-450/4-91-016. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. May 1991.

3. Telecon. U.S. Environmental Protection Agency, Region 4, Ms. Yasmin Yorker, February 4, 1992, concerning rule effectiveness.

4. Executive Office of the President, Office of Management and Budget. *Standard Industrial Classification Manual.* Order no. PB 87-100012. National Technical Information Service, Springfield, Virginia 22161. 1987.

5. Kentucky Division for Air Quality's TEMPO Point Source Database for the Year 2002.

3.0 AREA SOURCES

3.1 INTRODUCTION AND SCOPE

This section documents the development of the 2002 area source maintenance plan emissions for the Greenup County, Kentucky portion of the Huntington-Ashland ozone maintenance area (i.e., Boyd County and a portion of Greenup County). Area sources include non-traditional sources whose emissions are too small to be treated as stationary point sources. The emissions documented in this section are presented on an annual basis and for a typical summer day during the ozone season.

Including this introduction and scope, Section 3 is organized into four other subsections. Section 3.2 describes the approach taken to estimate emissions from each source category. Section 3.3 provides a summary of the area source emissions in the maintenance areas. Information explaining the calculations used to derive the area source emissions is discussed in Section 3.4. The references used in developing the area source portion of the inventory are located in Section 3.5.

3.2 METHODOLOGY AND APPROACH

3.2.1 Source Category Identification

The majority of area source categories considered in this inventory were identified from *Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone, Volume I.*[1] In addition, the U.S. EPA's Emission Inventory Improvement Program (EIIP) guidance[22] was consulted and utilized where feasible. Emissions estimates for some area source categories are not included in the inventory. Agricultural and slash burning, snowmobiles, and orchard heaters are not commonplace in Kentucky and therefore do not warrant inclusion. Rationale for not including these categories is discussed later in this narrative.

3.2.2 Emission Estimation Approach

Generally, area source emissions are calculated using factors based on one of four criteria for the inventoried areas: (a) population (per-capita), (b) commodity consumption, (c) level-of-activity, or (d) employment. These calculations are further explained in Section 3.4.

3.3 SUMMARY OF AREA SOURCE EMISSIONS

Table 1-3 contains the contribution of the maintenance area for each area source category and provides an emissions total for that area.

3.4 DISCUSSION OF THE AREA SOURCE CATEGORIES

Subsections 3.4.1 through 3.4.6 contain the descriptions for individual area source types and the methods used to calculate emissions for each. Calculations used to determine emissions are included within the narrative.

3.4.1. Gasoline Distribution.

Four categories are included under gasoline distribution: (a) Storage tank breathing losses; (b) Tank trucks in transit; (c) Tank truck unloading; and (d) Vehicle refueling. Vehicle refueling emissions are included in the Highway Mobile Source Inventory (Section 5) in the Mobile6.2 modeling runs.

Retail gasoline service station sales in 2002, for both the state and individual counties, were obtained from the 2002 *Economic Census Retail Trade* publication for Kentucky.[6] The 2002 taxable gasoline sales were only available for the state and were obtained from the Kentucky Revenue Cabinet's Motor Fuels Tax Section.[7] The 2002 statewide gasoline sales were segregated to the county level using 2002 retail trade sales information. 2072.35 million gallons of gasoline were sold in Kentucky in 2002. Emission factors were obtained from Tables 5.2-5 and 5.2-7 of AP-42, Volume I.[2, 22]

To calculate the emissions of VOC from any of the sources noted above, it was necessary to determine the total sales, in gallons, of gasoline in the maintenance area. Only the *Census Retail Trade* publication[6] lists county and state gasoline sales. Therefore, the percentage of county gasoline sales relative to the statewide gasoline in 2002 was calculated. State sales were obtained from Table 1 of the *Census Retail Trade* publication,[6] and county sales obtained from Table 3 of that document. This percentage was applied to the total state taxable gasoline sales in 2002 to determine county gasoline sales in 2002. After the county gasoline sales in 2002 were determined, specific methods were used to calculate the emissions of VOC from each of the categories listed. The calculations and

procedures described in EPA guidance,[1] were utilized. County-specific gasoline marketing data are shown in Table 3-1.

Table 3-1
Gasoline Marketing Data

County	2002 Gasoline Sales (1000 Gallons)
Greenup*	10022

*Denotes only a portion of the county.

3.4.1.1 Storage Tank Breathing Losses

County gasoline sales were multiplied by the emission factor found in Table 5.2-7 of AP-42, Volume I.[2] Tons of VOC emissions per year were converted to tons per typical summer day in accordance with Section 5.9 of reference 1. The seasonal adjustment factor (SAF) was determined by adding the total gasoline sales for June, July, and August of 2002--then dividing that total by the total state gasoline sales for 2002. This dividend was then divided by 0.25 to determine the percentage of activity, which occurred during those months since it was noted that the activity level for that quarter was higher than the other quarters. The denominator represents the uniform seasonal rate since one quarter or season equals 0.25. So if the total gasoline sales for June, July, and August is one quarter of the total annual sales, then the SAF equals 0.25 / 0.25, or 1.00. The seasonal adjustment factor applied for the gasoline marketing was 1.049. The activity days per week were considered to be 7.

The formula for this calculation is as follows:

$$\frac{\text{(June + July + August Monthly Gasoline Gallon Totals)/ (Year-End Gasoline Gallon Total)}}{0.25}$$

The calculations used to determine emissions from storage tank breathing losses are as follows.

$$TPY = \left(\text{County Sales (gallons)} \times \frac{1.0 \text{ lbs.}}{1000 \text{ (gal)}} \right) \times \frac{1 \text{ ton}}{(2000 \text{ lbs})}$$

$TSD = (TPY \times SAF) / (7 \times 52)$

The emissions, by county, produced by storage tank breathing losses are shown in Table 3-2.

3.4.1.2 Tank Trucks in Transit

Since some gasoline is delivered to bulk plants rather than delivered directly to service stations from bulk terminals, the amount of gasoline transferred in any area may exceed the total gasoline consumption, due to the additional trips involved. Reference 1 makes the following statements relating to this matter:

Table 3-2
Summary of Emissions From
Gasoline Breathing Losses

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	5.01	0.01

*Denotes only a portion of the county.

"A nationwide average of roughly 25 percent of all gasoline consumed goes through bulk plants. Hence, gasoline distribution in an area could be multiplied by 1.25 to estimate gasoline transported." and

"Emissions from tank trucks in transit, however, will generally be minimal, in most areas. Hence, a great deal of effort is not warranted in making this adjustment."

Based on these statements, and in the absence of specific bulk plant throughput information, 2002 county gasoline sales were multiplied by 1.25 to obtain the total gasoline transported in 2002. Per EPA EIIP guidance[22], the midpoints of the typical AP-42 Table 5.2-5 emission factors for tank trucks or bulk tanks loaded with product and return with vapor were determined, combined, and applied to gasoline transported in each county to determine the emissions of VOC per year. The yearly emissions were then converted to tons per typical summer day. The seasonal adjustment factor used for tank breathing losses was 1.049. The activity days per week were considered 6. The calculation

used to figure emissions from tank trucks in transit are as follows.

$$TPY = \left(\frac{(\text{County Gas Sales (gallons)} \times 1.25)}{} \times \frac{.060 \text{ lbs.}}{1000\text{gals.}} \right) \times \left(\frac{1 \text{ ton}}{2000 \text{ lbs}} \right)$$

$$TSD = (TPY \times SAF) / (6 \times 52)$$

The emissions, by county, produced by tank trucks in transit are provided in Table 3-3.

Table 3-3
Summary of Emissions From
Tank Trucks In Transit

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	0.38	0

*Denotes only a portion of the county.

3.4.1.3. Vehicle Refueling

The emissions for vehicle refueling have been calculated by Mobile6.2 and are included in the Mobile Source Emissions Inventory in Section 5, but are not listed separately.

3.4.1.4 Tank Truck Unloading

To calculate the emissions of VOC produced by tank truck unloading, the division performed a review of gasoline stations located in the ozone maintenance areas. The following assumptions were made.

For the ozone maintenance areas (i.e., Marshall County and a portion of Livingston County, Daviess County and a portion of Hancock County, Edmonson County, Fayette and Scott Counties, Boyd County and a portion of Greenup County) 90% of the gasoline throughput was subject to submerged filling and the remaining 10% of the gasoline throughput was subject to splash filling techniques.

Based on these assumptions, the fraction of gallons of gasoline throughput using each fill method was multiplied by the appropriate emission factors from Table 5.2-7 of AP-42, Volume I[2] to

derive emissions. Rule penetration was implicitly applied by allocating the gasoline throughput for each fill method. The yearly emissions were converted to tons per typical summer day in accordance with Section 5.9 of Reference 1. The seasonal adjustment factor of 1.049 for gasoline marketing was applied. The activity days per week for tank truck unloading was 6.[1] The calculations used to determine emissions from this category are as follows.

Submerged Fill

$$TPY = \text{Apportioned ((County Sales (gallons))} \times .90 \times \frac{7.3 \text{ lbs.}}{1000 \text{ gals}} \times \frac{1 \text{ ton}}{(2000 \text{ lbs})}$$

$$TSD = (TPY \times SAF) / (6 \times 52)$$

Splash Fill

$$TPY = \text{Apportioned ((County Sales (gallons))} \times .10 \times \frac{11.5 \text{ lbs.}}{1000 \text{ gals}} \times \frac{1 \text{ ton}}{(2000 \text{ lbs})}$$

$$TSD = (TPY \times SAF) / (6 \times 52)$$

Total Tank Truck Unloading Annual Emissions = Submerged Fill Annual + Splash Fill Annual

Total Tank Truck Unloading Summer Daily Emissions = Submerged Fill Daily + Splash Fill Daily

The emissions, by county, produced by tank truck unloading are shown in Table 3-4.

Table 3-4
Summary of Emissions From Tank Truck Unloading

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	38.68	0.13

*Denotes only a portion of the county.

3.4.1.5 Aircraft Refueling

Emissions from this category occur when vapor-laden air in a partially empty fuel tank is displaced to the atmosphere when the tank is refilled. The quantity of vapor displaced depends on the fuel temperature, fuel true vapor pressure, fuel molecular weight, aircraft fuel tank temperature

and fuel dispensing rate. The most commonly used types of aircraft fuels in the United States fall into three categories:

- Jet kerosene, primarily used by commercial turbojet and turboprop aircraft,
- Jet Naphtha, used primarily by military aircraft, and
- Aviation Gasoline, primarily used by aviation reciprocating engines.

Based on federal guidance found in Volume I,[1] emissions from aircraft refueling were estimated by multiplying apportioned fuel sales data[7], for each type of aircraft by the corresponding calculated fuel emission factors. Local fuel sales were obtained by apportioning state-level fuel sales to airports based on flight activities (LTOs) reported in Kentucky Airport Master Records[33] compiled by the Kentucky Division of Aeronautics for general aviation aircraft and Airport Activity Statistics[31] for commercial aircraft. Emissions were calculated for *General Aviation Refueling* and for *Refueling with Jet Kerosene*. Emissions for Jet Naptha, used in military aircraft, were not calculated because the Petroleum Marketing Annual 2002[26] did not list this type of fuel. However, the absence of emissions for jet naphtha refueling is not considered a significant problem since its true vapor measure is such that any calculated emissions would be negligible.

The calculated annual tons of VOC emissions were multiplied by a seasonal adjustment factor and then divided by the number of activity days per week, in this case 365. The seasonal adjustment factor for jet kerosene is .93 and for aviation gasoline is 1.19. The seasonal adjustment factors were calculated based on fuel sales data provided in the Petroleum Marketing Annual 2002[18] for the summer quarter. Emission factors were developed using the following method, pursuant to Volume I guidance.[1]

$$EF = \frac{(12.46)(S)(P)(M)}{T}$$

where: EF = emission factor in pounds VOC per 1,000 gallons fuel throughput

S = saturation factor of 1.45 (from Table 4.4-1 of AP-42)

P = fuel true vapor pressure in psia (from Table 4.3-2 of AP-42)
at 90°F = .021 psia for jet kerosene
at 90°F = 8.8 psia for aviation gasoline RVP 10

M = fuel molecular weight in lb/lbmol (from Table 4.3-2 of AP-42)
at 60°F for Jet Kerosene = 130
at 60°F for Aviation Gasoline RVP 10 = 66

T = study temperature in °R (°F + 460 degrees)

The calculations used to estimate emissions from aircraft refueling are as follows.

TPY = EF x Apportioned County Fuel Sales

TSD = (TPY x SAF) / 365

The VOC emissions, by county, from aircraft refueling are found in Tables 3-5 and 3-6. Airport information used to calculate these emissions are located in Table 3-7.

Table 3-5
Summary of Emissions From
General Aviation Refueling

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	0.10	0

*Denotes only a portion of the county.

Table 3-6
Summary of Emissions From
Commercial Aircraft Refueling

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	0	0

*Denotes only a portion of the county.

Table 3-7
Aircraft Fuel

County	Commercial Jet Fuel (1000 Gallons)	General Aviation Gasoline (1000 Gallons)
Greenup*	0	12

*Denotes only a portion of the county.

3.4.1.6 Petroleum Vessel Loading & Unloading

This category is included in the Point Source Inventory, Section 2.

3.4.2 Stationary Source Solvent Evaporation

The following eight subcategories are included in this area source category. All of these emit Volatile Organic Compounds (VOCs) because of their solvent usage. They are:

(1) Dry Cleaning;

(2) Surface Cleaning;

(3) Surface Coating;

(4) Graphic Arts;

(5) Cutback Asphalt Paving;

(6) Pesticide Applications; and,

(7) Commercial/Consumer Solvent Use.

Each of the previous-mentioned subcategories is discussed individually in the following subsections.

3.4.2.1 Dry Cleaning

Dry cleaning operations vary in size, type of service, and type of solvent used. Industrial, commercial, and self-service facilities clean not only personal clothing, but also uniforms, linens, drapes, and other fabric materials. Per previous EPA guidance[23], since emissions for coin operated and commercial/industrial dry cleaning are considered to be nonreactive (i.e., perchloroethylene emissions) <u>only other solvent emissions are reflected in the VOC emissions provided for dry cleaning</u>

Annual tons of VOC were calculated by multiplying the per capita emission factor by the county population. Rule penetration is implicitly applied by using the distinct per capita emission factors for each type of dry cleaning facility.

Emissions per typical summer day for this area source category were calculated using federal guidance.[1] The methodology involves multiplying the following per capita VOC emission factors by an area's population to estimate the dry cleaning emissions:

Mineral Spirits & other solvent facilities: 1.1 lb/capita/yr

The calculated annual tons of VOC emissions were then divided by the product of the number of activity days per week and the number of weeks in a year. For dry cleaning, no seasonal adjustment factor was applied since activity was considered uniform year round and the activity days

per week was 5. [1]

The calculations for this category are as follows:

$$TPY = \frac{\text{Other Solvents}}{(EF \times population)} \times \frac{1\ ton}{2000\ lbs} \qquad TSD = TPY/(5 \times 52)$$

Population statistics for the counties examined were obtained from information provided by the Kentucky State Data Center[3,4] and are found in Table 3-8.

Table 3-8
Area Population Information

County	Population Apportionment Factor	2002 Population
Greenup*	0.634	23306

*Denotes only a portion of the county.

Table 3-9
Summary of Emissions From Drycleaning

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	12.82	0.05

*Denotes only a portion of the county.

3.4.2.2 Surface Cleaning

Surface cleaning or degreasing is a physical method of removing grease, wax, or dirt from metal, glass, and fabric surfaces by exposing the material to an organic solvent. Degreasing activity is one of the many production steps associated with industrial categories involving metal furniture, primary metals, fabricated products, machinery, electric equipment, and instrumentation. In addition, there are many miscellaneous degreasing operations associated with auto repair shops, gasoline stations, and maintenance shops. There are three types of degreasers: small cold cleaners, open top vapor degreasers, and conveyorized vapor degreasers.

Surface operations, which include cold cleaning, manufacturing, and vapor in-line cleaning

and others use organic solvents as room temperature liquids. Uses include wiping, spraying, or dipping parts in the solvent. In open top vapor degreasing, cleaning takes place by exposing the part to solvent vapor. Conveyorized vapor degreasing entails the same activity as open top degreasing except that the parts to be cleaned continuously move in and out of the degreaser.

Federal guidance[1] provided the methodology the division used for calculating VOC emissions for this area source category. It involves multiplying the following per capita VOC emission factors by an area's population to estimate total surface cleaning emissions. Per EPA guidance[24], to avoid double counting, point source degreasing emissions were subtracted from the area source surface cleaning VOC emissions as appropriate.

Surface Cleaning Total: 4.3 lb/capita/yr
- Cold Cleaning
  - Auto Repair: 2.5 lb/capita/yr
  - Manufacturing: 1.1 lb/capita/yr
- Vapor & In-Line Cleaning
  - Electronics & Electrical : 0.21 lb/capita/yr
  - Other: 0.49 lb/capita/yr

Emissions per typical summer day for this area source category were calculated using section 5.9 of the federal guidance document.[1] The calculated annual tons of VOC divided by the product of the number of activity days per week and the number of weeks in a year. For surface cleaning, as found in Table 5.8-1,[1] no seasonal adjustment factor was applied since activity was considered uniform year round and the activity days per week was 6.

Emissions were calculated using the following method.

Cold Cleaning Auto Repair

$$TPY = ((EF \times population) \times \frac{1\ ton}{2000 lbs})) * .77^{25} \quad --- \quad TSD = TPY / (6 \times 52)$$

+

Cold Cleaning Manufacturing

$$TPY = ((EF \times population) \times \frac{1\ ton}{2000 lbs})) * .77^{25} \quad --- \quad TSD = TPY / (6 \times 52)$$

+

Vapor & In-Line

$$((EF \times population) \times \frac{1\ ton}{2000 lbs}) * .77^{25} \quad --- \quad TSD = TPY / (6 \times 52)$$

Area Source Surface Cleaning VOC Emissions (TSD) = TSD – Pt. Source Surface Cleaning VOC Emissions[24]

Per EPA guidance[25], perchloroethylene emissions have been removed from the surface cleaning emissions by reducing the emissions by 23 percent. Surface cleaning emissions are provided for individual counties in Table 3-10. Population information is provided in Table 3-8 and perchloroethylene removal and double counting information for surface cleaning is provided in Appendix B.

Table 3-10
Summary of Emissions From**
Surface Cleaning Operations

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	38.58	0.12

*Denotes only a portion of the county.

**Perchloroethylene emissions have been removed from the surface cleaning emissions by reducing the VOC emissions by 23 percent per EPA's May1993 Helms guidance memorandum[25].

3.4.2.3 Surface Coating

Surface coatings include paints, enamels, varnishes, lacquers and other product finishes. All of these products include either a water-based or solvent-based liquid carrier, which generally evaporates in the drying or curing process.

VOC emissions result from the evaporation of the paint solvent and any additional solvent used to thin the paint. Substantial emissions also result from the use of solvents in cleaning the surface prior to painting and in cleaning painting equipment after use.

Surface Coating operations are separated into two groups, industrial and nonindustrial. Industrial surface coating operations for such products as appliances, automobiles, paper, fabric and cans are included in the point source inventory. Non-industrial surface coating includes refinishing of automobiles, architectural coating, and traffic paints and are inventoried as area sources.

3.4.2.3.1 Architectural Surface Coating

Architectural surface coatings, often called "trade paints," are used primarily by homeowners and painting contractors to coat the interior/exterior of houses and buildings and on the surfaces of other structures such as pavements, curbs, or signs. Coating materials are applied to surfaces by spray, brush, roller, and dry at ambient conditions. Architectural coatings differ from industrial coatings, which are applied to manufactured products and are usually oven cured. Painting contractors and homeowners are the major users of architectural coatings.

Federal guidance[1] provided the methodology the division used for calculating VOC emissions for this area source category. This methodology involves multiplying the following per capita VOC emission factor by an area's population to estimate the architectural surface coating emissions:

Architectural Surface Coating: 4.6 lb/capita/yr (Represents reactive VOC). Population statistics for all areas examined were obtained from the University of Louisville, Urban Data Center.[3,4] Solvent use, which accounts for 25 to 40 percent of all solvent loss associated with architectural surface coating, is included in this per capita factor. Solvents used in architectural surface coatings or thinning and cleanup contain almost 100 percent reactive compounds.

Emissions per typical summer day for this area source were calculated using Section 5.9 of Reference 1. The calculated annual tons of VOC were multiplied by an appropriate seasonal adjustment factor and then divided by the product of the number of activity days per week and the number of weeks in a year. For architectural surface coating the seasonal adjustment factor was 1.3 and the activity days per week was 7.[1]

The following calculation was used to estimate emissions from architectural surface coating.

$$TPY = (EF \times Population) \times \frac{1\ ton}{(2000\ lbs)}$$

$$TSD = (TPY \times SAF) / (7 \times 52)$$

Architectural surface coating emissions are provided in Table 3-11.

Table 3-11
Summary of Emissions From**
Architectural Surface Coating

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	53.60	0.19

*Denotes only a portion of the county.

**Per a federal rule for this area source category, the VOC emissions reflect a 20% emission reduction.

3.4.2.3.2 Automobile Refinishing

Automobile refinishing is the repainting of worn or damaged automobiles, light duty trucks, and other vehicles. Surface coating during manufacturing is not considered refinishing. In automobile refinishing, lacquers and enamels are usually sprayed in paint booths. Since vehicles contain heat sensitive plastics and rubber, the solvent borne coatings are used in low temperature ovens. Paint booths may be equipped with paint arresters or water curtains to handle overspray. Solvents used in auto body refinishing will consist almost entirely of reactive VOC.

Federal guidance[1] provided the methodology the division used for calculating VOC emissions for this area source category. This methodology involves multiplying the following VOC per capita emission factor by an area's population to estimate auto body emissions:

Auto Body Refinishing: 2.3 lb/capita/yr

According to federal guidance, because auto body refinishing may be generally expected to relate to human activity, such a population based approach will provide reasonable emission estimates for this area source category. Population statistics for all areas examined were obtained from state references.[3,4]

Emissions per typical summer day for this area source category were calculated using federal guidance[1]. The calculated annual tons of VOC divided by the product of the number of activity days per week and by the number of weeks in a year. For auto body refinishing no seasonal adjustment factor was applied since the activity was considered uniform year round. The activity days per week was 5.

The calculations used to figure yearly and daily VOC emissions for this category are as

follows.

$$TPY = (EF \times population) \times \frac{1\ ton}{(2000\ lbs)}$$

$$TPD = TPY / (5 \times 52)$$

Auto body refinishing emissions are provided for individual counties in Table 3-12. Population information for individual areas is provided in Table 3-8.

Table 3-12
Summary of Emissions From**
Automobile Refinishing

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	26.80	0.1

*Denotes only a portion of the county.

**Per a federal rule for this area category, the VOC emissions reflect a 37% emission reduction.

3.4.2.3.3 Traffic Markings

Traffic paints are used to mark pavement. These markings include dividing lines for traffic lanes, parking space markings, crosswalks, arrows, and other markings. These markings are usually applied by state or local highway maintenance crews or by contractors during road construction. VOC emissions result from the evaporation of organic solvents during and shortly after the application of the marking paint. Traffic paint emissions are included in the area source inventory the emissions are not from any specific plant, but instead emanate from the roadways and surfaces where markings are applied.

Federal guidance[1] provided the methodology the division used for calculating VOC emissions for this area source category. This methodology involves multiplying the following VOC per capita emission factor by an area's population to estimate traffic marking emissions.

Traffic marking: 0.5 lb/capita/yr

According to federal guidance, because traffic marking emissions may be generally expected to relate to human activity, such a population based approach will provide reasonable emission estimates for this area source category. The activity level was considered 5 days per week. No

seasonal adjustment factor was applied for this category since none was provided in Volume I guidance.

The calculations used to derive yearly and daily VOC emissions for this category are as follows.

$$TPY = (EF \times population) \times \frac{1\ ton}{(2000\ lbs)}$$

$$TPD = TPY / (5 \times 52)$$

Traffic marking emissions are provided in Table 3-13. Population statistics for individual areas are provided in Table 3-8.

Table 3-13
Summary of Emissions From Traffic Markings**

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	5.80	0.02

*Denotes only a portion of the county.

**Per a federal rule for this area source category, the VOC emissions reflect a 20% emission reduction.

3.4.2.3.4 Other Small Industrial Surface Coating

Industrial surface coating includes the coating, during manufacture, of magnet wire, automobiles, cans, metal coils, paper, fabric, metal and wood furniture, and miscellaneous products. According to federal guidance,[1] to the maximum extent possible, small industrial surface coating operations should be treated as point sources. Therefore, the division will include small industrial surface coating emissions in the point source emissions inventory.

3.4.2.4 Graphic Arts

The graphic arts or printing industry consists of approximately 60,000 facilities (SIC 27) nationwide. About half of these establishments are in-house printing services in nonprinting industries. Printing newspapers, books, magazines, fabrics, wall coverings, and other materials, is considered a graphic arts application. Five types of printing are used in the industry: letterpress,

flexography, lithography, (roto)gravure, and screen process printing.

Solvent use is an integral part of the process and is the primary source of VOC emissions. Associated cleanup operations also require the use of solvents, thereby contributing to VOC emissions for the industry. All solvents used in the graphic arts industry are considered reactive.

Federal guidance[1] provided the methodology the division used for calculating VOC emissions for this area source category. This methodology involves multiplying the following per capita VOC emission factor by an area's population to estimate VOC emissions from graphic art facilities, which emit less than 100 tons:

Graphic Arts: 1.3 lb/capita/yr

In accordance with federal guidance,[1] any emissions associated with point source graphic arts facilities, which emit under 100 tons per year, should be subtracted from the area source inventory. Graphic arts emissions from point sources greater than or equal to 100 tons per year should not be subtracted, since they have already been excluded from the area source graphic arts emission factor of 1.3 lb/person/yr.

Population statistics for all areas examined were obtained from state references.[3,4]

Emissions per typical summer day for this area source category were calculated using federal guidance.[1] The calculated annual tons of VOC were then divided by the product of the number of activity days per week and the number of weeks in a year. For graphic arts no seasonal adjustment factor was applied since the activity was considered uniform year round and the activity days per week was 5.[1] Calculations for this category are as follows:

$$TPY = \left((EF \times Population) - \text{Point Source Emissions} \right) \times \frac{1\ ton}{(2000\ lbs)}$$

$$TPD = TPY / (5 \times 52)$$

Graphic arts emissions are provided in Table 3-14. Population information is provided in Table 3-8.

Table 3-14
Summary of Emissions From
Graphic Arts

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	15.15	0.06

*Denotes only a portion of the county.

3.4.2.5 Cutback Asphalt Paving

Cutback asphalt is a type of liquefied road surface that is prepared by blending or "cutting back" asphalt cement with various kinds of petroleum distillates. Cutback asphalt is used as a pavement sealant, tack coat, and as a bonding agent between layers of paving material. VOCs are emitted as the cutback asphalt cures and the petroleum distillates evaporate.

According to federal guidance,[1] because paving operations may be generally expected to relate to human activity, a population based approach will provide reasonable emission estimates for this area source category. The emission factor used for this category is as follows.

Cutback Asphalt Paving: 0.37 lb/capita/yr

The activity level was considered to be 5 days per week. The calculations for estimating emissions from this category are as follows.

$$TPY = (EF \times population) \times \frac{1\ ton}{(2000\ lbs)}$$

$$TPD = TPY / (5 \times 52)$$

Cutback asphalt emissions are provided in Table 3-15. Population for individual counties is found in Table 3-8.

Table 3-15
Summary of Emissions From
Cutback Asphalt Paving

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	4.31	0.02

*Denotes only a portion of the county.

3.4.2.6 Emulsified Asphalt

Emissions from emulsified asphalts were not calculated. Any emissions from this category would have been negligible since emulsified asphalt is water based.

3.4.2.7 Pesticide Application

Pesticides broadly include any substances used to kill or retard the growth of insects, rodents, fungi, weeds, or microorganisms. Pesticides fall into three basic categories: synthetics, nonsynthetics (petroleum products), and inorganics. Formulations are commonly made by combining synthetic materials with various petroleum products. The synthetic pest killing compounds in such formulation are labeled as "active" ingredients, and the petroleum product solvents acting as carriers or diluents for the active ingredients are labeled "inert." Neither of these toxicologic designations, active or inert, should be interpreted as indicators of photochemical reactivity; these designations refer only to their toxicological action.

The federal procedures document[1] described an emissions estimation process which requires the quantity and types of pesticides used in a study area. Contacts with both the Kentucky Department of Agriculture[8] and the University of Kentucky[9] revealed that such data is not available.

The Kentucky Division for Air Quality requested the use of an alternative method on September 30, 1989.[10] Since the largest single source of pesticide use is through agricultural application, the alternative method links pesticide application to harvested acreage. Utilizing the alternative method, VOC emissions were determined by multiplying an emission rate of two pounds of VOC per harvested acre by an area's 2002 harvested acreage.[21] The product was then multiplied by a factor of 0.9 to approximate the amount that evaporated and can be considered photochemically reactive VOC. This alternative method was approved by the U.S. EPA, Region 4 on November 7, 1989.[11] The yearly emissions were then converted to tons emitted per typical summer day in accordance with Section 5.9 of reference 1. The seasonal adjustment factor was 1.3, and the activity days per week was 6. The calculations for estimating emissions for this category are as follows.

$$TPY = ((\underset{Acres}{Harvested} \times \underset{Factor(lbs)}{Emission}) \times 0.9) \times \frac{1\ ton}{(2000\ lbs)}$$

TPD = (TPY x SAF) / (6 x 52)

The emissions, by county, produced by pesticide application are shown in Table 3-16. 2002 harvested acre information[21] used to calculate emissions for this category are found in Table 3-17.

Table 3-16
Summary of Emissions From Pesticide Application

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	2.47	0.01

*Denotes only a portion of the county.

Table 3-17
Harvested Acres

County	2002 Harvested Acres
Greenup*	2749

*Denotes only a portion of the county.

3.4.2.8 Commercial/Consumer Solvent Use

Many commercial/consumer products in common use contain VOCs. Some examples are household and automobile cleaners and polishes. These products have varying VOC content and the quantities used are difficult to estimate; therefore, the resulting VOC emissions are considered to be an area source.

EPA guidance[22, 1] provided the methodology the Division used for calculating the VOC emissions for this area source category. This methodology involves multiplying the following per capita VOC emission factor by an area's population to estimate commercial/consumer solvent use emissions.

Commercial/Consumer Solvent Use: 7.84 lb/capita/yr

The above EPA EIIP[22] per capita emission factor includes emissions from household products (cleaners, laundry detergents); personal care products (e.g., toiletries, aerosol products); automotive

aftermarket products (e.g., rubbing compounds, windshield washing fluids, polishes and waxes); non-industrial adhesives and sealants; pesticide products (home or business); and miscellaneous products.

Population statistics for all areas examined were obtained from state references.[3,4] Emissions per typical summer day for this area source category were calculated using a federal guidance document.[1] The calculated annual tons of VOC was divided by the product of the number of activity days per week and the number of weeks in a year. For commercial/consumer solvent use, no seasonal adjustment factor was applied since activity was considered uniform year round and the activity days per week were 7. The calculations for estimating emissions from this category are as follows.

$$TPY = \underset{(lbs)}{(EF \times Population)} \times \frac{1\ ton}{(2000\ lbs)}$$

$$TPD = TPY / (7 \times 52)$$

Commercial/Consumer solvent use emissions are provided for individual counties in Table 3-18. Population information for individual areas is provided in Table 3-8.

Table 3-18
Summary of Emissions From Consumer Solvent Usage**

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	91.36	0.25

*Denotes only a portion of the county.

**Per a federal rule for this area source category, the VOC emissions reflect a 20% emission reduction.

3.4.3 Waste Management Practices

The handling and management of solid and liquid waste depends on such factors as the type of waste generated and the form and composition of the waste. The following methods of waste disposal were examined in this inventory:

(1) Publicly Owned Treatment Works (POTW);

(2) Industrial Waste Water Treatment;

(3) Hazardous Waste (TSDFs);

(4) Municipal Landfills; and

(5) Solid Waste Incineration -- On-site Incineration and Open Burning

3.4.3.1 Publicly Owned Treatment Works

Federal guidance indicates that research has shown that approximately 85% of all volatile pollutants discharged to unacclimated wastewater treatment systems are stripped to the ambient air. Additionally, the concentration of volatile organic compounds found in POTW influent has been shown to be directly proportional to the industrial contribution to a POTW.

Federal guidance[1] provided the methodology the division used for calculating the VOC emissions for this area source category. The methodology involves multiplying the following emission factor by the number of gallons of industrial wastewater discharged to a POTW:
1.1×10^{-4} (.000110 lbs. of VOC emitted per gallon of industrial wastewater discharged to a POTW.

The amount of industrial wastewater discharged to a POTW was obtained from the Kentucky Division of Water.[12]

Emissions per typical summer day for this area source category were calculated using federal guidance.[1] The calculated annual tons of VOC was multiplied by an appropriate seasonal adjustment factor and then divided by the product of the number of activity days per week and the number of weeks in a year. For POTW a seasonal adjustment factor of 1.4. was applied and the number of activity days per week were 7.

$$TPY = \underset{\text{Flow (gallons)}}{(\text{Industrial Wastewater}} \times \underset{\text{(lbs)}}{\text{EF)}} \times \frac{1\ ton}{(2000\ lbs)}$$

$$TPD = (TPY \times SAF) / (7 \times 52)$$

POTW VOC emissions are provided for individual counties in Table 3-19. Additionally, total industrial wastewater discharge information to POTW for individual areas is provided in Table 3-20.

Table 3-19
Summary of Emissions From POTW

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	16.94	0.07

*Denotes only a portion of the county.

Table 3-20
Industrial Discharge Into POTW

County	POTW (Million Gallon Per Year)
Greenup*	308

*Denotes only a portion of the county.

3.4.3.2 Industrial Wastewater

The first step in estimating emissions from this category was to determine what facilities should be treated as point sources. Radian provided guidance[17] on how to determine what sources should be treated as point sources and what sources could be inventoried as area sources. The County Business Patterns[5] was used to determine the number of facilities within a given SIC code and the number of employees by facility within that code. In order to determine the number of employees for a particular SIC code a conversion from the NAICS code to the SIC code was completed, since the county business patterns now uses the NAICS code. However, a review of the data indicates that there are no facilities in Greenup County with the appropriate NAICS codes. Therefore no emissions are included for this category.

3.4.3.3. Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)

This is a relatively new inventory category. In view of the confusion, and resultant frustration, regarding emission estimates from TSDFs, the Division for Air Quality considered the

allowance of one ton of VOC per year per facility in order to report *any* figures for the inventory. However, such a blind apportionment of emissions undermined the intent of the inventory.

Assistance had been requested from Radian, in performing emission calculations for this category. However, in a letter received from Steve McCary, U.S. EPA, Region 4 on November 12, 1992, sufficient guidance is not available to inventory emissions from TSDFs at this time. It is expected that most emissions from these sources will be reported in the point source inventory.

3.4.3.4. Municipal Landfills

VOC emissions are produced from municipal solid waste landfills by three mechanisms: volatilization, chemical reaction, and biological decomposition of liquid and solid compounds into other chemical species. Based on EPA guidance,[1] since Kentucky has an average precipitation level over 23 inches, an emission factor of 13.6 tons of VOC per million tons of refuse in place plus an additional factor of 2.6 tons per year. No seasonal adjustment was applied since this activity is considered uniform according to *Volume I* guidance.

The amount of refuse in-place at facilities located in the maintenance areas in Kentucky was obtained in a municipal solid waste survey developed by the Kentucky Division for Air Quality.[16]

The calculations used to estimate emissions from this category are as follows.

$$TPY = \text{tons of municipal solid waste} \times \frac{(13.6 \text{ tons VOC})}{(1{,}000{,}000 \text{ tons of waste})} \times (2.6)$$

$$TSD = TPY / (7 \times 52)$$

A summary of emissions for this category may be found in Table 3-21. The tons of solid waste impounded are found in Table 3-22.

Table 3-21
Summary of Emissions From
Municipal Landfills

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	0	0

*Denotes only a portion of the county.

Table 3-22
Tons of Solid Waste
In Municipal Landfills

County	Landfill Waste (tons/year)
Greenup*	0

*Denotes only a portion of the county.

3.4.3.5 Solid Waste Incineration

Solid waste may consist of any discarded solid materials from industrial, commercial, or residential sources. The materials may be combustible or non-combustible and are often burned to reduce bulk, unless direct burial is either available or practical.

The solid waste disposal category includes on-site refuse disposal by residential, industrial, and commercial/institutional sources. On-site incineration is confined burning of waste leaves, landscape refuse, or other refuse or rubbish. Open burning is the unconfined burning of solid waste material.

3.4.3.5.1 On-Site Incineration

A federal guidance document[1] provides waste generation factors to estimate the tons of solid waste burned in on-site incineration. The amount of waste incinerated by residential, commercial/institutional and industrial sources was multiplied by the appropriate VOC, NO_x, and CO emission factors obtained from a federal reference document.[2]

The waste generation factors for on-site incineration appropriate for Region 4 are: 4 tons per 1000 population per year for residential sources; 23 tons per 1000 population per year for commercial/institutional sources; and 395 tons per 1000 manufacturing employees per year for industrial sources. The emission factors applied for on-site incineration are: 1.7 for VOC, 60 for CO, and 11 for NO_x. The emission factors are in pounds of pollutant per ton of solid waste incinerated.

Population statistics and manufacturing employment information for all areas examined for on-site incineration were obtained from state references.[4,5] Emissions per typical summer day for this area source category were calculated using a federal guidance document.[1] The calculated annual

tons of VOC were divided by the product of the number of activity days per week and the number of weeks in a year. For on-site incineration, no seasonal adjustment factor was applied since activity was considered uniform year round and activity days per week were 7. Calculations for estimating emissions from this category are as follows.

Residential

$$TPY = \left(\frac{4 \text{ Tons of waste}}{1000 \text{ pop.}} \times \frac{\text{county pop.}}{} \times EF \text{ (lbs)}\right) \times \left(\frac{1 \text{ ton}}{2000 \text{ lbs}}\right)$$

$$TSD = TPY / (7 \times 52)$$

Commercial/Institutional

$$TPY = \left(\frac{23 \text{ Tons of waste}}{1000 \text{ pop.}} \times \frac{\text{county pop.}}{} \text{ (lbs)}\right) \times EF \times \left(\frac{1 \text{ ton}}{2000 \text{ lbs}}\right)$$

$$TSD = TPY / (7 \times 52)$$

Industrial

$$TPY = \left(\frac{395 \text{ tons}}{1000 \text{ mfg employees}} \times \frac{\text{\# employees in mfg SICs 20-39}}{} \times EF \text{ (lbs)}\right) \times \left(\frac{1 \text{ ton}}{2000 \text{ lbs}}\right)$$

$$TSD = TPY / (7 \times 52)$$

On-site incineration emissions are provided for the ozone maintenance areas in Table 3-23. Manufacturing employee information for individual areas is provided in Table 3-24.

Table 3-23
Summary of Emissions From
On-Site Incineration

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)	Annual CO Emissions (tons/year)	Daily CO Emissions (tons/day)	Annual NOx Emissions (tons/year)	Daily NOx Emissions (tons/day)
Greenup*	0.65	0	23.07	0.06	4.23	0.01

*Denotes only a portion of the county.

Table 3-24
Manufacturing Employee Population

County	Manufacturing Employment (Employees)
Greenup*	354

*Denotes only a portion of the county.

3.4.3.5.2 Open Burning

A federal guidance document[1] provides waste generation factors to estimate the tons of solid waste burned in open burning. The amount of waste burned by residential, commercial/institutional, and industrial sources was multiplied by the appropriate VOC, NO_x, and CO emission factors obtained from a federal reference document.[2] The waste generation factors for open burning appropriate for Region 4 are: 450 tons per 1000 rural population per year for residential sources; 24 tons per 1000 rural population per year for commercial/institutional sources; and 160 tons per 1000 manufacturing employees per year for industrial sources. The emission factors applied for open burning are: 30 for VOC, 35 for CO, and 6 for NO_x. The emission factors are in units of pounds of pollutant per ton of solid non-agricultural waste burned. For an example of how the above information is utilized for this area source category, please see 3.4.3.5.1 regarding on-site incineration.

Rural population statistics and manufacturing employment information for all areas examined for open burning were obtained from state references.[3,4]

In January 1998, Kentucky adopted revisions to the open burning regulation to prohibit most types of open burning in moderate ozone nonattainment areas within Kentucky during the period of May – September when ozone is most likely. The emission reduction credit taken for this control measure is calculated as 80%. A copy of the regulation outlining this prohibition is included in Appendix F.

Emissions per typical summer day for this area source category were calculated using a federal guidance document.[1] The calculated annual tons of VOC was then divided by the product of the number of activity days per week and the number of weeks in a year. For open burning, no seasonal adjustment factor was applied since activity was considered uniform year round and activity days per week was 7. Emissions for this category were calculated as follows.

Residential

$$TPY = \left(\frac{450 \text{ Tons of waste}}{1000 \text{ rural population}} \times \text{county pop.}\right) \times EF) \times \frac{1 \text{ ton}}{(2000 \text{ lbs})}$$

$$TSD = TPY / (7 \times 52)$$

Commercial/Institutional

$$TPY = \left(\frac{24 \text{ Tons of waste}}{1000 \text{ rural population}} \times \text{county pop.}\right) \times EF \times \frac{1 \text{ ton}}{(2000 \text{ lbs})}$$

$$TSD = TPY / (7 \times 52)$$

Industrial

$$TPY = \left(\frac{160 \text{ tons}}{1000 \text{ mfg employees}} \times \text{\# employees in mfg SICs } 20\text{-}39\right) \times EF \text{ (lbs)}) \times \frac{1 \text{ ton}}{(2000 \text{ lbs})}$$

$$TSD = TPY / (7 \times 52)$$

Open burning emissions are provided for the ozone maintenance areas in Table 3-25. Manufacturing employee and rural population information is provided in Table 3-26.

Table 3-25
Summary of Emissions From
Open Burning of Solid Waste

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)	Annual CO Emissions (tons/year)	Daily CO Emissions (tons/day)	Annual NOx Emissions (tons/year)	Daily NOx Emissions (tons/day)
Greenup*	64.92	0.18	183.94	0.51	12.98	0.04

*Denotes only a portion of the county.

Table 3-26
Rural Population

County	2002 Rural Population
Greenup*	9010

*Denotes only a portion of the county.

3.4.4 Small Stationary Source Fossil Fuel Use

The category includes small boilers, furnaces, heaters, and other heating units too small to be considered point sources. A federal guidance document[1] indicates that it may not be worthwhile for an agency to perform the detailed procedures to calculate emissions for this entire fuel combustion category if: (1) its primary concern is updating the VOC inventory and (2) if an existing inventory already includes combustion. Since the division meets the aforementioned conditions it did not calculate emissions for this area source category.

3.4.5 Bioprocess Emissions Sources

Bioprocess emissions sources include those sources whose emissions result from biological processes (e.g. fermentation). Source categories include bakeries, breweries, distilleries, wineries, and silage storage.

3.4.5.1 Bakeries

The methodology used to estimate emissions from bakeries was prepared by Radian Corporation.[18] A review of *County Business Patterns 1990*,[5] provided the number of bakeries listed under retail bakeries (SIC 546) and larger manufacturing bakeries (SIC 2051). For the purposes of this inventory, except for one large bakery located in Daviess County, all bakeries in the maintenance areas were considered area sources and their emissions were calculated using Radian's guidance. A factor of .155 tons VOC/yr/1000 population was applied to county populations. This activity was considered uniform year round and activity days per week were 6.[1]

The calculations used to determine source emissions from this category are as follows.

$$TPY = \underbrace{\frac{.155\ tons}{(1000\ pop.)} \times population}_{Area\ Source\ Emissions} + \underbrace{\left(\left(\frac{lbs\ produced}{1000\ lbs}\right) \times EF\right) \times \frac{1\ ton}{(2000\ lbs)}}_{Point\ Source\ Emissions}$$

$$TSD = TPY / (6 \times 52)$$

Bakery emissions are shown in Table 3-27. Population information necessary for calculating these emissions is found in Table 3-8.

Table 3-27
Summary of Emissions From Bakeries

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*	3.61	0.01

*Denotes only a portion of the county.

3.4.5.2 Breweries

A review of *County Business Patterns*[5] showed no breweries in ozone maintenance areas in Kentucky. Therefore, this category was not inventoried.

3.4.5.3 Wineries

Based on EPA guidance,[1] a review of *County Business Patterns*[5] showed no wineries located in maintenance areas in Kentucky. Therefore, this category was not inventoried.

3.4.5.4 Distilleries

Emissions for this category are included in the point source portion of this inventory.

3.4.5.5 Silage Storage

EPA guidance[1] stated that this was not a required source category. Since emissions from silage would be typically during the winter months, this category was not inventoried.

3.4.6 Other Area Sources

Sources included in this category are miscellaneous combustion sources and leaking underground storage tanks.

3.4.6.1 Miscellaneous Combustion Sources

Several types of fires and burning activities potentially contribute to this subcategory. They are as follows:

(1) Forest Fires;

(2) Slash Burning and Prescribed Burning;

(3) Agricultural Burning;

(4) Structure Fires; and,

(5) Orchard Heaters.

The division calculated emissions for forest fires and structure fires. The remaining miscellaneous combustion activities were found not to be widespread in Kentucky and therefore were not addressed.

3.4.6.1.1 Forest Fires

A federal guidance document[1] provided the methodology the division used for calculating emissions for this area source category. This methodology involves estimating the amount of material consumed by multiplying the number of acres burned in each area examined by a fuel loading factor (i.e., material consumed per acre of land burned). A fuel loading factor of 6.6 tons of material consumed per acre burned and the number of acres burned in each area examined was obtained from the Kentucky Division of Forestry.[13] Appropriate emission factors from a federal reference document[2] are: 24 for Total Hydrocarbons (THC), 140 for CO, and 4 for NO_x. However, according to another federal reference document,[14] only 79.71 percent of the THC emissions derived from the above THC emission factor are reactive. Therefore, the VOC emission factor utilized for this area source category was 19.13. This VOC emission factor information is based on information derived from a federal reference document.[15] The emission factors are in units of pounds per ton of material burned.

Emissions per typical summer day for this area source category were calculated using a federal guidance document.[1] The calculated annual tons of VOC emissions was divided by the product of the number of activity days per week and the number of weeks in a year. For forest fires no seasonal adjustment factor was applied since activity was considered uniform year round and the activity days per week was 7. The calculations used to determine emissions from this category are as follows.

$$TPY = \left(\begin{array}{c}\text{\# of Acres Consumed} \\ \text{(per County}\end{array}\right) \times \left(\begin{array}{c}\text{Tons of Growth} \\ \text{per Acre} \\ \text{consumed}\end{array}\right) \times \frac{EF}{(lbs)} \times \frac{1\ ton}{(2000\ lbs)}$$

$$TSD = TPY / (7 \times 52)$$

Forest fire emissions are provided in Table 3-28. Additionally, acreage burned for individual areas is provided in Table 3-29.

Table 3-28
Summary of Emissions From Forest Fires

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)	Annual CO Emissions (tons/year)	Daily CO Emissions (tons/day)	Annual NOx Emissions (tons/year)	Daily NOx Emissions (tons/day)
Greenup*	9.09	0.02	66.53	0.18	1.90	0.01

*Denotes only a portion of the county.

Table 3-29
Acreage Burned By Forest Fires

County	2002 Forest Fires Acres Burned
Greenup*	227

*Denotes only a portion of the county.

3.4.6.1.2 Structure Fires

Federal guidance[1] provided the methodology the division used for calculating emissions for this area source category. This methodology involves estimating the amount of material consumed by multiplying the number of structure fires occurring in each area examined by a fuel loading factor (i.e., material consumed per structure fire). A fuel loading factor of 6.8 tons of material consumed per fire was provided in a federal guidance document[1] and information on the number of structure fires which occurred in Kentucky in 2002 was derived by assuming an average of 6 fires per 1000 population in an area in accordance with Volume I guidance. Based on federal guidance,[1] the emission factors applied are: 11 for VOC, 60 for CO, and 1.4 for NO_x. The emission factors are in units of pounds per ton of material burned.

Emissions per typical summer day for this area source category were calculated using federal guidance.[1] The calculated annual tons of VOC emissions were divided by the product of the number of activity days per week and the number of weeks in a year. For structure fires no seasonal adjustment factor was applied since activity was considered uniform year round and the activity days per week were 7. The calculations used to estimate emissions from this category are as follows.

$$TPY = \frac{(6\ fires}{(\ 1000\ pop.} \times (population) \times \begin{matrix} 6.8\ tons\ of \\ (material\ burned) \\ per\ fire \end{matrix} \times \begin{matrix} EF \\ (lbs)) \end{matrix} \times \frac{1\ ton}{(2000\ lbs)}$$

$$TSD = TPY / (7 \times 52)$$

Structure fire emissions are provided in Table 3-30. The data used to calculate these emissions is located in Table 3-31.

Table 3-30
Summary of Emissions From Structure Fires

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)	Annual CO Emissions (tons/year)	Daily CO Emissions (tons/day)	Annual NOx Emissions (tons/year)	Daily NOx Emissions (tons/day)
Greenup*	5.24	0.01	28.56	0.08	0.67	0

*Denotes only a portion of the county.

Table 3-31
Number of Structure Fires

County	Number of Structure Fires
Greenup*	140

*Denotes only a portion of the county.

3.4.6.1.3 Slash Burning and Prescribed Burning

Information received from the Kentucky Division of Forestry[19] revealed that these activities are not widespread in Kentucky and emissions for this category were not inventoried.

3.4.6.1.4 Agricultural Burning

Information received from the Kentucky Division of Forestry[19] showed that this is not a widespread practice in Kentucky and emissions for this category were not inventoried.

3.4.6.1.5 Orchard Heaters

The use of orchard heaters are not commonly used in Kentucky. Therefore, this category was not inventoried.

3.4.6.2 Leaking Underground Storage Tanks

Leaking underground storage tanks typically do not become quantifiable sources of VOC air emissions until excavation and remediation efforts are initiated. Remediation efforts vary widely depending upon the type of contaminant, magnitude of the leak and the extent of groundwater contamination, if any.

Methodology developed by Radian Corporation[32] was used to derive emissions from this category. An emission factor of 28 lbs per remediation was used in estimating these emissions. Remediation information was obtained from the Division of Waste Management's Leaking Underground Storage Tank Branch.[20] Calculations to estimate emissions for a typical summer day from this category are as follows.

$$TSD = \#\ of\ Remediations \times \frac{EF\ lbs}{Per\ Remediation} \times \frac{1\ ton}{2000\ lbs.}$$

Emissions for this area source are located in Table 3-32. Remediation information used to calculate these emissions are located in Table 3-33.

Table 3-32
Summary of Emissions From
Leaking Underground Storage Tanks

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)
Greenup*		0

*Denotes only a portion of the county.

Table 3-33
Number of Remediations

County	Number of Remediations
Greenup*	0

*Denotes only a portion of the county.

Table 3-34
Summary of Area Source Emissions

Source Category	Annual **VOC Emissions (tons/year)	Daily **VOC Emissions (tons/day)	Annual CO Emissions (tons/year)	Daily CO Emissions (tons/day)	Annual NOx Emissions (tons/year)	Daily NOx Emissions (tons/day)
Portion of Greenup County*						
Gasoline Breathing	5.01	0.01				
Gasoline Transit	0.38	0				
Total Gas Unloading	38.68	0.13				
Total Air Refueling	0.10	0				
Solvent Dry Cleaning	12.82	0.05				
Surface Cleaning Degreasing	38.58	0.12				
Architectural Surface Coating	53.60	0.19				
Auto Refinishing	26.80	0.10				
Traffic Markings	5.80	0.02				
Graphic Arts	15.15	0.06				
Cutback Asphalt Paving	4.31	0.02				
Pesticide Application	2.47	0.01				
Commercial/Consumer Use	91.36	0.25				
POTW	16.94	0.07				
Ind. Wastewater	0	0				
Municipal Landfills	0	0				
Total Onsite	0.65	0	23.07	0.06	4.23	0.01
Total Open Burning	64.92	0.18	183.94	0.51	12.98	0.04
Bakeries	3.61	0.01	0	0	0	0
Forest Fires	9.09	0.02	66.53	0.18	1.90	0.01
Structure Fires	5.24	0.01	28.56	0.08	0.67	0
Leaking Underground Storage Tanks	0	0	0	0	0	0
Total Greenup Portion Emissions	**395.51**	**1.25**	**302.10**	**0.83**	**19.78**	**0.06**

*Denotes only a portion of the county.

**Per federal rules for certain area source categories, the VOC emissions reflect applicable emissions reductions.

3.5 REFERENCES FOR SECTION 3

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19. Kentucky Natural Resources and Environmental Protection Cabinet, Department of Natural Resources, Division of Forestry. Correspondence confirming the lack of activity for slash Burning, Prescribed Burning, and Agricultural Burning, August 3, 1992.

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4.0 NON-HIGHWAY EMISSIONS

4.1 INTRODUCTION

This section documents the development of the 2002 nonroad emissions inventory for the Greenup County, Kentucky portion of the Huntington-Ashland ozone maintenance area (i.e., Boyd County and a portion of Greenup County). Nonroad sources include motorized vehicles and equipment, which are normally not operated on public roadways to provide transportation. The study and regulation of nonroad emission sources were mandated by the Clean Air Act Amendments of 1990.

4.2 METHODOLOGY AND APPROACH

Nonroad emissions were calculated in accordance with EPA's Mobile Volume IV[1] and EPA's National Emissions Inventory (NEI) development guidance[5]. For this inventory, nonroad emissions have been divided into three categories. Separate emission categories include aircraft, locomotives, and other nonroad (i.e., Non-Highway) sources. Methodologies for each of these categories are discussed separately.

4.3 SUMMARY OF EMISSIONS

Table 4-1 summarizes the inventory results for the other nonroad (i.e., Non-Highway) source emissions. Tables 4-2 and 4-3 summarize emissions from aircrafts. Tables 4-5 and 4-6 summarize emissions from locomotives. Table 4-8 summarizes emissions from all non-highway mobile emission categories.

4.4 DISCUSSION OF NONROAD CATEGORIES

4.4.1 Other Nonroad (i.e., Non-Highway) Sources

Emissions for the other nonroad source categories (e.g., construction and agricultural equipment) were estimated using EPA's Nonroad Model (Core Model Version 2005a, February 2006) in accordance with EPA Region 4 direction[6] and EPA's NEI guidance[5]. As for inputs for the nonroad model RVP and temperature information was provided in accordance with EPA Volume IV

guidance[1] and EPA Region 4 direction[6] (*See Appendix C for nonroad model output and Appendix D for more information on temperature determinations*).

The model provided county level ton per day (tpd) emission estimates for base year 2002 and for the projection years of 2005, 2008, 2011, 2014, 2017 and 2020. County level emissions were allocated to a portion of a county as follows:

Portion of County Emissions = (Nonroad Model County Level Emissions * Fraction of Population in Portion of County)

The emissions for this category are provided in Table 4-1.

Table 4-1
Summary of Emissions
Other Non-Highway Mobile Sources

County	**Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)	**Annual CO Emissions (tons/year)	Daily CO Emissions (tons/day)	**Annual NOx Emissions (tons/year)	Daily NOx Emissions (tons/day)
Greenup*	0	0.65	0	4.86	0	0.27

*Denotes only a portion of the county.

**Annual emissions not provided.

4.4.2 Aircraft Emissions

Emissions from aircraft have been determined in accordance with EPA's Volume IV[1] and NEI[5] guidance for nonroad mobile sources. The basic methodology determines aircraft fleet make-up and level of activity and then calculates air pollutant emissions on an annual basis.

Preparing an emissions inventory for aircraft focuses on the emission characteristics of this source relative to the vertical column of air that ultimately affects ground level pollutant concentrations. This portion of the atmosphere, which begins at the earth's surface and is simulated in air quality models, is often referred to as the mixing zone. The aircraft operations of interest within this layer are defined as the landing and takeoff (LTO) cycle. The cycle begins when the aircraft approaches the airport on its descent from cruising altitude, lands, and taxis to the gate. It continues as the aircraft taxis back out to the runway for subsequent takeoff and climbout as it heads

back up to cruising altitude. Thus, the five specific operating modes in a LTO are:

- Approach
- Taxi/idle-in
- Taxi/idle-out
- Takeoff
- Climbout

Most aircraft go through a similar sequence during a complete operating cycle. Helicopters may combine certain modes such as takeoff and climbout.

The LTO cycle provides a basis for calculating aircraft emissions. During each mode of operation, the aircraft engines operate at a fairly standard power setting for a given aircraft category. Emissions for one complete cycle for a given aircraft can be calculated by knowing emission factors for specific aircraft engines at those power settings. Then, if the activity of all aircraft in the modeling zone can be determined for the inventory period, the total emissions can be calculated.

4.4.2.1 Emissions for Commercial Aircraft (No Commercial Aircraft Emissions Reported For the Area)

Total emissions for commercial aircraft are included in Table 4-2. Airport documentation (i.e., LTOs) used to calculate these emissions is provided in Table 4-4.

Table 4-2
Summary of Emissions From Commercial Aircraft

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)	Annual CO Emissions (tons/year)	Daily CO Emissions (tons/day)	Annual NOx Emissions (tons/year)	Daily NOx Emissions (tons/day)
Greenup*	0	0	0	0	0	0

*Denotes only a portion of the county.

4.4.2.2 Emissions for General Aviation, Air Taxis, and Military Aircraft Landing at Non-Military Airports

For the purpose of creating an emissions inventory, business aircraft are combined with general aviation aircraft because of their similar size, use frequency, and operating profiles. In this inventory methodology they are referred to simply as general aviation. Similarly, air taxis are treated much like the general aviation category because they are typically the same types of aircraft. Military aircraft landing at non-military airports are also inventoried and were addressed much like air taxi and general aviation aircraft. As for military aircraft landing at military air bases, no military air bases were identified to be located in any of Kentucky's ozone maintenance counties.

Alternative, Fleet-Average Procedure

Pursuant to U.S. EPA Volume IV guidance[1], an alternative, fleet-average procedure was utilized to estimate emissions for general aviation, air taxi and military aircraft landing at non-military airports. This procedure involves multiplying the number LTOs for each type of aircraft by the following emission factors. Based on September and October 1992 telephone conversations with Joe Mangino, of the Radian Corporation, and Steve McCary, U.S. EPA Region 4, in the absence of fleet average emission factors for military aircraft landing at non-military airports air taxi factors were utilized. This is the same approach that EPA followed in preparing its 1999 National Emissions Inventory (NEI)[5] for these types of aircraft. The calculation for deriving emissions for general aviation, air taxi, and military aircraft landing at non-military airports is shown below.

Annual Aircraft Emissions = (Number of LTOs X Fleet Average Emission Factors) / 2000

General Aviation Fleet-Average Emission Factors:

HC 0.394 pounds per LTO

CO 12.014 pounds per LTO

NO_x 0.065 pounds per LTO

SO_2 0.010 pounds per LTO

Since air taxis have fewer of the smallest engines in their fleet and more turboprop and

turbojet engines, their emission factors are somewhat different.

Air Taxi Fleet-Average Emission Factors:

(utilized for the military aircraft landing at non-military airports)

HC 1.234 pounds per LTO

CO 28.130 pounds per LTO

NO_x 0.158 pounds per LTO

SO_2 0.015 pounds per LTO

Airport activity for general aviation aircraft, air taxis, and military aircraft landing at non-military airports was obtained from the 2002 Kentucky Airport Master Records[4] provided by the Kentucky Division of Aeronautics, and direct contact with local airports.

Seasonal Adjustment to Daily Emissions

Local airports in Kentucky's ozone maintenance areas were contacted by telephone to determine the airport activity levels during the 2000 summer quarter. Based on these contacts, the following seasonal adjustment factors were multiplied by the annual emissions (TYR) divided by 365 days of operation to determine typical summer day emissions (TSD). The seasonal adjustment factors for aircraft that were applied to the annual emissions are as follows:

Typical Summer Day Emissions (TSD) = (Annual Emissions (TYR) X Seasonal Adjustment Factor) / 365

The following seasonal adjustment factors (SAJ) were applied to annual emissions for general aviation, air taxis, and military aircraft landing at non-military airports:

Ashland-Boyd County Airport in Greenup County, KY-	SAJ Factor of 1.10 for all types of aircraft;

General Aviation and Air Taxi THC to VOC Conversions

Since the alternative, fleet-average procedure was used for general aviation, air taxis, and military aircraft landing at non-military aircraft, a single conversion factor was used for each aircraft category as follows. In concert with EPA's 1999 NEI[5] and EPA guidance[7] the THC to VOC conversion factor for military aircraft was utilized to better reflect military aircraft VOC emissions[7].

$$VOC_{GA\ FLEET} = THC_{GA\ FLEET} \times 0.9708 \qquad (5\text{-}18)$$

$$VOC_{AT\ FLEET} = THC_{AT\ FLEET} \times 0.9914 \qquad (5\text{-}21)$$

$$VOC_{AT\ FLEET} \text{ used for Military Aircraft} = THC_{AT\ FLEET} \times 1.100003 \qquad (5\text{-}21)$$

Total emissions for general aviation, air taxis, and military aircraft landing at non-military airports are provided in Table 4-3. Airport activity data used to calculate these emissions can be found in Table 4-4.

Table 4-3
Summary of Emissions From
From General Aviation, Air Taxi, & Military Aircraft (Non-Military Airports)

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)	Annual CO Emissions (tons/year)	Daily CO Emissions (tons/day)	Annual NOx Emissions (tons/year)	Daily NOx Emissions (tons/day)
Greenup*	1.74	0	44.83	0.14	0.26	0

*Denotes only a portion of the county.

Table 4-4
Airport Activity Levels

County	Commercial Aircraft LTOs	Air Taxi LTOs	General Aviation LTOs	Military LTOs
Greenup*	0	1600	3250	200

*Denotes only a portion of the county.

4.4.3 Locomotives

Emissions for railroad locomotives within Kentucky's ozone maintenance areas were calculated based upon December 1997 line haul and yard emission factors[5]. EPA utilized these same more recent emission factors in developing locomotive emissions for the 1999 National Emissions Inventory (NEI)[5]. EPA provided guidance to the Division in utilizing the newer locomotive emission factors[8].

Railroad locomotives used in the United States are primarily of two types: electric and diesel-electric. Electric locomotives are powered by electricity generated at stationary power plants and distributed by either a third rail or overhead catenary system. Emissions are produced only at the electrical generation plant, which is considered a point source and therefore not of interest here. Diesel-electric locomotives, on the other hand, use a diesel engine and an alternator or generator to produce the electricity required to power its traction motors. Emissions produced by these diesel engines are of interest in the non-highway emission inventory development. Emissions for hydrocarbons (HC), carbon monoxide (CO), oxides of nitrogen (NOx), sulfur dioxide (SO_2), and particulate matter (PM) from this source are covered in this chapter.

Railroads can be separated into three classes based on size: Class I, Class II, and Class III. Class I railroads represent the largest railroad systems in the country. Because of their size, Class I railroads operate over a large geographic area. Also, they carry most of the interstate freight and carry most of the passenger service. They are required to keep detailed records of their operations and to report yearly to the Interstate Commerce Commission (ICC).

Class II and III railroads represent the remainder of the rail transportation system and generally operate within smaller, localized areas. These smaller railroads are not subject to the same reporting requirements, and their record-keeping may be less extensive. Also, their fleet of locomotives tends to be older, with the Class I railroads buying almost all of the new locomotives.

Locomotives within each of the Classes can perform two different types of operations: line haul and yard (or switch). Line haul locomotives generally travel between distant locations, such as from one city to another. Yard locomotives are primarily responsible for moving rail cars within a particular railway yard.

Overview of Recommended Inventory Methodology

4.4.3.1 Line Haul Locomotives

For Class I, II, and III line haul locomotives, emissions were calculated by multiplying the amount of fuel consumed in the inventory area by the appropriate emission factors.

Line Haul Locomotive

Inventory Area Emissions = Fuel Consumption x Emission Factors Fuel Consumption

Line haul locomotive fuel consumption information for Kentucky's ozone maintenance counties was supplied directly to the Division for Air Quality pursuant to a Division railroad questionnaire that was mailed in April 5, 2000 to all railroads operating in the ozone maintenance areas *(Please see a copy of the 2000 railroad questionnaire which is included in Appendix C)*. The questionnaire also requested information regarding the number of yard locomotives operating in the ozone maintenance counties.

Emission Factors - Line Haul

With the line haul fuel consumption information obtained from the questionnaire, inventory area emissions were determined by multiplying that value by the fleet average emission factors for each pollutant (converted to pounds per gallon of fuel burned (lbs/gal)). The EPA recommended default emission factors[8] that were utilized for all line haul locomotives are as follows.

Line Haul Locomotive Emission Factors

Pollutant	Emission Factor (g/gal)
HC	10
CO	26.6
NOx	270
PM	6.7

* g/gal emission factors converted to lbs/gal by multiplying the g/gal emission factor by .0022046.

4.4.3.2 Yard Locomotives

The recommended method for yard locomotives was same method used for line haul locomotives. With the line yard locomotive fuel consumption information obtained from the questionnaire, inventory area emissions were determined by multiplying that value by the fleet average emission factors for each pollutant (converted to pounds per gallon of fuel burned (lbs/gal)). Emissions for yard locomotives are calculated using the following formula:

Yard Locomotive

Inventory Area Emissions = Fuel Consumption x Emission Factors

Yard Locomotive Emission Factors

The EPA recommended default emission factors[8] that were utilized for all yard locomotives are as follows.

Pollutant	Emission Factor (g/gal)
HC	21
CO	38.1
NO	362
PM	9.2

* g/gal emission factors converted to lbs/gal by multiplying the g/gal emission factor by .0022046.

Seasonal Considerations Line and Yard Locomotives

Based on telephone conversations with James Hou[2], Region 4 EPA, during March 2006 and Volume IV guidance[1], activity for railroad locomotives is considered to be uniform throughout the year. Additionally, the number of days of operation was assumed to be 365.

Therefore, typical summer day emissions for line haul and yard locomotives were derived by using the following equation.

Typical Summer Day Emissions (TSD) = Annual Locomotive Emissions (TYR) / 365 days

Converting from Total Hydrocarbons (THC) to Volatile Organic Compounds (VOC) For Line and Yard Locomotives

In accordance with Volume IV guidance, the following THC to VOC conversion factor was used to determine the VOC emissions for line and yard locomotives.

VOC Locomotive = THCFID Locomotive x 1.005

Emissions for line haul locomotives are provided in Table 4-5 and emissions for yard locomotives are provided in Table 4-6. Activity data (i.e., fuel consumed) used to calculate locomotive emissions can be found in Table 4-7. Total Non-Highway emissions are provided in Table 4-8.

Table 4-5
Summary of Emissions From
From Line Haul Locomotives

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)	Annual CO Emissions (tons/year)	Daily CO Emissions (tons/day)	Annual NOx Emissions (tons/year)	Daily NOx Emissions (tons/day)
Greenup*	6.25	0.02	16.54	0.05	167.91	0.46

*Denotes only a portion of the county.

Table 4-6
Summary of Emissions From
From Yard Locomotives

County	Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)	Annual CO Emissions (tons/year)	Daily CO Emissions (tons/day)	Annual NOx Emissions (tons/year)	Daily NOx Emissions (tons/day)
Greenup*	0	0	0	0	0	0

*Denotes only a portion of the county.

Table 4-7
Locomotive Fuel Information

County	Line Haul Locomotive Fuel (Gallons)	Yard Locomotive Fuel (Gallons)
Greenup*	564163	0

*Denotes only a portion of the county.

Table 4-8
Summary of Emissions From
Non-Highway Mobile Sources

County	Category	**Annual VOC Emissions (tons/year)	Daily VOC Emissions (tons/day)	**Annual CO Emissions (tons/year)	Daily CO Emissions (tons/day)	**Annual NOx Emissions (tons/year)	Daily NOx Emissions (tons/day)
Greenup*	Other Non-Highway	0	0.65	0	4.86	0	0.27
Greenup*	Locomotive	6.25	0.02	16.54	0.05	167.91	0.46
Greenup*	Aircraft	1.74	0	44.83	0.14	0.26	0
Greenup* Emissions		**7.99**	**0.67**	**61.37**	**5.05**	**168.17**	**0.73**

*Denotes only a portion of the county.

**Annual other non-highway emissions not reflected in Table 4-8.

4.5 REFERENCES FOR SECTION 4

1. U.S. Environmental Protection Agency, Procedures for the Emission Inventory Preparation, Volume IV: Mobile Sources, EPA-450/4-81-026d (Revised), U.S. EPA, Office of Mobile Sources, Ann Arbor, MI and Office of Air Quality Planning & Standards, RTP, NC, 1992.

2. E-mail communication, James Hou, US EPA, Region 4, to Joe Forgacs, Kentucky Division for Air Quality concerning procedures for inventorying other nonroad engine categories, March 6, 2006.

3. U.S. Department of Transportation, Federal Aviation Administration, Airport Activity Statistics of Certificated Route Air Carriers for 2000, Office of Management Systems, Washington, DC 20591.

4. Kentucky Transportation Cabinet, Aeronautics Division - 2002 Airport Master Records were obtained for general aviation, air taxi, and military aircraft.

5. U.S. Environmental Protection Agency, National Emissions Inventory (NEI) for 1999.

6. Communications with Dale Aspy, EPA Region 4, regarding nonroad emission inventory development, Summer and Fall 2002.

7. Communications with Dale Aspy, EPA Region 4, and Ken Petche, EPA OMS, regarding aircraft emission inventory development, Fall 2002.

8. Communications with Dale Aspy, EPA Region 4, and Chuck Moulis, EPA OMS, regarding locomotive emission inventory development, Fall 2002.

5.0 HIGHWAY VEHICLES

5.1 INTRODUCTION

This section documents the development of the 2002 highway mobile source emissions inventory for the Greenup County, Kentucky portion of the Huntington-Ashland Area, which includes Boyd County and a portion of Greenup County. The inventory addresses highway vehicles using gasoline and diesel. The inventory estimates are for a typical weekday during the summer ozone season (March - October), but more specifically for the summer quarter (i.e., June, July, and August).

In conjunction with Sierra Research, Inc.[1], the U.S. Environmental Protection Agency provided guidance for the preparation of this portion of the inventory.[2]

The transportation models used to generate daily vehicle miles traveled (DVMT) were run by the Division of Mass Transportation, Kentucky Transportation Cabinet. Emission factors for highway vehicle classes were obtained from EPA's MOBILE6.2 highway mobile source emission factor estimation model. MOBILE6.2 runs for the maintenance areas were performed by the Kentucky Division for Air Quality.

The highway vehicles inventory discussion is divided into three primary sections. Section 5.2 addresses the emissions estimation process using the MOBILE6.2 model.[3] Section 5.3 addresses the mobile emissions for each inventoried ozone maintenance area. Mobile source references are found in Section 5.4.

5.2 EMISSIONS ESTIMATION PROCESS

5.2.1 Overview of Highway Vehicle Emissions Estimates

Highway vehicle emission estimates for the maintenance area was calculated using the DVMT estimates and EPA's mobile source emission factor estimation model - MOBILE6.2. The emission factors produced by the MOBILE6.2 model in grams/mile (g/mile) were multiplied by the DVMT estimates to generate total emissions. Emission estimates were calculated for VOC, NO_x, and CO. Estimates of VOC emissions were made for vehicle exhaust, evaporative, refueling, resting, and running losses. The only sources of NO_x and CO emissions were vehicle exhaust losses. Highway vehicle emission estimates were calculated for base year 2002 and the projection years of

2005, 2008, 2011, 2014, 2017 and 2020. The agencies principally involved in producing the highway vehicle emission estimates were the Division of Planning, Department of Highways, Kentucky Transportation Cabinet; and the Kentucky Division for Air Quality. The Division of Planning provided the following mobile source information for ozone maintenance areas: (1) Road classifications, 2) Daily Vehicle Miles Traveled per road classification per county; and (3) Estimated average speeds for each road classification. The Division for Air Quality conducted all of the MOBILE6.2 model runs.

The inputs used to run the MOBILE6.2 model are described and presented in Section 5.2.2. Mobile source highway 2002 emissions are summarized in Table 5-1.

5.2.2 Inputs to MOBILE6.2

The new MOBILE6.2 model is a more-concise model, compared to the MOBILE5 model. The chief inputs to the MOBILE6.2 model can be grouped into two main categories: the run section and the scenario section. Unless otherwise specified, national default values are used in the MOBILE6.2 model. These values are used as they are representative of conditions found in Kentucky. The values used for each grouping in the area analysis are presented below and justified (*Please see Appendix D for mobile model input and output information).*

5.2.2.1 Run Section Data

This section is similar to the one-time data section from the MOBILE5 model. In general, the two main values specified in the run section are the Reid Vapor Pressure for conventional gasoline (identified as "Fuel RVP") and the minimum and maximum summer temperatures. Unlike the MOBILE5 model, ambient temperature values no longer need to be specified. Minimum and maximum summer temperature data will vary depending on the area in Kentucky (*Please see Appendix D for temperature information*).

5.2.2.2 Scenario Section Data

This part of Mobile6.2 allows the specification of data for several parameters that can be varied to evaluate many different mobile source emission scenarios. These parameters are described below:

Scenario Record - This parameter is used to indicate a title. For Kentucky's MOBILE6.2 model runs, the road classification is specified. The 12 road classifications (6 rural, 6 urban) that were used for the MOBILE5 model are also used for the MOBILE6.2 model runs. A thirteenth road classification, Ramp, is a new component in the MOBILE6.2 model and is included in these runs.

Calendar Year - The calendar years for the analysis was 2000, 2004, 2005, 2009, 2012 and 2015.

Evaluation Month – A value of 7 was used to denote a summer MOBILE6.2 model run.

Average Speed - For each of the highway road classifications, a single speed was applied. Speed data was supplied by the Kentucky Transportation Cabinet.

In the MOBILE6.2 model, there are four main speed categories: freeway, arterial, local, and ramp. For the 13 road classifications used in Kentucky's MOBILE6.2 model runs, each need to be assigned one of the four speed categories. The 12 road classifications are broken down into 3 freeway road classifications, 8 arterial road classifications, and 1 local road classification. It should be noted that Rural Local has a speed category of Arterial, as advised by EPA.

Specific default speed data are used for specific speed categories. For the local speeds, 12.9 mile per hour is used. For the ramp speed, 34.6 mile per hour is used.

For the average speed component, it should be noted that additional data are indicated for the 3 freeway road classifications.[4] Vehicle miles Traveled (VMT) distribution data are represented with 4 percentages: freeway, arterial, local, and ramp. For freeways, studies estimate that freeway and ramp represent 92% and 8% of all freeway VMT, respectively. Unless local data are available for the freeway category, the user needs to indicate "92.0 0.0 0.0 8.0".

Local data for VMT distribution can be used, if available. For example, the VMT distribution may be "92.4 0.0 0.0 7.6". Local data may even indicate that VMT distribution data are not needed for any of the freeway road classifications. The VMT distribution data will not be indicated in the Mobile6.2 input file for a freeway road classification unless

DVMT data are associated with it. The Kentucky Transportation Cabinet has supplied local data for VMT distribution for this emissions inventory that is different from the default values of "92.0 0.0 0.0 8.0". Please see Appendix D for more-detailed highway mobile input file and DVMT information.

5.3 Summary of Highway Vehicle Emissions

Highway vehicle emission estimates were calculated by multiplying the Mobile6.2 generated emission factors by the DVMT. Typical Summer Day (TSD) emission totals are listed in Table 5-1.

TABLE 5-1
SUMMARY OF HIGHWAY MOBILE SOURCE EMISSIONS
Greenup County, Kentucky Portion of the Huntington-Ashland Area

	2002 HIGHWAY MOBILE SOURCE EMISSIONS (2002 VMT * 2002 EF)		
COUNTY	TOTAL VOC TSD**	TOTAL CO TSD**	TOTAL NO_X TSD**
GREENUP*	1.09	11.55	1.56
TOTAL	1.09	11.55	1.56

*Denotes only a portion of the county.
**Multiply tons per summer (TSD) emissions by 365 to estimate annual emissions.

5.4 REFERENCES FOR SECTION 5

1. Sierra Research, Inc., *MOBILE6 On-Road Motor Vehicle Emissions Model: 5-Day Training Course*, Atlanta, Georgia. February 4-8, 2002.

2. U.S. Environmental Protection Agency. *User's Guide to MOBILE6 – Mobile Source Emission Factor Model.* EPA420-R-02-001. Office of Mobile Sources, Ann Arbor, Michigan. January 2002.

3. U.S. Environmental Protection Agency, Instructions provided with the mobile model - MOBILE6.

4. U.S. Environmental Protection Agency, Dale Aspy, Region 4. Electronic mail correspondence with Joe Forgacs, Kentucky Division for Air Quality. Correction in MOBILE6 model to accurately reflect "Freeway" component. September 9, 2002.

6.0 BIOGENIC EMISSIONS

6.1 BACKGROUND

This section documents the development of the biogenic emissions for the Greenup County, Kentucky portion of the Huntington-Ashland Area, which includes Boyd County and a portion of Greenup County. Biogenic emissions are those emissions that are the result of natural processes occurring in vegetation and soils, and marine ecosystems, as a result of geological activity in the form of geysers or volcanoes, as a result of meteorological activity such as lightning, and from fauna, such as ruminants and termites. In accordance with EPA guidance[1], the 2002 biogenic emissions presented were obtained and derived from county-specific biogenic emission estimates that EPA developed to assist states with the Consolidated Emissions Reporting Rule (CERR).

6.2 METHODOLOGY

EPA estimated the biogenic emissions for Kentucky counties using the Biogenic Emissions Inventory System - Version 2 (BEIS2.2). Maintenance area biogenic emissions were obtained from the following EPA web site: ftp://ftp.epa.gov/EmisInventory/prelim2002nei/biogenic/. Daily biogenic emissions were determined as follows:

Summer Seasonal
Adjustment Factor = (Summer County Emissions (June-August) / Annual County Emissions) / .25

Summer Day Emissions = (Annual County Emissions * Summer Seasonal Adjustment Factor) /365

For portions of counties the area apportionment factor provided in Table 1-1 was utilized to apportion emissions.

6.3 SUMMARY OF BIOGENIC EMISSIONS

6.3.1 Ozone Maintenance Areas

Biogenic emissions for the ozone maintenance areas can be found in Table 6-1 and also in Appendix E. References for biogenic emissions are provided in Section 6.4.

TABLE 6-1
SUMMARY OF BIOGENIC EMISSIONS**
GREENUP COUNTY, KENTUCKY PORTION OF THE HUNTINGTON-ASHLAND OZONE MAINTENANCE AREA

COUNTY	VOC EMISSIONS (tons/yr)	VOC EMISSIONS (tons/day)	NOx EMISSIONS (tons/yr)	NOx EMISSIONS (tons/day)
*Greenup	1096.07	7.12	11.77	0.04

*Denotes only a portion of a county.

**NEI biogenic emissions have been apportioned to the portion of a county based on the area apportionment factor provided in Table 1-1.

6.4 REFERENCES FOR SECTION 6

1. U.S. Environmental Protection Agency. EPA's estimate of 2002 Biogenic Emissions to assist states with the Consolidated Emissions Reporting Rule (CERR). Biogenic annual emission estimates are available at: ftp://ftp.epa.gov/EmisInventory/prelim2002nei/biogenic/. For more information please contact Marc Houyoux, with EPA's Emission Factors and Inventory Group, at (919) 541-3649.

APPENDIX A

Point Source Emissions Inventory Information

2002 Point Source Survey Information

SAMPLE REPORT OF AN EIS SURVEY REQUEST/FACILITIES REPORT

7/3/2007

KENTUCKY DIVISION FOR AIR QUALITY
EMISSIONS INVENTORY SURVEY
FOR CALENDAR YEAR 200

Facility ID: 21167

AI ID:

Mercer County

Plant Location

955 Warwick Rd
Harrodsburg, KY 40330

Harrodsburg, KY 40330

Attn:

E-mail:

Latitude: 37 **Longitude:** -84.

Phone: 859-734- **Fax:** 859-734-

Equipment ID (SI): EQPT0000000001 001

Equipment Description: AFM AREA

Operating Schedule Hours/Day	Days/Week	Weeks/Year	% Annual Throughput Dec-Feb	Mar-May	Jun-Aug	Sep-Nov
24	7	52	25	25	25	25

Stack Information:

Stack Height (ft)	Stack Diameter (ft)	Height of Release (ft)	Stack Flow Rate (acfm)	Stack Velocity (ft/sec)	Exit Temperature (F)	Construction Date
0	0	35.00	0	0	70.00	04/23/1987

Equipment ID (SI) Details:

Process ID:	Process Description:	Annual Process Throughput	SCC Units:
1	SOLVENT A		Gallons Material Processed

Equipment ID (SI): EQPT0000000003 003

Equipment Description: CONTROL UNIT AREA

Operating Schedule Hours/Day	Days/Week	Weeks/Year	% Annual Throughput Dec-Feb	Mar-May	Jun-Aug	Sep-Nov
24	7	52	25	25	25	25

Stack Information:

Stack Height (ft)	Stack Diameter (ft)	Height of Release (ft)	Stack Flow Rate (acfm)	Stack Velocity (ft/sec)	Exit Temperature (F)	Construction Date
0	0	35.00	0	0	70.00	04/23/1987

Equipment ID (SI) Details:

Process ID:	Process Description:	Annual Process Throughput	SCC Units:
1	Solvent A		Gallons Material Processed
2	Solvent T		Gallons Material Processed
3	Flux		Gallons Material Processed
4	Protectorant		Pounds Material Processed

Equipment ID (SI): EQPT0000000006 006

Equipment Description: NAT GAS USAGE

Operating Schedule Hours/Day	Days/Week	Weeks/Year	% Annual Throughput Dec-Feb	Mar-May	Jun-Aug	Sep-Nov
24	7	52	25	25	25	25

Stack Information:

Stack Height (ft)	Stack Diameter (ft)	Height of Release (ft)	Stack Flow Rate (acfm)	Stack Velocity (ft/sec)	Exit Temperature (F)	Construction Date
35.00	2.00	0	5000.00	26.50	70.00	04/23/1987

Equipment ID (SI) Details:

Process ID:	Process Description:	Annual Process Throughput	SCC Units:
1	NAT GAS USAGE		Million Cubic Feet Natural Gas Burned

Equipment ID (SI): EQPT0000000007 007

Equipment Description: INJECTION MOLDING AREA

Operating Schedule Hours/Day	Days/Week	Weeks/Year	% Annual Throughput Dec-Feb	Mar-May	Jun-Aug	Sep-Nov
24	7	52	25	25	25	25

Stack Information:

Stack Height (ft)	Stack Diameter (ft)	Height of Release (ft)	Stack Flow Rate (acfm)	Stack Velocity (ft/sec)	Exit Temperature (F)	Construction Date
0	0	35.00	0	0	70.00	04/23/1987

Equipment ID (SI) Details:

Process ID:	Process Description:	Annual Process Throughput	SCC Units:
1	INJECTION MOLDING AREA		Tons Material Processed

Facility ID: 21167 **AI ID:** 3147 Mercer County

Equipment ID (SI): EQPT0000000008 008
Equipment Description: ISC VALVE AREA

Operating Schedule Hours/Day	Days/Week	Weeks/Year	% Annual Throughput Dec-Feb	Mar-May	Jun-Aug	Sep-Nov
24	7	52	25	25	25	25

Stack Information:

Stack Height (ft)	Stack Diameter (ft)	Height of Release (ft)	Stack Flow Rate (acfm)	Stack Velocity (ft/sec)	Exit Temperature (F)	Construction Date
0	0	35.00	0	0	70.00	04/23/1987

Equipment ID (SI) Details:

Process ID:	Process Description:	Annual Process Throughput	SCC Units:
1	ISC VALVE AREA		Pounds Material Processed

Equipment ID (SI): EQPT0000000009 009
Equipment Description: MACHINING AREA

Operating Schedule Hours/Day	Days/Week	Weeks/Year	% Annual Throughput Dec-Feb	Mar-May	Jun-Aug	Sep-Nov
24	7	52	25	25	25	25

Stack Information:

Stack Height (ft)	Stack Diameter (ft)	Height of Release (ft)	Stack Flow Rate (acfm)	Stack Velocity (ft/sec)	Exit Temperature (F)	Construction Date
0	0	35.00	0	0	70.00	04/23/1987

Equipment ID (SI) Details:

Process ID:	Process Description:	Annual Process Throughput	SCC Units:
1	MACHINING AREA		Gallons Material Processed

Equipment ID (SI): EQPT0000000010 010
Equipment Description: THROTTLE CHM AREA

Operating Schedule Hours/Day	Days/Week	Weeks/Year	% Annual Throughput Dec-Feb	Mar-May	Jun-Aug	Sep-Nov
24	7	52	25	25	25	25

Stack Information:

Stack Height (ft)	Stack Diameter (ft)	Height of Release (ft)	Stack Flow Rate (acfm)	Stack Velocity (ft/sec)	Exit Temperature (F)	Constructi Date
0	0	35.00	0	0	70.00	04/23/1987

Equipment ID (SI) Details:

Process ID:	Process Description:	Annual Process Throughput	SCC Units:
1	THROTTLE CHM AREA		Pounds Material Processed

Equipment ID (SI): EQPT0000000011 011
Equipment Description: WASTEWATER EVAPORATOR UNT

Operating Schedule Hours/Day	Days/Week	Weeks/Year	% Annual Throughput Dec-Feb	Mar-May	Jun-Aug	Sep-Nov
24	7	52	25	25	25	25

Stack Information:

Stack Height (ft)	Stack Diameter (ft)	Height of Release (ft)	Stack Flow Rate (acfm)	Stack Velocity (ft/sec)	Exit Temperature (F)	Construction Date
0	0	35.00	0	0	70.00	03/01/2003

Equipment ID (SI) Details:

Process ID:	Process Description:	Annual Process Throughput	SCC Units:
1	WASTEWATER EVAPORATOR UNT		Gallons Solvent Consumed

KENTUCKY DIVISION FOR AIR QUALITY
EMISSIONS INVENTORY SURVEY
FOR CALENDAR YEAR 200

Facility ID: 21167 **AI ID:** Mercer County

I hereby certify that the information contained on the proceeding pages (number 1 through 3) and on the attached printout is accurate to the best of my knowledge. I understand that this information will be used to calculate the 2006 emission fee.

_____, *Company Official*

_____, *Official Title*

_____, *Date of Signature*

Refer to the attached printout for more detailed information, such as control equipment and emission factors.2006

The attached printout is an informational copy; do not return it with this survey form. Please make a copy of this survey form to keep for your records, and return the original in the enclosed envelope.

If you have any questions regarding any of the data contained in the printout or this survey form, please contact the Emissions Inventory Section at (502) 573-3382.

Facility ID: 2116

AI ID: Mercer County

2002 Point Source Emissions

Table 2-1 Greenup County, Kentucky Portion of the Huntington- Ashland Area 2002 Point Source Emissions				2002 Emissions (in tpd)			2002 Emissions (in tpy)		
			SIC	VOC	CO	NOx	VOC	CO	NOx
COUNTY	FACILITY NAME	Plant I.D. #	Code	tpd	tpd	tpd	tpy	tpy	tpy
Greenup*	CSX TRANSPORTATION INC	21-089-00004	4011	0.02	0.01	0.01	7.36	2.74	3.26
Greenup*	PACTIV CORPORATION	21-089-00014	3086	0.00	0.00	0.00	0.05	0.17	0.84
Greenup*	PCI INC	21-089-00032	2865	0.11	0.03	0.06	37.79	7.30	16.97
			GREENUP* PORTION TOTAL	**0.13**	**0.04**	**0.07**	**45.20**	**10.21**	**21.07**

*Denotes only a portion of county.

2002 CO Point Source Emissions

KENTUCKY 2002 MAINTENANCE AREA EMISSIONS INVENTORY
ACTUAL POINT SOURCE EMISSIONS OF VOC, CO, AND NO2
KENTUCKY PORTION OF THE HUNTINGTON-ASHLAND AREA
A PORTION OF GREENUP COUNTY
CO PROCESS LEVEL EMISSIONS

POLLUTANT=CO MSA=ASHLAND CNTY_CODE=089 COUNTY=GREENUP PLANT_ID=00004 NAME=CSX TRANSPORTATION INC

Obs	POLLUTANT	AQCR	CNTY_CODE	PLANT_ID	POINT	SEGMENT	INC	CTEFF	RE	CTEFFN	A_FLAG	S_FLAG	FASH	FSULFUR	FUELP	CONFID	ATHU	DWK	WKYR	CPROD	EF	CATNY	CATND
1	CO	103	089	00004	006	1	1	0	80	1.0000000	N	N	1	1	65.122	N	25	5	52	0.25047	84.0000	2.74	0.01

POLLUTANT=CO MSA=ASHLAND CNTY_CODE=089 COUNTY=GREENUP PLANT_ID=00014 NAME=PACTIV CORPORATION

Obs	POLLUTANT	AQCR	CNTY_CODE	PLANT_ID	POINT	SEGMENT	INC	CTEFF	RE	CTEFFN	A_FLAG	S_FLAG	FASH	FSULFUR	FUELP	CONFID	ATHU	DWK	WKYR	CPROD	EF	CATNY	CATND
2	CO	103	089	00014	004	1	1		80		N	N	1	1		Y						0.11	0.00
3	CO	103	089	00014	010	1	1	0	80	1.0000000	N	N	1	1	6.01	N	25	7	52	0.016511	20.0000	0.06	0.00
NAME																						0.17	0.00
PLANT_ID																						0.17	0.00

POLLUTANT=CO MSA=ASHLAND CNTY_CODE=089 COUNTY=GREENUP PLANT_ID=00032 NAME=PCI INC

Obs	POLLUTANT	AQCR	CNTY_CODE	PLANT_ID	POINT	SEGMENT	INC	CTEFF	RE	CTEFFN	A_FLAG	S_FLAG	FASH	FSULFUR	FUELP	CONFID	ATHU	DWK	WKYR	CPROD	EF	CATNY	CATND
4	CO	103	089	00032	001	1	1	0	80	1.0000000	N	N	1	1	45	N	25	7	26	0.24725	84.0000	1.89	0.01
5	CO	103	089	00032	001	2	1	0	80	1.0000000	N	N	1	1	0	N	25	7	26	0.00000	5.00000	0.00	0.00
6	CO	103	089	00032	002	1	1	0	80	1.0000000	N	N	1	1	45	N	25	7	26	0.24725	84.0000	1.89	0.01
7	CO	103	089	00032	002	2	1	0	80	1.0000000	N	N	1	1	0	N	25	7	26	0.00000	5.00000	0.00	0.00
8	CO	103	089	00032	003	1	1	0	80	1.0000000	N	N	1	1	18	N	25	7	26	0.09890	35.0000	0.32	0.00
9	CO	103	089	00032	003	2	1	0	80	1.0000000	N	N	1	1	0	N	25	7	26	0.00000	5.00000	0.00	0.00
10	CO	103	089	00032	004	1	1	0	80	1.0000000	N	N	1	1	18	N	25	7	26	0.09890	84.0000	0.76	0.00
11	CO	103	089	00032	004	2	1	0	80	1.0000000	N	N	1	1	0	N	25	7	26	0.00000	5.00000	0.00	0.00
12	CO	103	089	00032	007	1	1	0	80	1.0000000	N	N	1	1	58	N	25	7	50	0.16571	84	2.44	0.01
13	CO	103	089	00032	007	3	1	0	80	1.0000000	N	N	1	1	0	N	25	7	50	0.00000	6.06	0.00	0.00
NAME																						7.30	0.03
PLANT_ID																						7.30	0.03
COUNTY																						10.21	0.04
CNTY_CODE																						10.21	0.04
MSA																						10.21	0.04
POLLUTANT																						10.21	0.04
																						10.21	0.04

2002 NO_2 Point Source Emissions

KENTUCKY 2002 MAINTENANCF ^REA EMISSIONS INVENTORY
ACTUAL POINT SOURCE EMI{ 3 OF VOC, CO, AND NO2
KENTUCKY PORTION OF THE ..NTINGTON-ASHLAND AREA
A PORTION OF GREENUP COUNTY
NO2 PROCESS LEVEL EMISSIONS

POLLUTANT=NO2 MSA=ASHLAND CNTY_CODE=089 COUNTY=GREENUP PLANT_ID=00004 NAME=CSX TRANSPORTATION INC

Obs	POLLUTANT	AQCR	CNTY_CODE	PLANT_ID	POINT	SEGMENT	INC	CTEFF	RE	CTEFFN	A_FLAG	S_FLAG	FASH	FSULFUR	FUELP	CONFID	ATHU	DWK	WKYR	NPROD	EF	NATNY	NATND
1	NO2	103	089	00004	006	1	1	0	80	1.0000000	N	N	1	1	65.122	N	25	5	52	0.25047	100.000	3.26	0.01

POLLUTANT=NO2 MSA=ASHLAND CNTY_CODE=089 COUNTY=GREENUP PLANT_ID=00014 NAME=PACTIV CORPORATION

Obs	POLLUTANT	AQCR	CNTY_CODE	PLANT_ID	POINT	SEGMENT	INC	CTEFF	RE	CTEFFN	A_FLAG	S_FLAG	FASH	FSULFUR	FUELP	CONFID	ATHU	DWK	WKYR	NPROD	EF	NATNY	NATND
2	NO2	103	089	00014	004	1	1		80		N	N	1	1		Y						0.54	0.00
3	NO2	103	089	00014	010	1	1	0	80	1.0000000	N	N	1	1	6.01	N	25	7	52	0.016511	100.000	0.30	0.00
---																						---	---
NAME																						0.84	0.00
PLANT_ID																						0.84	0.00

POLLUTANT=NO2 MSA=ASHLAND CNTY_CODE=089 COUNTY=GREENUP PLANT_ID=00032 NAME=PCI INC

Obs	POLLUTANT	AQCR	CNTY_CODE	PLANT_ID	POINT	SEGMENT	INC	CTEFF	RE	CTEFFN	A_FLAG	S_FLAG	FASH	FSULFUR	FUELP	CONFID	ATHU	DWK	WKYR	NPROD	EF	NATNY	NATND
4	NO2	103	089	00032	001	1	1	0	80	1.0000000	N	N	1	1	45	N	25	7	26	0.24725	100.000	2.25	0.01
5	NO2	103	089	00032	001	2	1	0	80	1.0000000	N	N	1	1	0	N	25	7	26	0.00000	20.0000	0.00	0.00
6	NO2	103	089	00032	002	1	1	0	80	1.0000000	N	N	1	1	45	N	25	7	26	0.24725	100.000	2.25	0.01
7	NO2	103	089	00032	002	2	1	0	80	1.0000000	N	N	1	1	0	N	25	7	26	0.00000	20.0000	0.00	0.00
8	NO2	103	089	00032	003	1	1	0	80	1.0000000	N	N	1	1	18	N	25	7	26	0.09890	140.000	1.26	0.01
9	NO2	103	089	00032	003	2	1	0	80	1.0000000	N	N	1	1	0	N	25	7	26	0.00000	20.0000	0.00	0.00
10	NO2	103	089	00032	004	1	1	0	80	1.0000000	N	N	1	1	18	N	25	7	26	0.09890	100.000	0.90	0.00
11	NO2	103	089	00032	004	2	1	0	80	1.0000000	N	N	1	1	0	N	25	7	26	0.00000	20.0000	0.00	0.00
12	NO2	103	089	00032	007	1	1	0	80	1.0000000	N	N	1	1	58	N	25	7	50	0.16571	100	2.90	0.01
13	NO2	103	089	00032	007	2	1	0	80	1.0000000	N	N	1	1	234	N	25	7	50	0.66857	63.33	7.41	0.02
14	NO2	103	089	00032	007	3	1	0	80	1.0000000	N	N	1	1	0	N	25	7	50	0.00000	24.24	0.00	0.00
---																						---	---
NAME																						16.97	0.06
PLANT_ID																						16.97	0.06
COUNTY																						21.07	0.07
CNTY_CODE																						21.07	0.07
MSA																						21.07	0.07
POLLUTANT																						21.07	0.07
																						21.07	0.07

2002 VOC Point Source Emissions

KENTUCKY 2002 MAINTENANCE AREA EMISSIONS INVENTORY
ACTUAL POINT SOURCE EMISSIONS OF VOC, CO, AND NO2
KENTUCKY PORTION OF THE HUNTINGTON-ASHLAND AREA
A PORTION OF GREENUP COUNTY
VOC PROCESS LEVEL EMISSIONS

POLLUTANT=VOC MSA=ASHLAND CNTY_CODE=089 COUNTY=GREENUP PLANT_ID=00004 NAME=CSX TRANSPORTATION INC

Obs	POLLUTANT	AQCR	CNTY_CODE	PLANT_ID	POINT	SEGMENT	INC	CTEFF	RE	CTEFFN	A_FLAG	S_FLAG	FASH	FSULFUR	FUELP	CONFID	ATHU	DWK	WKYR	VPROD	EF	VATNY	VATND
1	VOC	103	089	00004	003	1	1	0	80	1.0000000	N	N	1	1	0	N	25	7	52	0.0000	3.49	0.00	0.00
2	VOC	103	089	00004	003	2	1	0	80	1.0000000	N	N	1	1	9982	N	25	7	52	27.4231	1.36000	6.79	0.02
3	VOC	103	089	00004	004	1	1	0	80	1.0000000	N	N	1	1	107	N	25	7	52	0.2940	7.30000	0.39	0.00
4	VOC	103	089	00004	006	1	1	0	80	1.0000000	N	N	1	1	65.122	N	25	5	52	0.2505	5.50000	0.18	0.00
NAME																						7.36	0.02
PLANT_ID																						7.36	0.02

POLLUTANT=VOC MSA=ASHLAND CNTY_CODE=089 COUNTY=GREENUP PLANT_ID=00014 NAME=PACTIV CORPORATION

Obs	POLLUTANT	AQCR	CNTY_CODE	PLANT_ID	POINT	SEGMENT	INC	CTEFF	RE	CTEFFN	A_FLAG	S_FLAG	FASH	FSULFUR	FUELP	CONFID	ATHU	DWK	WKYR	VPROD	EF	VATNY	VATND
5	VOC	103	089	00014	004	1	1		80		N	N	1	1		Y						0.03	0.00
6	VOC	103	089	00014	010	1	1	0	80	1.0000000	N	N	1	1	6.01	N	25	7	52	0.016511	5.30000	0.02	0.00
NAME																						0.05	0.00
PLANT_ID																						0.05	0.00

POLLUTANT=VOC MSA=ASHLAND CNTY_CODE=089 COUNTY=GREENUP PLANT_ID=00032 NAME=PCI INC

Obs	POLLUTANT	AQCR	CNTY_CODE	PLANT_ID	POINT	SEGMENT	INC	CTEFF	RE	CTEFFN	A_FLAG	S_FLAG	FASH	FSULFUR	FUELP	CONFID	ATHU	DWK	WKYR	VPROD	EF	VATNY	VATND
7	VOC	103	089	00032	001	1	1	0	80	1.0000000	N	N	1	1	45	N	25	7	26	0.2473	5.50000	0.12	0.00
8	VOC	103	089	00032	001	2	1	0	80	1.0000000	N	N	1	1	0	N	25	7	26	0.0000	.252000	0.00	0.00
9	VOC	103	089	00032	002	1	1	0	80	1.0000000	N	N	1	1	45	N	25	7	26	0.2473	5.50000	0.12	0.00
10	VOC	103	089	00032	002	2	1	0	80	1.0000000	N	N	1	1	0	N	25	7	26	0.0000	.252000	0.00	0.00
11	VOC	103	089	00032	003	1	1	0	80	1.0000000	N	N	1	1	18	N	25	7	26	0.0989	28.0000	0.25	0.00
12	VOC	103	089	00032	003	2	1	0	80	1.0000000	N	N	1	1	0	N	25	7	26	0.0000	.252000	0.00	0.00
13	VOC	103	089	00032	004	1	1	0	80	1.0000000	N	N	1	1	18	N	25	7	26	0.0989	5.50000	0.05	0.00
14	VOC	103	089	00032	004	2	1	0	80	1.0000000	N	N	1	1	0	N	25	7	26	0.0000	.200000	0.00	0.00
15	VOC	103	089	00032	005	1	1		80		N	N	1	1		Y						2.88	0.01
16	VOC	103	089	00032	005	3	1		80		N	N	1	1		Y						34.11	0.10
17	VOC	103	089	00032	005	4	1	90	80	0.2800000	N	N	1	1	0	N	25	7	50	0.0000	0.003	0.00	0.00
18	VOC	103	089	00032	006	1	1	90	80	0.2800000	N	N	1	1	14	N	25	7	50	0.0400	1.05	0.00	0.00

KENTUCKY 2002 MAINTENANCE AREA EMISSIONS INVENTORY
ACTUAL POINT SOURCE EMISSIONS OF VOC, CO, AND NO2
KENTUCKY PORTION OF THE HUNTINGTON-ASHLAND AREA
A PORTION OF GREENUP COUNTY
VOC PROCESS LEVEL EMISSIONS

POLLUTANT=VOC MSA=ASHLAND CNTY_CODE=089 COUNTY=GREENUP PLANT_ID=00032 NAME=PCI INC
(continued)

Obs	POLLUTANT	AQCR	CNTY_CODE	PLANT_ID	POINT	SEGMENT	INC	CTEFF	RE	CTEFFN	A_FLAG	S_FLAG	FASH	FSULFUR	FUELP	CONFID	ATHU	DWK	WKYR	VPROD	EF	VATNY	VATND
19	VOC	103	089	00032	006	2	1	0	80	1.0000000	N	N	1	1	6573	N	25	7	50	18.7800	0.0295	0.10	0.00
20	VOC	103	089	00032	007	1	1	0	80	1.0000000	N	N	1	1	58	N	25	7	50	0.1657	5.5	0.16	0.00
21	VOC	103	089	00032	007	3	1	0	80	1.0000000	N	N	1	1	0	N	25	7	50	0.0000	0.304	0.00	0.00
22	VOC	103	089	00032	013	1	1	0	80	1.0000000	N	N	1	1	0	N	25	7	50	0.0000	.218340	0.00	0.00
23	VOC	103	089	00032	013	2	1	0	80	1.0000000	N	N	1	1	0	N	25	7	50	0.0000	.013380	0.00	0.00
NAME																						37.79	0.11
PLANT_ID																						37.79	0.11
COUNTY																						45.20	0.13
CNTY_CODE																						45.20	0.13
MSA																						45.20	0.13
POLLUTANT																						45.20	0.13
																						45.20	0.13

APPENDIX B

Area Source Emissions Inventory Information

2002 EMISSIONS INVENTORY
AREA SOURCE DOCUMENTATION

INFORMATION ON

2002 SURFACE CLEANING

VOC EMISSIONS

Dry Cleaning Area Source Emissions
Remove Perchloroethylene Emissions From from Dry Cleaning Area Source VOC Emissions

County	2000 Apportioned County Population	EF	(TPD)	EF	(TPD)	EF	(TPD)**	Dry** Cleaning VOC Final Emissions (TPD)
BOYD	49,752	0.009	0.00	0.73	0.07	1.1	0.11	0.11
*GREENUP	23,389	0.009	0.00	0.73	0.03	1.1	0.05	0.05

*Denotes portion of county
**To avoid double counting, per previous EPA guidance, only Other Solvents dry cleaning emissions were included in the dry cleaning area source total VOC emissions. This was done to exclude perechloroethylene emissions.

Emissions were calculated using the following method.

TPD = (Coin Operated Dry Cleaning EF .009 X Population) / 2000 / (5 * 52) (Excluded Emissions)

TPD = (Commercial/Industrial Dry Cleaning EF .73 X Population) / 2000 / (5 * 52) (Excluded Emissions)

TPD = (**Other Solvents Dry Cleaning EF 1.1 X Population) / 2000 / (5 * 52) **(Included Emissions)

TOTAL AREA SOURCE DRY CLEANING VOC EMISSIONS (TPD) = **OTHER SOLVENTS DRY CLEANING VOC EMISSIONS (TPD)

Rona

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

13 MAY 1993

MAY 1 1993
REGION IV
ATLANTA, GA.
JUN 14 3 52 PM '93
DIRECTOR
KY DIVISION OF
POLLUTION CONTROL
RECEIVED

MEMORANDUM

SUBJECT: Perchloroethylene Emissions from Degreasing

FROM: G. T. Helms, Chief
Ozone/Carbon Monoxide Programs Branch (MD-15)

TO: Air Branch Chiefs, Regions I-X

The Environmental Protection Agency proposed (57 FR 48490, October 26, 1992) to add perchloroethylene (perc) to the list of negligibly reactive compounds in the definition of volatile organic compounds (VOC). Once EPA publishes the final listing of perc as a negligibly reactive compound, States will not be able to include perc in their VOC emissions inventories for determining reasonable further progress under the Clean Air Act and may not take credit for controlling perc emissions in their ozone State Implementation Plans.

States have asked for information on how much of their VOC emissions inventories contain perc from "degreasing" emissions so that they may know how to modify their 1990 rate-of-progress base year inventories for development of their 15 percent rate-of-progress plans, which are due November 15, 1993. This memorandum provides information in anticipation of the expected listing of perc as an exempt compound.

The major solvents used in degreasing, with national consumption data obtained from the Emission Standards Division, Office of Air Quality Planning and Standards are:

	Metric tons/year
trichloroethylene (TCE)	36,000
perchloroethylene	10,900
methylene chloride	7,600
1,1,1 trichloroethane (TCA)	72,200

Of these, only trichloroethylene and perc are currently considered to be VOC. The other two compounds are listed as having negligible photochemical reactivity in the definition of VOC (57 FR 3945).

The above numbers show that perc is about 23 percent of the VOC used for degreasing. Therefore, in the absence of more relevant local information, this national value may be used to

remove perc from the base year VOC inventory in developing the 15 percent rate-of-progress plan.

There is a potential problem with this value when existing inventories are adjusted by the above factor and then projected into the future. 1,1,1 trichloroethane (TCA), a stratospheric ozone depleter, will be phased out of production by January 1, 1996 and will be difficult to obtain after that date. It is expected that previous users will then shift from use of TCA to TCE. Therefore, the use of TCE will significantly rise in 1996, and perc is expected to become smaller than 23 percent of total VOC use for degreasing.

In summary, perc emissions need to be removed from the rate-of-progress base year inventory prior to preparing the 15 percent rate-of-progress plan since reductions in perc will not be creditable toward the 15 percent reduction in VOC emissions. The adjustment for perc will be necessary as a result of EPA's pending publication of the final listing of perc as a negligibly photochemically reactive compound. This memorandum has provided guidance on how to make this adjustment.

It is important not only to continue to collect the data for perc, ethane, and other "negligibly reactive" compounds in order to have a complete inventory, but also to distinguish perc and other compounds with negligible reactivity from the compounds that EPA considers reactive for purposes of the 15 percent plans. This is necessary because these data are needed for purposes of urban airshed modeling (which distinguishes compounds by level of reactivity) and may be useful for other States' inventory exercises such as air toxics, etc. If you have any questions, please address them to Bill Johnson at (919) 541-5245 or Mary Ann Warner-Selph at (919) 541-1192.

cc: D. Mobley
K. Berry
J. Silvasi
D. Cole
L. Schultz
K. Scavo
D. Misenheimer
M. Warner-Selph
S. Wyatt
P. Almodovar

2002 EMISSIONS INVENTORY
AREA SOURCE DOCUMENTATION

INFORMATION ON

2002 DRY CLEANING

VOC EMISSIONS

Surfa aning Area Source Emissions

Remove Perchloroethylene Emissions From from Surface Cleaning Area Source VOC Emissions & Address Double Counting From Point Source Surface Cleaning VOC Emissions

County	2000 Apportioned County Population	EF	(TPD)	EF	(TPD)	EF	(TPD)	**Surface Cleaning VOC Total Without (Perc) (TPD)	***Point Source VOC Emissions Subtracted From Area Sources (TPD)	Surface Cleaning VOC Final Emissions (TPD)
BOYD	49,752	2.5	0.15	1.1	0.07	0.7	0.04	0.26	0	0.26
*GREENUP	23,389	2.5	0.07	1.1	0.03	0.7	0.02	0.12	0	0.12

*Denotes portion of county

**Perchloroethylene emissions were removed by reducing surface cleaning VOC emissions by 23% per EPA's May 13, 1993, Helms memorandum.

***To avoid double counting, point source emissions for cold cleaning and vapor degreasing were subtracted from the area source emissions as appropriate.

Surface cleaning area source emissions were calculated using the following method:

TPD = ((Cold Cleaning Auto Repair EF 2.5 X Population) / 2000 / (6 * 52) * **Factor to Remove Perc .77)

+

TPD = ((Cold Cleaning Manufacturing EF 1.1 X Population) / 2000 / (6 * 52) * **Factor to Remove Perc 77)

+

TPD = ((Vapor & In-Line Cleaning EF .70 X Population) / 2000 / (6 * 52) * **Factor to Remove Perc .77)

TOTAL AREA SOURCE SURFACE CLEANING VOC EMISSIONS (TPD) = TOTAL AREA SOURCE SURFACE CLEANING VOC EMISSIONS (TPD) - ***POINT SOURCE SURFACE CLEANING VOC EMISSIONS (TPD)

APPENDIX C

Non-Highway Mobile Source Emissions Inventory Information

OTHER NON-HIGHWAY

MOBILE SOURCE

EMISSIONS SUMMARY

FROM NON-ROAD MODEL

Emission Totals by County and Pollutant

All Fuels

Tons/Day

Greenup County
2002 (Grnup02)

Typical weekday for Summer Season, 2002

Date of Model Run: Jul 09 13:31:17: 2007

Today's Date: 7/9/2007

FIPS	County	Vapor Displacement VOC	Spillage VOC	Hot Soak VOC	Running Loss VOC	Tank Permeation VOC	Hose Permeation VOC	Total VOC
21089	Greenup County	0.01	0.02	0.00	0.01	0.05	0.14	1.02
Totals:		**0.01**	**0.02**	**0.00**	**0.01**	**0.05**	**0.14**	**1.02**

Emission Totals by County and Pollutant

All Fuels

Tons/Day

Greenup County
2002 (Grnup02)

Typical weekday for Summer Season, 2002

Date of Model Run: Jul 09 13:31:17: 2007

Today's Date: 7/9/2007

FIPS	County	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM25	Exhaust SO2	Exhaust CO2	Crankcase VOC	Diurnal VOC
21089	Greenup County	0.69	0.43	7.59	0.05	0.04	45.34	0.01	0.08
Totals:		**0.69**	**0.43**	**7.59**	**0.05**	**0.04**	**45.34**	**0.01**	**0.08**

2002 EMISSIONS INVENTORY NON-HIGHWAY MOBILE SOURCE DOCUMENTATION

2002 LOCOMOTIVE QUESTIONNAIRE

2002 KENTUCKY RAILROAD INFORMATION

QUESTIONNAIRE

2002 Railroad General Information:

Railroad Name_____

Contact Person_____ Phone #_____

Contact Person E-mail_____

Contact Person Fax Number_____

Any clarifying remarks regarding the information provided_____

_____

_____

2002 System Level Railroad Information:

System Total Gross Ton Miles *(GTM)_____

System Total Fuel Consumption (gallons)_____

System Total Track Mileage (miles)_____

2002 State Level Railroad Information:

State Total Railroad Gross Ton Miles *(GTM) in Kentucky_____

State Total Railroad Fuel Consumption (gallons) in Kentucky_____

State Total Railroad Track Mileage (miles) in Kentucky_____

(Please see County Level information needed starting on Page 2.)

**When providing Gross Ton Miles (GTM) for the system, state, and county levels be consistent throughout in either including or not including the locomotive weight.*

2002 KENTUCKY RAILROAD INFORMATION

QUESTIONNAIRE

2002 County Level Railroad Information:

Please provide 2002 County Level information for Total Gross Ton Miles *(GTM), Total Track Mileage, Fuel Used by Line Haul Locomotives, the Number of Yard Locomotives Operated, and the Fuel Used by Yard Locomotives in the following table:

2002 KENTUCKY RAILROAD INFORMATION QUESTIONNAIRE - COUNTY LEVEL -					
KENTUCKY COUNTY NAME	**2002 TOTAL GROSS TON MILES *(GTM) FOR EACH COUNTY**	**2002 TOTAL TRACK MILEAGE (MILES) FOR EACH COUNTY**	**2002 TOTAL FUEL USAGE BY LINE HAUL LOCOMOTIVES FOR EACH COUNTY (GALLONS)**	**NUMBER OF YARD LOCOMOTIVES OPERATED IN EACH COUNTY IN 2002**	**2002 TOTAL FUEL USAGE BY YARD LOCOMOTIVES OPERATED IN EACH COUNTY (GALLONS)**
Adair					
Allen					
Anderson					
Ballard					
Barren					
Bath					
Bell					
Boone					
Bourbon					
Boyd					
Boyle					
Bracken					
Breathitt					

**When providing Gross Ton Miles (GTM) for the system, state, and county levels be consistent throughout in either i ling or not including the locomotive weight.*

2002 KENTUCKY RAILROAD INFORMATION QUESTIONNAIRE

- COUNTY LEVEL -

KENTUCKY COUNTY NAME	2002 TOTAL GROSS TON MILES *(GTM) FOR EACH COUNTY	2002 TOTAL TRACK MILEAGE (MILES) FOR EACH COUNTY	2002 TOTAL FUEL USAGE BY LINE HAUL LOCOMOTIVES FOR EACH COUNTY (GALLONS)	NUMBER OF YARD LOCOMOTIVES OPERATED IN EACH COUNTY IN 2002	2002 TOTAL FUEL USAGE BY YARD LOCOMOTIVES OPERATED IN EACH COUNTY (GALLONS)
Breckinridge					
Bullitt					
Butler					
Caldwell					
Calloway					
Campbell					
Carlisle					
Carroll					
Carter					
Casey					
Christian					
Clark					
Clay					
Clinton					
Crittenden					
Cumberland					
Daviess					
Edmonson					
Elliott					
Estill					

**When providing Gross Ton Miles (GTM) for the system, state, and county levels be consistent throughout in either including or not including the locomotive weight.*

2002 KENTUCKY RAILROAD INFORMATION QUESTIONNAIRE

- COUNTY LEVEL -

KENTUCKY COUNTY NAME	2002 TOTAL GROSS TON MILES *(GTM) FOR EACH COUNTY	2002 TOTAL TRACK MILEAGE (MILES) FOR EACH COUNTY	2002 TOTAL FUEL USAGE BY LINE HAUL LOCOMOTIVES FOR EACH COUNTY (GALLONS)	NUMBER OF YARD LOCOMOTIVES OPERATED IN EACH COUNTY IN 2002	2002 TOTAL FUEL USAGE BY YARD LOCOMOTIVES OPERATED IN EACH COUNTY (GALLONS)
Fayette					
Fleming					
Floyd					
Franklin					
Fulton					
Gallatin					
Garrard					
Grant					
Graves					
Grayson					
Green					
Greenup					
Hancock					
Hardin					
Harlan					
Harrison					
Hart					
Henderson					
Henry					
Hickman					

**When providing Gross Ton Miles (GTM) for the system, state, and county levels be consistent throughout in either including or not including the locomotive weight.*

2002 KENTUCKY RAILROAD INFORMATION QUESTIONNAIRE

- COUNTY LEVEL -

KENTUCKY COUNTY NAME	2002 TOTAL GROSS TON MILES *(GTM) FOR EACH COUNTY	2002 TOTAL TRACK MILEAGE (MILES) FOR EACH COUNTY	2002 TOTAL FUEL USAGE BY LINE HAUL LOCOMOTIVES FOR EACH COUNTY (GALLONS)	NUMBER OF YARD LOCOMOTIVES OPERATED IN EACH COUNTY IN 2002	2002 TOTAL FUEL USAGE BY YARD LOCOMOTIVES OPERATED IN EACH COUNTY (GALLONS)
Hopkins					
Jackson					
Jefferson					
Jessamine					
Johnson					
Kenton					
Knott					
Knox					
Larue					
Laurel					
Lawrence					
Lee					
Leslie					
Letcher					
Lewis					
Lincoln					
Livingston					
Logan					
Lyon					
Madison					

**When providing Gross Ton Miles (GTM) for the system, state, and county levels be consistent throughout in either including or not including the locomotive weight.*

2002 KENTUCKY RAILROAD INFORMATION QUESTIONNAIRE

- COUNTY LEVEL -

KENTUCKY COUNTY NAME	2002 TOTAL GROSS TON MILES *(GTM) FOR EACH COUNTY	2002 TOTAL TRACK MILEAGE (MILES) FOR EACH COUNTY	2002 TOTAL FUEL USAGE BY LINE HAUL LOCOMOTIVES FOR EACH COUNTY (GALLONS)	NUMBER OF YARD LOCOMOTIVES OPERATED IN EACH COUNTY IN 2002	2002 TOTAL FUEL USAGE BY YARD LOCOMOTIVES OPERATED IN EACH COUNTY (GALLONS)
Magoffin					
Marion					
Marshall					
Martin					
Mason					
McCracken					
McCreary					
McLean					
Meade					
Menifee					
Mercer					
Metcalfe					
Monroe					
Montgomery					
Morgan					
Muhlenberg					
Nelson					
Nicholas					
Ohio					
Oldham					

**When providing Gross Ton Miles (GTM) for the system, state, and county levels be consistent throughout in either including or not including the locomotive weight.*

2002 KENTUCKY RAILROAD INFORMATION QUESTIONNAIRE

- COUNTY LEVEL -

KENTUCKY COUNTY NAME	2002 TOTAL GROSS TON MILES *(GTM) FOR EACH COUNTY	2002 TOTAL TRACK MILEAGE (MILES) FOR EACH COUNTY	2002 TOTAL FUEL USAGE BY LINE HAUL LOCOMOTIVES FOR EACH COUNTY (GALLONS)	NUMBER OF YARD LOCOMOTIVES OPERATED IN EACH COUNTY IN 2002	2002 TOTAL FUEL USAGE BY YARD LOCOMOTIVES OPERATED IN EACH COUNTY (GALLONS)
Owen					
Owsley					
Pendleton					
Perry					
Pike					
Powell					
Pulaski					
Robertson					
Rockcastle					
Rowan					
Russell					
Scott					
Shelby					
Simpson					
Spencer					
Taylor					
Todd					
Trigg					
Trimble					
Union					

**When providing Gross Ton Miles (GTM) for the system, state, and county levels be consistent throughout in either i ling or not including the locomotive weight.*

2002 KENTUCKY RAILROAD INFORMATION QUESTIONNAIRE

- COUNTY LEVEL -

KENTUCKY COUNTY NAME	2002 TOTAL GROSS TON MILES *(GTM) FOR EACH COUNTY	2002 TOTAL TRACK MILEAGE (MILES) FOR EACH COUNTY	2002 TOTAL FUEL USAGE BY LINE HAUL LOCOMOTIVES FOR EACH COUNTY (GALLONS)	NUMBER OF YARD LOCOMOTIVES OPERATED IN EACH COUNTY IN 2002	2002 TOTAL FUEL USAGE BY YARD LOCOMOTIVES OPERATED IN EACH COUNTY (GALLONS)
Warren					
Washington					
Wayne					
Webster					
Whitley					
Wolfe					
Woodford					

*When providing Gross Ton Miles (GTM) for the system, state, and county levels be consistent throughout in either including or not including the locomotive weight.

APPENDIX D

Highway Mobile Source Emissions Inventory Information

HIGHWAY MOBILE SOURCE

EMISSIONS SUMMARY

YEAR:	2002	Mobile Model Used:	M6.2			THE ENTIRE COUNTY IS CONSIDERED, UNLESS A				MOBILE6.2 Default Controls
COUNTY:	Greenup					COUNTY APPORTIONMENT FACTOR IS INVOLVED.				
SCENARIO:	M6.2 Defaults									
ROAD CLASS	DVMT		VOC EF	CO EF	NOx EF		VOC tpd	CO tpd	NOx tpd	
R INTERST	0	Min/Max temperatures used: 66 and 92 (Degrees F), based on 2000-2002 data from UK Agricultural Weather Center Website.	1.509	23.013	3.593		0.00	0.00	0.00	2002
R PRIN ART	241,027		1.538	21.256	2.860		0.41	5.65	0.76	
R MIN ART	18,488		1.611	19.419	2.521		0.03	0.40	0.05	
R MAJ COLL	98,867		1.620	19.239	2.496		0.18	2.10	0.27	
R MIN COLL	40,728		1.666	18.416	2.410		0.07	0.83	0.11	
R LOCAL	83,589		1.734	17.474	2.353		0.16	1.61	0.22	
U INTERST	0		1.536	23.271	3.520		0.00	0.00	0.00	
U FREEWAY	0		1.536	23.271	3.520		0.00	0.00	0.00	
U PRIN ART	197,627		1.810	17.380	2.373		0.39	3.79	0.52	County
U MIN ART	85,885		1.876	17.488	2.409		0.18	1.66	0.23	Apport.
U COLL	44,142		1.769	17.430	2.363		0.09	0.85	0.11	Factor
U LOCAL	69,149		2.724	17.631	2.443		0.21	1.34	0.19	
	879,501						1.72	18.21	2.45	63.4%

GREENUP		
VOC tpd	CO tpd	NOx tpd
1.09	11.55	1.56

MINIMUM AND MAXIMUM SUMMER TEMPERATURE DATA

Greenup County's Temperatures Based on Top Ten 8-Hour Ozone Values (June-August 2000-2002)

County	Site	Date	ppm	Weather Station Used from UK Web Site	Chronological Unique Dates	Min T (Degrees F) Source: UK	Max T (Degrees F) Source: UK
Greenup	Worthington	06/01/00	0.085	Huntington, WV			
Greenup	Worthington	08/01/01	0.092	Huntington, WV			
Greenup	Worthington	06/18/01	0.090	Huntington, WV			
Greenup	Worthington	06/19/01	0.089	Huntington, WV			
Greenup	Worthington	08/02/01	0.088	Huntington, WV			
Greenup	Worthington	06/14/01	0.085	Huntington, WV			
Greenup	Worthington	07/10/01	0.084	Huntington, WV			
Greenup	Worthington	06/19/02	0.100	Huntington, WV			
Greenup	Worthington	06/20/02	0.086	Huntington, WV	06/01/00	66	86
Greenup	Worthington	06/25/02	0.084	Huntington, WV	06/14/01	66	90
					06/18/01	55	85
					06/19/01	59	89
					07/10/01	69	91
					08/01/01	66	88
					08/02/01	68	88
					06/19/02	58	86
					06/20/02	64	89
					06/25/02	66	91
				Average Min/Max T (Degrees F)		64	88
				Ambient T (Degrees F)			80.1
Area:	**Ashland**			**Final Min/Max T For Area:**		66	92

Local climatological data from the University of Kentucky's Agricultural Weather Center Web Site were used. The station selected was Huntington, West Virginia. The temperature guidance can be found in "Procedures for Emission Inventory Preparation, Volume 4: Mobile Sources" and was last updated with the MOBILE4.1 model.

Temperature

Temperature is normally calculated from the most recent three-year period for which validated ozone and/or CO monitoring data exists at the time the emission inventory is due. For 1990 inventories, the period to be used for temperature determination will be 1988-1990. The temperatures used in the 1990 inventory must also be used for all projection inventories.

Considering the three-year period as a whole, the analyst should determine the consecutive three-month period with the highest frequency of NAAQS exceedance days occurring in the inventory area. The same consecutive three-month period will apply for each year, with a total of nine months used to determine temperature. If the months containing the highest frequency of exceedances are not consecutive or if two or more sets of consecutive months have the same frequency, the analyst should use the months of June, July, and August for ozone modeling and the months of November, December, and January for carbon monoxide modeling.

The analyst should then list the 10 highest concentrations -- not necessarily exceedances -- that occurred in the inventory area during those nine months and the dates of those concentrations. Exceptions to this procedure are listed below:

- More than 10 highest concentrations may be needed to identify 10 unique dates.
- If the 10th ranked level occurs on more than one day, all of those days should be included in the temperature calculation.
- For the entire MSA monitoring network, if only two years of validated monitoring data exists for an MSA, the analyst should list the seven highest values.
- If only one year of data exists for the entire MSA monitoring network, the analyst should list the four highest values.

The ten highest ozone concentrations for each site in a county and the dates on which they occurred are contained in the Aerometric Information Retrieval System (AIRS) AMP440/Maximum Values Report. Eight-hour average CO concentrations and the dates on which they occurred can be found in the AIRS AMP350 raw data report. The AMP355/Standard Report contains the CO values that exceed the NAAQS. These reports are available from EPA's National Air Data Branch. Be sure to specify the year(s) and counties of interest and indicate that the request is for preparation of a SIP emission inventory, to avoid being charged the normal processing fee. To obtain copies of these reports, contact Tom Link at FTS 629-5456 or (919) 541-5456.

For the area being inventoried, the analyst should determine the maximum and minimum temperatures for each of the 10 days from the Local Climatological Data Monthly Summary, available from:

National Climatic Data Center
Federal Building
Asheville, NC 28801-2696

Telephone: (704) 259-0682
FTS 672-0682

Maximum and minimum daily temperatures are located in columns 2 and 3, respectively, on page 1 of the Summary .

The analyst should calculate the average maximum temperature and the average minimum temperature occurring on those 10 days, then calculate the ambient temperature using the following equation:

Ambient temp = [(2/3) x (avg max temp - avg min temp)] + (avg min temp)

If there is more than one meteorological station within the nonattainment area, the analyst should use that station which best characterizes temperatures associated with the bulk of mobile source emissions.

OZONE MONITORING DATA

USED FOR SUMMER

TEMPERATURE

CALCULATIONS

Current Date : 11/23/04
Current Time : 13:59

Maximum Hourly Averages Report - Validated DataBase
Kentucky Division for Air Quality

03/01/00 thru 10/31/00

Logger Id : B5
Logger Name : Ashland (Boyd Co.)
Avg Interval: 08 hour

Parameter : OZONE
Units : PPM
Avg Type : Forward

Rank	Average	Date	Hour
1	.085	06/09/00	10
2	.084	06/01/00	10
3	.079	06/08/00	11
4	.079	06/23/00	11
5	.079	07/08/00	11
6	.078	06/02/00	09
7	.078	07/01/00	11
8	.076	06/10/00	09
9	.076	07/06/00	12
10	.075	06/12/00	10
11	.073	04/30/00	11
12	.072	05/26/00	11
13	.071	04/29/00	11
14	.071	07/17/00	11
15	.071	08/15/00	10
16	.070	03/08/00	11
17	.070	05/01/00	10
18	.070	07/12/00	11
19	.069	06/04/00	11
20	.068	07/09/00	11
21	.068	07/27/00	10
22	.067	03/15/00	11
23	.067	04/28/00	11
24	.067	05/18/00	10
25	.067	05/31/00	10

Current Date : 11/23/04
Current Time : 14:00

Maximum Hourly Averages Report - Validated DataBase
Kentucky Division for Air Quality

03/01/01 thru 08/31/01

Logger Id : B5
Logger Name : Ashland (Boyd Co.)
Avg Interval: 08 hour

Parameter : OZONE
Units : PPM
Avg Type : Forward

Rank	Average	Date	Hour
1	.091	08/02/01	11
2	.089	07/10/01	11
3	.085	06/14/01	11
4	.085	06/28/01	11
5	.083	06/19/01	10
6	.083	08/08/01	11
7	.080	08/01/01	11
8	.080	08/15/01	11
9	.078	06/18/01	11
10	.077	05/04/01	10
11	.077	07/20/01	12
12	.077	08/07/01	11
13	.076	05/03/01	12
14	.076	06/10/01	10
15	.074	05/06/01	11
16	.074	07/09/01	12
17	.073	05/05/01	12
18	.073	06/12/01	10
19	.071	04/30/01	10
20	.071	07/30/01	12
21	.070	04/27/01	10
22	.070	06/09/01	11
23	.070	06/11/01	10
24	.070	06/20/01	10
25	.069	07/16/01	10

Current Date : 11/23/04
Current Time : 14:00

Maximum Hourly Averages Report - Validated DataBase
Kentucky Division for Air Quality

08/01/01 thru 10/31/01

Logger Id : 5J
Logger Name : FIVCO (Boyd Co.)
Avg Interval: 08 hour

Parameter : OZONE
Units : PPM
Avg Type : Forward

Rank	Average	Date	Hour
1	.081	09/06/01	11
2	.081	09/13/01	10
3	.071	10/03/01	10
4	.070	10/04/01	10
5	.066	10/21/01	10
6	.064	10/02/01	11
7	.062	09/12/01	11
8	.061	08/28/01	11
9	.061	10/20/01	10
10	.060	08/16/01	10
11	.060	08/23/01	09
12	.060	09/07/01	10
13	.059	08/26/01	10
14	.059	09/08/01	10
15	.059	09/09/01	11
16	.059	10/05/01	08
17	.058	08/15/01	14
18	.057	09/02/01	11
19	.057	10/22/01	10
20	.057	10/31/01	10
21	.056	09/18/01	10
22	.054	09/17/01	11
23	.054	09/22/01	10
24	.054	09/23/01	11
25	.053	08/24/01	12

Current Date : 11/23/04
Current Time : 14:00

Maximum Hourly Averages Report - Validated DataBase
Kentucky Division for Air Quality

03/01/02 thru 10/31/02

Logger Id : 5J
Logger Name : FIVCO (Boyd Co.)
Avg Interval: 08 hour

Parameter : OZONE
Units : PPM
Avg Type : Forward

Rank	Average	Date	Hour
1	.107	06/19/02	11
2	.105	08/02/02	10
3	.103	06/25/02	10
4	.102	09/07/02	10
5	.099	09/06/02	12
6	.099	09/08/02	11
7	.096	09/09/02	11
8	.095	06/20/02	10
9	.095	08/01/02	11
10	.094	07/16/02	11
11	.094	08/03/02	10
12	.094	08/21/02	12
13	.093	09/10/02	11
14	.092	08/05/02	11
15	.092	08/13/02	11
16	.091	06/22/02	11
17	.090	06/21/02	11
18	.089	07/17/02	09
19	.089	08/10/02	10
20	.087	08/09/02	12
21	.086	06/10/02	11
22	.086	09/13/02	11
23	.085	06/18/02	11
24	.084	08/23/02	10
25	.082	05/24/02	11

Current Date : 07/09/07
Current Time : 09:57

Maximum Hourly Averages Report - Validated DataBase
Environmental Systems Corporation

06/01/00 thru 08/31/00

Logger Id : 5D
Logger Name : Worthington (Greenup Co.)
Avg Interval: 08 hour

Parameter : OZONE
Units : PPM
Avg Type : Forward

Rank	Average	Date	Hour
1	.085	06/01/00	10
2	.080	06/09/00	10
3	.077	06/08/00	12
4	.075	07/06/00	11
5	.073	07/08/00	11
6	.072	06/10/00	10
7	.069	07/01/00	11
8	.067	06/02/00	11
9	.067	06/23/00	11
10	.067	07/14/00	07
11	.067	07/17/00	12
12	.066	06/07/00	12
13	.066	06/12/00	09
14	.066	07/09/00	12
15	.065	07/13/00	11
16	.065	07/27/00	10
17	.065	08/29/00	11
18	.064	06/04/00	11
19	.064	06/13/00	10
20	.064	07/26/00	11
21	.064	08/15/00	11
22	.062	07/12/00	11
23	.062	07/18/00	11
24	.061	06/24/00	22
25	.061	07/28/00	10

Current Date : 07/09/07
Current Time : 10:15

Maximum Hourly Averages Report - Validated DataBase
Environmental Systems Corporation

06/01/01 thru 08/31/01

Logger Id : 5D
Logger Name : Worthington (Greenup Co.)
Avg Interval: 08 hour

Parameter : OZONE
Units : PPM
Avg Type : Forward

Rank	Average	Date	Hour
1	.092	08/01/01	11
2	.090	06/18/01	11
3	.089	06/19/01	11
4	.088	08/02/01	11
5	.085	06/14/01	10
6	.084	07/10/01	11
7	.082	08/15/01	11
8	.081	06/12/01	10
9	.081	08/08/01	09
10	.080	07/21/01	11
11	.079	06/28/01	10
12	.078	08/07/01	11
13	.077	06/20/01	10
14	.076	07/16/01	10
15	.076	07/30/01	11
16	.075	06/11/01	11
17	.074	06/09/01	11
18	.074	06/10/01	11
19	.074	07/20/01	11
20	.073	06/13/01	11
21	.073	07/31/01	10
22	.071	06/21/01	10
23	.070	07/09/01	11
24	.069	08/05/01	11
25	.068	08/06/01	10

Current Date : 07/09/07
Current Time : 10:21

Maximum Hourly Averages Report - Validated DataBase
Environmental Systems Corporation

06/01/02 thru 08/31/02

Logger Id : 5W
Logger Name : Worthington 2002
Avg Interval: 08 hour

Parameter : OZONE
Units : PPM
Avg Type : Forward

Rank	Average	Date	Hour
1	.100	06/19/02	11
2	.086	06/20/02	11
3	.084	06/25/02	11
4	.083	06/21/02	10
5	.083	08/21/02	11
6	.082	06/22/02	10
7	.082	07/16/02	11
8	.081	06/23/02	10
9	.081	08/02/02	10
10	.079	08/01/02	10
11	.078	08/05/02	11
12	.077	07/01/02	11
13	.077	08/10/02	11
14	.077	08/13/02	10
15	.076	06/10/02	11
16	.075	07/17/02	10
17	.075	08/03/02	10
18	.074	06/11/02	10
19	.074	07/07/02	12
20	.073	06/30/02	11
21	.072	06/18/02	12
22	.072	08/09/02	11
23	.071	06/24/02	10
24	.070	06/29/02	11
25	.070	08/23/02	08

SPEED AND DVMT DATA

FROM

KENTUCKY

TRANSPORTATION CABINET

Daily VMT Estimates and forecasts

Greenup County (Entire County)

Road Classification	% M6 Freeway	% M6 Ramp	Speed (mpd)	2002	2005	2008	2011	2014	2017	2020
Rural Interstate	98.5	1.5	69.0	0	0	0	0	0	0	0
Rural Principal Arterial			57.0	241,027	261,169	289,434	313,048	327,364	338,819	348,845
Rural Minor Arterial			47.0	18,488	20,033	22,201	24,012	25,110	25,989	26,758
Rural Major Collector			46.0	98,867	107,129	118,723	128,409	134,281	138,980	143,093
Rural Minor Collector			41.0	40,728	44,131	48,907	52,897	55,316	57,252	58,946
Rural Local			35.0	83,589	90,575	100,377	108,567	113,531	117,504	120,981
Urban Interstate	92.4	7.6	71.0	0	0	0	0	0	0	0
Urban Freeway	92.4	7.6	65.0	0	0	0	0	0	0	0
Urban Principal Arterial			31.0	197,627	214,143	237,318	256,680	268,418	277,811	286,032
Urban Minor Arterial			28.0	85,885	93,062	103,134	111,548	116,649	120,731	124,304
Urban Collector			33.0	44,142	47,830	53,007	57,332	59,953	62,051	63,887
Urban Local			12.9	69,149	74,928	83,037	89,812	93,919	97,205	100,082
Total DVMT				879,501	953,000	1,056,136	1,142,306	1,194,542	1,236,344	1,272,928
Total Interstate				0	0					0
Total Non-interstate				879,501	953,000					1,272,928
				879,501	953,000	1,056,136	1,142,306	1,194,542	1,236,344	1,272,928

NOTE:

Interstate and Non-interstate VMT for 2000-2005 taken from HPMS data (VMT05.xls)

Interstate and Non-interstate VMT forecasts for 2005, 2010, 2015 and 2020 taken from 2004-2030 VMT Tables.xls file (which uses 2004 HPMS data)

VMT for all other years interpolated

Methodology for 2004-2030 VMT Tables.xls is explained in the file

Functional Class % taken from VMT04.xls file -- this FC % applied to all forecast years as well as to 2000-2003. This assumes that recent functional class changes are more accurate than the fu

2003 speeds (column D) were determined using the new UK speed study HERS methodology --2002 HPMS data

2003 speeds used for all forecasted years

Default value of 12.9mph for functional class of "urban local" roads was used since insufficient local or state data exists

Ramp % based on KYTC report "KYTC Ramp DVMT Calculations" August 2002

Source: Kentucky Transportation Cabinet, Division of Planning - November, 2006

MOBILE6.2

INPUT

FILE

```
* Filename:  d:\Mobile62\Ky_M62\1-Hr03\1HrMaint.in                    1HrMaint

* This input file is a MOBILE6.2 run for the former 1-hour ozone maintenance counties, except
* for NKY, Louisville, and Boyd County.  The three areas of exception are either having or are
* going to have 8-hour ozone redesignation requests submitted to EPA.  So for this MOBILE6.2
* run, the counties are a portion of Greenup (Ashland), Fayette and Scott (Lexington), Edmonson,
* a portion of Livingston and Marshall (Paducah), and Daviess and a portion of Hancock (Owensboro)
* Counties.  The model years will be 2002, 2005, 2008, 2011, 2014, 2017, and 2020.

* NOTE:  For some Road Classifications, there are no DVMT.  The lowest speed that the
* MOBILE6 model accepts is 2.5 mph.  For these Road Classifications, 2.5 mph is indicated
* simply to make the model run.  These corresponding emission factors will not influence
* the emission total because DVMT = 0 for that Road Classification.

* According to the EPA document, "Technical Guidance on the Use of MOBILE6.2 for Emission
* Inventory Preparation" (August 2004), Kentucky has amended the standard MOBILE6.2 input
* file to reflect three modifications relating to highway mobile source emission calculations.
* The modifications are:  (1) Do not include Ramp as a single Road Classification entry,
* (2) for Rural Local, change Local in the Average Speed line to Arterial and use KYTC's actual
* Rural Local speed and not 12.9 mph, and (3) replace the Diesel Sulfur value of 500 ppm with a
* state-specific value provided on an EPA web link.

******************************      Header Section      *********************************
MOBILE6 INPUT FILE :
REPORT FILE        : d:\Mobile62\Ky_M62\1-Hr03\1HrMaint.out
RUN DATA

******************************      Run Section #1      *********************************
************************************  ASHLAND  ****************************************

FUEL RVP           : 9.0
MIN/MAX TEMP       : 66.0 92.0

******************************      Scenario Section #1      *********************************
* Model Run is for 2002.

SCENARIO RECORD    : Greenup                Rural Interstate 69.0 mph - CY2002
DIESEL SULFUR      : 325.00
CALENDAR YEAR      : 2002
EVALUATION MONTH   : 7
AVERAGE SPEED      : 69.0 Freeway 98.5 0.0 0.0 1.5

SCENARIO RECORD    : Greenup                Rural Principal Arterial 57.0 mph - CY2002
DIESEL SULFUR      : 325.00
CALENDAR YEAR      : 2002
EVALUATION MONTH   : 7
```

```
AVERAGE SPEED       : 57.0 Arterial

SCENARIO RECORD     : Greenup                Rural Minor Arterial 47.0 mph - CY2002
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 47.0 Arterial

SCENARIO RECORD     : Greenup                Rural Major Collector 46.0 mph - CY2002
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 46.0 Arterial

SCENARIO RECORD     : Greenup                Rural Minor Collector 41.0 mph - CY2002
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 41.0 Arterial

SCENARIO RECORD     : Greenup                Rural Local 35.0 mph - CY2002
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 35.0 Arterial

* Unless a specific local speed is available, a default MOBILE6 average speed of 12.9 mph is used.

SCENARIO RECORD     : Greenup                Urban Interstate 71.0 mph - CY2002
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 71.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD     : Greenup                Urban Freeway 65.0 mph - CY2002
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 65.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD     : Greenup                Urban Principal Arterial 31.0 mph - CY2002
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 31.0 Arterial

SCENARIO RECORD     : Greenup                Urban Minor Arterial 28.0 mph - CY2002
DIESEL SULFUR       : 324.00
```

```
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 28.0 Arterial

SCENARIO RECORD     : Greenup              Urban Collector 33.0 mph - CY2002
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 33.0 Arterial

SCENARIO RECORD     : Greenup              Urban Local 12.9 mph Default - CY2002
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 12.9 Local
```

* Note that 12.9 mph is the default MOBILE6 average speed for Local and cannot be changed.

MOBILE6.2

OUTPUT

FILE

```
*************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                            *
* Input file: D:\MOBILE62\KY_M62\1-HRO3\1HRMAINT.IN (file 1, run 1).    *
*************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Interstate 69.0 mph - CY2002
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M 96 Warning:
                 69.0     speed reduced to 65 mph maximum
  M515 Warning:
            The combined freeway and ramp average speed entered
            cannot be greater than 64.2 miles per hour.
            The average speed will be reset to this value.
  M582 Warning:
            The user supplied freeway average speed of 64.2
            will be used for all hours of the day. 100% of VMT
            has been assigned to a fixed combination of freeways
            and freeway ramps for all hours of the day and all
             vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                  Calendar Year:  2002
                          Month:  July
                       Altitude:  Low
             Minimum Temperature:  66.0 (F)
             Maximum Temperature:  92.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   9.0 psi
                   Weathered RVP:   8.6 psi
             Fuel Sulfur Content:  279. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  No
                Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.382	1.580	2.504	1.816	1.838	0.574	0.770	0.443	2.93	1.509
Composite CO :	21.49	25.70	36.12	28.37	27.98	1.583	1.545	3.009	24.94	23.013
Composite NOX :	1.249	1.481	1.832	1.571	5.974	2.582	2.668	25.673	1.65	3.593

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Principal Arterial 57.0 mph - CY2002
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 57.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2002
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:  279. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.410	1.617	2.572	1.862	1.856	0.576	0.772	0.446	2.47	1.538
Composite CO :	19.90	24.08	34.46	26.74	21.29	1.462	1.429	2.526	13.04	21.256
Composite NOX :	1.218	1.440	1.789	1.529	5.693	1.952	2.016	17.406	1.45	2.860

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Minor Arterial 47.0 mph - CY2002
* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 47.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
```

```
          type for all hours of the day and all vehicle types.
M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2002
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:  279. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.476	1.689	2.691	1.945	1.982	0.602	0.807	0.489	2.35	1.611
Composite CO :	18.02	22.10	32.43	24.75	17.99	1.420	1.388	2.358	9.99	19.419
Composite NOX :	1.186	1.393	1.743	1.483	5.316	1.521	1.570	13.930	1.21	2.521

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Major Collector 46.0 mph - CY2002
* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
M583 Warning:
          The user supplied arterial average speed of 46.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2002
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
```

```
              Nominal Fuel RVP:   9.0 psi
                 Weathered RVP:   8.6 psi
           Fuel Sulfur Content:  279. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  No
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:              <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:     0.4568    0.3091    0.1063              0.0360    0.0008    0.0017    0.0833    0.0060    1.0000
 ---------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      1.485     1.697     2.703     1.955     2.000     0.606     0.812     0.496      2.35     1.620
    Composite CO  :      17.82     21.90     32.21     24.54     17.87     1.421     1.389     2.361     10.05    19.239
    Composite NOX :      1.183     1.389     1.739     1.478     5.277     1.492     1.540    13.693      1.20     2.496
 ---------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Minor Collector 41.0 mph - CY2002
* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 41.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                  Calendar Year:  2002
                          Month:  July
                       Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:   9.0 psi
                 Weathered RVP:   8.6 psi
           Fuel Sulfur Content:  279. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  No
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
```

```
          GVWR:                 <6000     >6000            1HRMAINT
                                                     (All)
                         ------   ------   ------   ------
   VMT Distribution:    0.4568   0.3091   0.1063             0.0360   0.0008   0.0017   0.0833   0.0060   1.0000
 ----------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     1.529    1.735    2.764    1.999     2.114    0.633    0.847    0.539    2.40     1.666
     Composite CO  :    16.88    20.91    31.20    23.54     18.06     1.447    1.414    2.466   10.71    18.416
     Composite NOX :     1.169    1.367    1.718    1.457     5.089    1.397    1.441   12.925    1.17     2.410
 ----------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup           Rural Local 35.0 mph - CY2002
* File 1, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of 35.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
           there are no sales for vehicle class HDGV8b

               Calendar Year:  2002
                       Month:  July
                    Altitude:  Low
         Minimum Temperature:  66.0 (F)
         Maximum Temperature:  92.0 (F)
           Absolute Humidity:   75. grains/lb
            Nominal Fuel RVP:   9.0 psi
               Weathered RVP:   8.6 psi
         Fuel Sulfur Content:  279. ppm

         Exhaust I/M Program:  No
            Evap I/M Program:  No
                 ATP Program:  No
            Reformulated Gas:  No

      Vehicle Type:     LDGV    LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
              GVWR:              <6000    >6000    (All)
                       ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
   VMT Distribution:   0.4568   0.3091   0.1063            0.0360   0.0008   0.0017   0.0833   0.0060   1.0000
 ----------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :    1.592    1.788    2.846    2.058    2.310    0.678    0.907    0.613    2.49     1.734
     Composite CO  :   15.73    19.70    29.96    22.33    19.61     1.519    1.483    2.754   12.08    17.474
     Composite NOX :    1.158    1.347    1.701    1.438    4.858    1.345    1.388   12.508    1.13     2.353
 ----------------------------------------------------------------------------------------------------------------
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Interstate 71.0 mph - CY2002
* File 1, Run 1, Scenario 7.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M 96 Warning:
                 71.0     speed reduced to 65 mph maximum
  M515 Warning:
            The combined freeway and ramp average speed entered
            cannot be greater than 60.9 miles per hour.
            The average speed will be reset to this value.
  M582 Warning:
            The user supplied freeway average speed of 60.9
            will be used for all hours of the day. 100% of VMT
            has been assigned to a fixed combination of freeways
            and freeway ramps for all hours of the day and all
             vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2002
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:  279. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                       ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.410	1.608	2.543	1.847	1.868	0.581	0.778	0.454	2.91	1.536
Composite CO :	21.90	25.92	36.35	28.59	27.47	1.579	1.542	2.995	24.15	23.271
Composite NOX :	1.259	1.493	1.844	1.583	5.904	2.506	2.589	24.714	1.62	3.520

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Freeway 65.0 mph - CY2002
* File 1, Run 1, Scenario 8.
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M515 Warning:
            The combined freeway and ramp average speed entered
            cannot be greater than 60.9 miles per hour.
            The average speed will be reset to this value.
  M582 Warning:
            The user supplied freeway average speed of 60.9
            will be used for all hours of the day. 100% of VMT
            has been assigned to a fixed combination of freeways
            and freeway ramps for all hours of the day and all
             vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                  Calendar Year:  2002
                          Month:  July
                       Altitude:  Low
             Minimum Temperature:  66.0 (F)
             Maximum Temperature:  92.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
             Fuel Sulfur Content:  279. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  No
                Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.410	1.608	2.543	1.847	1.868	0.581	0.778	0.454	2.91	1.536
Composite CO :	21.90	25.92	36.35	28.59	27.47	1.579	1.542	2.995	24.15	23.271
Composite NOX :	1.259	1.493	1.844	1.583	5.904	2.506	2.589	24.714	1.62	3.520

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Principal Arterial 31.0 mph - CY2002
* File 1, Run 1, Scenario 9.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 31.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
```

```
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2002
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:  279. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.661	1.853	2.954	2.135	2.496	0.719	0.961	0.680	2.59	1.810
Composite CO :	15.51	19.41	29.80	22.07	21.76	1.602	1.563	3.084	13.42	17.380
Composite NOX :	1.183	1.366	1.721	1.456	4.712	1.354	1.397	12.581	1.10	2.373

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Urban Minor Arterial 28.0 mph - CY2002
* File 1, Run 1, Scenario 10.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
            The user supplied arterial average speed of 28.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2002
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
```

```
           Nominal Fuel RVP:   9.0 psi
               Weathered RVP:   8.6 psi
        Fuel Sulfur Content:  279. ppm

        Exhaust I/M Program:  No
           Evap I/M Program:  No
                ATP Program:  No
           Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.720	1.908	3.041	2.198	2.675	0.756	1.010	0.741	2.67	1.876
Composite CO :	15.51	19.36	29.89	22.05	24.03	1.685	1.644	3.418	14.65	17.488
Composite NOX :	1.212	1.390	1.750	1.482	4.602	1.378	1.422	12.771	1.07	2.409

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup            Urban Collector 33.0 mph - CY2002
* File 1, Run 1, Scenario 11.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 33.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
           there are no sales for vehicle class HDGV8b

              Calendar Year:  2002
                      Month:  July
                   Altitude:  Low
        Minimum Temperature:  66.0 (F)
        Maximum Temperature:  92.0 (F)
          Absolute Humidity:   75. grains/lb
           Nominal Fuel RVP:   9.0 psi
              Weathered RVP:   8.6 psi
        Fuel Sulfur Content:  279. ppm

        Exhaust I/M Program:  No
           Evap I/M Program:  No
                ATP Program:  No
           Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh

				1HRMAINT						
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.624	1.819	2.896	2.094	2.397	0.697	0.932	0.645	2.54	1.769
Composite CO :	15.63	19.56	29.88	22.21	20.62	1.558	1.521	2.909	12.71	17.430
Composite NOX :	1.170	1.356	1.710	1.447	4.790	1.349	1.392	12.542	1.12	2.363

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Local 12.9 mph Default - CY2002
* File 1, Run 1, Scenario 12.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M585 Warning:
            100% of VMT has been assigned to the local roadway
            type for all hours of the day for all vehicle types
            with an average speed of 12.9 mph.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2002
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:  279. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	2.529	2.662	4.111	3.033	4.880	1.095	1.461	1.298	3.57	2.724
Composite CO :	13.24	18.32	30.19	21.36	53.37	2.668	2.594	7.348	28.22	17.631
Composite NOX :	1.184	1.313	1.672	1.405	4.024	1.803	1.862	13.972	0.91	2.443

APPENDIX E

Biogenic Emissions Inventory Information

TABLE 6-1
SUMMARY OF BIOGENIC EMISSIONS**
GREENUP COUNTY, KENTUCKY PORTION OF THE HUNTINGTON-ASHLAND OZONE MAINTENANCE AREA

COUNTY	VOC EMISSIONS (tons/yr)	VOC EMISSIONS (tons/day)	NOx EMISSIONS (tons/yr)	NOx EMISSIONS (tons/day)
*Greenup	1096.07	7.12	11.77	0.04

*Denotes only a portion of a county.

**NEI biogenic emissions have been apportioned to the portion of a county based on the area apportionment factor provided in Table 1-1.

APPENDIX D

Emission Projections Summary

Ashland Ozone Maintenance Area

PROPOSED UPDATED MAINTENANCE EMISSIONS BUDGET

ASHLAND OZONE MAINTENANCE AREA
A PORTION OF GREENUP COUNTY

EMISSIONS SUMMARY FOR ASHLAND AREA (*tons per day*)

VOC

Greenup County (portion)

Source Category	2002 Baseyear	2005 Projected	2008 Projected	2011 Projected	2014 Projected	2017 Projected	2020 Projected
POINT SOURCE EMISSIONS	**0.13**	**0.13**	**0.14**	**0.14**	**0.15**	**0.15**	**0.17**
AREA SOURCE EMISSIONS							
Gasoline Distribution							
Storage Tank Breathing Losses	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Tank Trucks in Transit	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vehicle Refueling	-------	-------	-------	-------	-------	-------	-------
Tank Truck Unloading	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Aircraft Refueling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Petroleum Vessel Loading & Unloading	-------	-------	-------	-------	-------	-------	-------
TOTAL GASOLINE DISTRIBUTION	**0.14**	**0.14**	**0.14**	**0.14**	**0.14**	**0.14**	**0.14**
Stationary Source Solvent Evaporation							
Dry Cleaning	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Surface Cleaning	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Surface Coating	-------	-------	-------	-------	-------	-------	-------
Architectural Surface Coating	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Automobile Refinishing	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Traffic Markings	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Other Small Industrial Surface Coating	-------	-------	-------	-------	-------	-------	-------
Graphic Arts	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Cutback Asphalt Paving	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Emulsified Asphalt	-------	-------	-------	-------	-------	-------	-------
Pesticide Application	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Commercial/Consumer Solvent Use	0.25	0.25	0.25	0.25	0.25	0.25	0.25
TOTAL STATIONARY SOLVENT EVAPORATION	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**
aste Management Practices							
Publicly Owned Treatment Works	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Industrial Wastewater	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hazardous Treatment, Disposal (TSDFs)	-------	-------	-------	-------	-------	-------	-------
Municipal Solid Waste Landfills	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solid Waste Incineration							
On-Site Incineration	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Burning	0.18	0.18	0.18	0.18	0.18	0.18	0.18
TOTAL WASTE MANAGEMENT PRACTICES	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**
Small Stationary Source Fossil Fuel Use	-------	-------	-------	-------	-------	-------	-------
Bioprocess Emissions Sources							
Bakeries	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Breweries	-------	-------	-------	-------	-------	-------	-------
Wineries	-------	-------	-------	-------	-------	-------	-------
Distilleries	-------	-------	-------	-------	-------	-------	-------
Silage Storage	-------	-------	-------	-------	-------	-------	-------
TOTAL BIOPROCESS EMISSIONS	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
Other Area Sources							
Forest Fires	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Slash & Prescribed Burning	-------	-------	-------	-------	-------	-------	-------
Agricultural Burning	-------	-------	-------	-------	-------	-------	-------
Structure Fires	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Orchard Heaters	-------	-------	-------	-------	-------	-------	-------
Leaking Underground Storage Tanks	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL OTHER AREA SOURCE EMISSIONS	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**
TOTAL AREA SOURCE EMISSIONS	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
HIGHWAY MOBILE SOURCE EMISSIONS	**1.09**	**0.87**	**0.75**	**0.64**	**0.54**	**0.48**	**0.42**
NON-HIGHWAY MOBILE SOURCE EMISSIONS							
Aircraft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Locomotives	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Other Non-Highway	0.65	0.59	0.53	0.48	0.47	0.46	0.47
TOTAL NON-HIGHWAY MOBILE SOURCE EMISSIONS	**0.67**	**0.61**	**0.55**	**0.50**	**0.49**	**0.48**	**0.49**
AND TOTAL: ALL EMISSION CATEGORIES	**3.14**	**2.86**	**2.69**	**2.53**	**2.43**	**2.36**	**2.33**

EMISSIONS SUMMARY FOR ASHLAND AREA (tons per day)

CO

Greenup County (portion)

Source Category	2002 Baseyear	2005 Projected	2008 Projected	2011 Projected	2014 Projected	2017 Projected	2020 Projected
POINT SOURCE EMISSIONS	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.05**	**0.05**
AREA SOURCE EMISSIONS							
Gasoline Distribution							
Storage Tank Breathing Losses							
Tank Trucks in Transit							
Vehicle Refueling							
Tank Truck Unloading							
Aircraft Refueling							
Petroleum Vessel Loading & Unloading							
TOTAL GASOLINE DISTRIBUTION	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Stationary Source Solvent Evaporation							
Dry Cleaning							
Surface Cleaning							
Surface Coating							
Architectural Surface Coating							
Automobile Refinishing							
Traffic Markings							
Other Small Industrial Surface Coating							
Graphic Arts							
Cutback Asphalt Paving							
Emulsified Asphalt							
Pesticide Application							
Commercial/Consumer Solvent Use							
TOTAL STATIONARY SOLVENT EVAPORATION	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Waste Management Practices							
Publicly Owned Treatment Works							
Industrial Wastewater							
Hazardous Treatment, Disposal (TSDFs)							
Municipal Solid Waste Landfills							
Solid Waste Incineration							
On-Site Incineration	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Open Burning	0.51	0.51	0.51	0.51	0.51	0.51	0.51
TOTAL WASTE MANAGEMENT PRACTICES	**0.57**	**0.57**	**0.57**	**0.57**	**0.57**	**0.57**	**0.57**
Small Stationary Source Fossil Fuel Use							
Bioprocess Emissions Sources							
Bakeries							
Breweries							
Wineries							
Distilleries							
Silage Storage							
TOTAL BIOPROCESS EMISSIONS	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Other Area Sources							
Forest Fires	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Slash & Prescribed Burning	-------	-------	-------	-------	-------	-------	-------
Agricultural Burning	-------	-------	-------	-------	-------	-------	-------
Structure Fires	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Orchard Heaters	-------	-------	-------	-------	-------	-------	-------
Leaking Underground Storage Tanks							
TOTAL OTHER AREA SOURCE EMISSIONS	**0.26**	**0.26**	**0.26**	**0.26**	**0.26**	**0.26**	**0.26**
TOTAL AREA SOURCE EMISSIONS	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**
HIGHWAY MOBILE SOURCE EMISSIONS	**11.55**	**8.71**	**7.41**	**6.67**	**6.05**	**5.75**	**5.60**
NON-HIGHWAY MOBILE SOURCE EMISSIONS							
Aircraft	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Locomotives	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Other Non-Highway	4.86	5.07	5.20	5.33	5.48	5.65	5.85
TOTAL NON-HIGHWAY MOBILE SOURCE EMISSIONS	**5.05**	**5.26**	**5.39**	**5.52**	**5.67**	**5.84**	**6.04**
GRAND TOTAL: ALL EMISSION CATEGORIES	**17.47**	**14.84**	**13.67**	**13.06**	**12.59**	**12.47**	**12.52**

EMISSIONS SUMMARY FOR ASHLAND AREA (tons per day)

NOx

Greenup County (portion)

Source Category	2002 Baseyear	2005 Projected	2008 Projected	2011 Projected	2014 Projected	2017 Projected	2020 Projected
POINT SOURCE EMISSIONS	0.07	0.07	0.07	0.08	0.08	0.08	0.08
AREA SOURCE EMISSIONS							
Gasoline Distribution							
Storage Tank Breathing Losses							
Tank Trucks in Transit							
Vehicle Refueling							
Tank Truck Unloading							
Aircraft Refueling							
Petroleum Vessel Loading & Unloading							
TOTAL GASOLINE DISTRIBUTION	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stationary Source Solvent Evaporation							
Dry Cleaning							
Surface Cleaning							
Surface Coating							
Architectural Surface Coating							
Automobile Refinishing							
Traffic Markings							
Other Small Industrial Surface Coating							
Graphic Arts							
Cutback Asphalt Paving							
Emulsified Asphalt							
Pesticide Application							
Commercial/Consumer Solvent Use							
TOTAL STATIONARY SOLVENT EVAPORATION	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste Management Practices							
Publicly Owned Treatment Works							
Industrial Wastewater							
Hazardous Treatment, Disposal (TSDFs)							
Municipal Solid Waste Landfills							
Solid Waste Incineration							
On-Site Incineration	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Open Burning	0.04	0.04	0.04	0.04	0.04	0.04	0.04
TOTAL WASTE MANAGEMENT PRACTICES	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Small Stationary Source Fossil Fuel Use							
Bioprocess Emissions Sources							
Bakeries							
Breweries							
Wineries							
Distilleries							
Silage Storage							
TOTAL BIOPROCESS EMISSIONS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Area Sources							
Forest Fires	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Slash & Prescribed Burning	-------	-------	-------	-------	-------	-------	-------
Agricultural Burning	-------	-------	-------	-------	-------	-------	-------
Structure Fires	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Orchard Heaters	-------	-------	-------	-------	-------	-------	-------
Leaking Underground Storage Tanks							
TOTAL OTHER AREA SOURCE EMISSIONS	0.01	0.01	0.01	0.01	0.01	0.01	0.01
TOTAL AREA SOURCE EMISSIONS	0.06	0.06	0.06	0.06	0.06	0.06	0.06
HIGHWAY MOBILE SOURCE EMISSIONS	1.56	1.33	1.12	0.90	0.68	0.53	0.44
NON-HIGHWAY MOBILE SOURCE EMISSIONS							
Aircraft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Locomotives	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Other Non-Highway	0.27	0.26	0.24	0.22	0.19	0.16	0.15
TOTAL NON-HIGHWAY MOBILE SOURCE EMISSIONS	0.73	0.72	0.70	0.68	0.65	0.62	0.61
GRAND TOTAL: ALL EMISSION CATEGORIES	2.42	2.18	1.95	1.72	1.47	1.29	1.19

FORMER 1-HOUR OZONE MAINTENANCE AREA SUMMARY: 2002, 2005, 2008, 2011, 2014, 2017, AND 2020

Ashland Area: Greenup County (portion)

Note: All emissions reflect any applicable Federal or State controls.

POINT SOURCE EMISSIONS (in tons per day)

	2002 Baseyear			2005 Projected			2008 Projected			2011 Projected			2014 Projected			2017 Projected			2020 Projected		
	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx
Greenup	0.13	0.04	0.07	0.13	0.04	0.07	0.14	0.04	0.07	0.14	0.04	0.08	0.15	0.04	0.08	0.15	0.05	0.08	0.17	0.05	0.08
VOC	0.13			0.13			0.14			0.14			0.15			0.15			0.17		
CO		0.04			0.04			0.04			0.04			0.04			0.05			0.05	
NOx			0.07			0.07			0.07			0.08			0.08			0.08			0.08

AREA SOURCE EMISSIONS (in tons per day)

	2002 Baseyear			2005 Projected			2008 Projected			2011 Projected			2014 Projected			2017 Projected			2020 Projected		
	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx
Greenup	1.25	0.83	0.06	1.25	0.83	0.06	1.25	0.83	0.06	1.25	0.83	0.06	1.25	0.83	0.06	1.25	0.83	0.06	1.25	0.83	0.06
VOC	1.25			1.25			1.25			1.25			1.25			1.25			1.25		
CO		0.83			0.83			0.83			0.83			0.83			0.83			0.83	
NOx			0.06			0.06			0.06			0.06			0.06			0.06			0.06

HIGHWAY MOBILE SOURCE EMISSIONS (in tons per day)

	2002 Baseyear			2005 Projected			2008 Projected			2011 Projected			2014 Projected			2017 Projected			2020 Projected		
	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx
Greenup	1.09	11.55	1.56	0.87	8.71	1.33	0.75	7.41	1.12	0.64	6.67	0.90	0.54	6.05	0.68	0.48	5.75	0.53	0.42	5.60	0.44
VOC	1.09			0.87			0.75			0.64			0.54			0.48			0.42		
CO		11.55			8.71			7.41			6.67			6.05			5.75			5.60	
NOx			1.56			1.33			1.12			0.90			0.68			0.53			0.44

NON-HIGHWAY SOURCE EMISSIONS (in tons per day)

	2002 Baseyear			2005 Projected			2008 Projected			2011 Projected			2014 Projected			2017 Projected			2020 Projected		
	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx
Greenup	0.67	5.05	0.73	0.61	5.26	0.72	0.55	5.39	0.70	0.50	5.52	0.68	0.49	5.67	0.65	0.48	5.84	0.62	0.49	6.04	0.61
VOC	0.67			0.61			0.55			0.50			0.49			0.48			0.49		
CO		5.05			5.26			5.39			5.52			5.67			5.84			6.04	
NOx			0.73			0.72			0.70			0.68			0.65			0.62			0.61

TOTAL EMISSIONS (in tons per day)

	2002 Baseyear			2005 Projected			2008 Projected			2011 Projected			2014 Projected			2017 Projected			2020 Projected		
	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx
Greenup	3.14	17.47	2.42	2.86	14.84	2.18	2.69	13.67	1.95	2.53	13.06	1.72	2.43	12.59	1.47	2.36	12.47	1.29	2.33	12.52	1.19
VOC	3.14			2.86			2.69			2.53			2.43			2.36			2.33		
CO		17.47			14.84			13.67			13.06			12.59			12.47			12.52	
NOx			2.42			2.18			1.95			1.72			1.47			1.29			1.19

Note: Biogenic emission totals not included in this summary.

APPENDIX E

Point Source Emission Projection Methodology & Documentation

Ashland Ozone Maintenance Area

PROPOSED UPDATED MAINTENANCE EMISSIONS BUDGET

ASHLAND OZONE MAINTENANCE AREA
A PORTION OF GREENUP COUNTY

INDUSTRY NAMES AND STANDARD INDUSTRIAL CLASSIFICATION CODES

Industry Names and SIC Codes

The following is the unabridged listing of industry names used by BEA for the Regional Projections to 2045, along with the corresponding 1987 SIC codes which are included in each industrial category.

INDUSTRY	1987 SIC
Farm	01, 02
Agricultural services, forestry, fishing, and other	07 - 09
Mining	
Metal mining	10
Coal mining	12
Oil and gas extraction	13
Nonmetallic minerals, except fuels	14
Construction	15 - 17
Manufacturing	
Durable goods	
Lumber and wood products	24
Furniture and fixtures	25
Stone, clay, and glass products	32
Primary metal industries	33
Fabricated metal products	34
Industrial machinery and equipment	35
Electronic and other electric equipment	36
Motor vehicles and equipment	371
Other transportation equipment	37 (except 371)
Instruments and related products	38
Miscellaneous manufacturing industries	39
Nondurable goods	
Food and kindred products	20
Tobacco Products	21
Textile mill products	22
Apparel and other textile products	23
Paper and allied products	26
Printing and publishing	27
Chemicals and allied products	28
Petroleum and coal products	29
Rubber and miscellaneous plastics products	30
Leather and leather products	31
Transportation and public utilities	
Railroad transportation	40
Local and interurban passenger transit	41
Trucking and warehousing	42
Water transportation	44
Transportation by air	45
Pipelines, except natural gas	46
Transportation services	47

Communications	48
Electric, gas, and sanitary services	49
Wholesale and retail trade	
Wholesale trade	50, 51
Retail trade	52 - 59
Finance, insurance, and real estate	
Banks, credit agencies, and investment services	60 - 62, 67
Insurance	63, 64
Real estate	65
Services	
Hotels and other lodging places	70
Personal services	72
Business and miscellaneous repair services	73, 76
Auto repair, services, and parking	75
Amusement and recreation services and motion pictures	78, 79
Health services	80
Legal services	81
Educational services	82
Social services and membership organizations	83, 86
Private households	88
Other services	84, 87, 89
Government and government enterprises	
Federal, civilian	—
Federal, military	—
State and local	—

Kentucky: Employment (thousands)

Sort Key = None		1969	1970	1971	1972
01.	All-Industry Total	1,328.1	1,332.7	1,354.8	1,386.2
02.	Farm	144.6	144.1	143.3	143.1
03.	Nonfarm	1,183.5	1,188.7	1,211.5	1,243.0
04.	Agricultural services	4.2	4.4	4.6	4.9
05.	Mining	29.1	31.2	32.6	33.9
06.	Metal mining	0.1	0.1	0.1	0.1
07.	Coal mining	21.3	23.7	25.5	26.7
08.	Oil & gas	4.7	4.5	4.0	4.2
09.	Nonmetalic minerals	3.1	3.0	3.0	2.9
10.	Construction	75.5	69.6	71.3	75.3
11.	Manufacturing	253.3	256.3	254.6	269.9
12.	Durable goods	136.3	139.0	138.0	149.7
13.	Lumber & wood	10.6	10.3	10.1	11.0
14.	Furniture	7.2	6.9	7.1	7.6
15.	Stone, clay, glass	7.4	7.3	7.3	7.8
16.	Primary metals	13.5	14.3	14.3	15.0
17.	Fabricated metals	19.9	18.8	17.4	19
18.	Indust. machinery	25.1	27.1	27.4	29.0
19.	Electronic equip.	36.0	37.1	36.9	41.3
20.	Motor vehicles	8.1	8.5	8.5	8.8
21.	Other trans. equip.	1.7	1.8	1.9	2.0
22.	Instruments	2.7	2.8	3.0	3.5
23.	Misc. manufacturing	4.1	4.1	4.1	4.5
24.	Nondurable goods	117.0	117.3	116.6	120.3
25.	Food & kindred	25.4	25.0	24.3	23.8
26.	Tobacco products	13.4	13.7	12.7	13.3
27.	Textile mill prod.	3.2	6.0	6.1	6.3
28.	Apparel & textile	30.6	27.2	27.2	28.7
29.	Paper products	4.3	4.7	4.9	5.3
30.	Printing & publish.	13.1	13.6	13.3	13.1
31.	Chemicals	14.4	14.2	13.6	13.9
32.	Petroleum products	1.1	1.2	2.2	1.9
33.	Rubber & plastics	6.2	6.8	7.6	8.5
34.	Leather products	5.3	4.8	4.8	5.3
35.	Transport. & utilities	66.5	68.0	67.1	69.9

Kentucky: Employment (thousands)

Sort Key = None		1969	1970	1971	1972
36.	Railroad transport.	15.6	16.2	15.9	15.6
37.	Local & interurban	4.4	4.2	4.0	3.9
38.	Trucking	19.5	19.8	18.7	21.0
39.	Water transportation	1.5	1.4	1.5	1.4
40.	Transportation by air	1.4	1.4	1.4	1.4
41.	Pipelines	0.2	0.2	0.2	0.2
42.	Transport. services	1.6	1.7	1.7	1.8
43.	Communications	11.4	11.9	12.1	12.6
44.	Utilities	10.9	11.2	11.6	12.0
45.	Wholesale and retail	231.1	236.1	244.8	247.4
46.	Wholesale trade	43.3	45.6	45.5	48.1
47.	Retail trade	187.8	190.4	199.3	199.3
48.	F.I.R.E.	62.7	67.8	73.7	75.0
49.	Banks & investment	22.4	27.2	32.7	30.9
50.	Insurance	16.7	16.9	16.4	16.6
51.	Real estate	23.6	23.7	24.7	5
52.	Services	216.7	216.4	223.8	233.4
53.	Hotels & lodging	11.2	11.1	11.4	11.3
54.	Personal services	24.1	24.5	24.9	25.1
55.	Business services	20.5	21.1	20.5	23.6
56.	Auto repair & parking	8.1	8.3	8.9	9.0
57.	Amusement	11.1	11.2	11.2	11.2
58.	Health services	40.4	41.2	44.1	47.0
59.	Legal services	5.5	5.7	5.7	6.1
60.	Educational services	15.6	14.8	15.1	15.3
61.	Social services	29.5	28.6	29.3	30.3
62.	Private households	38.1	37.1	36.3	35.6
63.	Other services	12.7	12.7	16.4	18.9
64.	Government	244.3	238.9	238.9	233.2
65.	Federal, civilian	41.9	40.8	39.0	39.2
66.	Federal, military	73.3	63.1	60.5	52.4
67.	State and local	129.1	135.0	139.3	141.7

Kentucky: Employment (thousands)

Sort Key = None	1973	1974	1975	1976
01. All-Industry Total	1,455.8	1,492.3	1,460.5	1,518.4
02. Farm	145.3	149.1	135.8	143.6
03. Nonfarm	1,310.5	1,343.2	1,324.8	1,374.9
04. Agricultural services	5.6	5.7	6.0	6.7
05. Mining	34.2	41.8	49.6	50.0
06. Metal mining	0.1	0.1	(L)	0.1
07. Coal mining	27.1	34.8	42.5	43.1
08. Oil & gas	3.9	4.0	4.1	3.9
09. Nonmetalic minerals	3.0	2.9	2.9	2.9
10. Construction	77.8	75.2	71.3	77.7
11. Manufacturing	291.4	296.1	262.8	278.2
12. Durable goods	166.8	171.0	146.5	156.4
13. Lumber & wood	12.7	12.5	11.4	12.3
14. Furniture	7.9	7.1	5.4	6.2
15. Stone, clay, glass	8.5	8.5	8.5	8.8
16. Primary metals	17.1	17.8	15.8	16.8
17. Fabricated metals	21.3	21.5	18.7	1
18. Indust. machinery	32.9	35.2	34.4	35.4
19. Electronic equip.	44.8	44.3	33.4	36.5
20. Motor vehicles	10.7	12.1	10.3	11.1
21. Other trans. equip.	2.0	2.2	1.7	1.6
22. Instruments	3.9	4.8	2.6	3.3
23. Misc. manufacturing	5.1	4.9	4.3	4.6
24. Nondurable goods	124.6	125.1	116.3	121.8
25. Food & kindred	23.5	23.0	22.2	22.7
26. Tobacco products	14.0	14.3	12.7	12.6
27. Textile mill prod.	6.7	7.2	6.7	7.2
28. Apparel & textile	30.0	29.2	26.4	28.1
29. Paper products	5.7	5.9	6.6	7.1
30. Printing & publish.	13.6	13.7	12.5	12.9
31. Chemicals	14.4	14.6	14.4	15.5
32. Petroleum products	1.9	2.7	2.9	3.2
33. Rubber & plastics	9.0	8.9	6.8	7.3
34. Leather products	5.8	5.6	5.1	5.2
35. Transport. & utilities	72.4	73.5	71.5	71.6

Kentucky: Employment (thousands)

Sort Key = None		1973	1974	1975	1976
36.	Railroad transport.	15.8	16.1	15.4	15.1
37.	Local & interurban	3.7	3.7	3.3	3.0
38.	Trucking	22.2	22.6	22.6	22.8
39.	Water transportation	1.5	1.6	1.9	1.9
40.	Transportation by air	1.5	1.5	1.6	1.6
41.	Pipelines	0.2	0.2	0.2	0.2
42.	Transport. services	1.9	1.8	0.9	1.0
43.	Communications	13.3	13.7	13.9	13.9
44.	Utilities	12.5	12.2	11.8	12.2
45.	Wholesale and retail	259.5	264.1	270.1	283.8
46.	Wholesale trade	49.7	50.5	61.5	61.9
47.	Retail trade	209.8	213.6	208.6	221.9
48.	F.I.R.E.	79.0	80.8	79.9	82.3
49.	Banks & investment	32.5	33.2	31.9	32.0
50.	Insurance	16.7	17.3	17.7	18.2
51.	Real estate	29.9	30.4	30.3	[illegible]
52.	Services	247.4	252.0	255.3	26[illegible].6
53.	Hotels & lodging	12.7	12.9	13.0	13.2
54.	Personal services	24.8	24.6	24.5	25.3
55.	Business services	28.7	31.0	30.3	31.0
56.	Auto repair & parking	9.4	9.8	9.8	10.2
57.	Amusement	12.0	12.8	13.4	13.4
58.	Health services	53.4	56.2	61.9	66.9
59.	Legal services	6.7	6.9	7.0	7.3
60.	Educational services	16.2	17.1	13.2	13.2
61.	Social services	30.1	30.2	36.2	35.5
62.	Private households	33.8	30.8	30.0	30.0
63.	Other services	19.6	19.9	16.0	16.5
64.	Government	243.1	254.0	258.2	262.0
65.	Federal, civilian	38.4	39.5	39.9	39.6
66.	Federal, military	57.4	59.7	56.6	58.1
67.	State and local	147.3	154.7	161.7	164.3

Kentucky: Employment (thousands)

Sort Key = None	1977	1978	1979	1980
01. All-Industry Total	1,575.7	1,643.8	1,663.0	1,638.7
02. Farm	142.1	145.2	132.6	137.1
03. Nonfarm	1,433.6	1,498.6	1,530.4	1,501.6
04. Agricultural services	7.3	8.3	9.0	9.5
05. Mining	55.1	56.2	58.8	58.1
06. Metal mining	0.1	(L)	0.1	0.1
07. Coal mining	47.7	48.5	50.2	48.6
08. Oil & gas	4.5	4.9	5.6	6.8
09. Nonmetalic minerals	2.9	2.8	2.9	2.6
10. Construction	83.6	95.9	97.0	83.8
11. Manufacturing	291.0	297.4	302.7	283.4
12. Durable goods	166.3	172.4	176.4	160.2
13. Lumber & wood	12.1	12.5	13.4	12.9
14. Furniture	6.7	6.6	6.2	5.3
15. Stone, clay, glass	9.7	9.8	10.5	9.6
16. Primary metals	17.4	18.0	19.3	18.6
17. Fabricated metals	21.9	22.5	21.4	1[illegible]
18. Indust. machinery	36.2	38.4	40.1	39.3
19. Electronic equip.	39.1	40.1	40.5	36.0
20. Motor vehicles	13.2	14.5	14.1	9.8
21. Other trans. equip.	1.8	1.7	2.0	1.9
22. Instruments	3.4	3.6	4.1	3.6
23. Misc. manufacturing	4.7	4.8	4.9	4.7
24. Nondurable goods	124.7	125.1	126.3	123.1
25. Food & kindred	23.1	22.2	21.9	22.0
26. Tobacco products	12.5	12.1	12.0	10.2
27. Textile mill prod.	7.5	7.3	7.0	6.6
28. Apparel & textile	28.7	27.9	27.9	28.0
29. Paper products	7.3	7.4	7.5	7.4
30. Printing & publish.	13.5	14.1	15.2	15.7
31. Chemicals	16.1	16.4	16.2	15.8
32. Petroleum products	3.7	3.6	3.7	3.7
33. Rubber & plastics	7.8	9.6	10.4	9.7
34. Leather products	4.6	4.5	4.4	4.2
35. Transport. & utilities	76.3	80.5	82.1	81.4

Kentucky: Employment (thousands)

Sort Key = None		1977	1978	1979	1980
36.	Railroad transport.	15.4	15.5	16.0	15.4
37.	Local & interurban	2.9	2.8	2.6	2.3
38.	Trucking	25.5	27.9	27.6	27.0
39.	Water transportation	2.2	2.3	2.3	2.2
40.	Transportation by air	1.7	1.8	1.9	1.9
41.	Pipelines	0.2	0.2	0.2	0.2
42.	Transport. services	1.1	1.2	1.4	1.5
43.	Communications	14.8	15.6	16.5	16.7
44.	Utilities	12.6	13.1	13.5	14.1
45.	Wholesale and retail	295.2	314.4	320.8	313.9
46.	Wholesale trade	62.3	67.0	68.2	66.4
47.	Retail trade	232.9	247.4	252.6	247.5
48.	F.I.R.E.	89.7	93.7	93.9	97.9
49.	Banks & investment	34.4	38.4	39.8	43.9
50.	Insurance	19.2	20.0	20.4	20.6
51.	Real estate	36.1	35.3	33.7	[illegible]
52.	Services	273.8	286.3	293.9	2[illegible].5
53.	Hotels & lodging	13.4	14.7	14.5	14.1
54.	Personal services	26.4	27.6	27.8	27.4
55.	Business services	34.0	36.1	38.6	38.7
56.	Auto repair & parking	11.6	12.5	12.9	13.0
57.	Amusement	14.4	14.8	15.0	15.7
58.	Health services	69.5	73.9	78.4	84.5
59.	Legal services	7.7	8.0	8.8	9.5
60.	Educational services	13.0	13.2	13.8	14.2
61.	Social services	34.8	36.1	36.9	35.1
62.	Private households	30.7	29.9	27.5	24.9
63.	Other services	18.2	19.3	19.8	20.5
64.	Government	261.7	265.7	272.3	276.3
65.	Federal, civilian	38.8	38.2	38.4	40.2
66.	Federal, military	57.0	54.1	53.8	54.8
67.	State and local	165.9	173.4	180.1	181.3

Kentucky: Employment (thousands)

Sort Key = None	1981	1982	1983	1984
01. All-Industry Total	1,628.6	1,601.0	1,608.2	1,659.4
02. Farm	139.7	140.1	148.9	142.1
03. Nonfarm	1,488.9	1,460.9	1,459.3	1,517.4
04. Agricultural services	10.2	11.0	12.4	13.6
05. Mining	60.6	59.6	48.9	52.2
06. Metal mining	0.1	0.1	0.1	0.1
07. Coal mining	49.8	48.5	38.0	41.3
08. Oil & gas	8.3	8.6	8.5	8.5
09. Nonmetalic minerals	2.5	2.5	2.3	2.3
10. Construction	78.9	77.0	73.8	79.2
11. Manufacturing	278.7	252.3	248.6	264.0
12. Durable goods	156.8	135.3	133.8	147.5
13. Lumber & wood	11.8	10.2	10.6	11.9
14. Furniture	4.8	4.3	4.8	5.3
15. Stone, clay, glass	8.6	8.0	8.0	8.0
16. Primary metals	18.4	16.3	16.3	18.2
17. Fabricated metals	18.1	15.5	14.7	[illegible]
18. Indust. machinery	38.8	33.2	30.5	34.3
19. Electronic equip.	35.2	29.0	29.0	31.4
20. Motor vehicles	10.9	10.0	10.8	13.5
21. Other trans. equip.	1.8	1.2	1.2	1.6
22. Instruments	3.9	3.4	3.6	3.9
23. Misc. manufacturing	4.5	4.2	4.5	4.3
24. Nondurable goods	121.9	117.0	114.8	116.5
25. Food & kindred	21.3	21.1	20.3	19.6
26. Tobacco products	10.3	9.6	8.4	8.4
27. Textile mill prod.	6.3	6.3	6.1	6.0
28. Apparel & textile	26.9	25.9	26.4	26.5
29. Paper products	7.3	7.0	7.0	7.6
30. Printing & publish.	15.8	15.3	15.6	16.6
31. Chemicals	15.4	14.2	13.3	13.5
32. Petroleum products	4.0	3.9	3.9	3.9
33. Rubber & plastics	10.6	9.9	10.7	12.0
34. Leather products	4.0	3.6	3.0	2.5
35. Transport. & utilities	80.3	77.9	76.0	79.5

Kentucky: Employment (thousands)

Sort Key = None

		1981	1982	1983	1984
36.	Railroad transport.	14.4	12.1	10.4	10.4
37.	Local & interurban	2.2	2.3	2.2	2.1
38.	Trucking	26.9	26.5	27.2	31.1
39.	Water transportation	2.2	2.3	2.4	2.7
40.	Transportation by air	1.9	2.1	2.4	2.8
41.	Pipelines	0.2	0.2	0.2	0.2
42.	Transport. services	1.3	1.4	1.5	1.7
43.	Communications	16.7	16.4	15.1	14.0
44.	Utilities	14.5	14.7	14.6	14.5
45.	Wholesale and retail	313.5	314.1	318.1	333.4
46.	Wholesale trade	66.9	65.6	64.3	67.4
47.	Retail trade	246.6	248.5	253.7	266.1
48.	F.I.R.E.	95.6	93.6	92.0	92.5
49.	Banks & investment	42.9	40.8	38.9	38.6
50.	Insurance	20.8	20.7	20.8	21.3
51.	Real estate	32.0	32.2	32.4	[illegible]
52.	Services	301.6	308.0	320.6	[illegible]
53.	Hotels & lodging	14.0	14.5	15.0	15.0
54.	Personal services	27.3	27.6	29.0	30.4
55.	Business services	40.3	43.6	47.9	54.0
56.	Auto repair & parking	12.8	13.1	14.0	15.8
57.	Amusement	15.1	14.8	15.2	15.7
58.	Health services	89.8	92.0	95.2	95.9
59.	Legal services	10.0	10.6	10.7	11.1
60.	Educational services	14.2	14.1	14.6	15.4
61.	Social services	33.8	32.8	32.6	32.4
62.	Private households	24.7	24.9	24.4	23.8
63.	Other services	19.6	20.1	22.1	23.0
64.	Government	269.6	267.4	268.9	270.6
65.	Federal, civilian	38.6	39.8	40.6	40.4
66.	Federal, military	54.7	57.6	58.8	57.6
67.	State and local	176.3	170.1	169.5	172.6

Kentucky: Employment (thousands)

Sort Key = None	1985	1986	1987	1988
01. All-Industry Total	1,694.8	1,722.1	1,769.3	1,817.0
02. Farm	132.9	134.5	127.7	123.7
03. Nonfarm	1,561.9	1,587.6	1,641.7	1,693.3
04. Agricultural services	14.9	15.7	17.3	17.7
05. Mining	50.5	45.9	44.2	40.5
06. Metal mining	0.1	0.1	(L)	(L)
07. Coal mining	39.9	37.0	35.7	32.4
08. Oil & gas	8.3	6.5	6.1	5.6
09. Nonmetalic minerals	2.3	2.3	2.4	2.5
10. Construction	82.7	87.2	92.5	95.1
11. Manufacturing	262.9	260.1	268.0	280.7
12. Durable goods	144.9	140.8	144.6	152.7
13. Lumber & wood	11.7	11.9	12.6	13.6
14. Furniture	5.5	5.4	5.2	5.2
15. Stone, clay, glass	8.4	8.8	9.3	9.6
16. Primary metals	17.5	16.0	16.5	17.2
17. Fabricated metals	15.2	15.0	16.3	1[illegible]
18. Indust. machinery	34.3	31.9	31.5	32.4
19. Electronic equip.	28.6	28.3	28.9	30.1
20. Motor vehicles	14.0	13.0	13.2	15.2
21. Other trans. equip.	1.8	2.3	2.6	2.8
22. Instruments	3.6	3.4	3.7	4.3
23. Misc. manufacturing	4.4	4.8	4.8	5.5
24. Nondurable goods	118.0	119.3	123.4	128.0
25. Food & kindred	19.4	19.6	19.3	19.2
26. Tobacco products	7.9	7.0	6.2	5.9
27. Textile mill prod.	5.8	5.9	6.2	6.3
28. Apparel & textile	27.1	27.5	29.3	30.9
29. Paper products	7.8	7.8	8.3	8.5
30. Printing & publish.	17.7	18.9	19.7	20.6
31. Chemicals	13.3	13.0	12.9	13.5
32. Petroleum products	3.8	3.8	4.1	4.0
33. Rubber & plastics	13.1	14.0	15.2	16.8
34. Leather products	2.2	1.9	2.2	2.4
35. Transport. & utilities	81.6	82.5	86.1	88.6

Kentucky: Employment (thousands)

Sort Key = None

		1985	1986	1987	1988
36.	Railroad transport.	9.8	8.9	8.1	7.3
37.	Local & interurban	2.3	2.2	2.3	2.4
38.	Trucking	33.0	34.1	33.1	34.8
39.	Water transportation	2.8	2.8	2.9	3.1
40.	Transportation by air	3.4	3.9	8.6	9.5
41.	Pipelines	0.2	0.2	0.1	0.1
42.	Transport. services	1.8	2.1	2.1	2.3
43.	Communications	13.5	13.2	13.2	13.3
44.	Utilities	14.9	15.1	15.7	15.9
45.	Wholesale and retail	347.3	351.9	368.7	383.2
46.	Wholesale trade	69.2	67.5	70.3	71.3
47.	Retail trade	278.1	284.4	298.3	311.9
48.	F.I.R.E.	93.3	94.9	94.0	94.5
49.	Banks & investment	38.6	38.6	38.8	37.7
50.	Insurance	21.1	22.1	22.9	23.2
51.	Real estate	33.6	34.2	32.3	[illegible]
52.	Services	350.0	365.0	383.2	400.3
53.	Hotels & lodging	15.5	16.1	16.3	16.9
54.	Personal services	34.8	36.5	36.5	34.7
55.	Business services	59.8	65.6	71.4	72.2
56.	Auto repair & parking	16.7	17.4	18.4	18.5
57.	Amusement	15.9	15.9	16.8	21.7
58.	Health services	99.7	103.6	109.9	114.6
59.	Legal services	11.6	12.1	12.5	12.5
60.	Educational services	15.8	16.6	17.5	18.5
61.	Social services	32.8	33.3	35.8	38.3
62.	Private households	23.3	22.8	22.0	20.8
63.	Other services	23.8	25.1	26.0	31.5
64.	Government	278.8	284.6	287.8	292.7
65.	Federal, civilian	41.4	41.8	42.2	42.4
66.	Federal, military	60.2	59.4	59.2	58.3
67.	State and local	177.3	183.4	186.3	192.0

Kentucky: Employment (thousands)

Sort Key = None	1989	1990	1991	1992
01. All-Industry Total	1,863.3	1,912.9	1,915.5	1,961.0
02. Farm	127.1	125.2	119.4	122.1
03. Nonfarm	1,736.2	1,787.7	1,796.1	1,838.9
04. Agricultural services	17.0	18.5	19.3	18.7
05. Mining	38.5	39.4	35.8	33.2
06. Metal mining	(L)	(L)	(L)	(L)
07. Coal mining	31.0	31.8	28.5	26.4
08. Oil & gas	5.1	4.9	4.9	4.4
09. Nonmetalic minerals	2.4	2.6	2.4	2.4
10. Construction	98.8	100.6	98.7	105.9
11. Manufacturing	290.8	294.6	288.8	293.1
12. Durable goods	158.8	161.1	155.2	157.3
13. Lumber & wood	14.4	15.5	15.2	15.3
14. Furniture	4.8	4.6	4.3	4.6
15. Stone, clay, glass	10.3	10.6	10.6	11.0
16. Primary metals	17.4	17.3	16.8	16.9
17. Fabricated metals	18.5	19.4	19.0	1[illegible]
18. Indust. machinery	33.0	32.0	29.7	29.6
19. Electronic equip.	30.5	30.0	27.4	27.6
20. Motor vehicles	17.2	19.2	19.5	20.0
21. Other trans. equip.	3.0	3.0	2.9	3.1
22. Instruments	4.1	4.0	4.0	4.1
23. Misc. manufacturing	5.7	5.5	5.8	5.6
24. Nondurable goods	132.0	133.6	133.6	135.8
25. Food & kindred	19.0	19.5	20.9	21.4
26. Tobacco products	5.7	5.6	5.3	5.4
27. Textile mill prod.	9.7	10.3	9.6	9.9
28. Apparel & textile	30.6	29.2	29.3	30.3
29. Paper products	9.1	9.6	9.6	10.1
30. Printing & publish.	20.7	21.1	21.3	20.7
31. Chemicals	13.8	14.5	14.9	14.9
32. Petroleum products	4.1	3.7	3.7	3.8
33. Rubber & plastics	17.2	17.8	16.8	17.4
34. Leather products	2.2	2.3	2.1	1.9
35. Transport. & utilities	91.3	95.6	97.0	96.7

Kentucky: Employment (thousands)

Sort Key = None

		1989	1990	1991	1992
36.	Railroad transport.	6.6	6.4	6.3	5.7
37.	Local & interurban	2.6	2.8	3.0	3.3
38.	Trucking	36.3	38.9	40.0	39.7
39.	Water transportation	3.2	3.7	3.8	3.9
40.	Transportation by air	10.6	11.7	11.9	12.6
41.	Pipelines	0.1	0.1	0.1	0.1
42.	Transport. services	2.5	2.9	3.1	3.0
43.	Communications	13.4	13.4	13.2	12.8
44.	Utilities	16.1	15.7	15.5	15.4
45.	Wholesale and retail	396.6	404.3	405.1	415.0
46.	Wholesale trade	75.6	76.6	77.5	79.5
47.	Retail trade	321.0	327.7	327.6	335.5
48.	F.I.R.E.	95.0	97.1	98.4	96.7
49.	Banks & investment	38.2	38.5	37.8	37.6
50.	Insurance	23.3	23.8	24.9	24.5
51.	Real estate	33.4	34.8	35.7	[illegible]
52.	Services	410.0	436.1	447.0	462.9
53.	Hotels & lodging	17.0	17.5	17.1	17.2
54.	Personal services	31.7	34.8	35.2	36.2
55.	Business services	73.6	83.5	83.6	88.5
56.	Auto repair & parking	18.7	19.6	19.9	20.0
57.	Amusement	24.1	24.0	24.2	24.9
58.	Health services	120.1	128.3	136.5	143.3
59.	Legal services	12.9	13.4	13.7	14.4
60.	Educational services	19.1	20.0	22.0	22.1
61.	Social services	40.7	43.1	44.3	45.8
62.	Private households	19.7	18.0	17.7	17.9
63.	Other services	32.4	33.8	32.7	32.5
64.	Government	298.1	301.3	306.0	316.8
65.	Federal, civilian	43.5	45.6	44.5	44.9
66.	Federal, military	57.1	51.3	47.6	54.0
67.	State and local	197.5	204.4	213.9	218.0

Kentucky: Employment (thousands)

Sort Key = None	1993	1998	2000	2005
01. All-Industry Total	2,002.7	2,145.9	2,190.9	2,295.0
02. Farm	118.7	117.5	117.0	114.9
03. Nonfarm	1,884.0	2,028.5	2,074.0	2,180.1
04. Agricultural services	19.1	22.5	23.8	27.0
05. Mining	31.3	27.1	25.4	23.4
06. Metal mining	(L)	N/A	(L)	(L)
07. Coal mining	24.6	N/A	18.9	17.0
08. Oil & gas	4.3	N/A	3.9	3.7
09. Nonmetalic minerals	2.4	N/A	2.6	2.7
10. Construction	109.7	118.9	120.2	125.2
11. Manufacturing	302.7	311.5	313.5	317.3
12. Durable goods	162.9	166.6	166.8	167.9
13. Lumber & wood	16.5	N/A	18.6	19.6
14. Furniture	5.1	N/A	5.2	5.2
15. Stone, clay, glass	11.3	N/A	11.9	12.0
16. Primary metals	16.3	N/A	15.9	15.6
17. Fabricated metals	20.8	N/A	22.4	[illegible]
18. Indust. machinery	31.0	N/A	30.1	29.5
19. Electronic equip.	27.3	N/A	25.5	24.4
20. Motor vehicles	21.8	N/A	23.6	24.4
21. Other trans. equip.	3.2	N/A	3.9	4.2
22. Instruments	3.9	N/A	4.0	4.2
23. Misc. manufacturing	5.6	N/A	5.6	5.6
24. Nondurable goods	139.8	144.9	146.8	149.4
25. Food & kindred	22.3	N/A	22.8	22.7
26. Tobacco products	5.3	N/A	4.6	4.2
27. Textile mill prod.	10.3	N/A	10.4	10.2
28. Apparel & textile	31.1	N/A	32.5	32.7
29. Paper products	10.7	N/A	12.5	13.5
30. Printing & publish.	21.2	N/A	22.8	23.7
31. Chemicals	14.8	N/A	15.1	15.1
32. Petroleum products	3.6	N/A	3.5	3.5
33. Rubber & plastics	18.5	N/A	20.9	22.4
34. Leather products	2.0	N/A	1.7	1.5
35. Transport. & utilities	99.5	107.1	109.2	114.7

Kentucky: Employment (thousands)

Sort Key = None		1993	1998	2000	2005
36.	Railroad transport.	5.2	N/A	5.0	4.8
37.	Local & interurban	3.6	N/A	4.1	4.4
38.	Trucking	41.9	N/A	47.0	49.9
39.	Water transportation	3.8	N/A	3.9	3.9
40.	Transportation by air	13.3	N/A	16.0	17.7
41.	Pipelines	0.1	N/A	0.1	0.1
42.	Transport. services	3.4	N/A	4.4	5.0
43.	Communications	12.8	N/A	12.6	12.4
44.	Utilities	15.4	N/A	16.1	16.5
45.	Wholesale and retail	426.7	462.1	469.3	491.2
46.	Wholesale trade	78.5	N/A	85.5	88.9
47.	Retail trade	348.2	N/A	383.8	402.2
48.	F.I.R.E.	98.1	102.8	106.6	111.0
49.	Banks & investment	37.8	N/A	40.3	41.4
50.	Insurance	25.5	N/A	28.6	30.2
51.	Real estate	34.8	N/A	37.7	[illegible]
52.	Services	480.6	545.5	570.8	6[illegible].9
53.	Hotels & lodging	17.2	N/A	19.2	20.5
54.	Personal services	36.4	N/A	38.6	39.6
55.	Business services	95.1	N/A	122.4	138.6
56.	Auto repair & parking	20.8	N/A	23.7	25.5
57.	Amusement	26.9	N/A	31.9	34.2
58.	Health services	147.9	N/A	180.9	201.8
59.	Legal services	15.0	N/A	17.1	18.3
60.	Educational services	22.8	N/A	26.1	28.1
61.	Social services	47.7	N/A	56.9	62.0
62.	Private households	17.9	N/A	15.9	14.6
63.	Other services	32.8	N/A	38.1	41.9
64.	Government	316.3	331.0	335.2	345.4
65.	Federal, civilian	42.4	41.2	40.5	39.3
66.	Federal, military	50.2	50.5	50.3	50.3
67.	State and local	223.8	239.3	244.4	255.8

Kentucky: Employment (thousands)

Sort Key = None	2010	2015	2025	2045
01. All-Industry Total	2,380.8	2,439.3	2,490.0	2,731.4
02. Farm	112.0	108.1	99.3	93.9
03. Nonfarm	2,268.7	2,331.2	2,390.7	2,637.5
04. Agricultural services	29.8	31.9	34.5	40.2
05. Mining	21.8	20.6	18.3	15.8
06. Metal mining	(L)	(L)	(L)	(L)
07. Coal mining	15.5	14.5	12.5	10.1
08. Oil & gas	3.5	3.3	3.1	2.7
09. Nonmetalic minerals	2.7	2.8	2.8	3.0
10. Construction	129.4	131.9	133.5	146.0
11. Manufacturing	319.8	320.3	316.2	335.0
12. Durable goods	168.3	167.9	164.9	174.2
13. Lumber & wood	20.3	20.6	20.5	21.4
14. Furniture	5.2	5.2	5.0	5.1
15. Stone, clay, glass	12.1	12.2	12.3	13.7
16. Primary metals	15.3	15.0	14.4	14.9
17. Fabricated metals	23.8	24.1	24.3	2[illegible]
18. Indust. machinery	28.9	28.3	27.0	27.6
19. Electronic equip.	23.4	22.5	21.0	21.0
20. Motor vehicles	25.0	25.4	25.7	28.1
21. Other trans. equip.	4.4	4.6	4.7	5.2
22. Instruments	4.3	4.4	4.4	4.9
23. Misc. manufacturing	5.6	5.6	5.4	5.8
24. Nondurable goods	151.5	152.4	151.2	160.8
25. Food & kindred	22.5	22.4	21.9	23.1
26. Tobacco products	3.8	3.5	3.0	2.7
27. Textile mill prod.	10.0	9.8	9.4	9.7
28. Apparel & textile	32.8	32.5	30.9	30.6
29. Paper products	14.3	14.9	15.7	17.8
30. Printing & publish.	24.4	24.9	25.3	27.6
31. Chemicals	15.2	15.2	14.9	15.8
32. Petroleum products	3.4	3.4	3.3	3.5
33. Rubber & plastics	23.7	24.7	25.8	29.1
34. Leather products	1.4	1.2	1.0	0.9
35. Transport. & utilities	119.2	122.4	125.4	139.1

Kentucky: Employment (thousands)

Sort Key = None		2010	2015	2025	2045
36.	Railroad transport.	4.6	4.4	4.0	3.7
37.	Local & interurban	4.6	4.7	4.9	5.5
38.	Trucking	52.3	53.9	55.7	62.5
39.	Water transportation	4.0	4.1	4.1	4.6
40.	Transportation by air	19.0	20.2	21.6	24.9
41.	Pipelines	0.1	0.1	0.1	0.1
42.	Transport. services	5.5	5.9	6.4	7.6
43.	Communications	12.2	11.9	11.4	11.7
44.	Utilities	16.8	17.1	17.1	18.5
45.	Wholesale and retail	510.6	522.9	533.5	589.7
46.	Wholesale trade	91.4	92.8	93.3	101.6
47.	Retail trade	419.1	430.1	440.2	488.1
48.	F.I.R.E.	114.5	116.9	118.7	129.2
49.	Banks & investment	42.4	42.9	43.2	46.6
50.	Insurance	31.5	32.4	33.4	36.9
51.	Real estate	40.6	41.5	42.1	[illegible]
52.	Services	670.2	705.4	747.8	[illegible]
53.	Hotels & lodging	21.4	22.1	22.8	24.9
54.	Personal services	40.4	40.9	41.1	44.3
55.	Business services	152.2	163.0	176.6	205.2
56.	Auto repair & parking	26.9	28.0	29.2	32.6
57.	Amusement	36.1	37.5	38.9	43.1
58.	Health services	219.8	234.4	253.8	296.9
59.	Legal services	19.1	19.7	20.3	22.5
60.	Educational services	29.7	30.9	32.3	36.6
61.	Social services	66.0	68.9	71.7	79.4
62.	Private households	13.5	12.7	11.3	10.7
63.	Other services	45.0	47.3	49.9	56.3
64.	Government	353.5	359.0	362.8	390.1
65.	Federal, civilian	38.4	37.5	35.9	37.0
66.	Federal, military	50.3	50.3	50.3	50.3
67.	State and local	264.8	271.3	276.7	302.8

POINT SOURCE

EMISSIONS INVENTORY

GROWTH FACTORS

2002 Point Source Emissions Inventory & Projections: 2005, 2008, 2011, 2014, 2017, and 2020
Using Most Recent Bureau of Economic Analysis (BEA) Employment Data for Computing Growth Factors -- August 1995

SIC	dat2000	'00 - '02 Growth	PROJ dat2002	'02 - '05 Growth	'02 - '08 Growth	dat2010	'02 - '11 Growth	'02 - '14 Growth	'02 - '17 Growth	'02 - '20 Growth	dat2020
1	2356.7	1.04	2456.86	1.06	1.13	2895.7	1.15	1.21	1.27	1.33	3257.1
2	2356.7	1.04	2456.86	1.06	1.13	2895.7	1.15	1.21	1.27	1.33	3257.1
7	455.8	1.08	490.30	1.12	1.24	632.2	1.30	1.42	1.56	1.70	826.5
8	455.8	1.08	490.30	1.12	1.24	632.2	1.30	1.42	1.56	1.70	826.5
9	455.8	1.08	490.30	1.12	1.24	632.2	1.30	1.42	1.56	1.70	826.5
10	0.4	1.05	0.42	1.07	1.14	0.5	1.20	1.27	1.35	1.44	0.6
11	3648.5	1.05	3823.85	1.07	1.15	4601.2	1.17	1.23	1.30	1.37	5207.9
12	3648.5	1.05	3823.85	1.07	1.15	4601.2	1.17	1.23	1.30	1.37	5207.9
13	72.2	0.99	71.34	0.98	0.96	68	0.96	0.95	0.94	0.93	66.2
14	166.9	1.03	171.88	1.04	1.09	193.1	1.12	1.17	1.21	1.26	216.2
15	2837.8	1.02	2883.48	1.02	1.05	3072.7	1.06	1.09	1.11	1.13	3259.6
16	2837.8	1.02	2883.48	1.02	1.05	3072.7	1.06	1.09	1.11	1.13	3259.6
17	2837.8	1.02	2883.48	1.02	1.05	3072.7	1.06	1.09	1.11	1.13	3259.6
20	1819.4	1.01	1845.92	1.02	1.04	1956.4	1.07	1.09	1.11	1.14	2102
21	596.2	0.94	558.03	0.91	0.82	425.9	0.78	0.72	0.66	0.60	335
22	279.3	1.03	287.38	1.04	1.09	321.8	1.12	1.16	1.21	1.25	359.5
23	853.5	1.05	897.44	1.08	1.16	1093.6	1.20	1.27	1.35	1.43	1278.4
24	331.6	1.03	341.04	1.04	1.09	381.2	1.10	1.14	1.18	1.22	414.6
25	149.9	1.02	152.71	1.03	1.06	164.4	1.08	1.11	1.13	1.16	177.4
26	879.4	1.06	934.47	1.10	1.20	1186.1	1.26	1.36	1.47	1.59	1474
27	893.1	1.01	901.50	1.01	1.03	935.8	1.04	1.06	1.07	1.09	978.1
28	1380.6	1.03	1417.47	1.04	1.08	1573.7	1.11	1.16	1.20	1.24	1757.7
29	384.1	1.03	395.97	1.05	1.10	443.7	1.13	1.18	1.23	1.28	505.2
30	1020.1	1.05	1073.49	1.08	1.16	1312.3	1.22	1.30	1.39	1.48	1582.9
31	43.9	0.98	42.99	0.97	0.94	39.5	0.92	0.90	0.88	0.85	36.7
32	583.1	1.03	600.57	1.05	1.09	673.1	1.13	1.18	1.23	1.29	772.3
33	964	1.01	977.39	1.02	1.04	1032.6	1.06	1.09	1.11	1.13	1107.3
34	1071.5	1.03	1108.14	1.05	1.11	1265.9	1.14	1.20	1.25	1.31	1444.8
35	2507.8	1.04	2620.11	1.07	1.14	3114.6	1.17	1.23	1.29	1.36	3556.1
36	1797.6	1.03	1851.99	1.05	1.09	2084.2	1.12	1.16	1.21	1.25	2319.9
37	209	1.07	222.98	1.10	1.21	281.4	1.27	1.38	1.49	1.61	357.5
38	190.7	1.03	196.65	1.05	1.10	222.1	1.13	1.18	1.23	1.28	252
39	244.8	1.04	253.56	1.05	1.11	297.4	1.15	1.21	1.27	1.33	336.2
40	677	1.04	704.13	1.06	1.12	822.4	1.14	1.19	1.25	1.30	917.1
41	75	1.03	76.88	1.04	1.08	84.8	1.10	1.14	1.18	1.22	93.5
42	1902.8	1.04	1978.15	1.06	1.12	2306.3	1.16	1.22	1.29	1.35	2666.6
44	95.8	1.01	96.53	1.01	1.02	99.5	1.04	1.06	1.07	1.09	104.8
45	829.2	1.07	883.31	1.10	1.21	1131.9	1.27	1.38	1.49	1.62	1418.2
46	24.3	1.01	24.54	1.01	1.03	25.5	1.05	1.06	1.08	1.09	26.8
47	141.1	1.05	148.63	1.08	1.17	182.4	1.21	1.30	1.38	1.47	218.2
	1927.4	1.04	2013.55	1.07	1.14	2392.8	1.18	1.25	1.32	1.39	2795.7
	2108.1	1.03	2164.44	1.04	1.08	2403.2	1.11	1.15	1.19	1.23	2664.8
	4225.4	1.04	4388.54	1.06	1.12	5097.5	1.15	1.21	1.27	1.33	5815.5
51	4225.4	1.04	4388.54	1.06	1.12	5097.5	1.15	1.21	1.27	1.33	5815.5
52	7767.2	1.04	8047.33	1.05	1.11	9258.2	1.15	1.20	1.26	1.32	10569.7
53	7767.2	1.04	8047.33	1.05	1.11	9258.2	1.15	1.20	1.26	1.32	10569.7
54	7767.2	1.04	8047.33	1.05	1.11	9258.2	1.15	1.20	1.26	1.32	10569.7
55	7767.2	1.04	8047.33	1.05	1.11	9258.2	1.15	1.20	1.26	1.32	10569.7
56	7767.2	1.04	8047.33	1.05	1.11	9258.2	1.15	1.20	1.26	1.32	10569.7
57	7767.2	1.04	8047.33	1.05	1.11	9258.2	1.15	1.20	1.26	1.32	10569.7
58	7767.2	1.04	8047.33	1.05	1.11	9258.2	1.15	1.20	1.26	1.32	10569.7
59	7767.2	1.04	8047.33	1.05	1.11	9258.2	1.15	1.20	1.26	1.32	10569.7
60	2306.9	1.04	2399.08	1.06	1.12	2800.8	1.16	1.22	1.29	1.35	3236.6
61	2306.9	1.04	2399.08	1.06	1.12	2800.8	1.16	1.22	1.29	1.35	3236.6
62	2306.9	1.04	2399.08	1.06	1.12	2800.8	1.16	1.22	1.29	1.35	3236.6
63	1172.9	1.04	1216.13	1.06	1.11	1403.3	1.15	1.21	1.27	1.33	1613
64	1172.9	1.04	1216.13	1.06	1.11	1403.3	1.15	1.21	1.27	1.33	1613
65	6317.1	1.03	6510.75	1.05	1.09	7338.3	1.13	1.17	1.22	1.27	8245.8
66	6317.1	1.03	6510.75	1.05	1.09	7338.3	1.13	1.17	1.22	1.27	8245.8
67	2306.9	1.04	2399.08	1.06	1.12	2800.3	1.16	1.22	1.29	1.35	3236.6
70	348.6	1.04	361.24	1.05	1.11	415.3	1.15	1.20	1.25	1.31	473.2
72	416.7	1.01	422.92	1.02	1.05	448.5	1.07	1.09	1.11	1.14	480.5
73	1883.1	1.05	1986.04	1.08	1.17	2448.7	1.22	1.30	1.39	1.48	2924
75	480.6	1.03	495.03	1.05	1.09	556.6	1.12	1.16	1.21	1.25	619.7
76	1883.1	1.05	1986.04	1.08	1.17	2448.7	1.22	1.30	1.39	1.48	2924
78	354.8	1.04	368.39	1.06	1.12	427.4	1.15	1.21	1.27	1.33	490.2
79	354.8	1.04	368.39	1.06	1.12	427.4	1.15	1.21	1.27	1.33	490.2
80	4008.8	1.04	4182.67	1.07	1.14	4945.9	1.17	1.24	1.31	1.38	5744.1
81	553	1.02	566.75	1.04	1.08	624.8	1.10	1.13	1.17	1.20	682
82	283.1	1.04	293.46	1.06	1.11	338.3	1.15	1.20	1.26	1.32	386
83	690.9	1.04	718.92	1.06	1.13	841.2	1.16	1.22	1.28	1.34	960.7
84	762.5	1.05	798.14	1.07	1.15	955.7	1.19	1.25	1.33	1.41	1118.3
86	690.9	1.04	718.92	1.06	1.13	841.2	1.16	1.22	1.28	1.34	960.7
88	96.5	1.01	97.15	1.01	1.02	99.8	1.03	1.05	1.06	1.07	103.8
89	762.5	1.05	798.14	1.07	1.15	955.7	1.19	1.25	1.33	1.41	1118.3
91	1720.5	1.00	1726.82	1.01	1.01	1752.3	1.03	1.04	1.05	1.06	1824.1
92	5372.9	1.03	5507.62	1.04	1.08	6076.5	1.10	1.14	1.18	1.22	6705
93	5372.9	1.03	5507.62	1.04	1.08	6076.5	1.10	1.14	1.18	1.22	6705
94	5372.9	1.03	5507.62	1.04	1.08	6076.5	1.10	1.14	1.18	1.22	6705
95	5372.9	1.03	5507.62	1.04	1.08	6076.5	1.10	1.14	1.18	1.22	6705
96	5372.9	1.03	5507.62	1.04	1.08	6076.5	1.10	1.14	1.18	1.22	6705
97	1720.5	1.00	1726.82	1.01	1.01	1752.3	1.03	1.04	1.05	1.06	1824.1
371	3471.3	1.03	3586.30	1.05	1.10	4080.3	1.14	1.19	1.24	1.30	4643.7
888	1852.1	1.04	1920.02	1.06	1.11	2214	1.17	1.23	1.30	1.37	2619.4
991	0	#NUM!	#NUM!	#NUM!	#NUM!	0	#NUM!	#NUM!	#NUM!	#NUM!	0
992	1150.9	1.01	1160.81	1.01	1.03	1201.2	1.05	1.07	1.09	1.11	1283.2
	9878.4	1.04	10292.18	1.06	1.13	12102.9	1.17	1.23	1.29	1.36	13982.2
	11521.3	1.03	11913.09	1.05	1.11	13599.3	1.14	1.19	1.24	1.29	15381.6
997	8149.7	1.03	8367.58	1.04	1.08	9290.9	1.12	1.16	1.20	1.25	10409
998	19671	1.03	20281.09	1.05	1.10	22890.2	1.13	1.18	1.22	1.27	25790.6
999	3967	1.01	4016.32	1.02	1.04	4219	1.06	1.08	1.10	1.12	4515

POINT SOURCE

GROWTH FACTOR

SUMMARY

Source: BEA Regional Projections to 2045: States
U.S. Department of Commerce
Bureau of Economic Analysis
Regional Economic Analysis Division
August 1995

Computed through interpolation between Present and Future years. 2002 PROJ BEA is used as the Present Year and 2010 BEA (for 2005 and 2008) and 2020 BEA (for 2011, 2014, 2017, and 2020) is used as the Future Year.

MSA	COUNTY	PLANT_ID	FACILITY NAME	SIC Code	2002 BEA	'02 - '05 GROWTH	'02 - '08 GROWTH	2010 BEA	'02 - '11 GROWTH	'02 - '14 GROWTH	'02 - '17 GROWTH	'02 - '20 GROWTH	2020 BEA
Ashland	Greenup	00004	CSX TRANSPORTATION INC	4011	704.13	1.06	1.12	822.40	1.14	1.19	1.25	1.30	917.10
Ashland	Greenup	00014	PACTIV CORPORATION	3086	1,073.49	1.08	1.16	1,312.30	1.22	1.30	1.39	1.48	1,582.90
Ashland	Greenup	00032	PCI INC	2865	1,417.47	1.04	1.08	1,573.70	1.11	1.16	1.20	1.24	1,757.70
Ashland	Greenup	00034	GREEN VALLEY ENV CORP	4953	2,164.44	1.04	1.08	2,403.20	1.11	1.15	1.19	1.23	2,664.80

APPENDIX F

Area Source Emission Projection Methodology & Documentation

Ashland Ozone Maintenance Area

PROPOSED UPDATED MAINTENANCE EMISSIONS BUDGET

ASHLAND OZONE MAINTENANCE AREA
A PORTION OF GREENUP COUNTY

POPULATION DATA FROM

U OF L STATE DATA CENTER

How Many Kentuckians: Population Forecasts 2001 - 2030

	Census	Census	Projections					
County	1990	2000	2005	2010	2015	2020	2025	2030
Kentucky	3,686,891	4,041,769	4,246,743	4,442,374	4,640,916	4,843,219	5,043,016	5,235,685
Adair	15,360	17,244	18,191	19,138	20,144	21,162	22,127	23,038
Allen	14,628	17,800	19,925	22,169	24,616	27,240	30,021	32,939
Anderson	14,571	19,111	21,977	25,036	28,495	32,347	36,492	40,853
Ballard	7,902	8,286	8,597	8,868	9,142	9,413	9,656	9,857
Barren	34,001	38,033	40,366	42,640	44,978	47,300	49,502	51,524
Bath	9,692	11,085	11,882	12,681	13,496	14,321	15,128	15,891
Bell	31,506	30,060	29,396	28,588	27,588	26,453	25,207	23,856
Boone	57,589	85,991	104,982	126,036	150,709	179,528	212,412	249,143
Bourbon	19,236	19,360	19,392	19,350	19,260	19,110	18,854	18,491
Boyd	51,150	49,752	49,095	48,148	46,975	45,631	44,094	42,372
Boyle	25,641	27,697	28,503	29,273	30,085	30,888	31,573	32,065
Bracken	7,766	8,279	8,698	9,107	9,517	9,902	10,253	10,564
Breathitt	15,703	16,100	16,414	16,627	16,734	16,702	16,550	16,282
Breckinridge	16,312	18,648	20,130	21,554	22,998	24,447	25,846	27,178
Bullitt	47,567	61,236	69,571	77,928	86,778	96,050	105,481	114,909
Butler	11,245	13,010	14,232	15,454	16,741	18,105	19,497	20,895
Caldwell	13,232	13,060	13,047	12,988	12,877	12,723	12,517	12,246
Calloway	30,735	34,177	35,692	37,317	38,631	39,790	40,846	41,932
Campbell	83,866	88,616	90,700	92,385	93,818	94,931	95,542	95,547
Carlisle	5,238	5,351	5,448	5,530	5,605	5,687	5,759	5,807
Carroll	9,292	10,155	10,815	11,442	12,048	12,626	13,166	13,645
Carter	24,340	26,889	28,214	29,406	30,544	31,564	32,425	33,122
Casey	14,211	15,447	16,181	16,853	17,464	18,033	18,550	18,988
Christian	68,941	72,265	73,955	74,791	75,147	75,404	75,345	74,633
Clark	29,496	33,144	35,135	36,932	38,631	40,226	41,637	42,813
Clay	21,746	24,556	26,152	27,615	28,938	30,020	30,904	31,553
Clinton	9,135	9,634	9,890	10,079	10,223	10,318	10,345	10,299
Crittenden	9,196	9,384	9,533	9,645	9,733	9,783	9,774	9,695
Cumberland	6,784	7,147	7,385	7,580	7,747	7,892	8,008	8,085
Daviess	87,189	91,545	92,994	94,022	94,772	95,221	95,237	94,749
Edmonson	10,357	11,644	12,428	13,152	13,854	14,536	15,180	15,775
Elliott	6,455	6,748	6,940	7,122	7,279	7,394	7,460	7,494
Estill	14,614	15,307	15,730	16,048	16,283	16,424	16,460	16,373
Fayette	225,366	260,512	279,005	295,664	311,436	326,446	340,043	351,829
Fleming	12,292	13,792	14,818	15,851	16,929	18,034	19,127	20,198
Floyd	43,586	42,441	41,893	41,052	39,881	38,419	36,688	34,674
Franklin	44,143	47,687	49,196	50,440	51,469	52,255	52,710	52,789
Fulton	8,271	7,752	7,580	7,419	7,257	7,089	6,907	6,706
Gallatin	5,393	7,870	9,618	11,638	14,063	16,911	20,200	23,981
Garrard	11,579	14,792	16,943	19,251	21,840	24,683	27,722	30,920
Grant	15,737	22,384	27,063	32,341	38,599	45,939	54,408	64,125
Graves	33,550	37,028	39,038	41,071	43,261	45,573	47,907	50,203
Grayson	21,050	24,053	25,908	27,698	29,490	31,248	32,950	34,572
Green	10,371	11,518	12,144	12,765	13,412	14,066	14,713	15,339
Greenup	36,742	36,891	37,086	36,989	36,668	36,190	35,566	34,798
Hancock	7,864	8,392	8,720	8,984	9,240	9,471	9,645	9,761
Hardin	89,240	94,174	97,374	100,278	102,989	105,299	107,223	108,851

How Many Kentuckians: Population Forecasts 2001 - 2030

County	Census 1990	Census 2000	Projections 2005	2010	2015	2020	2025	2030
Harlan	36,574	33,202	31,591	29,893	28,088	26,228	24,319	22,347
Harrison	16,248	17,983	19,195	20,380	21,590	22,772	23,861	24,815
Hart	14,890	17,445	19,151	20,854	22,638	24,504	26,452	28,449
Henderson	43,044	44,829	45,701	46,303	46,729	46,933	46,831	46,414
Henry	12,823	15,060	16,491	17,912	19,386	20,884	22,359	23,784
Hickman	5,566	5,262	5,116	4,987	4,853	4,712	4,549	4,360
Hopkins	46,126	46,519	46,665	46,644	46,460	46,077	45,442	44,552
Jackson	11,955	13,495	14,504	15,490	16,492	17,460	18,368	19,209
Jefferson	665,123	693,604	706,907	717,376	725,967	732,776	737,210	738,510
Jessamine	30,508	39,041	43,521	48,116	53,174	58,647	64,346	70,114
Johnson	23,248	23,445	23,592	23,550	23,349	23,002	22,477	21,765
Kenton	142,031	151,464	156,074	159,730	162,859	165,463	167,219	167,873
Knott	17,906	17,649	17,449	17,145	16,726	16,173	15,497	14,717
Knox	29,676	31,795	32,856	33,751	34,527	35,124	35,521	35,721
Larue	11,679	13,373	14,397	15,406	16,481	17,632	18,797	19,940
Laurel	43,438	52,715	58,091	63,370	68,810	74,334	79,783	85,088
Lawrence	13,998	15,569	16,678	17,696	18,643	19,503	20,287	20,971
Lee	7,422	7,916	8,214	8,483	8,692	8,830	8,896	8,883
Leslie	13,642	12,401	11,713	10,999	10,241	9,454	8,646	7,828
Letcher	27,000	25,277	24,546	23,660	22,620	21,452	20,169	18,772
Lewis	13,029	14,092	14,860	15,577	16,253	16,877	17,446	17,950
Lincoln	20,045	23,361	25,450	27,520	29,709	32,012	34,336	36,637
Livingston	9,062	9,804	10,298	10,763	11,221	11,651	12,032	12,350
Logan	24,416	26,573	27,993	29,362	30,754	32,140	33,450	34,643
Lyon	6,624	8,080	8,812	9,609	10,522	11,499	12,509	13,585
McCracken	62,879	65,514	66,566	67,329	67,926	68,329	68,391	68,004
McCreary	15,603	17,080	18,135	19,082	19,954	20,745	21,439	22,029
McLean	9,628	9,938	10,224	10,457	10,683	10,889	11,042	11,141
Madison	57,508	70,872	77,378	83,629	89,741	96,102	102,500	108,732
Magoffin	13,077	13,332	13,515	13,590	13,559	13,454	13,253	12,954
Marion	16,499	18,212	19,138	20,049	20,975	21,886	22,751	23,533
Marshall	27,205	30,125	31,598	32,970	34,325	35,607	36,736	37,677
Martin	12,526	12,578	12,652	12,597	12,418	12,165	11,856	11,459
Mason	16,666	16,800	16,929	16,966	16,930	16,834	16,658	16,362
Meade	24,170	26,349	27,647	28,963	30,417	32,045	33,852	35,873
Menifee	5,092	6,556	7,471	8,407	9,403	10,445	11,526	12,645
Mercer	19,148	20,817	21,735	22,549	23,339	24,110	24,795	25,353
Metcalfe	8,963	10,037	10,719	11,377	12,050	12,727	13,392	14,044
Monroe	11,401	11,756	12,028	12,246	12,415	12,538	12,614	12,644
Montgomery	19,561	22,554	24,349	26,089	27,841	29,617	31,394	33,106
Morgan	11,648	13,948	15,258	16,621	18,026	19,368	20,635	21,824
Muhlenberg	31,318	31,839	32,072	32,136	32,033	31,768	31,323	30,678
Nelson	29,710	37,477	42,078	46,792	51,905	57,328	62,881	68,458
Nicholas	6,725	6,813	6,869	6,895	6,884	6,849	6,790	6,695
Ohio	21,105	22,916	24,119	25,271	26,374	27,413	28,354	29,167
Oldham	33,263	46,178	54,441	62,789	71,753	81,508	91,920	102,650
Owen	9,035	10,547	11,575	12,618	13,728	14,911	16,129	17,361
Owsley	5,036	4,858	4,797	4,712	4,610	4,492	4,352	4,186
Pendleton	12,036	14,390	16,004	17,690	19,496	21,385	23,314	25,261

How Many Kentuckians: Population Forecasts 2001 - 2030

	Census	Census	Projections					
County	1990	2000	2005	2010	2015	2020	2025	2030
Perry	30,283	29,390	28,870	28,105	27,111	25,930	24,590	23,077
Pike	72,583	68,736	66,710	64,207	61,342	58,214	54,818	51,158
Powell	11,686	13,237	14,189	15,063	15,866	16,590	17,247	17,820
Pulaski	49,489	56,217	59,875	63,228	66,448	69,558	72,471	75,092
Robertson	2,124	2,266	2,340	2,411	2,476	2,528	2,570	2,597
Rockcastle	14,803	16,582	17,680	18,723	19,716	20,662	21,530	22,299
Rowan	20,353	22,094	22,490	22,856	23,021	23,131	23,136	23,005
Russell	14,716	16,315	17,122	17,830	18,494	19,088	19,584	19,986
Scott	23,867	33,061	38,696	44,851	51,981	60,146	69,167	78,858
Shelby	24,824	33,337	38,811	44,723	51,426	58,906	67,006	75,621
Simpson	15,145	16,405	17,098	17,737	18,411	19,105	19,732	20,260
Spencer	6,801	11,766	15,640	20,416	26,520	34,226	43,718	55,221
Taylor	21,146	22,927	23,622	24,227	24,758	25,168	25,444	25,611
Todd	10,940	11,971	12,671	13,365	14,109	14,871	15,620	16,347
Trigg	10,361	12,597	14,136	15,740	17,472	19,345	21,352	23,468
Trimble	6,090	8,125	9,545	11,134	12,976	15,079	17,408	19,984
Union	16,557	15,637	15,361	15,070	14,776	14,478	14,157	13,813
Warren	77,720	92,522	100,331	108,054	116,102	124,518	133,234	142,201
Washington	10,441	10,916	11,130	11,301	11,457	11,582	11,654	11,658
Wayne	17,468	19,923	21,411	22,863	24,348	25,838	27,284	28,684
Webster	13,955	14,120	14,362	14,573	14,755	14,856	14,876	14,824
Whitley	33,326	35,865	37,208	38,411	39,522	40,466	41,201	41,720
Wolfe	6,503	7,065	7,413	7,715	7,975	8,197	8,376	8,501
Woodford	19,955	23,208	24,896	26,427	27,897	29,288	30,485	31,408

POPULATION PROJECTION

GROWTH FACTORS

Population Growth Factors and Projections: Former 1-Hour Ozone Maintenance Areas

Population Growth Factors

County	MSA	Apportionment Factor	'02 - '05 GROWTH	'02 - '08 GROWTH	'02 - '11 GROWTH	'02 - '14 GROWTH	'02 - '17 GROWTH	'02 - '20 GROWTH
Edmonson	Bowling Green	100.0%	1.02	1.04	1.06	1.08	1.10	1.12
Greenup	Ashland	63.4%	1.00	1.01	1.00	1.00	1.00	1.00
Fayette	Lexington	100.0%	1.03	1.05	1.09	1.12	1.15	1.18
Scott	Lexington	100.0%	1.09	1.19	1.25	1.35	1.45	1.56
Daviess	Owensboro	100.0%	1.01	1.02	1.04	1.06	1.07	1.08
Hancock	Owensboro	22.6%	1.00	0.99	1.02	1.03	1.04	1.04
Livingston	Paducah	13.6%	1.00	0.99	1.01	1.01	1.01	1.02
Marshall	Paducah	100.0%	1.02	1.04	1.05	1.07	1.09	1.10

Population Projections

County	MSA	Apportionment Factor	2002 Population	Apportioned Population	PROJ 2005	PROJ 2008	Data U of L Est. 2010	PROJ 2011	PROJ 2014	PROJ 2017	Data U of L Est. 2020
Edmonson	Bowling Green	100.0%	11,841	11,841	12,047	12,258	12,398	12,504	12,733	12,967	13,200
Greenup	Ashland	63.4%	36,761	23,306	36,860	36,960	37,026	36,823	36,844	36,865	36,886
Fayette	Lexington	100.0%	263,618	263,618	270,255	277,059	281,613	286,096	294,007	302,137	310,262
Scott	Lexington	100.0%	35,320	35,320	38,506	41,979	44,322	44,143	47,549	51,218	54,871
Daviess	Owensboro	100.0%	91,694	91,694	92,763	93,845	94,567	95,496	96,798	98,118	99,438
Hancock	Owensboro	22.6%	8,573	1,937	8,547	8,522	8,505	8,752	8,813	8,874	8,935
Livingston	Paducah	13.6%	9,846	1,339	9,818	9,790	9,771	9,920	9,945	9,970	9,995
Marshall	Paducah	100.0%	30,261	30,261	30,793	31,334	31,696	31,797	32,326	32,864	33,402

Population data provided by the Kentucky State Data Center, University of Louisville

-- December 2006

APPENDIX G

Non-Highway Mobile Source Emission Projection Methodology & Documentation

Ashland Ozone Maintenance Area

PROPOSED UPDATED MAINTENANCE EMISSIONS BUDGET

ASHLAND OZONE MAINTENANCE AREA
A PORTION OF GREENUP COUNTY

POPULATION DATA

FROM

U OF L STATE DATA CENTER

How Many Kentuckians: Population Forecasts 2001 - 2030

	Census	Census	Projections					
County	1990	2000	2005	2010	2015	2020	2025	2030
Kentucky	3,686,891	4,041,769	4,246,743	4,442,374	4,640,916	4,843,219	5,043,016	5,235,685
Adair	15,360	17,244	18,191	19,138	20,144	21,162	22,127	23,038
Allen	14,628	17,800	19,925	22,169	24,616	27,240	30,021	32,939
Anderson	14,571	19,111	21,977	25,036	28,495	32,347	36,492	40,853
Ballard	7,902	8,286	8,597	8,868	9,142	9,413	9,656	9,857
Barren	34,001	38,033	40,366	42,640	44,978	47,300	49,502	51,524
Bath	9,692	11,085	11,882	12,681	13,496	14,321	15,128	15,891
Bell	31,506	30,060	29,396	28,588	27,588	26,453	25,207	23,856
Boone	57,589	85,991	104,982	126,036	150,709	179,528	212,412	249,143
Bourbon	19,236	19,360	19,392	19,350	19,260	19,110	18,854	18,491
Boyd	51,150	49,752	49,095	48,148	46,975	45,631	44,094	42,372
Boyle	25,641	27,697	28,503	29,273	30,085	30,888	31,573	32,065
Bracken	7,766	8,279	8,698	9,107	9,517	9,902	10,253	10,564
Breathitt	15,703	16,100	16,414	16,627	16,734	16,702	16,550	16,282
Breckinridge	16,312	18,648	20,130	21,554	22,998	24,447	25,846	27,178
Bullitt	47,567	61,236	69,571	77,928	86,778	96,050	105,481	114,909
Butler	11,245	13,010	14,232	15,454	16,741	18,105	19,497	20,895
Caldwell	13,232	13,060	13,047	12,988	12,877	12,723	12,517	12,246
Calloway	30,735	34,177	35,692	37,317	38,631	39,790	40,846	41,932
Campbell	83,866	88,616	90,700	92,385	93,818	94,931	95,542	95,547
Carlisle	5,238	5,351	5,448	5,530	5,605	5,687	5,759	5,807
Carroll	9,292	10,155	10,815	11,442	12,048	12,626	13,166	13,645
Carter	24,340	26,889	28,214	29,406	30,544	31,564	32,425	33,122
Casey	14,211	15,447	16,181	16,853	17,464	18,033	18,550	18,988
Christian	68,941	72,265	73,955	74,791	75,147	75,404	75,345	74,633
Clark	29,496	33,144	35,135	36,932	38,631	40,226	41,637	42,813
Clay	21,746	24,556	26,152	27,615	28,938	30,020	30,904	31,553
Clinton	9,135	9,634	9,890	10,079	10,223	10,318	10,345	10,299
Crittenden	9,196	9,384	9,533	9,645	9,733	9,783	9,774	9,695
Cumberland	6,784	7,147	7,385	7,580	7,747	7,892	8,008	8,085
Daviess	87,189	91,545	92,994	94,022	94,772	95,221	95,237	94,749
Edmonson	10,357	11,644	12,428	13,152	13,854	14,536	15,180	15,775
Elliott	6,455	6,748	6,940	7,122	7,279	7,394	7,460	7,494
Estill	14,614	15,307	15,730	16,048	16,283	16,424	16,460	16,373
Fayette	225,366	260,512	279,005	295,664	311,436	326,446	340,043	351,829
Fleming	12,292	13,792	14,818	15,851	16,929	18,034	19,127	20,198
Floyd	43,586	42,441	41,893	41,052	39,881	38,419	36,688	34,674
Franklin	44,143	47,687	49,196	50,440	51,469	52,255	52,710	52,789
Fulton	8,271	7,752	7,580	7,419	7,257	7,089	6,907	6,706
Gallatin	5,393	7,870	9,618	11,638	14,063	16,911	20,200	23,981
Garrard	11,579	14,792	16,943	19,251	21,840	24,683	27,722	30,920
Grant	15,737	22,384	27,063	32,341	38,599	45,939	54,408	64,125
Graves	33,550	37,028	39,038	41,071	43,261	45,573	47,907	50,203
Grayson	21,050	24,053	25,908	27,698	29,490	31,248	32,950	34,572
Green	10,371	11,518	12,144	12,765	13,412	14,066	14,713	15,339
Greenup	36,742	36,891	37,086	36,989	36,668	36,190	35,566	34,798
Hancock	7,864	8,392	8,720	8,984	9,240	9,471	9,645	9,761
Hardin	89,240	94,174	97,374	100,278	102,989	105,299	107,223	108,851

How Many Kentuckians: Population Forecasts 2001 - 2030

County	Census 1990	Census 2000	Projections 2005	2010	2015	2020	2025	2030
Harlan	36,574	33,202	31,591	29,893	28,088	26,228	24,319	22,347
Harrison	16,248	17,983	19,195	20,380	21,590	22,772	23,861	24,815
Hart	14,890	17,445	19,151	20,854	22,638	24,504	26,452	28,449
Henderson	43,044	44,829	45,701	46,303	46,729	46,933	46,831	46,414
Henry	12,823	15,060	16,491	17,912	19,386	20,884	22,359	23,784
Hickman	5,566	5,262	5,116	4,987	4,853	4,712	4,549	4,360
Hopkins	46,126	46,519	46,665	46,644	46,460	46,077	45,442	44,552
Jackson	11,955	13,495	14,504	15,490	16,492	17,460	18,368	19,209
Jefferson	665,123	693,604	706,907	717,376	725,967	732,776	737,210	738,510
Jessamine	30,508	39,041	43,521	48,116	53,174	58,647	64,346	70,114
Johnson	23,248	23,445	23,592	23,550	23,349	23,002	22,477	21,765
Kenton	142,031	151,464	156,074	159,730	162,859	165,463	167,219	167,873
Knott	17,906	17,649	17,449	17,145	16,726	16,173	15,497	14,717
Knox	29,676	31,795	32,856	33,751	34,527	35,124	35,521	35,721
Larue	11,679	13,373	14,397	15,406	16,481	17,632	18,797	19,940
Laurel	43,438	52,715	58,091	63,370	68,810	74,334	79,783	85,088
Lawrence	13,998	15,569	16,678	17,696	18,643	19,503	20,287	20,971
Lee	7,422	7,916	8,214	8,483	8,692	8,830	8,896	8,883
Leslie	13,642	12,401	11,713	10,999	10,241	9,454	8,646	7,828
Letcher	27,000	25,277	24,546	23,660	22,620	21,452	20,169	18,772
Lewis	13,029	14,092	14,860	15,577	16,253	16,877	17,446	17,950
Lincoln	20,045	23,361	25,450	27,520	29,709	32,012	34,336	36,637
Livingston	9,062	9,804	10,298	10,763	11,221	11,651	12,032	12,350
Logan	24,416	26,573	27,993	29,362	30,754	32,140	33,450	34,643
Lyon	6,624	8,080	8,812	9,609	10,522	11,499	12,509	13,585
McCracken	62,879	65,514	66,566	67,329	67,926	68,329	68,391	68,004
McCreary	15,603	17,080	18,135	19,082	19,954	20,745	21,439	22,029
McLean	9,628	9,938	10,224	10,457	10,683	10,889	11,042	11,141
Madison	57,508	70,872	77,378	83,629	89,741	96,102	102,500	108,732
Magoffin	13,077	13,332	13,515	13,590	13,559	13,454	13,253	12,954
Marion	16,499	18,212	19,138	20,049	20,975	21,886	22,751	23,533
Marshall	27,205	30,125	31,598	32,970	34,325	35,607	36,736	37,677
Martin	12,526	12,578	12,652	12,597	12,418	12,165	11,856	11,459
Mason	16,666	16,800	16,929	16,966	16,930	16,834	16,658	16,362
Meade	24,170	26,349	27,647	28,963	30,417	32,045	33,852	35,873
Menifee	5,092	6,556	7,471	8,407	9,403	10,445	11,526	12,645
Mercer	19,148	20,817	21,735	22,549	23,339	24,110	24,795	25,353
Metcalfe	8,963	10,037	10,719	11,377	12,050	12,727	13,392	14,044
Monroe	11,401	11,756	12,028	12,246	12,415	12,538	12,614	12,644
Montgomery	19,561	22,554	24,349	26,089	27,841	29,617	31,394	33,106
Morgan	11,648	13,948	15,258	16,621	18,026	19,368	20,635	21,824
Muhlenberg	31,318	31,839	32,072	32,136	32,033	31,768	31,323	30,678
Nelson	29,710	37,477	42,078	46,792	51,905	57,328	62,881	68,458
Nicholas	6,725	6,813	6,869	6,895	6,884	6,849	6,790	6,695
Ohio	21,105	22,916	24,119	25,271	26,374	27,413	28,354	29,167
Oldham	33,263	46,178	54,441	62,789	71,753	81,508	91,920	102,650
Owen	9,035	10,547	11,575	12,618	13,728	14,911	16,129	17,361
Owsley	5,036	4,858	4,797	4,712	4,610	4,492	4,352	4,186
Pendleton	12,036	14,390	16,004	17,690	19,496	21,385	23,314	25,261

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	Census	Census	Projections					
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Pike	72,583	68,736	66,710	64,207	61,342	58,214	54,818	51,158
Powell	11,686	13,237	14,189	15,063	15,866	16,590	17,247	17,820
Pulaski	49,489	56,217	59,875	63,228	66,448	69,558	72,471	75,092
Robertson	2,124	2,266	2,340	2,411	2,476	2,528	2,570	2,597
Rockcastle	14,803	16,582	17,680	18,723	19,716	20,662	21,530	22,299
Rowan	20,353	22,094	22,490	22,856	23,021	23,131	23,136	23,005
Russell	14,716	16,315	17,122	17,830	18,494	19,088	19,584	19,986
Scott	23,867	33,061	38,696	44,851	51,981	60,146	69,167	78,858
Shelby	24,824	33,337	38,811	44,723	51,426	58,906	67,006	75,621
Simpson	15,145	16,405	17,098	17,737	18,411	19,105	19,732	20,260
Spencer	6,801	11,766	15,640	20,416	26,520	34,226	43,718	55,221
Taylor	21,146	22,927	23,622	24,227	24,758	25,168	25,444	25,611
Todd	10,940	11,971	12,671	13,365	14,109	14,871	15,620	16,347
Trigg	10,361	12,597	14,136	15,740	17,472	19,345	21,352	23,468
Trimble	6,090	8,125	9,545	11,134	12,976	15,079	17,408	19,984
Union	16,557	15,637	15,361	15,070	14,776	14,478	14,157	13,813
Warren	77,720	92,522	100,331	108,054	116,102	124,518	133,234	142,201
Washington	10,441	10,916	11,130	11,301	11,457	11,582	11,654	11,658
Wayne	17,468	19,923	21,411	22,863	24,348	25,838	27,284	28,684
Webster	13,955	14,120	14,362	14,573	14,755	14,856	14,876	14,824
Whitley	33,326	35,865	37,208	38,411	39,522	40,466	41,201	41,720
Wolfe	6,503	7,065	7,413	7,715	7,975	8,197	8,376	8,501
Woodford	19,955	23,208	24,896	26,427	27,897	29,288	30,485	31,408

POPULATION PROJECTION

GROWTH FACTORS

Population Growth Factors and Projectior Former 1-Hour Ozone Maintenance Areas

Population Growth Factors

County	MSA	Apportionment Factor	'02 - '05 GROWTH	'02 - '08 GROWTH	'02 - '11 GROWTH	'02 - '14 GROWTH	'02 - '17 GROWTH	'02 - '20 GROWTH
Edmonson	Bowling Green	100.0%	1.02	1.04	1.06	1.08	1.10	1.12
Greenup	Ashland	63.4%	1.00	1.01	1.00	1.00	1.00	1.00
Fayette	Lexington	100.0%	1.03	1.05	1.09	1.12	1.15	1.18
Scott	Lexington	100.0%	1.09	1.19	1.25	1.35	1.45	1.56
Daviess	Owensboro	100.0%	1.01	1.02	1.04	1.06	1.07	1.08
Hancock	Owensboro	22.6%	1.00	0.99	1.02	1.03	1.04	1.04
Livingston	Paducah	13.6%	1.00	0.99	1.01	1.01	1.01	1.02
Marshall	Paducah	100.0%	1.02	1.04	1.05	1.07	1.09	1.10

Population Projections

County	MSA	Apportionment Factor	2002 Population	Apportioned Population	PROJ 2005	PROJ 2008	Data U of L Est. 2010	PROJ 2011	PROJ 2014	PROJ 2017	Data U of L Est. 2020
Edmonson	Bowling Green	100.0%	11,841	11,841	12,047	12,258	12,398	12,504	12,733	12,967	13,200
Greenup	Ashland	63.4%	36,761	23,306	36,860	36,960	37,026	36,823	36,844	36,865	36,886
Fayette	Lexington	100.0%	263,618	263,618	270,255	277,059	281,613	286,096	294,007	302,137	310,262
Scott	Lexington	100.0%	35,320	35,320	38,506	41,979	44,322	44,143	47,549	51,218	54,871
Daviess	Owensboro	100.0%	91,694	91,694	92,763	93,845	94,567	95,496	96,798	98,118	99,438
Hancock	Owensboro	22.6%	8,573	1,937	8,547	8,522	8,505	8,752	8,813	8,874	8,935
Livingston	Paducah	13.6%	9,846	1,339	9,818	9,790	9,771	9,920	9,945	9,970	9,995
Marshall	Paducah	100.0%	30,261	30,261	30,793	31,334	31,696	31,797	32,326	32,864	33,402

Population data provided by the Kentucky State Data Center, University of Louisville

-- December 2006

OTHER NON-HIGHWAY

MOBILE SOURCE

EMISSIONS SUMMARY

FROM NON-ROAD MODEL

Emission Totals by County and Pollutant

All Fuels

Tons/Day

Greenup County
2002 (Grnup02)

Typical weekday for Summer Season, 2002

Date of Model Run: Jul 09 13:31:17: 2007

Today's Date: 7/9/2007

FIPS	County	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM25	Exhaust SO2	Exhaust CO2	Crankcase VOC	Diurnal VOC
21089	Greenup County	0.69	0.43	7.59	0.05	0.04	45.34	0.01	0.08
Totals:		**0.69**	**0.43**	**7.59**	**0.05**	**0.04**	**45.34**	**0.01**	**0.08**

Emission Totals by County and Pollutant

All Fuels

Tons/Day

Greenup County
2002 (Grnup02)

Typical weekday for Summer Season, 2002

Date of Model Run: Jul 09 13:31:17: 2007

Today's Date: 7/9/2007

FIPS	County	Vapor Displacement VOC	Spillage VOC	Hot Soak VOC	Running Loss VOC	Tank Permeation VOC	Hose Permeation VOC	Total VOC
21089	Greenup County	0.01	0.02	0.00	0.01	0.05	0.14	1.02
Totals:		**0.01**	**0.02**	**0.00**	**0.01**	**0.05**	**0.14**	**1.02**

#Name?

Emission Totals by County and Pollutant

All Fuels

Tons/Day

Greenup County
2005 (Grnup05)

Typical weekday for Summer Season, 2005

Date of Model Run: Jul 09 13:47:16: 2007

Today's Date: 7/9/2007

FIPS	County	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM25	Exhaust SO2	Exhaust CO2	Crankcase VOC	Diurnal VOC
21089	Greenup County	0.09	0.00	1.14	0.01	0.00	1.79	0.00	0.00
Totals:		**0.09**	**0.00**	**1.14**	**0.01**	**0.00**	**1.79**	**0.00**	**0.00**

Emission Totals by County and Pollutant

All Fuels

Tons/Day

Greenup County
2005 (Grnup05)

Typical weekday for Summer Season, 2005

Date of Model Run: Jul 09 13:47:16: 2007

Today's Date: 7/9/2007

FIPS	County	Vapor Displacement VOC	Spillage VOC	Hot Soak VOC	Running Loss VOC	Tank Permeation VOC	Hose Permeation VOC	Total VOC
21089	Greenup County	0.00	0.01	0.00	0.00	0.00	0.01	0.12
Totals:		**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.01**	**0.12**

Emission Totals by County and Pollutant

All Fuels

Tons/Day

Greenup County
2008 (Grnup08)

Typical weekday for Summer Season, 2008

Date of Model Run: Jul 09 13:59:17: 2007

Today's Date: 7/9/2007

FIPS	County	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM25	Exhaust SO2	Exhaust CO2	Crankcase VOC	Diurnal VOC
21089	Greenup County	0.46	0.38	8.12	0.04	0.05	49.98	0.00	0.08
Totals:		**0.46**	**0.38**	**8.12**	**0.04**	**0.05**	**49.98**	**0.00**	**0.08**

Emission Totals by County and Pollutant

All Fuels

Tons/Day

Greenup County
2008 (Grnup08)

Typical weekday for Summer Season, 2008

Date of Model Run: Jul 09 13:59:17: 2007

Today's Date: 7/9/2007

FIPS	County	Vapor Displacement VOC	Spillage VOC	Hot Soak VOC	Running Loss VOC	Tank Permeation VOC	Hose Permeation VOC	Total VOC
21089	Greenup County	0.01	0.02	0.00	0.01	0.06	0.15	0.80
Totals:		**0.01**	**0.02**	**0.00**	**0.01**	**0.06**	**0.15**	**0.80**

Emission Totals by County and Pollutant

All Fuels

Greenup County
2011 (Grnup11)

Typical weekday for Summer Season, 2011

Date of Model Run: Jul 09 14:12:00: 2007

Tons/Day

Today's Date: 7/9/2007

FIPS	County	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM25	Exhaust SO2	Exhaust CO2	Crankcase VOC	Diurnal VOC
21089	Greenup County	0.39	0.34	8.33	0.04	0.05	52.52	0.00	0.08
Totals:		**0.39**	**0.34**	**8.33**	**0.04**	**0.05**	**52.52**	**0.00**	**0.08**

Emission Totals by County and Pollutant

All Fuels

Tons/Day

Greenup County
2011 (Grnup11)

Typical weekday for Summer Season, 2011

Date of Model Run: Jul 09 14:12:00: 2007

Today's Date: 7/9/2007

FIPS	County	Vapor Displacement VOC	Spillage VOC	Hot Soak VOC	Running Loss VOC	Tank Permeation VOC	Hose Permeation VOC	Total VOC
21089	Greenup County	0.01	0.02	0.00	0.01	0.06	0.16	0.74
Totals:		**0.01**	**0.02**	**0.00**	**0.01**	**0.06**	**0.16**	**0.74**

Emission Totals by County and Pollutant

All Fuels

Tons/Day

Greenup County
2014 (Grnup14)

Typical weekday for Summer Season, 2014

Date of Model Run: Jul 09 14:16:51: 2007

Today's Date: 7/9/2007

FIPS	County	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM25	Exhaust SO2	Exhaust CO2	Crankcase VOC	Diurnal VOC
21089	Greenup County	0.35	0.30	8.56	0.05	0.05	55.23	0.00	0.09
Totals:		**0.35**	**0.30**	**8.56**	**0.05**	**0.05**	**55.23**	**0.00**	**0.09**

#Name?

Emission Totals by County and Pollutant

All Fuels

Tons/Day

Greenup County
2014 (Grnup14)

Typical weekday for Summer Season, 2014

Date of Model Run: Jul 09 14:16:51: 2007

Today's Date: 7/9/2007

FIPS	County	Vapor Displacement VOC	Spillage VOC	Hot Soak VOC	Running Loss VOC	Tank Permeation VOC	Hose Permeation VOC	Total VOC
21089	Greenup County	0.01	0.02	0.00	0.01	0.06	0.17	0.71
Totals:		**0.01**	**0.02**	**0.00**	**0.01**	**0.06**	**0.17**	**0.71**

Emission Totals by County and Pollutant

All Fuels

Greenup County
2017 (Grnup17)

Typical weekday for Summer Season, 2017

Date of Model Run: Jul 09 14:21:57: 2007

Tons/Day

Today's Date: 7/9/2007

FIPS	County	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM25	Exhaust SO2	Exhaust CO2	Crankcase VOC	Diurnal VOC
21089	Greenup County	0.33	0.26	8.83	0.05	0.05	58.00	0.00	0.09
Totals:		**0.33**	**0.26**	**8.83**	**0.05**	**0.05**	**58.00**	**0.00**	**0.09**

Emission Totals by County and Pollutant

All Fuels

Tons/Day

Greenup County
2017 (Grnup17)

Typical weekday for Summer Season, 2017

Date of Model Run: Jul 09 14:21:57: 2007

Today's Date: 7/9/2007

FIPS	County	Vapor Displacement VOC	Spillage VOC	Hot Soak VOC	Running Loss VOC	Tank Permeation VOC	Hose Permeation VOC	Total VOC
21089	Greenup County	0.01	0.02	0.00	0.01	0.06	0.17	0.70
Totals:		**0.01**	**0.02**	**0.00**	**0.01**	**0.06**	**0.17**	**0.70**

Emission Totals by County and Pollutant

All Fuels

Tons/Day

Greenup County
2020 (Grnup20)

Typical weekday for Summer Season, 2020

Date of Model Run: Jul 09 14:27:06: 2007

Today's Date: 7/9/2007

FIPS	County	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM25	Exhaust SO2	Exhaust CO2	Crankcase VOC	Diurnal VOC
21089	Greenup County	0.32	0.23	9.14	0.06	0.05	60.79	0.00	0.09
Totals:		**0.32**	**0.23**	**9.14**	**0.06**	**0.05**	**60.79**	**0.00**	**0.09**

Emission Totals by County and Pollutant

All Fuels

Tons/Day

Greenup County
2020 (Grnup20)

Typical weekday for Summer Season, 2020

Date of Model Run: Jul 09 14:27:06: 2007

Today's Date: 7/9/2007

FIPS	County	Vapor Displacement VOC	Spillage VOC	Hot Soak VOC	Running Loss VOC	Tank Permeation VOC	Hose Permeation VOC	Total VOC
21089	Greenup County	0.01	0.02	0.00	0.01	0.07	0.18	0.71
Totals:		**0.01**	**0.02**	**0.00**	**0.01**	**0.07**	**0.18**	**0.71**

APPENDIX H

Highway Mobile Source Emission Projection Methodology & Documentation

Ashland Ozone Maintenance Area

PROPOSED UPDATED MAINTENANCE EMISSIONS BUDGET

ASHLAND OZONE MAINTENANCE AREA
A PORTION OF GREENUP COUNTY

HIGHWAY MOBILE SOURCE

EMISSIONS SUMMARY

HIGHWAY MOBILE SOURCE EMISSIONS: FORMER 1-HR OZONE MAINTENANCE COUNTIES (8 TOTAL)

YEAR: 2002 | COUNTY: Greenup | SCENARIO: M6.2 Defaults | Mobile Model Used: M6.2

THE ENTIRE COUNTY IS CONSIDERED, UNLESS A COUNTY APPORTIONMENT FACTOR IS INVOLVED.

MOBILE6.2 Default Controls

2002

Min/Max temperatures used 66 and 92 (Degrees F), basec on 2000-2002 data from UK Agricultura Weather Center Website.

ROAD CLASS	DVMT	VOC EF	CO EF	NOx EF	VOC tpd	CO tpd	NOx tpd
R INTERST	0	1.509	23.013	3.593	0.00	0.00	0.00
R PRIN ART	241,027	1.538	21.256	2.860	0.41	5.65	0.76
R MIN ART	18,488	1.611	19.419	2.521	0.03	0.40	0.05
R MAJ COLL	98,867	1.620	19.239	2.496	0.18	2.10	0.27
R MIN COLL	40,728	1.666	18.416	2.410	0.07	0.83	0.11
R LOCAL	83,589	1.734	17.474	2.353	0.16	1.61	0.22
U INTERST	0	1.536	23.271	3.520	0.00	0.00	0.00
U FREEWAY	0	1.536	23.271	3.520	0.00	0.00	0.00
U PRIN ART	197,627	1.810	17.380	2.373	0.39	3.79	0.52
U MIN ART	85,885	1.876	17.488	2.409	0.18	1.66	0.23
U COLL	44,142	1.769	17.430	2.363	0.09	0.85	0.11
U LOCAL	69,149	2.724	17.631	2.443	0.21	1.34	0.19
	879,501				1.72	18.21	2.45

County Apport. Factor: 63.4%

GREENUP VOC tpd	GREENUP CO tpd	GREENUP NOx tpd
1.09	11.55	1.56

YEAR: 2005 | COUNTY: Greenup | SCENARIO: M6.2 Defaults | Mobile Model Used: M6.2

THE ENTIRE COUNTY IS CONSIDERED, UNLESS A COUNTY APPORTIONMENT FACTOR IS INVOLVED.

MOBILE6.2 Default Controls

2005

Min/Max temperatures used: 66 and 92 (Degrees F), based on 2000-2002 data from UK Agricultural Weather Center Website.

ROAD CLASS	DVMT	VOC EF	CO EF	NOx EF	VOC tpd	CO tpd	NOx tpd
R INTERST	0	1.103	15.892	2.802	0.00	0.00	0.00
R PRIN ART	261,169	1.129	14.689	2.275	0.33	4.23	0.66
R MIN ART	20,033	1.190	13.442	1.985	0.03	0.30	0.04
R MAJ COLL	107,129	1.197	13.321	1.964	0.14	1.57	0.23
R MIN COLL	44,131	1.234	12.768	1.889	0.06	0.62	0.09
R LOCAL	90,575	1.268	12.139	1.840	0.13	1.21	0.18
U INTERST	0	1.122	16.022	2.750	0.00	0.00	0.00
U FREEWAY	0	1.122	16.022	2.750	0.00	0.00	0.00
U PRIN ART	214,143	1.344	12.102	1.856	0.32	2.86	0.44
U MIN ART	93,062	1.393	12.205	1.886	0.14	1.25	0.19
U COLL	47,830	1.315	12.122	1.848	0.07	0.64	0.10
U LOCAL	74,928	2.015	12.732	1.992	0.17	1.05	0.16
	953,000				1.38	13.73	2.10

County Apport. Factor: 63.4%

GREENUP VOC tpd	GREENUP CO tpd	GREENUP NOx tpd
0.87	8.71	1.33

YEAR: 2008 | COUNTY: Greenup | SCENARIO: M6.2 Defaults | Mobile Model Used: M6.2

THE ENTIRE COUNTY IS CONSIDERED, UNLESS A COUNTY APPORTIONMENT FACTOR IS INVOLVED.

MOBILE6.2 Default Controls

2008

Min/Max temperatures used: 66 and 92 (Degrees F), based on 2000-2002 data from UK Agricultural Weather Center Website.

ROAD CLASS	DVMT	VOC EF	CO EF	NOx EF	VOC tpd	CO tpd	NOx tpd
R INTERST	0	0.857	12.050	2.117	0.00	0.00	0.00
R PRIN ART	289,434	0.877	11.166	1.732	0.28	3.56	0.55
R MIN ART	22,201	0.922	10.256	1.509	0.02	0.25	0.04
R MAJ COLL	118,723	0.927	10.169	1.493	0.12	1.33	0.20
R MIN COLL	48,907	0.955	9.770	1.437	0.05	0.53	0.08
R LOCAL	100,377	0.996	9.318	1.400	0.11	1.03	0.15
U INTERST	0	0.870	12.110	2.078	0.00	0.00	0.00
U FREEWAY	0	0.870	12.110	2.078	0.00	0.00	0.00
U PRIN ART	237,318	1.037	9.309	1.412	0.27	2.44	0.37
U MIN ART	103,134	1.073	9.402	1.434	0.12	1.07	0.16
U COLL	53,007	1.015	9.314	1.406	0.06	0.54	0.08
U LOCAL	83,037	1.536	10.198	1.540	0.14	0.93	0.14
	1,056,136				1.18	11.69	1.77

County Apport. Factor: 63.4%

GREENUP VOC tpd	GREENUP CO tpd	GREENUP NOx tpd
0.75	7.41	1.12

YEAR: 2011 | COUNTY: Greenup | SCENARIO: M6.2 Defaults | Mobile Model Used: M6.2

THE ENTIRE COUNTY IS CONSIDERED, UNLESS A COUNTY APPORTIONMENT FACTOR IS INVOLVED.

MOBILE6.2 Default Controls

2011

Min/Max temperatures used: 66 and 92 (Degrees F), based on 2000-2002 data from UK Agricultural Weather Center Website.

ROAD CLASS	DVMT	VOC EF	CO EF	NOx EF	VOC tpd	CO tpd	NOx tpd
R INTERST	0	0.689	10.003	1.537	0.00	0.00	0.00
R PRIN ART	313,048	0.702	9.276	1.275	0.24	3.20	0.44
R MIN ART	24,012	0.734	8.523	1.118	0.02	0.23	0.03
R MAJ COLL	128,409	0.738	8.450	1.106	0.10	1.20	0.17
R MIN COLL	52,897	0.758	8.117	1.066	0.04	0.47	0.06
R LOCAL	108,567	0.788	7.735	1.040	0.09	0.93	0.12
U INTERST	0	0.698	10.043	1.510	0.00	0.00	0.00
U FREEWAY	0	0.698	10.043	1.510	0.00	0.00	0.00
U PRIN ART	256,680	0.819	7.736	1.049	0.23	2.19	0.30
U MIN ART	111,548	0.846	7.817	1.066	0.10	0.96	0.13
U COLL	57,332	0.802	7.735	1.044	0.05	0.49	0.07
U LOCAL	89,812	1.200	8.649	1.149	0.12	0.86	0.11
	1,142,306				1.01	10.52	1.42

County Apport. Factor: 63.4%

GREENUP VOC tpd	GREENUP CO tpd	GREENUP NOx tpd
0.64	6.67	0.90

YEAR: 2014
COUNTY: Greenup
SCENARIO: M6.2 Defaults

Mobile Model Used: M6.2

THE ENTIRE COUNTY IS CONSIDERED, UNLESS A COUNTY APPORTIONMENT FACTOR IS INVOLVED.

MOBILE6.2 Default Controls

2014

Min/Max temperatures used: 66 and 92 (Degrees F), based on 2000-2002 data from UK Agricultural Weather Center Website.

ROAD CLASS	DVMT	VOC EF	CO EF	NOx EF	VOC tpd	CO tpd	NOx tpd
R INTERST	0	0.559	8.665	1.080	0.00	0.00	0.00
R PRIN ART	327,364	0.568	8.030	0.910	0.21	2.90	0.33
R MIN ART	25,110	0.591	7.376	0.806	0.02	0.20	0.02
R MAJ COLL	134,281	0.594	7.313	0.798	0.09	1.08	0.12
R MIN COLL	55,316	0.610	7.024	0.771	0.04	0.43	0.05
R LOCAL	113,531	0.633	6.693	0.753	0.08	0.84	0.09
U INTERST	0	0.566	8.692	1.063	0.00	0.00	0.00
U FREEWAY	0	0.566	8.692	1.063	0.00	0.00	0.00
U PRIN ART	268,418	0.658	6.702	0.760	0.19	1.98	0.22
U MIN ART	116,649	0.679	6.778	0.772	0.09	0.87	0.10
U COLL	59,953	0.645	6.698	0.757	0.04	0.44	0.05
U LOCAL	93,919	0.968	7.659	0.827	0.10	0.79	0.09
	1,194,542				0.85	9.54	1.07

County Apport. Factor: 63.4%

GREENUP VOC tpd	GREENUP CO tpd	GREENUP NOx tpd
0.54	6.05	0.68

YEAR: 2017
COUNTY: Greenup
SCENARIO: M6.2 Defaults

Mobile Model Used: M6.2

THE ENTIRE COUNTY IS CONSIDERED, UNLESS A COUNTY APPORTIONMENT FACTOR IS INVOLVED.

MOBILE6.2 Default Controls

2017

Min/Max temperatures used: 66 and 92 (Degrees F), based on 2000-2002 data from UK Agricultural Weather Center Website.

ROAD CLASS	DVMT	VOC EF	CO EF	NOx EF	VOC tpd	CO tpd	NOx tpd
R INTERST	0	0.476	7.948	0.800	0.00	0.00	0.00
R PRIN ART	338,819	0.483	7.360	0.682	0.18	2.75	0.25
R MIN ART	25,989	0.502	6.759	0.611	0.01	0.19	0.02
R MAJ COLL	138,980	0.505	6.701	0.606	0.08	1.03	0.09
R MIN COLL	57,252	0.519	6.437	0.586	0.03	0.41	0.04
R LOCAL	117,504	0.538	6.135	0.574	0.07	0.79	0.07
U INTERST	0	0.482	7.968	0.789	0.00	0.00	0.00
U FREEWAY	0	0.482	7.968	0.789	0.00	0.00	0.00
U PRIN ART	277,811	0.560	6.150	0.579	0.17	1.88	0.18
U MIN ART	120,731	0.578	6.224	0.589	0.08	0.83	0.08
U COLL	62,051	0.548	6.142	0.576	0.04	0.42	0.04
U LOCAL	97,205	0.835	7.140	0.624	0.09	0.77	0.07
	1,236,344				0.75	9.07	0.84

County Apport. Factor: 63.4%

GREENUP VOC tpd	GREENUP CO tpd	GREENUP NOx tpd
0.48	5.75	0.53

YEAR: 2020
COUNTY: Greenup
SCENARIO: M6.2 Defaults

Mobile Model Used: M6.2

THE ENTIRE COUNTY IS CONSIDERED, UNLESS A COUNTY APPORTIONMENT FACTOR IS INVOLVED.

MOBILE6.2 Default Controls

2020

Min/Max temperatures used: 66 and 92 (Degrees F), based on 2000-2002 data from UK Agricultural Weather Center Website.

ROAD CLASS	DVMT	VOC EF	CO EF	NOx EF	VOC tpd	CO tpd	NOx tpd
R INTERST	0	0.409	7.524	0.622	0.00	0.00	0.00
R PRIN ART	348,845	0.415	6.960	0.544	0.16	2.68	0.21
R MIN ART	26,758	0.431	6.386	0.492	0.01	0.19	0.01
R MAJ COLL	143,093	0.434	6.331	0.488	0.07	1.00	0.08
R MIN COLL	58,946	0.446	6.079	0.474	0.03	0.40	0.03
R LOCAL	120,981	0.464	5.791	0.464	0.06	0.77	0.06
U INTERST	0	0.414	7.542	0.615	0.00	0.00	0.00
U FREEWAY	0	0.414	7.542	0.615	0.00	0.00	0.00
U PRIN ART	286,032	0.482	5.808	0.469	0.15	1.83	0.15
U MIN ART	124,304	0.499	5.880	0.477	0.07	0.81	0.07
U COLL	63,887	0.472	5.799	0.466	0.03	0.41	0.03
U LOCAL	100,082	0.732	6.798	0.504	0.08	0.75	0.06
	1,272,928				0.67	8.83	0.70

County Apport. Factor: 63.4%

GREENUP VOC tpd	GREENUP CO tpd	GREENUP NOx tpd
0.42	5.60	0.44

SPEED AND DVMT DATA

FROM

KENTUCKY

TRANSPORTATION CABINET

Daily VMT Estimates and forecasts

Greenup County (Entire County)

Road Classification	% M6 Freeway	% M6 Ramp	Speed (mpd)	2002	2005	2008	2011	2014	2017	2020
Rural Interstate	98.5	1.5	69.0	0	0	0	0	0	0	0
Rural Principal Arterial			57.0	241,027	261,169	289,434	313,048	327,364	338,819	348,845
Rural Minor Arterial			47.0	18,488	20,033	22,201	24,012	25,110	25,989	26,758
Rural Major Collector			46.0	98,867	107,129	118,723	128,409	134,281	138,980	143,093
Rural Minor Collector			41.0	40,728	44,131	48,907	52,897	55,316	57,252	58,946
Rural Local			35.0	83,589	90,575	100,377	108,567	113,531	117,504	120,981
Urban Interstate	92.4	7.6	71.0	0	0	0	0	0	0	0
Urban Freeway	92.4	7.6	65.0	0	0	0	0	0	0	0
Urban Principal Arterial			31.0	197,627	214,143	237,318	256,680	268,418	277,811	286,032
Urban Minor Arterial			28.0	85,885	93,062	103,134	111,548	116,649	120,731	124,304
Urban Collector			33.0	44,142	47,830	53,007	57,332	59,953	62,051	63,887
Urban Local			12.9	69,149	74,928	83,037	89,812	93,919	97,205	100,082
Total DVMT				879,501	953,000	1,056,136	1,142,306	1,194,542	1,236,344	1,272,928
Total Interstate				0	0					0
Total Non-interstate				879,501	953,000					1,272,928
				879,501	953,000	1,056,136	1,142,306	1,194,542	1,236,344	1,272,928

NOTE:

Interstate and Non-interstate VMT for 2000-2005 taken from HPMS data (VMT05.xls)

Interstate and Non-interstate VMT forecasts for 2005, 2010, 2015 and 2020 taken from 2004-2030 VMT Tables.xls file (which uses 2004 HPMS data)

VMT for all other years interpolated

Methodology for 2004-2030 VMT Tables.xls is explained in the file

Functional Class % taken from VMT04.xls file -- this FC % applied to all forecast years as well as to 2000-2003. This assumes that recent functional class changes are more accurate than the fu

2003 speeds (column D) were determined using the new UK speed study HERS methodology --2002 HPMS data

2003 speeds used for all forecasted years

Default value of 12.9mph for functional class of "urban local" roads was used since insufficient local or state data exists

Ramp % based on KYTC report "KYTC Ramp DVMT Calculations" August 2002

Source: Kentucky Transportation Cabinet, Division of Planning - November, 2006

PLANNING ASSUMPTIONS

FROM

KENTUCKY

TRANSPORTATION CABINET

Planning Assumptions and MOBILE6 Input Parameters

ANALYSIS YEARS

As requested by the Kentucky Division for Air Quality (DAQ), the Kentucky Transportation Cabinet (KYTC) is providing speeds and Daily Vehicle Miles Traveled (DVMTs) for the years 2000, 2003, 2006, 2009, 2012, and 2015 for Boyd, Daviess, Edmonson, Fayette, Greenup, Hancock, Livingston, Marshall, and Scott Counties.

Daily VMT

2001 is the most recent year of Highway Performance Monitoring System (HPMS) DVMT available. Using historical HPMS and population data, as well as the Kentucky Data Center population forecasts, DVMT forecasts are made by KYTC separately for interstate and non-interstate for the years 2005, 2010, 2015, 2020, 2025, and 2030 (see spreadsheet "2001-2030 VMT Tables.xls"). For each of the forecast years, these data were distributed over the HPMS functional classes based on the 2001 facility distribution (see spreadsheet "FC%.xls"). The DVMT by HPMS functional class for the analysis years 2003, 2006, 2009, and 2012 were determined by interpolating between the bounding forecast years.

Attached are spreadsheets containing requested DVMT and the associated speeds for the twelve HPMS functional classes for the requested counties for each of the requested years. The spreadsheets are named "Boyd County VMT Forecasts 120902.xls", etc. All the DVMT are for the entire county, therefore, the appropriate apportionment will have to be used when calculating emissions.

SPEEDS

In most cases (exception being Edmonson County), speeds were taken from county-wide transportation models. Note that while the transportation models are developed to produce accurate VMT, they do not, necessarily, produce accurate speeds at this time. Furthermore, for various reasons, the speeds for similar type roads may vary from model to model. However, KYTC believes this is the best data available. We will continue to work with the modelers to improve our processes

Speeds for Hancock and Livingston Counties were assumed to be the same as derived from adjacent county models – Owensboro (Daviess County) and Marshall County, respectively. Having no transportation model for Edmonson County (and no adjacent county model), we chose to use the FHWA Highway Economics Requirements Systems (HERS) equations and apply to the 2000 Kentucky HPMS data statewide (the 2001 HPMS data was not available at the time of the analysis). The HERS documentation is available on request.

Mapping HPMS functional class and speed to MOBILE 6 driving cycles

As previously discussed, we recommend you map the HPMS functional class and speed to MOBILE 6 driving cycles as follows:

M6	HPMS
Freeway	Rural Interstate, Urban Interstate, Urban Freeway
Local	Rural Local, Urban Local
Arterial/Collector	All other HPMS functional classes

RAMPS

We have listed in the spreadsheets the recommended M6 freeway/ramp percentages based on the KYTC report "KYTC Ramp DVMT Calculations" completed in August, 2002. This analysis is based on the most recent Kentucky data available. KYTC feels it is necessary to deviate from M6 default.

OTHER DATA

Additionally, KYTC investigated using Kentucky vehicle registration data for vehicle age and vehicle type distribution. However, the available data can not readily be translated to the required M6 data input. We will continue to investigate, but recommend we stay with the M6 defaults for this analysis.

KYTC has made a sizeable effort in an attempt to use as much local data as possible. We will continue to investigate our local data options and continue to refine the M6 inputs.

MOBILE6.2

INPUT

FILE

```
* Filename:  d:\Mobile62\Ky_M62\1-Hr03\1HrMaint.in

* This input file is a MOBILE6.2 run for the former 1-hour ozone maintenance counties, except
* for NKY, Louisville, and Boyd County.  The three areas of exception are either having or are
* going to have 8-hour ozone redesignation requests submitted to EPA.  So for this MOBILE6.2
* run, the counties are a portion of Greenup (Ashland), Fayette and Scott (Lexington), Edmonson,
* a portion of Livingston and Marshall (Paducah), and Daviess and a portion of Hancock (Owensboro)
* Counties.  The model years will be 2002, 2005, 2008, 2011, 2014, 2017, and 2020.

* NOTE:  For some Road Classifications, there are no DVMT.  The lowest speed that the
* MOBILE6 model accepts is 2.5 mph.  For these Road Classifications, 2.5 mph is indicated
* simply to make the model run.  These corresponding emission factors will not influence
* the emission total because DVMT = 0 for that Road Classification.

* According to the EPA document, "Technical Guidance on the Use of MOBILE6.2 for Emission
* Inventory Preparation" (August 2004), Kentucky has amended the standard MOBILE6.2 input
* file to reflect three modifications relating to highway mobile source emission calculations.
* The modifications are:  (1) Do not include Ramp as a single Road Classification entry,
* (2) for Rural Local, change Local in the Average Speed line to Arterial and use KYTC's actual
* Rural Local speed and not 12.9 mph, and (3) replace the Diesel Sulfur value of 500 ppm with a
* state-specific value provided on an EPA web link.

******************************      Header Section      ********************************
MOBILE6 INPUT FILE :
REPORT FILE        : d:\Mobile62\Ky_M62\1-Hr03\1HrMaint.out
RUN DATA

******************************      Run Section #1      ********************************

************************************  ASHLAND  ****************************************

FUEL RVP           : 9.0
MIN/MAX TEMP       : 66.0 92.0

******************************     Scenario Section #1     ********************************

* Model Run is for 2002.

SCENARIO RECORD    : Greenup              Rural Interstate 69.0 mph - CY2002
DIESEL SULFUR      : 325.00
CALENDAR YEAR      : 2002
EVALUATION MONTH   : 7
AVERAGE SPEED      : 69.0 Freeway 98.5 0.0 0.0 1.5

SCENARIO RECORD    : Greenup              Rural Principal Arterial 57.0 mph - CY2002
DIESEL SULFUR      : 325.00
CALENDAR YEAR      : 2002
EVALUATION MONTH   : 7
```

```
AVERAGE SPEED       : 57.0 Arterial

SCENARIO RECORD     : Greenup                Rural Minor Arterial 47.0 mph - CY2002
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 47.0 Arterial

SCENARIO RECORD     : Greenup                Rural Major Collector 46.0 mph - CY2002
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 46.0 Arterial

SCENARIO RECORD     : Greenup                Rural Minor Collector 41.0 mph - CY2002
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 41.0 Arterial

SCENARIO RECORD     : Greenup                Rural Local 35.0 mph - CY2002
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 35.0 Arterial

* Unless a specific local speed is available, a default MOBILE6 average speed of 12.9 mph is used.

SCENARIO RECORD     : Greenup                Urban Interstate 71.0 mph - CY2002
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 71.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD     : Greenup                Urban Freeway 65.0 mph - CY2002
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 65.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD     : Greenup                Urban Principal Arterial 31.0 mph - CY2002
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 31.0 Arterial

SCENARIO RECORD     : Greenup                Urban Minor Arterial 28.0 mph - CY2002
DIESEL SULFUR       : 324.00
```

```
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 28.0 Arterial

SCENARIO RECORD     : Greenup              Urban Collector 33.0 mph - CY2002
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 33.0 Arterial

SCENARIO RECORD     : Greenup              Urban Local 12.9 mph Default - CY2002
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
AVERAGE SPEED       : 12.9 Local
```

* Note that 12.9 mph is the default MOBILE6 average speed for Local and cannot be changed.

* Model Run is for 2005.

```
SCENARIO RECORD     : Greenup              Rural Interstate 69.0 mph - CY2005
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2005
EVALUATION MONTH    : 7
AVERAGE SPEED       : 69.0 Freeway 98.5 0.0 0.0 1.5

SCENARIO RECORD     : Greenup              Rural Principal Arterial 57.0 mph - CY2005
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2005
EVALUATION MONTH    : 7
AVERAGE SPEED       : 57.0 Arterial

SCENARIO RECORD     : Greenup              Rural Minor Arterial 47.0 mph - CY2005
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2005
EVALUATION MONTH    : 7
AVERAGE SPEED       : 47.0 Arterial

SCENARIO RECORD     : Greenup              Rural Major Collector 46.0 mph - CY2005
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2005
EVALUATION MONTH    : 7
AVERAGE SPEED       : 46.0 Arterial

SCENARIO RECORD     : Greenup              Rural Minor Collector 41.0 mph - CY2005
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2005
EVALUATION MONTH    : 7
```

```
AVERAGE SPEED       : 41.0 Arterial

SCENARIO RECORD     : Greenup                Rural Local 35.0 mph - CY2005
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2005
EVALUATION MONTH    : 7
AVERAGE SPEED       : 35.0 Arterial
```

* Unless a specific local speed is available, a default MOBILE6 average speed of 12.9 mph is used.

```
SCENARIO RECORD     : Greenup                Urban Interstate 71.0 mph - CY2005
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2005
EVALUATION MONTH    : 7
AVERAGE SPEED       : 71.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD     : Greenup                Urban Freeway 65.0 mph - CY2005
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2005
EVALUATION MONTH    : 7
AVERAGE SPEED       : 65.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD     : Greenup                Urban Principal Arterial 31.0 mph - CY2005
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2005
EVALUATION MONTH    : 7
AVERAGE SPEED       : 31.0 Arterial

SCENARIO RECORD     : Greenup                Urban Minor Arterial 28.0 mph - CY2005
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2005
EVALUATION MONTH    : 7
AVERAGE SPEED       : 28.0 Arterial

SCENARIO RECORD     : Greenup                Urban Collector 33.0 mph - CY2005
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2005
EVALUATION MONTH    : 7
AVERAGE SPEED       : 33.0 Arterial

SCENARIO RECORD     : Greenup                Urban Local 12.9 mph Default - CY2005
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2005
EVALUATION MONTH    : 7
AVERAGE SPEED       : 12.9 Local
```

* Note that 12.9 mph is the default MOBILE6 average speed for Local and cannot be changed.

* Model Run is for 2008.

```
SCENARIO RECORD     : Greenup                Rural Interstate 69.0 mph - CY2008
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2008
EVALUATION MONTH    : 7
AVERAGE SPEED       : 69.0 Freeway 98.5 0.0 0.0 1.5

SCENARIO RECORD     : Greenup                Rural Principal Arterial 57.0 mph - CY2008
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2008
EVALUATION MONTH    : 7
AVERAGE SPEED       : 57.0 Arterial

SCENARIO RECORD     : Greenup                Rural Minor Arterial 47.0 mph - CY2008
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2008
EVALUATION MONTH    : 7
AVERAGE SPEED       : 47.0 Arterial

SCENARIO RECORD     : Greenup                Rural Major Collector 46.0 mph - CY2008
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2008
EVALUATION MONTH    : 7
AVERAGE SPEED       : 46.0 Arterial

SCENARIO RECORD     : Greenup                Rural Minor Collector 41.0 mph - CY2008
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2008
EVALUATION MONTH    : 7
AVERAGE SPEED       : 41.0 Arterial

SCENARIO RECORD     : Greenup                Rural Local 35.0 mph - CY2008
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2008
EVALUATION MONTH    : 7
AVERAGE SPEED       : 35.0 Arterial
```

* Unless a specific local speed is available, a default MOBILE6 average speed of 12.9 mph is used.

```
SCENARIO RECORD     : Greenup                Urban Interstate 71.0 mph - CY2008
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2008
EVALUATION MONTH    : 7
AVERAGE SPEED       : 71.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD     : Greenup                Urban Freeway 65.0 mph - CY2008
DIESEL SULFUR       : 323.00
```

```
CALENDAR YEAR       : 2008
EVALUATION MONTH    : 7
AVERAGE SPEED       : 65.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD     : Greenup              Urban Principal Arterial 31.0 mph - CY2008
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2008
EVALUATION MONTH    : 7
AVERAGE SPEED       : 31.0 Arterial

SCENARIO RECORD     : Greenup              Urban Minor Arterial 28.0 mph - CY2008
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2008
EVALUATION MONTH    : 7
AVERAGE SPEED       : 28.0 Arterial

SCENARIO RECORD     : Greenup              Urban Collector 33.0 mph - CY2008
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2008
EVALUATION MONTH    : 7
AVERAGE SPEED       : 33.0 Arterial

SCENARIO RECORD     : Greenup              Urban Local 12.9 mph Default - CY2008
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2008
EVALUATION MONTH    : 7
AVERAGE SPEED       : 12.9 Local

* Note that 12.9 mph is the default MOBILE6 average speed for Local and cannot be changed.

* Model Run is for 2011.

SCENARIO RECORD     : Greenup              Rural Interstate 69.0 mph - CY2011
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2011
EVALUATION MONTH    : 7
AVERAGE SPEED       : 69.0 Freeway 98.5 0.0 0.0 1.5

SCENARIO RECORD     : Greenup              Rural Principal Arterial 57.0 mph - CY2011
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2011
EVALUATION MONTH    : 7
AVERAGE SPEED       : 57.0 Arterial

SCENARIO RECORD     : Greenup              Rural Minor Arterial 47.0 mph - CY2011
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2011
EVALUATION MONTH    : 7
```

AVERAGE SPEED : 47.0 Arterial

SCENARIO RECORD : Greenup Rural Major Collector 46.0 mph - CY2011
DIESEL SULFUR : 324.00
CALENDAR YEAR : 2011
EVALUATION MONTH : 7
AVERAGE SPEED : 46.0 Arterial

SCENARIO RECORD : Greenup Rural Minor Collector 41.0 mph - CY2011
DIESEL SULFUR : 324.00
CALENDAR YEAR : 2011
EVALUATION MONTH : 7
AVERAGE SPEED : 41.0 Arterial

SCENARIO RECORD : Greenup Rural Local 35.0 mph - CY2011
DIESEL SULFUR : 323.00
CALENDAR YEAR : 2011
EVALUATION MONTH : 7
AVERAGE SPEED : 35.0 Arterial

* Unless a specific local speed is available, a default MOBILE6 average speed of 12.9 mph is used.

SCENARIO RECORD : Greenup Urban Interstate 71.0 mph - CY2011
DIESEL SULFUR : 323.00
CALENDAR YEAR : 2011
EVALUATION MONTH : 7
AVERAGE SPEED : 71.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD : Greenup Urban Freeway 65.0 mph - CY2011
DIESEL SULFUR : 323.00
CALENDAR YEAR : 2011
EVALUATION MONTH : 7
AVERAGE SPEED : 65.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD : Greenup Urban Principal Arterial 31.0 mph - CY2011
DIESEL SULFUR : 324.00
CALENDAR YEAR : 2011
EVALUATION MONTH : 7
AVERAGE SPEED : 31.0 Arterial

SCENARIO RECORD : Greenup Urban Minor Arterial 28.0 mph - CY2011
DIESEL SULFUR : 324.00
CALENDAR YEAR : 2011
EVALUATION MONTH : 7
AVERAGE SPEED : 28.0 Arterial

SCENARIO RECORD : Greenup Urban Collector 33.0 mph - CY2011
DIESEL SULFUR : 324.00

```
CALENDAR YEAR       : 2011
EVALUATION MONTH    : 7
AVERAGE SPEED       : 33.0 Arterial

SCENARIO RECORD     : Greenup               Urban Local 12.9 mph Default - CY2011
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2011
EVALUATION MONTH    : 7
AVERAGE SPEED       : 12.9 Local
```

* Note that 12.9 mph is the default MOBILE6 average speed for Local and cannot be changed.

* Model Run is for 2014.

```
SCENARIO RECORD     : Greenup               Rural Interstate 69.0 mph - CY2014
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2014
EVALUATION MONTH    : 7
AVERAGE SPEED       : 69.0 Freeway 98.5 0.0 0.0 1.5

SCENARIO RECORD     : Greenup               Rural Principal Arterial 57.0 mph - CY2014
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2014
EVALUATION MONTH    : 7
AVERAGE SPEED       : 57.0 Arterial

SCENARIO RECORD     : Greenup               Rural Minor Arterial 47.0 mph - CY2014
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2014
EVALUATION MONTH    : 7
AVERAGE SPEED       : 47.0 Arterial

SCENARIO RECORD     : Greenup               Rural Major Collector 46.0 mph - CY2014
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2014
EVALUATION MONTH    : 7
AVERAGE SPEED       : 46.0 Arterial

SCENARIO RECORD     : Greenup               Rural Minor Collector 41.0 mph - CY2014
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2014
EVALUATION MONTH    : 7
AVERAGE SPEED       : 41.0 Arterial

SCENARIO RECORD     : Greenup               Rural Local 35.0 mph - CY2014
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2014
EVALUATION MONTH    : 7
```

AVERAGE SPEED : 35.0 Arterial

* Unless a specific local speed is available, a default MOBILE6 average speed of 12.9 mph is used.

SCENARIO RECORD : Greenup Urban Interstate 71.0 mph - CY2014
DIESEL SULFUR : 323.00
CALENDAR YEAR : 2014
EVALUATION MONTH : 7
AVERAGE SPEED : 71.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD : Greenup Urban Freeway 65.0 mph - CY2014
DIESEL SULFUR : 323.00
CALENDAR YEAR : 2014
EVALUATION MONTH : 7
AVERAGE SPEED : 65.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD : Greenup Urban Principal Arterial 31.0 mph - CY2014
DIESEL SULFUR : 324.00
CALENDAR YEAR : 2014
EVALUATION MONTH : 7
AVERAGE SPEED : 31.0 Arterial

SCENARIO RECORD : Greenup Urban Minor Arterial 28.0 mph - CY2014
DIESEL SULFUR : 324.00
CALENDAR YEAR : 2014
EVALUATION MONTH : 7
AVERAGE SPEED : 28.0 Arterial

SCENARIO RECORD : Greenup Urban Collector 33.0 mph - CY2014
DIESEL SULFUR : 324.00
CALENDAR YEAR : 2014
EVALUATION MONTH : 7
AVERAGE SPEED : 33.0 Arterial

SCENARIO RECORD : Greenup Urban Local 12.9 mph Default - CY2014
DIESEL SULFUR : 325.00
CALENDAR YEAR : 2014
EVALUATION MONTH : 7
AVERAGE SPEED : 12.9 Local

* Note that 12.9 mph is the default MOBILE6 average speed for Local and cannot be changed.

* Model Run is for 2017.

SCENARIO RECORD : Greenup Rural Interstate 69.0 mph - CY2017
DIESEL SULFUR : 325.00
CALENDAR YEAR : 2017
EVALUATION MONTH : 7

```
AVERAGE SPEED       : 69.0 Freeway 98.5 0.0 0.0 1.5

SCENARIO RECORD     : Greenup               Rural Principal Arterial 57.0 mph - CY2017
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2017
EVALUATION MONTH    : 7
AVERAGE SPEED       : 57.0 Arterial

SCENARIO RECORD     : Greenup               Rural Minor Arterial 47.0 mph - CY2017
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2017
EVALUATION MONTH    : 7
AVERAGE SPEED       : 47.0 Arterial

SCENARIO RECORD     : Greenup               Rural Major Collector 46.0 mph - CY2017
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2017
EVALUATION MONTH    : 7
AVERAGE SPEED       : 46.0 Arterial

SCENARIO RECORD     : Greenup               Rural Minor Collector 41.0 mph - CY2017
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2017
EVALUATION MONTH    : 7
AVERAGE SPEED       : 41.0 Arterial

SCENARIO RECORD     : Greenup               Rural Local 35.0 mph - CY2017
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2017
EVALUATION MONTH    : 7
AVERAGE SPEED       : 35.0 Arterial

* Unless a specific local speed is available, a default MOBILE6 average speed of 12.9 mph is used.

SCENARIO RECORD     : Greenup               Urban Interstate 71.0 mph - CY2017
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2017
EVALUATION MONTH    : 7
AVERAGE SPEED       : 71.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD     : Greenup               Urban Freeway 65.0 mph - CY2017
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2017
EVALUATION MONTH    : 7
AVERAGE SPEED       : 65.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD     : Greenup               Urban Principal Arterial 31.0 mph - CY2017
DIESEL SULFUR       : 324.00
```

```
CALENDAR YEAR       : 2017
EVALUATION MONTH    : 7
AVERAGE SPEED       : 31.0 Arterial

SCENARIO RECORD     : Greenup              Urban Minor Arterial 28.0 mph - CY2017
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2017
EVALUATION MONTH    : 7
AVERAGE SPEED       : 28.0 Arterial

SCENARIO RECORD     : Greenup              Urban Collector 33.0 mph - CY2017
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2017
EVALUATION MONTH    : 7
AVERAGE SPEED       : 33.0 Arterial

SCENARIO RECORD     : Greenup              Urban Local 12.9 mph Default - CY2017
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2017
EVALUATION MONTH    : 7
AVERAGE SPEED       : 12.9 Local

* Note that 12.9 mph is the default MOBILE6 average speed for Local and cannot be changed.

* Model Run is for 2020.

SCENARIO RECORD     : Greenup              Rural Interstate 69.0 mph - CY2020
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2020
EVALUATION MONTH    : 7
AVERAGE SPEED       : 69.0 Freeway 98.5 0.0 0.0 1.5

SCENARIO RECORD     : Greenup              Rural Principal Arterial 57.0 mph - CY2020
DIESEL SULFUR       : 325.00
CALENDAR YEAR       : 2020
EVALUATION MONTH    : 7
AVERAGE SPEED       : 57.0 Arterial

SCENARIO RECORD     : Greenup              Rural Minor Arterial 47.0 mph - CY2020
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2020
EVALUATION MONTH    : 7
AVERAGE SPEED       : 47.0 Arterial

SCENARIO RECORD     : Greenup              Rural Major Collector 46.0 mph - CY2020
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2020
EVALUATION MONTH    : 7
```

```
AVERAGE SPEED       : 46.0 Arterial

SCENARIO RECORD     : Greenup                Rural Minor Collector 41.0 mph - CY2020
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2020
EVALUATION MONTH    : 7
AVERAGE SPEED       : 41.0 Arterial

SCENARIO RECORD     : Greenup                Rural Local 35.0 mph - CY2020
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2020
EVALUATION MONTH    : 7
AVERAGE SPEED       : 35.0 Arterial

* Unless a specific local speed is available, a default MOBILE6 average speed of 12.9 mph is used.

SCENARIO RECORD     : Greenup                Urban Interstate 71.0 mph - CY2020
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2020
EVALUATION MONTH    : 7
AVERAGE SPEED       : 71.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD     : Greenup                Urban Freeway 65.0 mph - CY2020
DIESEL SULFUR       : 323.00
CALENDAR YEAR       : 2020
EVALUATION MONTH    : 7
AVERAGE SPEED       : 65.0 Freeway 92.4 0.0 0.0 7.6

SCENARIO RECORD     : Greenup                Urban Principal Arterial 31.0 mph - CY2020
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2020
EVALUATION MONTH    : 7
AVERAGE SPEED       : 31.0 Arterial

SCENARIO RECORD     : Greenup                Urban Minor Arterial 28.0 mph - CY2020
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2020
EVALUATION MONTH    : 7
AVERAGE SPEED       : 28.0 Arterial

SCENARIO RECORD     : Greenup                Urban Collector 33.0 mph - CY2020
DIESEL SULFUR       : 324.00
CALENDAR YEAR       : 2020
EVALUATION MONTH    : 7
AVERAGE SPEED       : 33.0 Arterial

SCENARIO RECORD     : Greenup                Urban Local 12.9 mph Default - CY2020
DIESEL SULFUR       : 325.00
```

1HrMaint

CALENDAR YEAR : 2020
EVALUATION MONTH : 7
AVERAGE SPEED : 12.9 Local

* Note that 12.9 mph is the default MOBILE6 average speed for Local and cannot be changed.

END OF RUN

MOBILE6.2

OUTPUT

FILE

```
*************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                            *
* Input file: D:\MOBILE62\KY_M62\1-HRO3\1HRMAINT.IN (file 1, run 1).    *
*************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Interstate 69.0 mph - CY2002
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M 96 Warning:
                 69.0      speed reduced to 65 mph maximum
  M515 Warning:
            The combined freeway and ramp average speed entered
            cannot be greater than 64.2 miles per hour.
            The average speed will be reset to this value.
  M582 Warning:
            The user supplied freeway average speed of 64.2
            will be used for all hours of the day. 100% of VMT
            has been assigned to a fixed combination of freeways
            and freeway ramps for all hours of the day and all
             vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                  Calendar Year:  2002
                          Month:  July
                       Altitude:  Low
             Minimum Temperature:  66.0 (F)
             Maximum Temperature:  92.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   9.0 psi
                   Weathered RVP:   8.6 psi
             Fuel Sulfur Content:  279. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.382	1.580	2.504	1.816	1.838	0.574	0.770	0.443	2.93	1.509
Composite CO :	21.49	25.70	36.12	28.37	27.98	1.583	1.545	3.009	24.94	23.013
Composite NOX :	1.249	1.481	1.832	1.571	5.974	2.582	2.668	25.673	1.65	3.593

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Principal Arterial 57.0 mph - CY2002
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 57.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2002
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:  279. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.410	1.617	2.572	1.862	1.856	0.576	0.772	0.446	2.47	1.538
Composite CO :	19.90	24.08	34.46	26.74	21.29	1.462	1.429	2.526	13.04	21.256
Composite NOX :	1.218	1.440	1.789	1.529	5.693	1.952	2.016	17.406	1.45	2.860

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Minor Arterial 47.0 mph - CY2002
* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 47.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
```

```
          type for all hours of the day and all vehicle types.
M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2002
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:  279. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.476	1.689	2.691	1.945	1.982	0.602	0.807	0.489	2.35	1.611
Composite CO :	18.02	22.10	32.43	24.75	17.99	1.420	1.388	2.358	9.99	19.419
Composite NOX :	1.186	1.393	1.743	1.483	5.316	1.521	1.570	13.930	1.21	2.521

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Major Collector 46.0 mph - CY2002
* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
M583 Warning:
          The user supplied arterial average speed of 46.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2002
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
```

```
              Nominal Fuel RVP:   9.0 psi
                 Weathered RVP:   8.6 psi
           Fuel Sulfur Content:  279. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  No
              Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:              <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:   0.4568    0.3091    0.1063              0.0360    0.0008    0.0017    0.0833    0.0060    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     1.485     1.697     2.703     1.955     2.000     0.606     0.812     0.496      2.35     1.620
    Composite CO  :     17.82     21.90     32.21     24.54     17.87     1.421     1.389     2.361     10.05    19.239
    Composite NOX :     1.183     1.389     1.739     1.478     5.277     1.492     1.540    13.693      1.20     2.496
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Minor Collector 41.0 mph - CY2002
* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 41.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                  Calendar Year:  2002
                          Month:  July
                       Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:  279. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
```

GVWR:		<6000	>6000	1HRMAINT (All)						
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.529	1.735	2.764	1.999	2.114	0.633	0.847	0.539	2.40	1.666
Composite CO :	16.88	20.91	31.20	23.54	18.06	1.447	1.414	2.466	10.71	18.416
Composite NOX :	1.169	1.367	1.718	1.457	5.089	1.397	1.441	12.925	1.17	2.410

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Local 35.0 mph - CY2002
* File 1, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 35.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                  Calendar Year:  2002
                          Month:  July
                       Altitude:  Low
             Minimum Temperature:  66.0 (F)
             Maximum Temperature:  92.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
             Fuel Sulfur Content:  279. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  No
                Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.592	1.788	2.846	2.058	2.310	0.678	0.907	0.613	2.49	1.734
Composite CO :	15.73	19.70	29.96	22.33	19.61	1.519	1.483	2.754	12.08	17.474
Composite NOX :	1.158	1.347	1.701	1.438	4.858	1.345	1.388	12.508	1.13	2.353

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Urban Interstate 71.0 mph - CY2002
* File 1, Run 1, Scenario 7.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M 96 Warning:
                71.0     speed reduced to 65 mph maximum
  M515 Warning:
           The combined freeway and ramp average speed entered
           cannot be greater than 60.9 miles per hour.
           The average speed will be reset to this value.
  M582 Warning:
           The user supplied freeway average speed of 60.9
           will be used for all hours of the day. 100% of VMT
           has been assigned to a fixed combination of freeways
           and freeway ramps for all hours of the day and all
            vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                Calendar Year:  2002
                        Month:  July
                     Altitude:  Low
         Minimum Temperature:  66.0 (F)
         Maximum Temperature:  92.0 (F)
           Absolute Humidity:   75. grains/lb
            Nominal Fuel RVP:   9.0 psi
               Weathered RVP:   8.6 psi
         Fuel Sulfur Content:  279. ppm

         Exhaust I/M Program:  No
            Evap I/M Program:  No
                 ATP Program:  No
           Reformulated Gas:   No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.410	1.608	2.543	1.847	1.868	0.581	0.778	0.454	2.91	1.536
Composite CO :	21.90	25.92	36.35	28.59	27.47	1.579	1.542	2.995	24.15	23.271
Composite NOX :	1.259	1.493	1.844	1.583	5.904	2.506	2.589	24.714	1.62	3.520

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Urban Freeway 65.0 mph - CY2002
* File 1, Run 1, Scenario 8.
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M515 Warning:
            The combined freeway and ramp average speed entered
            cannot be greater than 60.9 miles per hour.
            The average speed will be reset to this value.
  M582 Warning:
            The user supplied freeway average speed of 60.9
            will be used for all hours of the day. 100% of VMT
            has been assigned to a fixed combination of freeways
            and freeway ramps for all hours of the day and all
             vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                  Calendar Year:  2002
                          Month:  July
                       Altitude:  Low
             Minimum Temperature:  66.0 (F)
             Maximum Temperature:  92.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   9.0 psi
                   Weathered RVP:   8.6 psi
             Fuel Sulfur Content:  279. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  No
                Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.410	1.608	2.543	1.847	1.868	0.581	0.778	0.454	2.91	1.536
Composite CO :	21.90	25.92	36.35	28.59	27.47	1.579	1.542	2.995	24.15	23.271
Composite NOX :	1.259	1.493	1.844	1.583	5.904	2.506	2.589	24.714	1.62	3.520

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Principal Arterial 31.0 mph - CY2002
* File 1, Run 1, Scenario 9.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 31.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
```

```
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2002
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:  279. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.661	1.853	2.954	2.135	2.496	0.719	0.961	0.680	2.59	1.810
Composite CO :	15.51	19.41	29.80	22.07	21.76	1.602	1.563	3.084	13.42	17.380
Composite NOX :	1.183	1.366	1.721	1.456	4.712	1.354	1.397	12.581	1.10	2.373

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Minor Arterial 28.0 mph - CY2002
* File 1, Run 1, Scenario 10.
* # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of 28.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2002
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
```

```
              Nominal Fuel RVP:   9.0 psi
                 Weathered RVP:   8.6 psi
            Fuel Sulfur Content:  279. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
              Reformulated Gas:   No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.720	1.908	3.041	2.198	2.675	0.756	1.010	0.741	2.67	1.876
Composite CO :	15.51	19.36	29.89	22.05	24.03	1.685	1.644	3.418	14.65	17.488
Composite NOX :	1.212	1.390	1.750	1.482	4.602	1.378	1.422	12.771	1.07	2.409

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Collector 33.0 mph - CY2002
* File 1, Run 1, Scenario 11.
* # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 33.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                  Calendar Year:  2002
                          Month:  July
                       Altitude:  Low
             Minimum Temperature:  66.0 (F)
             Maximum Temperature:  92.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   9.0 psi
                   Weathered RVP:   8.6 psi
             Fuel Sulfur Content:  279. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  No
               Reformulated Gas:   No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh

1HRMAINT

GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.624	1.819	2.896	2.094	2.397	0.697	0.932	0.645	2.54	1.769
Composite CO :	15.63	19.56	29.88	22.21	20.62	1.558	1.521	2.909	12.71	17.430
Composite NOX :	1.170	1.356	1.710	1.447	4.790	1.349	1.392	12.542	1.12	2.363

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Local 12.9 mph Default - CY2002
* File 1, Run 1, Scenario 12.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M585 Warning:
            100% of VMT has been assigned to the local roadway
            type for all hours of the day for all vehicle types
            with an average speed of 12.9 mph.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2002
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:  279. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	2.529	2.662	4.111	3.033	4.880	1.095	1.461	1.298	3.57	2.724
Composite CO :	13.24	18.32	30.19	21.36	53.37	2.668	2.594	7.348	28.22	17.631
Composite NOX :	1.184	1.313	1.672	1.405	4.024	1.803	1.862	13.972	0.91	2.443

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
```

```
* Greenup                Rural Interstate 69.0 mph - CY2005
* File 1, Run 1, Scenario 13.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M 96 Warning:
                 69.0     speed reduced to 65 mph maximum
  M515 Warning:
            The combined freeway and ramp average speed entered
            cannot be greater than 64.2 miles per hour.
            The average speed will be reset to this value.
  M582 Warning:
            The user supplied freeway average speed of 64.2
            will be used for all hours of the day. 100% of VMT
            has been assigned to a fixed combination of freeways
            and freeway ramps for all hours of the day and all
             vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2005
                          Month:  July
                       Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   92. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                       ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.4158	0.3387	0.1165		0.0360	0.0006	0.0019	0.0849	0.0057	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.016	1.105	1.780	1.277	1.430	0.460	0.634	0.346	2.93	1.103
Composite CO :	15.30	17.34	22.52	18.66	18.66	1.440	1.260	2.563	24.94	15.892
Composite NOX :	0.968	1.198	1.526	1.282	5.124	2.093	2.179	19.048	1.65	2.802

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Principal Arterial 57.0 mph - CY2005
* File 1, Run 1, Scenario 14.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
```

```
M583 Warning:
          The user supplied arterial average speed of 57.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2005
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   92. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.4158	0.3387	0.1165		0.0360	0.0006	0.0019	0.0849	0.0057	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.044	1.136	1.833	1.314	1.448	0.462	0.636	0.348	2.46	1.129
Composite CO :	14.22	16.29	21.36	17.58	14.20	1.331	1.166	2.151	13.04	14.689
Composite NOX :	0.943	1.163	1.488	1.246	4.883	1.584	1.648	13.288	1.45	2.275

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Minor Arterial 47.0 mph - CY2005
* File 1, Run 1, Scenario 15.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
M583 Warning:
          The user supplied arterial average speed of 47.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2005
                         Month:  July
```

```
            Altitude:  Low
 Minimum Temperature:  66.0 (F)
 Maximum Temperature:  92.0 (F)
   Absolute Humidity:   75. grains/lb
    Nominal Fuel RVP:   9.0 psi
       Weathered RVP:   8.6 psi
 Fuel Sulfur Content:   92. ppm

 Exhaust I/M Program:  No
    Evap I/M Program:  No
         ATP Program:  No
    Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.4158	0.3387	0.1165		0.0360	0.0006	0.0019	0.0849	0.0057	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.104	1.192	1.925	1.380	1.542	0.482	0.664	0.382	2.35	1.190
Composite CO :	12.93	15.00	19.93	16.26	12.00	1.293	1.133	2.008	9.99	13.442
Composite NOX :	0.915	1.123	1.447	1.206	4.560	1.236	1.284	10.385	1.21	1.985

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Major Collector 46.0 mph - CY2005
* File 1, Run 1, Scenario 16.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of 46.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
           there are no sales for vehicle class HDGV8b

       Calendar Year:  2005
               Month:  July
            Altitude:  Low
 Minimum Temperature:  66.0 (F)
 Maximum Temperature:  92.0 (F)
   Absolute Humidity:   75. grains/lb
    Nominal Fuel RVP:   9.0 psi
       Weathered RVP:   8.6 psi
 Fuel Sulfur Content:   92. ppm

 Exhaust I/M Program:  No
    Evap I/M Program:  No
```

```
                ATP Program:  No
          Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:              <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:   0.4158    0.3387    0.1165              0.0360    0.0006    0.0019    0.0849    0.0057    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     1.111     1.199     1.935     1.387     1.556     0.485     0.669     0.387      2.35     1.197
    Composite CO  :    12.80     14.87     19.78     16.13     11.91     1.294     1.134     2.011     10.05    13.321
    Composite NOX :     0.912     1.119     1.443     1.202     4.526     1.212     1.259    10.187      1.20     1.964
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Minor Collector 41.0 mph - CY2005
* File 1, Run 1, Scenario 17.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 41.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                  Calendar Year:  2005
                          Month:  July
                       Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   92. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:              <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:   0.4158    0.3387    0.1165              0.0360    0.0006    0.0019    0.0849    0.0057    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     1.148     1.228     1.982     1.421     1.637     0.506     0.698     0.421      2.39     1.234
```

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Composite CO :	12.15	14.22	19.07	15.46	12.04	1.318	1.154	2.100	10.71	12.768
Composite NOX :	0.900	1.100	1.424	1.183	4.365	1.135	1.179	9.546	1.17	1.889

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Local 35.0 mph - CY2005
* File 1, Run 1, Scenario 18.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 35.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2005
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   92. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.4158	0.3387	0.1165		0.0360	0.0006	0.0019	0.0849	0.0057	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.201	1.270	2.046	1.468	1.775	0.540	0.747	0.478	2.49	1.288
Composite CO :	11.36	13.44	18.20	14.66	13.07	1.383	1.210	2.345	12.08	12.139
Composite NOX :	0.889	1.082	1.408	1.166	4.167	1.093	1.136	9.197	1.13	1.840

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Interstate 71.0 mph - CY2005
* File 1, Run 1, Scenario 19.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M 96 Warning:
                71.0      speed reduced to 65 mph maximum
```

```
M515 Warning:
          The combined freeway and ramp average speed entered
          cannot be greater than 60.9 miles per hour.
          The average speed will be reset to this value.
M582 Warning:
          The user supplied freeway average speed of 60.9
          will be used for all hours of the day. 100% of VMT
          has been assigned to a fixed combination of freeways
          and freeway ramps for all hours of the day and all
           vehicle types.
M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2005
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   92. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.4158	0.3387	0.1165		0.0360	0.0006	0.0019	0.0849	0.0057	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.036	1.123	1.807	1.298	1.452	0.466	0.641	0.354	2.90	1.122
Composite CO :	15.53	17.46	22.63	18.78	18.32	1.437	1.258	2.551	24.15	16.022
Composite NOX :	0.974	1.205	1.535	1.289	5.064	2.031	2.114	18.396	1.62	2.750

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Freeway 65.0 mph - CY2005
* File 1, Run 1, Scenario 20.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
M515 Warning:
          The combined freeway and ramp average speed entered
          cannot be greater than 60.9 miles per hour.
          The average speed will be reset to this value.
M582 Warning:
```

```
        The user supplied freeway average speed of 60.9
        will be used for all hours of the day. 100% of VMT
        has been assigned to a fixed combination of freeways
        and freeway ramps for all hours of the day and all
         vehicle types.
 M 48 Warning:
         there are no sales for vehicle class HDGV8b

              Calendar Year:  2005
                      Month:  July
                   Altitude:  Low
        Minimum Temperature:  66.0 (F)
        Maximum Temperature:  92.0 (F)
          Absolute Humidity:   75. grains/lb
         Nominal Fuel RVP:     9.0 psi
              Weathered RVP:   8.6 psi
        Fuel Sulfur Content:   92. ppm

        Exhaust I/M Program:  No
           Evap I/M Program:  No
                ATP Program:  No
           Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.4158	0.3387	0.1165		0.0360	0.0006	0.0019	0.0849	0.0057	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.036	1.123	1.807	1.298	1.452	0.466	0.641	0.354	2.90	1.122
Composite CO :	15.53	17.46	22.63	18.78	18.32	1.437	1.258	2.551	24.15	16.022
Composite NOX :	0.974	1.205	1.535	1.289	5.064	2.031	2.114	18.396	1.62	2.750

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Urban Principal Arterial 31.0 mph - CY2005
* File 1, Run 1, Scenario 21.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
        The user supplied arterial average speed of 31.0
        will be used for all hours of the day.  100% of VMT
        has been assigned to the arterial/collector roadway
        type for all hours of the day and all vehicle types.
 M 48 Warning:
         there are no sales for vehicle class HDGV8b

              Calendar Year:  2005
                      Month:  July
```

```
                 Altitude:  Low
Minimum Temperature:  66.0 (F)
Maximum Temperature:  92.0 (F)
  Absolute Humidity:   75. grains/lb
   Nominal Fuel RVP:   9.0 psi
      Weathered RVP:   8.6 psi
Fuel Sulfur Content:   92. ppm

Exhaust I/M Program:  No
   Evap I/M Program:  No
        ATP Program:  No
   Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.4158	0.3387	0.1165		0.0360	0.0006	0.0019	0.0849	0.0057	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.254	1.316	2.122	1.522	1.905	0.572	0.792	0.531	2.59	1.344
Composite CO :	11.23	13.29	18.09	14.52	14.51	1.457	1.275	2.627	13.42	12.102
Composite NOX :	0.910	1.098	1.426	1.182	4.042	1.101	1.143	9.258	1.10	1.856

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Urban Minor Arterial 28.0 mph - CY2005
* File 1, Run 1, Scenario 22.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 28.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                 Calendar Year:  2005
                         Month:  July
                      Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   92. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
```

ATP Program: No
Reformulated Gas: No

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.4158	0.3387	0.1165		0.0360	0.0006	0.0019	0.0849	0.0057	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.300	1.355	2.183	1.567	2.030	0.601	0.833	0.578	2.67	1.393
Composite CO :	11.25	13.29	18.17	14.54	16.03	1.532	1.340	2.911	14.65	12.205
Composite NOX :	0.933	1.118	1.451	1.203	3.947	1.120	1.163	9.417	1.07	1.886

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Collector 33.0 mph - CY2005
* File 1, Run 1, Scenario 23.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 33.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2005
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   92. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.4158	0.3387	0.1165		0.0360	0.0006	0.0019	0.0849	0.0057	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.226	1.291	2.082	1.494	1.836	0.555	0.769	0.503	2.54	1.315

```
                                                                  1HRMAINT
    Composite CO  :      11.30     13.37     18.15     14.59     13.75     1.418     1.241     2.477     12.71    12.122
    Composite NOX :      0.899     1.089     1.417     1.173     4.108     1.097     1.139     9.226      1.12     1.848
  ---------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Local 12.9 mph Default - CY2005
* File 1, Run 1, Scenario 24.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M585 Warning:
            100% of VMT has been assigned to the local roadway
            type for all hours of the day for all vehicle types
            with an average speed of 12.9 mph.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2005
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   92. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:                <6000     >6000     (All)
                          ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:     0.4158    0.3387    0.1165              0.0360    0.0006    0.0019    0.0849    0.0057    1.0000
  ---------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :       1.911     1.884     2.960     2.160     3.575     0.863     1.207     1.012      3.56     2.015
    Composite CO  :      10.06     13.02     18.54     14.43     35.59     2.418     2.108     6.257     28.22    12.732
    Composite NOX :      0.918     1.069     1.397     1.153     3.451     1.463     1.522    11.220      0.91     1.992
  ---------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Interstate 69.0 mph - CY2008
* File 1, Run 1, Scenario 25.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M 96 Warning:
                 69.0     speed reduced to 65 mph maximum
  M515 Warning:
```

```
          The combined freeway and ramp average speed entered
          cannot be greater than 64.2 miles per hour.
          The average speed will be reset to this value.
M582 Warning:
          The user supplied freeway average speed of 64.2
          will be used for all hours of the day. 100% of VMT
          has been assigned to a fixed combination of freeways
          and freeway ramps for all hours of the day and all
           vehicle types.
M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2008
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.777	0.838	1.383	0.977	1.101	0.224	0.423	0.286	2.92	0.857
Composite CO :	11.42	12.89	17.41	14.05	13.68	0.991	0.841	1.945	24.94	12.050
Composite NOX :	0.703	0.897	1.274	0.994	3.520	1.094	1.503	14.258	1.65	2.117

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Principal Arterial 57.0 mph - CY2008
* File 1, Run 1, Scenario 26.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
M583 Warning:
          The user supplied arterial average speed of 57.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
M 48 Warning:
```

```
there are no sales for vehicle class HDGV8b

      Calendar Year:  2008
              Month:  July
           Altitude:  Low
Minimum Temperature:  66.0 (F)
Maximum Temperature:  92.0 (F)
  Absolute Humidity:   75. grains/lb
   Nominal Fuel RVP:   9.0 psi
      Weathered RVP:   8.6 psi
Fuel Sulfur Content:   30. ppm

Exhaust I/M Program:  No
   Evap I/M Program:  No
        ATP Program:  No
   Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.799	0.859	1.424	1.003	1.116	0.225	0.425	0.288	2.45	0.877
Composite CO :	10.67	12.15	16.50	13.26	10.41	0.905	0.770	1.633	13.04	11.166
Composite NOX :	0.686	0.872	1.244	0.967	3.354	0.827	1.134	10.088	1.45	1.732

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Minor Arterial 47.0 mph - CY2008
* File 1, Run 1, Scenario 27.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
M583 Warning:
          The user supplied arterial average speed of 47.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
M 48 Warning:
          there are no sales for vehicle class HDGV8b

      Calendar Year:  2008
              Month:  July
           Altitude:  Low
Minimum Temperature:  66.0 (F)
Maximum Temperature:  92.0 (F)
  Absolute Humidity:   75. grains/lb
   Nominal Fuel RVP:   9.0 psi
      Weathered RVP:   8.6 psi
```

```
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:     0.3728    0.3705    0.1273              0.0359    0.0004    0.0019    0.0857    0.0055    1.0000
 ---------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.845     0.898     1.498     1.051     1.186     0.236     0.446     0.316      2.33     0.922
    Composite CO  :      9.75     11.23     15.38     12.29      8.79     0.876     0.745     1.524      9.99    10.256
    Composite NOX :      0.667     0.843     1.211     0.937     3.132     0.643     0.882     7.858      1.21     1.509
 ---------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Major Collector 46.0 mph - CY2008
* File 1, Run 1, Scenario 28.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 46.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2008
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
```

```
                                                        1HRMAINT
  VMT Distribution:    0.3728    0.3705    0.1273              0.0359    0.0004    0.0019    0.0857    0.0055    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.850     0.903     1.505     1.057     1.195     0.237     0.450     0.320      2.34     0.927
    Composite CO  :      9.66     11.13     15.26     12.19      8.73     0.876     0.745     1.526     10.05    10.169
    Composite NOX :      0.665     0.840     1.208     0.934     3.109     0.631     0.864     7.707      1.20     1.493
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Minor Collector 41.0 mph - CY2008
* File 1, Run 1, Scenario 29.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 41.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2008
                          Month:  July
                       Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:              <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3728    0.3705    0.1273              0.0359    0.0004    0.0019    0.0857    0.0055    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.879     0.923     1.543     1.082     1.253     0.248     0.472     0.348      2.38     0.955
    Composite CO  :      9.20     10.67     14.70     11.70      8.83     0.895     0.761     1.594     10.71     9.770
    Composite NOX :      0.656     0.826     1.193     0.920     2.998     0.590     0.809     7.214      1.17     1.437
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Local 35.0 mph - CY2008
```

```
* File 1, Run 1, Scenario 30.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 35.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2008
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3728    0.3705    0.1273              0.0359    0.0004    0.0019    0.0857    0.0055    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.919     0.952     1.594     1.116     1.351     0.267     0.509     0.395      2.48     0.996
     Composite CO  :     8.64     10.11     14.01     11.11      9.58     0.946     0.803     1.780     12.08     9.318
     Composite NOX :     0.650     0.813     1.181     0.907     2.862     0.568     0.778     6.947      1.13     1.400
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Interstate 71.0 mph - CY2008
* File 1, Run 1, Scenario 31.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M 96 Warning:
                71.0      speed reduced to 65 mph maximum
  M515 Warning:
            The combined freeway and ramp average speed entered
            cannot be greater than 60.9 miles per hour.
            The average speed will be reset to this value.
  M582 Warning:
            The user supplied freeway average speed of 60.9
```

will be used for all hours of the day. 100% of VMT
has been assigned to a fixed combination of freeways
and freeway ramps for all hours of the day and all
vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

```
      Calendar Year:  2008
              Month:  July
           Altitude:  Low
Minimum Temperature:  66.0 (F)
Maximum Temperature:  92.0 (F)
  Absolute Humidity:   75. grains/lb
   Nominal Fuel RVP:   9.0 psi
      Weathered RVP:   8.6 psi
Fuel Sulfur Content:   30. ppm

Exhaust I/M Program:  No
   Evap I/M Program:  No
        ATP Program:  No
   Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.791	0.849	1.403	0.991	1.117	0.227	0.429	0.293	2.89	0.870
Composite CO :	11.54	12.96	17.47	14.11	13.43	0.988	0.839	1.936	24.15	12.110
Composite NOX :	0.707	0.901	1.281	0.998	3.478	1.062	1.458	13.780	1.62	2.078

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Freeway 65.0 mph - CY2008
* File 1, Run 1, Scenario 32.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
```

M515 Warning:
The combined freeway and ramp average speed entered
cannot be greater than 60.9 miles per hour.
The average speed will be reset to this value.

M582 Warning:
The user supplied freeway average speed of 60.9
will be used for all hours of the day. 100% of VMT
has been assigned to a fixed combination of freeways
and freeway ramps for all hours of the day and all
vehicle types.

M 48 Warning:

```
there are no sales for vehicle class HDGV8b

      Calendar Year:  2008
              Month:  July
           Altitude:  Low
Minimum Temperature:  66.0 (F)
Maximum Temperature:  92.0 (F)
  Absolute Humidity:   75. grains/lb
   Nominal Fuel RVP:   9.0 psi
      Weathered RVP:   8.6 psi
Fuel Sulfur Content:   30. ppm

Exhaust I/M Program:  No
   Evap I/M Program:  No
        ATP Program:  No
   Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.791	0.849	1.403	0.991	1.117	0.227	0.429	0.293	2.89	0.870
Composite CO :	11.54	12.96	17.47	14.11	13.43	0.988	0.839	1.936	24.15	12.110
Composite NOX :	0.707	0.901	1.281	0.998	3.478	1.062	1.458	13.780	1.62	2.078

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Urban Principal Arterial 31.0 mph - CY2008
* File 1, Run 1, Scenario 33.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of 31.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

      Calendar Year:  2008
              Month:  July
           Altitude:  Low
Minimum Temperature:  66.0 (F)
Maximum Temperature:  92.0 (F)
  Absolute Humidity:   75. grains/lb
   Nominal Fuel RVP:   9.0 psi
      Weathered RVP:   8.6 psi
```

```
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3728    0.3705    0.1273              0.0359    0.0004    0.0019    0.0857    0.0055    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.958     0.985     1.650     1.155     1.441     0.285     0.543     0.439      2.57     1.037
    Composite CO  :      8.57     10.03     13.92     11.02     10.63     1.004     0.852     1.993     13.42     9.309
    Composite NOX :      0.664     0.825     1.195     0.919     2.776     0.572     0.784     6.994      1.10     1.412
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Minor Arterial 28.0 mph - CY2008
* File 1, Run 1, Scenario 34.
* # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 28.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2008
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
```

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VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.992	1.013	1.698	1.188	1.528	0.300	0.574	0.478	2.66	1.073
Composite CO :	8.60	10.05	13.96	11.05	11.75	1.063	0.901	2.209	14.65	9.402
Composite NOX :	0.681	0.840	1.216	0.936	2.711	0.582	0.798	7.115	1.07	1.434

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Collector 33.0 mph - CY2008
* File 1, Run 1, Scenario 35.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 33.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2008
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.937	0.968	1.620	1.135	1.393	0.276	0.525	0.416	2.52	1.015
Composite CO :	8.61	10.07	13.97	11.07	10.08	0.973	0.826	1.880	12.71	9.314
Composite NOX :	0.657	0.819	1.188	0.913	2.822	0.570	0.781	6.969	1.12	1.406

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Local 12.9 mph Default - CY2008
```

```
* File 1, Run 1, Scenario 36.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M585 Warning:
            100% of VMT has been assigned to the local roadway
            type for all hours of the day for all vehicle types
            with an average speed of 12.9 mph.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2008
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.444	1.395	2.308	1.629	2.606	0.443	0.857	0.837	3.55	1.536
Composite CO :	8.17	10.26	14.51	11.35	26.09	1.759	1.481	4.749	28.22	10.198
Composite NOX :	0.676	0.815	1.182	0.909	2.371	0.763	1.047	8.676	0.91	1.540

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Interstate 69.0 mph - CY2011
* File 1, Run 1, Scenario 37.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M 96 Warning:
                69.0     speed reduced to 65 mph maximum
  M515 Warning:
            The combined freeway and ramp average speed entered
            cannot be greater than 64.2 miles per hour.
            The average speed will be reset to this value.
  M582 Warning:
            The user supplied freeway average speed of 64.2
            will be used for all hours of the day. 100% of VMT
```

```
          has been assigned to a fixed combination of freeways
          and freeway ramps for all hours of the day and all
           vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2011
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3367	0.3972	0.1365		0.0360	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.584	0.667	1.170	0.795	0.853	0.120	0.298	0.238	2.91	0.689
Composite CO :	9.58	10.62	14.41	11.59	9.57	0.775	0.620	1.283	24.94	10.003
Composite NOX :	0.539	0.687	1.073	0.786	2.385	0.549	1.006	9.760	1.65	1.537

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Principal Arterial 57.0 mph - CY2011
* File 1, Run 1, Scenario 38.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of 57.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2011
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
```

```
          Maximum Temperature:  92.0 (F)
            Absolute Humidity:   75. grains/lb
             Nominal Fuel RVP:   9.0 psi
                Weathered RVP:   8.6 psi
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  No
             Evap I/M Program:  No
                  ATP Program:  No
             Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3367	0.3972	0.1365		0.0360	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.599	0.681	1.202	0.814	0.866	0.121	0.299	0.239	2.44	0.702
Composite CO :	8.96	10.00	13.63	10.93	7.28	0.704	0.565	1.077	13.04	9.276
Composite NOX :	0.526	0.668	1.049	0.766	2.273	0.414	0.759	6.957	1.45	1.275

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Minor Arterial 47.0 mph - CY2011
* File 1, Run 1, Scenario 39.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 47.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2011
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3367	0.3972	0.1365		0.0360	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.631	0.707	1.260	0.849	0.914	0.127	0.315	0.262	2.32	0.734
Composite CO :	8.21	9.23	12.67	10.11	6.15	0.679	0.545	1.005	9.99	8.523
Composite NOX :	0.511	0.646	1.023	0.743	2.122	0.322	0.589	5.411	1.21	1.118

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Major Collector 46.0 mph - CY2011
* File 1, Run 1, Scenario 40.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 46.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2011
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3367	0.3972	0.1365		0.0360	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.635	0.710	1.266	0.852	0.921	0.128	0.317	0.266	2.33	0.738
Composite CO :	8.13	9.15	12.57	10.03	6.11	0.680	0.546	1.006	10.05	8.450
Composite NOX :	0.509	0.644	1.021	0.740	2.107	0.316	0.578	5.306	1.20	1.106

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Minor Collector 41.0 mph - CY2011
* File 1, Run 1, Scenario 41.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 41.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2011
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3367	0.3972	0.1365		0.0360	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.656	0.725	1.296	0.871	0.960	0.134	0.333	0.289	2.37	0.758
Composite CO :	7.76	8.77	12.09	9.62	6.18	0.695	0.558	1.051	10.71	8.117
Composite NOX :	0.503	0.634	1.009	0.730	2.032	0.295	0.541	4.964	1.17	1.066

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Local 35.0 mph - CY2011
* File 1, Run 1, Scenario 42.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 35.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
```

```
          type for all hours of the day and all vehicle types.
M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2011
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3367	0.3972	0.1365		0.0360	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.685	0.745	1.336	0.896	1.023	0.145	0.361	0.329	2.47	0.788
Composite CO :	7.30	8.31	11.50	9.12	6.71	0.737	0.591	1.174	12.08	7.735
Composite NOX :	0.498	0.624	1.000	0.720	1.940	0.284	0.520	4.778	1.13	1.040

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Urban Interstate 71.0 mph - CY2011
* File 1, Run 1, Scenario 43.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
M 96 Warning:
              71.0     speed reduced to 65 mph maximum
M515 Warning:
          The combined freeway and ramp average speed entered
          cannot be greater than 60.9 miles per hour.
          The average speed will be reset to this value.
M582 Warning:
          The user supplied freeway average speed of 60.9
          will be used for all hours of the day. 100% of VMT
          has been assigned to a fixed combination of freeways
          and freeway ramps for all hours of the day and all
           vehicle types.
M 48 Warning:
            there are no sales for vehicle class HDGV8b
```

```
              Calendar Year:  2011
                      Month:  July
                   Altitude:  Low
        Minimum Temperature:  66.0 (F)
        Maximum Temperature:  92.0 (F)
          Absolute Humidity:   75. grains/lb
           Nominal Fuel RVP:   9.0 psi
              Weathered RVP:   8.6 psi
        Fuel Sulfur Content:   30. ppm

        Exhaust I/M Program:  No
           Evap I/M Program:  No
                ATP Program:  No
           Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3367	0.3972	0.1365		0.0360	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.594	0.675	1.185	0.805	0.864	0.122	0.302	0.243	2.88	0.698
Composite CO :	9.67	10.67	14.45	11.63	9.39	0.773	0.618	1.277	24.15	10.043
Composite NOX :	0.541	0.689	1.079	0.789	2.357	0.533	0.976	9.436	1.62	1.510

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Freeway 65.0 mph - CY2011
* File 1, Run 1, Scenario 44.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M515 Warning:
            The combined freeway and ramp average speed entered
            cannot be greater than 60.9 miles per hour.
            The average speed will be reset to this value.
  M582 Warning:
            The user supplied freeway average speed of 60.9
            will be used for all hours of the day. 100% of VMT
            has been assigned to a fixed combination of freeways
            and freeway ramps for all hours of the day and all
             vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

              Calendar Year:  2011
                      Month:  July
                   Altitude:  Low
        Minimum Temperature:  66.0 (F)
```

```
          Maximum Temperature:  92.0 (F)
            Absolute Humidity:   75. grains/lb
             Nominal Fuel RVP:   9.0 psi
                Weathered RVP:   8.6 psi
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  No
             Evap I/M Program:  No
                  ATP Program:  No
             Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3367	0.3972	0.1365		0.0360	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.594	0.675	1.185	0.805	0.864	0.122	0.302	0.243	2.88	0.698
Composite CO :	9.67	10.67	14.45	11.63	9.39	0.773	0.618	1.277	24.15	10.043
Composite NOX :	0.541	0.689	1.079	0.789	2.357	0.533	0.976	9.436	1.62	1.510

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Principal Arterial 31.0 mph - CY2011
* File 1, Run 1, Scenario 45.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 31.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                  Calendar Year:  2011
                          Month:  July
                       Altitude:  Low
             Minimum Temperature:  66.0 (F)
             Maximum Temperature:  92.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   9.0 psi
                   Weathered RVP:   8.6 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  No
                Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3367	0.3972	0.1365		0.0360	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.713	0.769	1.383	0.926	1.081	0.155	0.386	0.364	2.56	0.819
Composite CO :	7.25	8.26	11.44	9.07	7.44	0.786	0.629	1.315	13.42	7.736
Composite NOX :	0.508	0.633	1.012	0.730	1.881	0.286	0.524	4.811	1.10	1.049

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Urban Minor Arterial 28.0 mph - CY2011
* File 1, Run 1, Scenario 46.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of 28.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2011
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3367	0.3972	0.1365		0.0360	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.738	0.789	1.421	0.951	1.136	0.165	0.408	0.397	2.65	0.846
Composite CO :	7.29	8.29	11.49	9.11	8.22	0.834	0.667	1.457	14.65	7.817
Composite NOX :	0.521	0.644	1.028	0.742	1.837	0.291	0.533	4.895	1.07	1.066

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Collector 33.0 mph - CY2011
* File 1, Run 1, Scenario 47.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 33.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2011
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                       ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3367	0.3972	0.1365		0.0360	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.698	0.756	1.358	0.910	1.050	0.150	0.373	0.345	2.51	0.802
Composite CO :	7.27	8.28	11.47	9.10	7.05	0.760	0.608	1.240	12.71	7.735
Composite NOX :	0.503	0.628	1.005	0.725	1.912	0.285	0.522	4.794	1.12	1.044

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Local 12.9 mph Default - CY2011
* File 1, Run 1, Scenario 48.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M585 Warning:
            100% of VMT has been assigned to the local roadway
            type for all hours of the day for all vehicle types
            with an average speed of 12.9 mph.
```

```
M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2011
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3367	0.3972	0.1365		0.0360	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.073	1.083	1.924	1.298	1.830	0.247	0.615	0.695	3.54	1.200
Composite CO :	7.28	8.72	12.14	9.59	18.25	1.408	1.118	3.132	28.22	8.649
Composite NOX :	0.525	0.634	1.004	0.728	1.606	0.382	0.700	6.038	0.91	1.149

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Interstate 69.0 mph - CY2014
* File 1, Run 1, Scenario 49.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
M 96 Warning:
              69.0     speed reduced to 65 mph maximum
M515 Warning:
          The combined freeway and ramp average speed entered
          cannot be greater than 64.2 miles per hour.
          The average speed will be reset to this value.
M582 Warning:
          The user supplied freeway average speed of 64.2
          will be used for all hours of the day. 100% of VMT
          has been assigned to a fixed combination of freeways
          and freeway ramps for all hours of the day and all
           vehicle types.
M 48 Warning:
           there are no sales for vehicle class HDGV8b
M 48 Warning:
```

```
there are no sales for vehicle class LDDT12

      Calendar Year:  2014
              Month:  July
           Altitude:  Low
Minimum Temperature:  66.0 (F)
Maximum Temperature:  92.0 (F)
  Absolute Humidity:   75. grains/lb
   Nominal Fuel RVP:   9.0 psi
      Weathered RVP:   8.6 psi
Fuel Sulfur Content:   30. ppm

Exhaust I/M Program:  No
   Evap I/M Program:  No
        ATP Program:  No
   Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3099	0.4167	0.1431		0.0360	0.0003	0.0021	0.0866	0.0053	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.445	0.541	0.966	0.649	0.667	0.080	0.243	0.202	2.91	0.559
Composite CO :	8.20	9.20	12.42	10.02	8.71	0.668	0.537	0.762	24.94	8.665
Composite NOX :	0.408	0.530	0.904	0.626	1.509	0.288	0.726	6.216	1.65	1.080

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Principal Arterial 57.0 mph - CY2014
* File 1, Run 1, Scenario 50.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 57.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

      Calendar Year:  2014
              Month:  July
           Altitude:  Low
Minimum Temperature:  66.0 (F)
Maximum Temperature:  92.0 (F)
  Absolute Humidity:   75. grains/lb
```

```
              Nominal Fuel RVP:   9.0 psi
                 Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:              <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3099    0.4167    0.1431              0.0360    0.0003    0.0021    0.0866    0.0053    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.456     0.550     0.990     0.663     0.676     0.080     0.244     0.203      2.44     0.568
    Composite CO  :      7.68      8.66     11.73      9.44      6.63     0.607     0.490     0.640     13.04     8.030
    Composite NOX :      0.399     0.516     0.884     0.610     1.438     0.217     0.548     4.433      1.45     0.910
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Minor Arterial 47.0 mph - CY2014
* File 1, Run 1, Scenario 51.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 47.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                   Calendar Year:  2014
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3099	0.4167	0.1431		0.0360	0.0003	0.0021	0.0866	0.0053	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.478	0.570	1.034	0.688	0.713	0.085	0.257	0.223	2.32	0.591
Composite CO :	7.04	7.99	10.88	8.73	5.60	0.585	0.473	0.597	9.99	7.376
Composite NOX :	0.387	0.499	0.862	0.592	1.343	0.169	0.426	3.451	1.21	0.806

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Major Collector 46.0 mph - CY2014
* File 1, Run 1, Scenario 52.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 46.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                   Calendar Year:  2014
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  66.0 (F)
             Maximum Temperature:  92.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   9.0 psi
                   Weathered RVP:   8.6 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  No
                Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3099	0.4167	0.1431		0.0360	0.0003	0.0021	0.0866	0.0053	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.481	0.572	1.038	0.691	0.718	0.085	0.259	0.226	2.33	0.594

```
                                                        1HRMAINT
   Composite CO  :      6.98      7.92     10.79      8.65      5.56     0.586     0.474     0.598     10.05     7.313
   Composite NOX :      0.386     0.498     0.860     0.590     1.333     0.166     0.418     3.384      1.20     0.798
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Minor Collector 41.0 mph - CY2014
* File 1, Run 1, Scenario 53.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of 41.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b
 M 48 Warning:
            there are no sales for vehicle class LDDT12

                 Calendar Year:  2014
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:      0.3099    0.4167    0.1431              0.0360    0.0003    0.0021    0.0866    0.0053    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.497     0.583     1.061     0.705     0.748     0.090     0.271     0.245      2.37     0.610
    Composite CO  :      6.66      7.59     10.36      8.30      5.62     0.599     0.484     0.624     10.71     7.024
    Composite NOX :      0.381     0.490     0.851     0.582     1.286     0.155     0.391     3.167      1.17     0.771
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Local 35.0 mph - CY2014
* File 1, Run 1, Scenario 54.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
```

```
M583 Warning:
          The user supplied arterial average speed of 35.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
M 48 Warning:
            there are no sales for vehicle class HDGV8b
M 48 Warning:
            there are no sales for vehicle class LDDT12

                 Calendar Year:  2014
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3099	0.4167	0.1431		0.0360	0.0003	0.0021	0.0866	0.0053	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.520	0.598	1.092	0.724	0.798	0.097	0.292	0.279	2.47	0.633
Composite CO :	6.28	7.18	9.85	7.86	6.10	0.635	0.512	0.697	12.08	6.693
Composite NOX :	0.377	0.482	0.843	0.574	1.227	0.149	0.377	3.049	1.13	0.753

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Interstate 71.0 mph - CY2014
* File 1, Run 1, Scenario 55.
* # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
M 96 Warning:
             71.0      speed reduced to 65 mph maximum
M515 Warning:
          The combined freeway and ramp average speed entered
          cannot be greater than 60.9 miles per hour.
          The average speed will be reset to this value.
M582 Warning:
          The user supplied freeway average speed of 60.9
```

will be used for all hours of the day. 100% of VMT
has been assigned to a fixed combination of freeways
and freeway ramps for all hours of the day and all
vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

M 48 Warning:
there are no sales for vehicle class LDDT12

```
      Calendar Year:  2014
              Month:  July
           Altitude:  Low
Minimum Temperature:  66.0 (F)
Maximum Temperature:  92.0 (F)
  Absolute Humidity:   75. grains/lb
   Nominal Fuel RVP:   9.0 psi
      Weathered RVP:   8.6 psi
Fuel Sulfur Content:   30. ppm

Exhaust I/M Program:  No
   Evap I/M Program:  No
        ATP Program:  No
   Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3099	0.4167	0.1431		0.0360	0.0003	0.0021	0.0866	0.0053	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.452	0.546	0.978	0.657	0.675	0.081	0.247	0.207	2.88	0.566
Composite CO :	8.26	9.23	12.45	10.05	8.55	0.666	0.535	0.758	24.15	8.692
Composite NOX :	0.410	0.532	0.909	0.628	1.492	0.279	0.704	6.009	1.62	1.063

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Freeway 65.0 mph - CY2014
* File 1, Run 1, Scenario 56.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
```

M515 Warning:
The combined freeway and ramp average speed entered
cannot be greater than 60.9 miles per hour.
The average speed will be reset to this value.

M582 Warning:
The user supplied freeway average speed of 60.9
will be used for all hours of the day. 100% of VMT
has been assigned to a fixed combination of freeways
and freeway ramps for all hours of the day and all

```
            vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b
 M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2014
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3099	0.4167	0.1431		0.0360	0.0003	0.0021	0.0866	0.0053	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.452	0.546	0.978	0.657	0.675	0.081	0.247	0.207	2.88	0.566
Composite CO :	8.26	9.23	12.45	10.05	8.55	0.666	0.535	0.758	24.15	8.692
Composite NOX :	0.410	0.532	0.909	0.628	1.492	0.279	0.704	6.009	1.62	1.063

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Principal Arterial 31.0 mph - CY2014
* File 1, Run 1, Scenario 57.
* # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
            The user supplied arterial average speed of 31.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b
 M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2014
                          Month:  July
```

```
                 Altitude:  Low
Minimum Temperature:  66.0 (F)
Maximum Temperature:  92.0 (F)
  Absolute Humidity:   75. grains/lb
   Nominal Fuel RVP:   9.0 psi
      Weathered RVP:   8.6 psi
Fuel Sulfur Content:   30. ppm

Exhaust I/M Program:  No
   Evap I/M Program:  No
        ATP Program:  No
   Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3099	0.4167	0.1431		0.0360	0.0003	0.0021	0.0866	0.0053	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.542	0.617	1.127	0.747	0.842	0.104	0.312	0.309	2.56	0.658
Composite CO :	6.25	7.15	9.79	7.83	6.77	0.677	0.544	0.781	13.42	6.702
Composite NOX :	0.385	0.489	0.853	0.582	1.190	0.150	0.379	3.069	1.10	0.760

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Minor Arterial 28.0 mph - CY2014
* File 1, Run 1, Scenario 58.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 28.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                   Calendar Year:  2014
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm
```

```
            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:                <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:     0.3099    0.4167    0.1431              0.0360    0.0003    0.0021    0.0866    0.0053    1.0000
 ---------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.561     0.634     1.157     0.767     0.884     0.110     0.329     0.337      2.65     0.679
    Composite CO  :      6.29      7.19      9.84      7.87      7.48     0.720     0.577     0.866     14.65     6.778
    Composite NOX :      0.395     0.497     0.866     0.592     1.163     0.153     0.386     3.123      1.07     0.772
 ---------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Urban Collector 33.0 mph - CY2014
* File 1, Run 1, Scenario 59.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 33.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                   Calendar Year:  2014
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:                <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
```

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VMT Distribution:	0.3099	0.4167	0.1431		0.0360	0.0003	0.0021	0.0866	0.0053	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.530	0.607	1.108	0.735	0.819	0.100	0.302	0.293	2.51	0.645
Composite CO :	6.26	7.17	9.82	7.85	6.42	0.655	0.527	0.737	12.71	6.698
Composite NOX :	0.381	0.485	0.847	0.578	1.210	0.150	0.378	3.058	1.12	0.757

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Local 12.9 mph Default - CY2014
* File 1, Run 1, Scenario 60.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M585 Warning:
            100% of VMT has been assigned to the local roadway
            type for all hours of the day for all vehicle types
            with an average speed of 12.9 mph.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2014
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3099	0.4167	0.1431		0.0360	0.0003	0.0021	0.0866	0.0053	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.829	0.878	1.561	1.052	1.423	0.166	0.490	0.590	3.54	0.968
Composite CO :	6.58	7.70	10.48	8.41	16.61	1.217	0.959	1.860	28.22	7.659
Composite NOX :	0.405	0.493	0.846	0.583	1.016	0.201	0.506	3.844	0.91	0.827

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
```

```
* Greenup                Rural Interstate 69.0 mph - CY2017
* File 1, Run 1, Scenario 61.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M 96 Warning:
                 69.0     speed reduced to 65 mph maximum
  M515 Warning:
            The combined freeway and ramp average speed entered
            cannot be greater than 64.2 miles per hour.
            The average speed will be reset to this value.
  M582 Warning:
            The user supplied freeway average speed of 64.2
            will be used for all hours of the day. 100% of VMT
            has been assigned to a fixed combination of freeways
            and freeway ramps for all hours of the day and all
             vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                  Calendar Year:  2017
                          Month:  July
                       Altitude:  Low
             Minimum Temperature:  66.0 (F)
             Maximum Temperature:  92.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   9.0 psi
                   Weathered RVP:   8.6 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  No
                Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2912	0.4304	0.1478		0.0361	0.0003	0.0022	0.0869	0.0052	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.358	0.468	0.809	0.555	0.530	0.059	0.206	0.181	2.91	0.476
Composite CO :	7.43	8.45	11.27	9.17	8.46	0.599	0.484	0.533	24.94	7.948
Composite NOX :	0.322	0.432	0.766	0.518	1.014	0.155	0.554	4.150	1.65	0.800

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Principal Arterial 57.0 mph - CY2017
```

```
* File 1, Run 1, Scenario 62.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 57.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                   Calendar Year:  2017
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:                <6000     >6000     (All)
                         ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:     0.2912    0.4304    0.1478              0.0361    0.0003    0.0022    0.0869    0.0052    1.0000
  ---------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      0.367     0.476     0.828     0.566     0.537     0.059     0.206     0.183      2.44     0.483
     Composite CO  :      6.96      7.95     10.64      8.64      6.44     0.544     0.442     0.447     13.04     7.360
     Composite NOX :      0.314     0.420     0.749     0.504     0.966     0.117     0.418     2.944      1.45     0.682
  ---------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Minor Arterial 47.0 mph - CY2017
* File 1, Run 1, Scenario 63.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 47.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
```

```
            there are no sales for vehicle class HDGV8b
M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2017
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2912	0.4304	0.1478		0.0361	0.0003	0.0022	0.0869	0.0052	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.385	0.493	0.863	0.588	0.566	0.063	0.216	0.200	2.32	0.502
Composite CO :	6.39	7.33	9.85	7.98	5.44	0.525	0.428	0.418	9.99	6.759
Composite NOX :	0.306	0.406	0.730	0.489	0.902	0.091	0.326	2.294	1.21	0.611

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Major Collector 46.0 mph - CY2017
* File 1, Run 1, Scenario 64.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
M583 Warning:
            The user supplied arterial average speed of 46.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
M 48 Warning:
            there are no sales for vehicle class HDGV8b
M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2017
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  66.0 (F)
```

```
          Maximum Temperature:  92.0 (F)
            Absolute Humidity:   75. grains/lb
             Nominal Fuel RVP:   9.0 psi
                Weathered RVP:   8.6 psi
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  No
             Evap I/M Program:  No
                  ATP Program:  No
             Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2912	0.4304	0.1478		0.0361	0.0003	0.0022	0.0869	0.0052	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.388	0.495	0.866	0.590	0.571	0.063	0.218	0.203	2.33	0.505
Composite CO :	6.33	7.27	9.77	7.91	5.40	0.525	0.428	0.418	10.05	6.701
Composite NOX :	0.305	0.405	0.728	0.488	0.895	0.090	0.320	2.250	1.20	0.606

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Minor Collector 41.0 mph - CY2017
* File 1, Run 1, Scenario 65.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 41.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                   Calendar Year:  2017
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
```

```
                 ATP Program:  No
           Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2912    0.4304    0.1478              0.0361    0.0003    0.0022    0.0869    0.0052    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :      0.402     0.505     0.885     0.602     0.596     0.066     0.228     0.221      2.37     0.519
   Composite CO  :      6.05      6.96      9.38      7.58      5.46     0.537     0.437     0.437     10.71     6.437
   Composite NOX :      0.301     0.398     0.720     0.480     0.863     0.084     0.299     2.106      1.17     0.586
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Local 35.0 mph - CY2017
* File 1, Run 1, Scenario 66.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of 35.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b
 M 48 Warning:
            there are no sales for vehicle class LDDT12

                Calendar Year:  2017
                        Month:  July
                     Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                     ATP Program:  No
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2912    0.4304    0.1478              0.0361    0.0003    0.0022    0.0869    0.0052    1.0000
 ---------------------------------------------------------------------------------------------------------------------
```

```
Composite Emission Factors (g/mi):
    Composite VOC :      0.422     0.518     0.910     0.618     0.637     0.072     0.245     0.251     2.47      0.538
    Composite CO  :      5.70      6.59      8.91      7.18      5.93      0.570     0.462     0.488    12.08      6.135
    Composite NOX :      0.298     0.392     0.712     0.474     0.824     0.081     0.288     2.028     1.13      0.574
 ---------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Interstate 71.0 mph - CY2017
* File 1, Run 1, Scenario 67.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M 96 Warning:
                 71.0     speed reduced to 65 mph maximum
  M515 Warning:
            The combined freeway and ramp average speed entered
            cannot be greater than 60.9 miles per hour.
            The average speed will be reset to this value.
  M582 Warning:
            The user supplied freeway average speed of 60.9
            will be used for all hours of the day. 100% of VMT
            has been assigned to a fixed combination of freeways
            and freeway ramps for all hours of the day and all
             vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                   Calendar Year:  2017
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  66.0 (F)
             Maximum Temperature:  92.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   9.0 psi
                   Weathered RVP:   8.6 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  No
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:     0.2912    0.4304    0.1478              0.0361    0.0003    0.0022    0.0869    0.0052    1.0000
 ---------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
```

```
                                                    1HRMAINT
   Composite VOC :      0.364     0.473     0.819     0.562     0.537     0.060     0.208     0.186      2.88     0.482
   Composite CO  :      7.48      8.48     11.29      9.20      8.31     0.598     0.483     0.530     24.15     7.968
   Composite NOX :      0.322     0.433     0.770     0.520     1.002     0.151     0.537     4.011      1.62     0.789
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Freeway 65.0 mph - CY2017
* File 1, Run 1, Scenario 68.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
 M515 Warning:
          The combined freeway and ramp average speed entered
          cannot be greater than 60.9 miles per hour.
          The average speed will be reset to this value.
 M582 Warning:
          The user supplied freeway average speed of 60.9
          will be used for all hours of the day. 100% of VMT
          has been assigned to a fixed combination of freeways
          and freeway ramps for all hours of the day and all
           vehicle types.
 M 48 Warning:
           there are no sales for vehicle class HDGV8b
 M 48 Warning:
           there are no sales for vehicle class LDDT12

                 Calendar Year:  2017
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  66.0 (F)
           Maximum Temperature:  92.0 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:   9.0 psi
                 Weathered RVP:   8.6 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  No
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:             <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:      0.2912    0.4304    0.1478              0.0361    0.0003    0.0022    0.0869    0.0052    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :      0.364     0.473     0.819     0.562     0.537     0.060     0.208     0.186      2.88     0.482
   Composite CO  :      7.48      8.48     11.29      9.20      8.31     0.598     0.483     0.530     24.15     7.968
   Composite NOX :      0.322     0.433     0.770     0.520     1.002     0.151     0.537     4.011      1.62     0.789
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Principal Arterial 31.0 mph - CY2017
* File 1, Run 1, Scenario 69.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 31.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2017
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2912	0.4304	0.1478		0.0361	0.0003	0.0022	0.0869	0.0052	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.441	0.535	0.939	0.638	0.673	0.077	0.261	0.278	2.56	0.560
Composite CO :	5.69	6.57	8.87	7.16	6.58	0.608	0.491	0.546	13.42	6.150
Composite NOX :	0.305	0.398	0.721	0.480	0.799	0.081	0.290	2.042	1.10	0.579

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Minor Arterial 28.0 mph - CY2017
* File 1, Run 1, Scenario 70.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 28.0
```

```
        will be used for all hours of the day.  100% of VMT
        has been assigned to the arterial/collector roadway
        type for all hours of the day and all vehicle types.
 M 48 Warning:
          there are no sales for vehicle class HDGV8b
 M 48 Warning:
          there are no sales for vehicle class LDDT12

             Calendar Year:  2017
                     Month:  July
                  Altitude:  Low
       Minimum Temperature:  66.0 (F)
       Maximum Temperature:  92.0 (F)
         Absolute Humidity:   75. grains/lb
          Nominal Fuel RVP:   9.0 psi
             Weathered RVP:   8.6 psi
       Fuel Sulfur Content:   30. ppm

       Exhaust I/M Program:  No
          Evap I/M Program:  No
               ATP Program:  No
          Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2912	0.4304	0.1478		0.0361	0.0003	0.0022	0.0869	0.0052	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.457	0.549	0.964	0.655	0.707	0.081	0.275	0.303	2.65	0.578
Composite CO :	5.73	6.61	8.91	7.20	7.27	0.646	0.520	0.605	14.65	6.224
Composite NOX :	0.313	0.405	0.733	0.489	0.781	0.083	0.295	2.078	1.07	0.589

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup            Urban Collector 33.0 mph - CY2017
* File 1, Run 1, Scenario 71.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
        The user supplied arterial average speed of 33.0
        will be used for all hours of the day.  100% of VMT
        has been assigned to the arterial/collector roadway
        type for all hours of the day and all vehicle types.
 M 48 Warning:
          there are no sales for vehicle class HDGV8b
 M 48 Warning:
          there are no sales for vehicle class LDDT12
```

```
              Calendar Year:  2017
                      Month:  July
                   Altitude:  Low
         Minimum Temperature:  66.0 (F)
         Maximum Temperature:  92.0 (F)
           Absolute Humidity:   75. grains/lb
            Nominal Fuel RVP:   9.0 psi
               Weathered RVP:   8.6 psi
         Fuel Sulfur Content:   30. ppm

         Exhaust I/M Program:  No
            Evap I/M Program:  No
                 ATP Program:  No
            Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2912	0.4304	0.1478		0.0361	0.0003	0.0022	0.0869	0.0052	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.431	0.526	0.923	0.627	0.654	0.074	0.253	0.264	2.51	0.548
Composite CO :	5.70	6.58	8.89	7.17	6.23	0.588	0.475	0.515	12.71	6.142
Composite NOX :	0.302	0.395	0.716	0.477	0.813	0.081	0.289	2.035	1.12	0.576

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Local 12.9 mph Default - CY2017
* File 1, Run 1, Scenario 72.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M585 Warning:
            100% of VMT has been assigned to the local roadway
            type for all hours of the day for all vehicle types
            with an average speed of 12.9 mph.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

              Calendar Year:  2017
                      Month:  July
                   Altitude:  Low
         Minimum Temperature:  66.0 (F)
         Maximum Temperature:  92.0 (F)
           Absolute Humidity:   75. grains/lb
            Nominal Fuel RVP:   9.0 psi
               Weathered RVP:   8.6 psi
         Fuel Sulfur Content:   30. ppm
```

```
            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:                <6000     >6000    (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:     0.2912    0.4304    0.1478              0.0361    0.0003    0.0022    0.0869    0.0052    1.0000
 ---------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.695     0.772     1.307     0.908     1.150     0.123     0.405     0.531      3.54     0.835
    Composite CO  :      6.17      7.16      9.59      7.78     16.14     1.095     0.860     1.301     28.22     7.140
    Composite NOX :      0.324     0.402     0.714     0.481     0.683     0.108     0.386     2.548      0.91     0.624
 ---------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Interstate 69.0 mph - CY2020
* File 1, Run 1, Scenario 73.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M 96 Warning:
                 69.0     speed reduced to 65 mph maximum
  M515 Warning:
            The combined freeway and ramp average speed entered
            cannot be greater than 64.2 miles per hour.
            The average speed will be reset to this value.
  M582 Warning:
            The user supplied freeway average speed of 64.2
            will be used for all hours of the day. 100% of VMT
            has been assigned to a fixed combination of freeways
            and freeway ramps for all hours of the day and all
             vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                  Calendar Year:  2020
                          Month:  July
                       Altitude:  Low
             Minimum Temperature:  66.0 (F)
             Maximum Temperature:  92.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   9.0 psi
                   Weathered RVP:   8.6 psi
             Fuel Sulfur Content:   30. ppm
```

```
            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:                <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:     0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.305     0.408     0.661     0.473     0.425     0.048     0.162     0.170      2.91     0.409
    Composite CO  :      7.04      8.03     10.42      8.64      8.29     0.571     0.416     0.388     24.94     7.524
    Composite NOx :      0.271     0.387     0.676     0.461     0.707     0.099     0.415     2.735      1.65     0.622
 ---------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Principal Arterial 57.0 mph - CY2020
* File 1, Run 1, Scenario 74.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 57.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                   Calendar Year:  2020
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:                <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
```

```
                                                        1HRMAINT
  VMT Distribution:     0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :       0.312     0.415     0.675     0.482     0.431     0.049     0.162     0.171      2.44     0.415
    Composite CO  :       6.59      7.55      9.83      8.13      6.31     0.518     0.379     0.326     13.04     6.960
    Composite NOX :       0.266     0.376     0.661     0.449     0.674     0.075     0.314     1.971      1.45     0.544
 ---------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Minor Arterial 47.0 mph - CY2020
* File 1, Run 1, Scenario 75.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 47.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2020
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

      Vehicle Type:       LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:                <6000     >6000     (All)
                         ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:     0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :       0.329     0.430     0.702     0.499     0.455     0.051     0.170     0.188      2.32     0.431
    Composite CO  :       6.06      6.96      9.09      7.50      5.33     0.499     0.366     0.304      9.99     6.386
    Composite NOX :       0.259     0.363     0.643     0.435     0.630     0.058     0.245     1.525      1.21     0.492
 ---------------------------------------------------------------------------------------------------------------------------
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Major Collector 46.0 mph - CY2020
* File 1, Run 1, Scenario 76.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 46.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                   Calendar Year:  2020
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  66.0 (F)
              Maximum Temperature:  92.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.332	0.431	0.705	0.501	0.458	0.052	0.171	0.190	2.33	0.434
Composite CO :	6.00	6.90	9.02	7.44	5.30	0.500	0.366	0.305	10.05	6.331
Composite NOX :	0.258	0.362	0.641	0.434	0.625	0.057	0.240	1.495	1.20	0.488

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Rural Minor Collector 41.0 mph - CY2020
* File 1, Run 1, Scenario 77.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 41.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
```

```
          type for all hours of the day and all vehicle types.
M 48 Warning:
            there are no sales for vehicle class HDGV8b
M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2020
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.345	0.440	0.720	0.511	0.480	0.054	0.179	0.207	2.37	0.446
Composite CO :	5.74	6.60	8.65	7.13	5.35	0.511	0.375	0.318	10.71	6.079
Composite NOX :	0.255	0.356	0.634	0.427	0.603	0.054	0.225	1.397	1.17	0.474

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Rural Local 35.0 mph - CY2020
* File 1, Run 1, Scenario 78.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
M583 Warning:
          The user supplied arterial average speed of 35.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
M 48 Warning:
            there are no sales for vehicle class HDGV8b
M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2020
                          Month:  July
```

```
                 Altitude:  Low
Minimum Temperature:  66.0 (F)
Maximum Temperature:  92.0 (F)
  Absolute Humidity:   75. grains/lb
   Nominal Fuel RVP:   9.0 psi
      Weathered RVP:   8.6 psi
Fuel Sulfur Content:   30. ppm

Exhaust I/M Program:  No
   Evap I/M Program:  No
        ATP Program:  No
   Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.363	0.452	0.740	0.525	0.515	0.059	0.193	0.235	2.47	0.464
Composite CO :	5.41	6.24	8.21	6.75	5.81	0.543	0.397	0.355	12.08	5.791
Composite NOX :	0.253	0.351	0.627	0.421	0.575	0.052	0.216	1.343	1.13	0.464

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Urban Interstate 71.0 mph - CY2020
* File 1, Run 1, Scenario 79.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M 96 Warning:
              71.0     speed reduced to 65 mph maximum
  M515 Warning:
           The combined freeway and ramp average speed entered
           cannot be greater than 60.9 miles per hour.
           The average speed will be reset to this value.
  M582 Warning:
           The user supplied freeway average speed of 60.9
           will be used for all hours of the day. 100% of VMT
           has been assigned to a fixed combination of freeways
           and freeway ramps for all hours of the day and all
            vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                 Calendar Year:  2020
                         Month:  July
                      Altitude:  Low
```

```
          Minimum Temperature:  66.0 (F)
          Maximum Temperature:  92.0 (F)
            Absolute Humidity:   75. grains/lb
             Nominal Fuel RVP:   9.0 psi
                Weathered RVP:   8.6 psi
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  No
             Evap I/M Program:  No
                  ATP Program:  No
             Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.310	0.412	0.669	0.478	0.431	0.049	0.164	0.174	2.88	0.414
Composite CO :	7.08	8.06	10.44	8.67	8.14	0.569	0.415	0.387	24.15	7.542
Composite NOX :	0.272	0.388	0.680	0.463	0.699	0.096	0.403	2.646	1.62	0.615

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Freeway 65.0 mph - CY2020
* File 1, Run 1, Scenario 80.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M515 Warning:
            The combined freeway and ramp average speed entered
            cannot be greater than 60.9 miles per hour.
            The average speed will be reset to this value.
  M582 Warning:
            The user supplied freeway average speed of 60.9
            will be used for all hours of the day. 100% of VMT
            has been assigned to a fixed combination of freeways
            and freeway ramps for all hours of the day and all
             vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                  Calendar Year:  2020
                          Month:  July
                       Altitude:  Low
             Minimum Temperature:  66.0 (F)
             Maximum Temperature:  92.0 (F)
               Absolute Humidity:   75. grains/lb
```

```
            Nominal Fuel RVP:   9.0 psi
               Weathered RVP:   8.6 psi
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  No
             Evap I/M Program:  No
                  ATP Program:  No
             Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.310	0.412	0.669	0.478	0.431	0.049	0.164	0.174	2.88	0.414
Composite CO :	7.08	8.06	10.44	8.67	8.14	0.569	0.415	0.387	24.15	7.542
Composite NOX :	0.272	0.388	0.680	0.463	0.699	0.096	0.403	2.646	1.62	0.615

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Principal Arterial 31.0 mph - CY2020
* File 1, Run 1, Scenario 81.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 31.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                  Calendar Year:  2020
                          Month:  July
                       Altitude:  Low
             Minimum Temperature:  66.0 (F)
             Maximum Temperature:  92.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   9.0 psi
                   Weathered RVP:   8.6 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  No
                Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.381	0.467	0.764	0.543	0.546	0.063	0.205	0.261	2.56	0.482
Composite CO :	5.40	6.22	8.17	6.72	6.45	0.579	0.422	0.398	13.42	5.808
Composite NOX :	0.259	0.355	0.635	0.427	0.558	0.052	0.218	1.353	1.10	0.469

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup              Urban Minor Arterial 28.0 mph   CY2020
* File 1, Run 1, Scenario 82.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 28.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2020
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
              Reformulated Gas:   No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.396	0.480	0.784	0.558	0.574	0.067	0.217	0.284	2.65	0.499

				1HRMAINT						
Composite CO :	5.44	6.26	8.22	6.76	7.12	0.615	0.448	0.441	14.65	5.880
Composite NOX :	0.266	0.362	0.645	0.434	0.545	0.053	0.221	1.377	1.07	0.477

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Collector 33.0 mph - CY2020
* File 1, Run 1, Scenario 83.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
M583 Warning:
          The user supplied arterial average speed of 33.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
M 48 Warning:
          there are no sales for vehicle class HDGV8b
M 48 Warning:
          there are no sales for vehicle class LDDT12

                Calendar Year:  2020
                        Month:  July
                     Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.372	0.459	0.751	0.534	0.529	0.061	0.199	0.247	2.51	0.472
Composite CO :	5.40	6.23	8.19	6.73	6.11	0.560	0.409	0.375	12.71	5.799
Composite NOX :	0.256	0.353	0.631	0.424	0.567	0.052	0.217	1.348	1.12	0.466

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Greenup                Urban Local 12.9 mph Default - CY2020
* File 1, Run 1, Scenario 84.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
```

```
M585 Warning:
          100% of VMT has been assigned to the local roadway
          type for all hours of the day for all vehicle types
          with an average speed of 12.9 mph.
M 48 Warning:
            there are no sales for vehicle class HDGV8b
M 48 Warning:
            there are no sales for vehicle class LDDT12

                 Calendar Year:  2020
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  66.0 (F)
            Maximum Temperature:  92.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.617	0.686	1.073	0.785	0.952	0.101	0.320	0.498	3.54	0.732
Composite CO :	5.95	6.82	8.90	7.35	15.82	1.044	0.750	0.948	28.22	6.798
Composite NOX :	0.277	0.358	0.626	0.427	0.476	0.069	0.290	1.746	0.91	0.504

APPENDIX I

Public Hearing Announcement & Documentation

Ashland Ozone Maintenance Area

PROPOSED UPDATED MAINTENANCE EMISSIONS BUDGET

ASHLAND OZONE MAINTENANCE AREA
A PORTION OF GREENUP COUNTY

KENTUCKY DIVISION FOR AIR QUALITY
NOTICE OF PUBLIC HEARING
TO REVISE KENTUCKY'S STATE IMPLEMENTATION PLAN

The Kentucky Environmental and Public Protection Cabinet will conduct a public hearing on January 15, 2008, at 10:00 a.m. (EDT) in the Conference Room of the Division for Air Quality, 803 Schenkel Lane, Frankfort, KY. This hearing is being held to receive comments on a revision to the Kentucky State Implementation Plan (SIP). This revision provides a second ten-year maintenance plan for the following 8-hour ozone attainment/1-hour ozone maintenance areas: Kentucky portion of the Huntington-Ashland Area (a portion of Greenup Co.); Lexington Area (Fayette and Scott Counties); Owensboro Area (Daviess and a portion of Hancock County); Edmonson County Area (Edmonson Co.); and the Paducah Area (Marshall Co. and a portion of Livingston Co.).

This hearing is open to the public and all interested persons will be given the opportunity to present testimony. To assure that all comments are accurately recorded, the Division requests that oral comments presented at the hearing also be provided in written form, if possible. To be considered part of the hearing record, comments must be received by the close of the hearing. Comments should be sent to the contact person.

The full text of the proposed SIP revision is available for public inspection and copying during regular business hours (8:00 a.m. to 4:30 p.m.) at the locations listed below. Any individual requiring copies may submit a request to the Division for Air Quality in writing, by telephone, or by fax. Requests for copies should be directed to the contact person. In addition, an electronic version of the proposed SIP revision document and relevant attachments can be downloaded from the Division for Air Quality's web site at:
http://www.air.ky.gov/homepage_repository/Public+Hearings.htm.

The hearing facility is accessible to people with disabilities. An interpreter or other auxiliary aid or service will be provided upon request. Please direct these requests to the contact person.

CONTACT PERSON: Leslie Eggen, Environmental Technologist I, Division for Air Quality, 803 Schenkel Lane, Frankfort, Kentucky 40601. Phone (502) 573-3382; Fax (502) 573-3787; E-mail lesliem.eggen@ky.gov.

The Environmental and Public Protection Cabinet does not discriminate on the basis of race, color, national origin, sex, age, religion, or disability and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford an individual with a disability an equal opportunity to participate in all services, programs, and activities.

Lou-Metro Air Pollution Control District
850 Barret Avenue, Suite 205
Louisville, KY 40204-1745

Frankfort Regional Office
643 Teton Trail, Suite B
Frankfort, KY 40601-1758

Paducah Regional Office
130 Eagle Nest Drive
Paducah, KY 42003-0823

Greenup County Clerk
301 Main Street
Greenup, KY 41144

Scott County Clerk
101 East Main Street
Georgetown, KY 40324-1794

Ashland Regional Office
1550 Wolohan Drive, Suite 1
Ashland, KY 41102-8942

Hazard Regional Office
233 Birch Street, Suite 2
Hazard, KY 41701-2179

Daviess County Clerk
212 St. Ann Street
Owensboro, KY 42302-0389

Hancock County Clerk
200 Court Square
Hawesville, Ky. 42348-0250

Bowling Green Regional Office
1508 Westen Avenue
Bowling Green, KY 42104

London Regional Office
875 S Main Street
London, KY 40741

Edmonson County Clerk
Main Street
Brownsville, KY 42210

Livingston County Clerk
335 Court St.
Smithland, KY 42081

Florence Regional Office
8020 Veterans Mem Dr, Suite 110
Florence, KY 41042

Owensboro Regional Office
3032 Alvey Park Dr W, Suite 700
Owensboro, KY 42303-2191

Fayette County Clerk
162 East Main Street
Lexington, KY 40507-1334

Marshall County Clerk
1101 Main Street
Benton, KY 42025-1498

APPENDIX J

Updated Consumer Products Guidance

Ashland Ozone Maintenance Area

PROPOSED UPDATED MAINTENANCE EMISSIONS BUDGET

ASHLAND OZONE MAINTENANCE AREA
A PORTION OF GREENUP COUNTY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

MAY 30 2007

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

MEMORANDUM

SUBJECT: Emission Reduction Credit for Three Federal Rules for Categories of Consumer and Commercial Products under Section 183(e) of the Clean Air Act

FROM: Stephen D. Page, Director
Office of Air Quality Planning and Standards

TO: Air Division Directors, Regions I through X

The phase II 8-hour ozone implementation rule requires States to submit their modeled attainment demonstration and reasonable further progress (RFP) elements of their State implementation plans (SIPs) for most ozone nonattainment areas by June 15, 2007, (November 29, 2005 (70 FR 71612); 40 CFR 51.908).[a] In the development of these plans, States will be considering measures to reduce volatile organic compound (VOC) emissions (as well as nitrogen oxide (NOx) emissions) in and around those nonattainment areas.

This memorandum is in follow-up to the Consumer Products Sector Government Summit teleconference (Summit) convened by the Office of Air Quality Planning and Standards (OAQPS) on April 10, 2007, and attended by representatives from nearly every Regional Office, 28 State and local agencies, and several multi-jurisdictional organizations. The purpose of this memorandum is to provide guidance concerning credit that States can take for reductions associated with three Federal rules being promulgated this calendar year under authority of section 183(e) of the Clean Air Act. These rules, which are discussed separately below, will establish or amend VOC content limits for (1) aerosol coatings (new rule), (2) architectural and industrial maintenance (AIM) coatings (amendments), and (3) household and institutional consumer products (amendments). OAQPS is working to finalize these national consumer and commercial products rules as soon as possible so that fully creditable emission reductions will be achieved by January 1, 2009. Since some States have nonattainment areas that must achieve reductions prior to 2009, this memorandum also includes provisions for taking partial credit for early reductions achieved prior to 2009.

[a]The system of classifications of nonattainment areas was established under the phase 1 8-hour ozone implementation rule; the classification of an area affects the SIP requirements that apply to the area. (April 30, 2004 (69 FR 23951)). However, on December 22, 2006, the D.C. Circuit Court of Appeals in *South Coast v. EPA* vacated the phase 1 rule, leaving in doubt the classification of areas and thus which requirements apply. EPA has requested rehearing and clarification of the Court's ruling. Until the Court responds to that request, EPA's advice to States concerning SIP requirements and the June 15, 2007 submission data is contained in a March 19, 2007 memorandum from William L. Wehrum, "Impacts of the Court Decision on the Phase 1 Ozone Implementation Rule."

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Aerosol Coatings Rule

The aerosol coatings category is included in Group III of the section 183(e) list and schedule for regulation, as modified on May 16, 2006 (71 FR 28320). Pursuant to court order, EPA is required to promulgate a final rule for this category no later than September 30, 2007. We are currently developing a new Federal rule, to be codified as 40 CFR 59 subpart E, based on California's reactivity-based aerosol coatings rule. We have determined that the reactivity scale used by California is suitable for use nationwide, and we discuss this issue in detail in the preamble of the proposed aerosol coatings rule. Our aerosol coatings reactivity rule will establish product-weighted reactivity limits on the ingredient content of aerosol coatings, which will, in turn, limit the ozone formed by the products. Consequently, there may or may not be a reduction in the mass of VOC emitted from the products, although ozone formation is reduced. Compliance will be required by January 1, 2009.

To estimate equivalent VOC mass reductions for credit purposes, we calculated the VOC reductions that would have been achieved by a mass-based rule equivalent in ozone formation reduction to our reactivity-based rule. We based this calculation on work done by the California Air Resources Board (ARB). The ARB had previously developed a mass-based aerosol coatings rule whose limits were later determined to be technologically infeasible for certain product categories. The California reactivity-based rule was developed by ARB as an equivalent replacement for the mass-based rule's VOC limits. We agree with ARB's determination that the ozone formation reduction achieved by their reactivity-based rule is equivalent to ozone reductions that may have been achieved from their earlier mass-based rule.[b] As a result, we have estimated that our aerosol coatings reactivity rule will achieve the equivalent of a 19 percent reduction in mass VOC emissions from the 1990 baseline. The year 1990 represents the baseline, since there has been no previous Federal rulemaking for aerosol coatings. The creditable reduction that may be claimed is 0.114 pound per capita in previously unregulated areas.

AIM Coatings Rule

We are in the process of amending our 1998 AIM rule, 40 CFR 59 subpart D. The amended rule generally follows the 2001 Ozone Transport Commission (OTC) Phase I model rule, which is based on the California Suggested Control Measure published in 2000. The amendments will be proposed in June 2007, followed by promulgation in December 2007. The compliance date will be January 1, 2009.

There have been issues raised in the past associated with baseline emission factors and how to calculate VOC reductions for AIM coatings rules. On August 31, 2005 (70 FR 51694), EPA published an advance notice of proposed rulemaking (ANPR) to discuss the AIM baseline issue and solicit comments on how to calculate the VOC reductions achieved in ozone

[b]Revisions to the California State Implementation Plan and Revision to the Definition Of Volatile Organic Compounds (VOC) - Removal of VOC Exemptions for California's Aerosol Coating Products Reactivity-based Regulation (September 13, 2005 (70 FR 53930)).

nonattainment areas from AIM coating rules. We plan to address the issues raised in the ANPR in the preambles of the proposed and final notices for the AIM amendments. However, the following is our best advice at this time to assist States in calculating their creditable reductions in their June 2007, SIP submissions.

For purposes of determining the base year emission inventory from AIM coating operations for the 8-hour ozone plans, we have determined that an emission factor of 3.6 pounds per capita should be used. When we promulgated the 1998 Federal AIM rule, we used a 4.5 pound per capita pre-rule baseline emission factor. At that time, we advised the States that the 1998 Federal AIM rule would achieve a 20 percent reduction, resulting in a 3.6 pounds per capita post-1998 Federal rule emission factor.

A number of States that are members of the OTC have already adopted State AIM regulations based upon the OTC model rule that are more stringent than the 1998 Federal rule. These States should calculate the amount of VOC reduction credit from the new Federal AIM rule for their 8-hour ozone plans in the same way as those States where only the 1998 Federal AIM rule has applied. This is because the compliance date specified in these States' AIM regulations based upon the OTC model rule is January 1, 2005, and the design values for the areas designated nonattainment for 8-hour ozone were set using monitoring data from years prior to 2005. Therefore, the emissions monitored from operations involving AIM coatings during the years used to determine the design values of the 8-hour ozone nonattainment areas were reflective of compliance levels of the 1998 Federal rule and not the more stringent State regulations. As the design value for an area is the level of nonattainment (or starting point) from which an attainment plan's strategies must reduce emissions to reach ambient air quality levels that meet the NAAQS, it is important to account for, or inventory, the emission levels from each source category that were actually being emitted, and therefore monitored, during the years used to determine that design value. In compiling the emission inventory for SIP planning purposes, a base year is chosen from among the same years for which the monitoring data is used to determine the design value. For the 8-hour ozone SIP, the emission inventory base year is generally 2002. Reductions in emissions that have occurred after the years used to determine the design value and the emission inventory base year are creditable reductions in both progress and attainment plans.

We estimate that the amended Federal AIM rule will achieve a reduction of 31 percent from the post-1998 Federal rule baseline of 3.6 pounds per capita. This is a creditable reduction of 1.1 pounds per capita.

Consumer Products Rule

We are also in the process of amending our 1998 consumer products rule, 40 CFR 59 subpart C. The AIM coatings amendments and consumer products amendments will be proposed in the same action. The amended rule is based on the 2006 revised OTC model rule, which is essentially the same as the California CONS-1 rule. The amended Federal rule will apply to many more product categories and provide for more stringent VOC content limits than the old 1998 Federal rule. We plan to propose the amendments in June 2007, followed by promulgation in December 2007. Compliance will be required by January 1, 2009.

The baseline for calculating reductions from the amended rule will be compliance with the 1998 Federal rule, or about 3.1 pounds per capita. For the same reason explained above for AIM coatings, States who have adopted consumer products rules with compliance dates after the baseline year for determining design values also should use this 3.1 pound per capita baseline. We have calculated that the amended Federal rule will achieve a VOC reduction of approximately 29 percent beyond that achieved by the 1998 Federal rule. This is a creditable reduction of 0.9 pound per capita.

Partial Credit for Early Reductions

The compliance date for the three Federal rules will be January 1, 2009. Consequently, these rules cannot assure creditable VOC reductions prior to that date. During the Summit, we were reminded that some States have areas that must achieve reductions prior to 2009. We are aware that, for aerosol coatings, consumer products, and AIM coatings, nearly all products distributed nationwide are already formulated to comply with one or more State regulations with categories and limits that meet or exceed the requirements of the new Federal rules. As a result, we are confident that a large majority of the reductions that will be assured by the three Federal rules are already being achieved. We believe that a conservative approach to providing assistance to States needing to show reductions before 2009 is to allow an immediate partial credit of 75 percent of the total creditable reduction for each of the three Federal rules in advance of the January 2009 compliance date. If a State, after consulting with industry representatives and with approval of the appropriate Regional Office, provides information that will support a claim of partial credit different than (greater or less than) 75 percent, that State may claim that amount in the interim period preceding January 1, 2009.

Shortfalls

In summary, States may claim credit for the per capita VOC emission reductions from source categories covered by the above rules in the attainment demonstration and RFP elements of their SIP if the emission reductions occur after the baseline year(s) for those plan elements. However, if the EPA rule does not provide the reduction anticipated for a particular area, any State claiming credit from the Federal rule will be responsible for developing measures to make up the shortfall.

Please share this information with the States in your region. Should a State find that specific circumstances or data for a given area indicate that the amount of reduction credits from a VOC control measure be calculated differently from the information provided in this memorandum, that State is urged to work closely with the appropriate Regional Office prior to formally submitting the SIP revision in which they are seeking those emission reduction credits.

For questions concerning the general status of the three Federal rules or the section 183(e) consumer and commercial products program, please contact Bruce Moore of the Sector Policies and Programs Division at (919) 541-5460, *moore.bruce@epa.gov*. For questions regarding attainment demonstrations and RFP plans, contact John Silvasi of the Air Quality Policy Division at (919) 541-5666, *silvasi.john@epa.gov*.

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APPENDIX K

401 KAR 50:012. General Application

Ashland Ozone Maintenance Area

PROPOSED UPDATED MAINTENANCE EMISSIONS BUDGET

ASHLAND OZONE MAINTENANCE AREA
A PORTION OF GREENUP COUNTY

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
Division for Air Quality

401 KAR 50:012. General application.

RELATES TO: KRS 224.10-100, 224.20-120, 40 CFR 60.14, 42 USC 7401 et seq., 7408, 7410

STATUTORY AUTHORITY: KRS 224.10-100

NECESSITY, FUNCTION, AND CONFORMITY: KRS 224.10-100 requires the Natural Resources and Environmental Protection Cabinet to prescribe administrative regulations for the prevention, abatement, and control of air pollution. 42 USC 7410 likewise requires the state to implement standards for national primary and secondary ambient air quality. This administrative regulation provides guidelines by which all administrative regulations of 401 KAR Chapters 50 to 65, are to be understood.

Section 1. General Application of Administrative Regulations and Standards. Administrative Regulations of the cabinet shall be construed and applied according to subsections (1) through (6) of this section, which shall guide the cabinet in the issuance, modification, and revocation of permits.

(1) All major sources of VOCs located in a county or portion of a county which is designated ozone nonattainment, for any nonattainment classification except marginal, under 401 KAR 51:010, shall install and use control technology which is reasonable and available.

(a) The determination of reasonably available control technology shall be approved by the cabinet and shall be based upon:

1. A Control Techniques Guidelines Document issued by the U.S. EPA and promulgated in regulatory form by the cabinet; or

2. If no Control Techniques Guidelines Document is appropriate, the lowest emission limit that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility. The cabinet may require technology that has been applied to similar, but not necessarily identical source categories.

(b) For those reasonably available control technology determinations not based on a control techniques guidelines document, the cabinet shall:

1. Hold a public hearing on the determination.

2. Submit the determination to the U.S. EPA for approval.

(c) For these determinations, that portion of a source with facilities uncontrolled by reasonably available control technology which emit VOCs that sum to 100 tpy or greater shall be considered a major source.

(2) In the absence of a standard specified in these administrative regulations, all major air contaminant sources shall as a minimum apply control procedures that are reasonable, available, and practical.

(3) Nothing in these administrative regulations is intended to permit a practice which is in violation of a statute, ordinance, or administrative regulation.

(4) These administrative regulations shall be complementary to each other, and to other administrative regulations adopted by the cabinet. If a provision of these administrative regulations or the application thereof to a person or circumstance is held to be invalid, the invalidity shall not affect other provisions or application of another part of these administrative

regulations and to this end each provision of these administrative regulations and the various applications thereof are declared to be severable.

(5) Except as provided by 401 KAR 50:055, nothing in these administrative regulations shall allow a source to remove control equipment or discontinue procedures previously required in a nonattainment area to achieve the national ambient air quality standards until a state implementation plan containing different requirements has been approved by the U.S. EPA.

(6) For the purpose of applying the definition of modification, an increase in the amount of an air pollutant shall be determined as in 40 CFR 60.14.

(5 Ky.R. 352; eff. 6-6-79; Recodified from 401 KAR 50:005, 7-31-90; Am. 18 Ky.R. 2604; 2929; 3333; eff. 6-24-92; 24 Ky.R. 648; eff. 11-12-97.)