

**MAG 2014 EIGHT-HOUR OZONE PLAN – SUBMITTAL
OF MARGINAL AREA REQUIREMENTS FOR THE
MARICOPA NONATTAINMENT AREA**

JUNE 2014



**MAG 2014 EIGHT-HOUR OZONE PLAN – SUBMITTAL
OF MARGINAL AREA REQUIREMENTS FOR THE
MARICOPA NONATTAINMENT AREA**

Prepared by:



June 2014

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REQUIREMENTS FOR THE MARICOPA NONATTAINMENT AREA**

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- Exhibit 2: Letter from the Arizona Department of Environmental Quality to EPA Submitting the 2012 New Source Review State Implementation Plan Revision. October 29, 2012.
- Exhibit 3. Arizona Revised Statute Section 49-402 and Delegation Agreement # EV12-0061 Between Arizona Department of Environmental Quality and Pinal County.
- Exhibit 4 Documentation from the Arizona Department of Environmental Quality Submitted to EPA that Includes the Arizona State Legislature Authorization of the Vehicle Emissions Inspection Program through January 1, 2017. June 22, 2009.

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- Exhibit 1: Public Hearing Process Documentation.
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MAG 2014 EIGHT-HOUR OZONE PLAN – SUBMITTAL OF MARGINAL AREA REQUIREMENTS FOR THE MARICOPA NONATTAINMENT AREA

Within the Maricopa nonattainment area, the National Ambient Air Quality Standard has not yet been attained for the 2008 eight-hour ozone standard of 0.075 parts per million (ppm). The area is classified as a Marginal Area under the Clean Air Act. The Maricopa Association of Governments (MAG) was designated by the Governor of Arizona in 1978 and recertified by the Arizona Legislature in 1992 to serve as the Regional Air Quality Planning Agency to develop plans to address air pollution problems. The plans are prepared through a coordinated effort with the Arizona Department of Environmental Quality (ADEQ), Arizona Department of Transportation, and Maricopa County Air Quality Department (MCAQD).

On June 15, 2004, the Environmental Protection Agency (EPA) designated a 4,880 square mile area located mainly in Maricopa County and Apache Junction in Pinal County as the nonattainment area for the eight-hour ozone standard (0.08 ppm) established by EPA in 1997. The area had a June 2009 attainment date. The MAG 2007 Eight-Hour Ozone Plan demonstrated attainment of the standard by June 2008. In February 2009, the MAG 2009 Eight-Hour Ozone Redesignation Request and Maintenance Plan was submitted to EPA, which demonstrated that the standard would be maintained through 2025. There have been no violations of the 0.08 ppm standard since 2004. On June 13, 2012, EPA published a final notice to approve the MAG 2007 Eight-Hour Ozone Plan. On March 14, 2014, EPA signed a notice to propose approval of the MAG 2009 Eight-Hour Ozone Redesignation Request and Maintenance Plan. In the notice, EPA also proposed to redesignate the area to attainment status. The notice was published in the Federal Register on March 26, 2014.

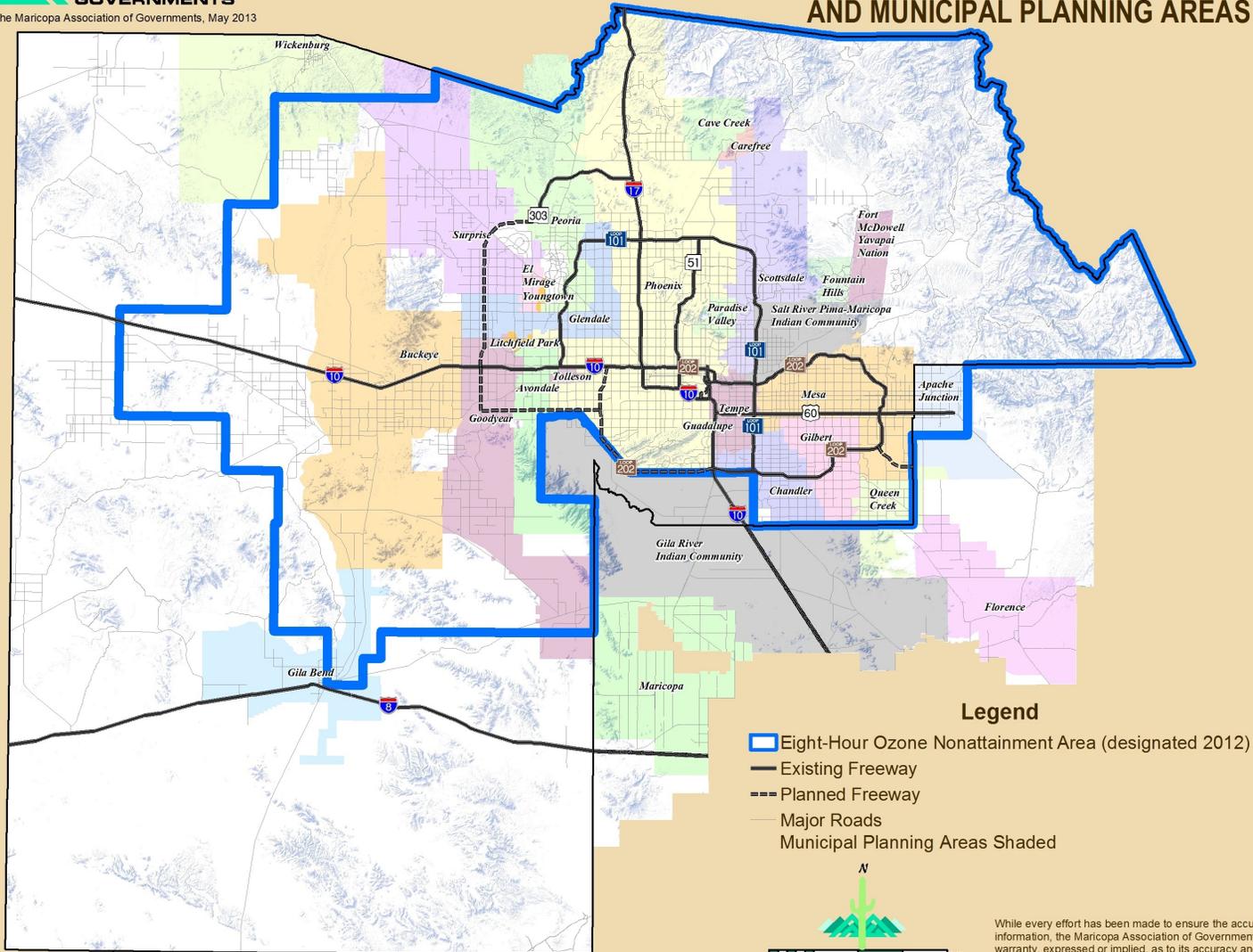
In 2008, EPA revised the eight-hour ozone standard to 0.075 parts per million. On May 21, 2012, EPA published a final rule to designate the Maricopa nonattainment area as a Marginal Area with a December 31, 2015 attainment date. The boundaries of the ozone nonattainment area were also expanded slightly to the west and south to include new power plants. The new eight-hour ozone nonattainment area boundary encompasses 5,017 square miles and is included in Figure 1.

MARGINAL AREA REQUIREMENTS

On June 6, 2013, the Environmental Protection Agency published a proposed rule on the Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements. As a Marginal Area, the Maricopa nonattainment area will have a December 31, 2015 attainment date. EPA assumes that Marginal Areas will be in attainment of the eight-hour ozone standard (0.075 parts per million) within three years of designation without any additional control measures. According to the proposed guidance, Marginal Areas would not be required to submit an attainment demonstration,

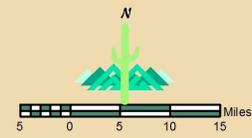
Figure 1

EIGHT-HOUR OZONE NONATTAINMENT AREA AND MUNICIPAL PLANNING AREAS



Legend

- Eight-Hour Ozone Nonattainment Area (designated 2012)
- Existing Freeway
- Planned Freeway
- Major Roads
- Municipal Planning Areas Shaded



While every effort has been made to ensure the accuracy of this information, the Maricopa Association of Governments makes no warranty, expressed or implied, as to its accuracy and expressly disclaims liability for the accuracy thereof.

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reasonably available control technologies and measures, reasonable further progress demonstration, and contingency measures. Final planning guidance from EPA will be forthcoming.

The Clean Air Act requirements for Marginal eight-hour ozone nonattainment areas are listed below. A narrative discussion of each bullet is provided in subsequent text.

- An Emissions Statement - CAA Section 182(a)(3)(B)
- A Baseline Emissions Inventory - CAA Section 182(a)(1)
- A Periodic Emissions Inventory, No Later than Every Three Years Until Attainment of the Standard - CAA Section 182(a)(3)(A)
- Pre-1990 Reasonably Available Control Technology Corrections - CAA Section 182(a)(2)(A)
- A Nonattainment Area Preconstruction Permit Program - CAA Section 182(a)(2)(C)
- New Source Review - CAA Title I, Part D
- Offset Requirements: 1.1 to 1 (Ratio of Total Emission Reductions of Volatile Organic Compounds to Total Increased Emissions) - CAA Section 182(a)(4)
- Pre-1990 Corrections to Previously Required Vehicle Inspection and Maintenance Programs - CAA Section 182(a)(2)(B)
- Meet Transportation Conformity Requirements - CAA Section 176(c)

An Emissions Statement - CAA Section 182(a)(3)(B)

The State is required to submit a revision to the Arizona State Implementation Plan that requires the owner or operator of each stationary source of nitrogen oxides or volatile organic compounds to provide the State with a statement showing the actual emissions of nitrogen oxides or volatile organic compounds from that source as described in Section 182(a)(3)(B). On November 5, 2012, the EPA finalized approval and incorporation of Maricopa County Air Quality Department Rule 100, Section 500, "Monitoring and Records", and Arizona Department of Environmental Quality Rule R18-2-327, "Annual Emissions Inventory Questionnaire", into the Arizona State Implementation Plan. The incorporated rules establish the requirements for permitted sources (including sources with emissions of volatile organic compounds and nitrogen oxides) operating in Maricopa County and the State of Arizona to submit annual emissions statements to each agency.

On December 20, 2000, EPA approved through direct final rule the incorporation of Pinal County Air Quality Control District Rule 3-1-103, "Annual emissions inventory

questionnaire”, and Rule 3-1-150, “Monitoring”, into the Arizona State Implementation Plan. These incorporated rules establish the requirements for permitted sources (including sources with emissions of volatile organic compounds and nitrogen oxides) operating in Pinal County to submit annual emissions statements to the Pinal County Air Quality Control District.

A Baseline Emissions Inventory - CAA Section 182(a)(1)

The State is required to submit a comprehensive, accurate, and current emissions inventory of all sources as described in Section 182(a)(1). On February 28, 2014, the Maricopa County Air Quality Department released the final 2011 Periodic Emissions Inventory for Ozone Precursors for the Maricopa County, Arizona, Eight-Hour Ozone Nonattainment Area. The inventory includes emission estimates from all sources of volatile organic compounds, nitrogen oxides and carbon monoxide in the eight-hour ozone nonattainment area. Annual totals as well as ozone season-day emissions are provided for all source categories. The 2011 Periodic Emissions Inventory for Ozone Precursors is included in Appendix A, Exhibit 1. A summary table of nonattainment area annual and ozone season-day emissions from the 2011 Periodic Emissions Inventory is shown in Table 1.

A Periodic Emissions Inventory, No Later than Every Three Years Until Attainment of the Standard - CAA Section 182(a)(3)(A)

Section 182(a)(3)(A) requires the State to submit periodic emission inventories every three years after the initial base year inventory for the Marginal nonattainment area. The base year inventory for the Maricopa eight-hour ozone Marginal nonattainment area is the 2011 Periodic Emissions Inventory for Ozone Precursors as described above and included in Appendix A, Exhibit 1.

EPA’s proposed implementation rule for the 2008 ozone standard advises States to rely on the three-year cycle inventory as described in EPA’s final Air Emissions Reporting Requirements (AERR) rule to meet the periodic emissions inventory requirement. As stated in the guidance,

“The EPA thinks it would be appropriate for states with periodic inventory obligations under 182(a)(3)(A) to rely on their 3-year cycle inventory as described in the AERR to satisfy their 182(a)(3)(A) periodic inventory obligation. In cases where a state will use its 3-year cycle inventory to meet its 182(a)(3)(A) inventory obligation, we are further proposing that the emissions reporting requirements of the AERR be applied to determine all of the data elements required for such inventories.” (78 FR 34202)

The next three-year cycle inventory required by the AERR will be for calendar year 2014. As such, the Maricopa County Air Quality Department will complete a 2014 periodic emissions inventory of ozone precursors for the Maricopa nonattainment area to satisfy the requirements of Section 182(a)(3)(A).

Table 1
Summary Table of Nonattainment Area Emissions from the Maricopa County Air Quality Department
2011 Periodic Emissions Inventory for Ozone Precursors, February 2014

Table 1.6–9. Annual and season-day emissions from all sources in the eight-hour ozone nonattainment area.

Section	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
POINT SOURCES:	768.54	1,754.12	1,078.48	4,908.3	15,407.1	9,715.8
AREA SOURCES:						
<i>Fuel combustion:</i>						
Industrial distillate oil: Boilers	0.61	60.61	15.15	3.9	388.5	97.1
Industrial distillate oil: Engines	0.00	1,830.35	393.95	0.0	11,733.0	2,525.3
Industrial natural gas	36.83	727.80	453.34	216.9	4,285.3	2,669.3
Comm./inst. distillate oil: Boilers	0.00	0.12	0.03	0.0	0.8	0.2
Comm./inst. distillate oil: Engines	0.00	3.70	0.80	0.0	23.7	5.1
Comm./inst. natural gas	54.42	1,079.44	662.05	251.7	4,992.0	3,061.7
Residential distillate oil	0.01	0.35	0.10	0.0	0.0	0.0
Residential natural gas	50.20	857.96	365.09	120.5	2,060.1	876.7
Residential LPG	2.02	51.93	14.73	0.0	0.0	0.0
Residential wood combustion	515.53	58.38	2,993.75	0.0	0.0	0.0
Residential kerosene	0.00	0.03	0.01	0.0	0.0	0.0
All Fuel Combustion:	659.63	4,670.68	4,898.99	593.0	23,483.5	9,235.4
<i>Industrial processes:</i>						
Chemical manufacturing	77.09			596.5		
Commercial cooking	151.03		397.07	829.8		2,181.7
Bakeries	77.85			545.4		
Secondary metal production	41.01	15.02	98.36	306.4	107.9	697.4
Rubber/plastic product manufacturing	1,759.15			14,110.1		
Electrical equipment manufacturing	122.80	23.47	2.98	746.2	135.8	16.4
Industrial processes, NEC	47.55	224.92	91.84	318.0	1,245.8	525.2
All Industrial Processes:	2,276.48	263.41	590.27	17,452.4	1,489.5	3,420.8
<i>Solvent use:</i>						
Architectural coatings	5,033.13			30,973.1		
Auto refinishing	1,327.53			10,211.8		
Traffic markings	171.12			1,737.5		
Factory finished wood	137.12			1,390.7		
Wood furniture	414.77			3,419.9		
Aircraft surface coating	65.84			473.1		
Miscellaneous surface coating	315.02			2,440.0		
Degreasing	216.62			1,445.1		
Dry cleaning	23.42			180.1		
Graphics arts	289.73			2,216.1		
Miscellaneous industrial solvent use	718.75			5,104.6		
Consumer and commercial products	17,605.51			96,468.5		
Cutback asphalt	788.72			4,309.9		
Emulsified asphalt	817.24			4,465.8		
Roofing asphalt	3.08			23.7		
Agricultural pesticides	212.18			1,697.5		
All Solvent Use:	28,139.77			166,557.4		

Table 1 Continued

Table 1.6–9. Annual and season-day emissions from all sources in the eight-hour ozone nonattainment area (continued).

Section	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Storage/transport:						
Residential portable gas cans	2,968.67			16,311.39		
Commercial portable gas cans	570.89			3,136.73		
Bulk plants	120.91			659.3		
Gas stations Stage I: Submerged fill	85.08			528.7		
Gas stations Stage I: Bal. submerged fill	229.60			1,426.8		
Gas stations Stage II	0.00			0.0		
Underground tanks: Breathing/emptying	777.00			4,138.6		
Airports: Aviation gasoline Stage I	344.41			1,887.2		
Airports: Aviation gasoline Stage II	17.87			97.9		
Truck: Gasoline (tank trucks in transit)	50.82			315.8		
Pipeline gasoline	17.32			94.5		
Volatile organic liquids storage/transport	28.80			169.3		
All Storage/Transport:	5,211.35			28,766.2		
Waste treatment/disposal:						
On-site incineration	0.17	3.31	0.79	1.1	21.4	5.3
Open Burning: Land clearing debris	0.30	0.13	2.81	9.1	4.1	86.4
Landfills	36.59	30.40	108.55	200.7	167.4	596.4
Publicly owned treatment works	75.88			583.7		
Leaking underground storage tanks	1.05			32.3		
Other waste	2.12	22.19	77.93	10.9	122.8	431.4
All Waste Treatment/Disposal:	116.10	56.04	190.06	837.8	315.6	1,119.6
Misc. area sources:						
Agricultural field burning	15.28	6.79	144.32	470.2	209.0	4,440.7
Structure fires	14.95	1.90	81.55	73.3	9.3	399.7
Aircraft engine testing	4.72	46.36	16.16	26.1	259.3	91.2
Vehicle fires	9.38	1.17	36.64	51.4	6.4	200.8
Crematories	1.18	11.14	2.22	50.9	88.1	17.2
Accidental releases	0.45	0.00	0.00	2.1	0.0	0.0
Hospitals	8.66			52.9		
Wildfires	206.08	93.95	4,379.28	12,794.0	5,832.6	271,872.2
Prescribed fires	0.39	0.38	4.54	129.2	127.1	1,523.2
All Misc. Area Sources	261.09	161.70	4,664.71	13,650.0	6,531.8	278,544.9
ALL AREA SOURCES:	36,664.42	5,151.83	10,344.03	227,856.8	31,820.5	292,320.7
NONROAD MOBILE SOURCES:						
Agricultural equipment	22.52	193.22	177.56	192.5	1,615.1	1,510.9
Airport ground support equipment (+APU)	111.43	404.49	3,259.08	584.5	2,128.9	17,071.7
Commercial equipment	1,916.15	1,355.57	30,094.46	14,474.7	8,299.0	202,531.2
Construction & mining equipment	1,941.80	13,349.23	14,855.32	13,534.5	90,774.0	103,125.0
Industrial equipment	339.78	1,831.45	7,110.33	2,203.1	11,712.9	45,940.4
Lawn and garden equipment	4,970.15	876.55	55,425.05	52,584.9	7,078.4	529,218.9
Pleasure craft	530.39	96.56	1,249.66	11,527.0	1,996.8	26,738.3
Railway maintenance equipment	1.96	8.64	16.67	14.4	59.7	119.1
Recreational equipment	684.30	29.78	2,871.27	8,020.9	306.0	33,528.7
Aircraft	1,705.43	2,585.98	11,719.36	8,385.8	12,535.3	64,993.6
Locomotives	50.15	901.12	153.29	274.8	4,937.7	839.9
ALL NONROAD MOBILE SOURCES:	12,274.06	21,632.59	126,932.05	111,797.1	141,443.8	1,025,617.7
ONROAD MOBILE SOURCES:	24,110.04	56,861.82	226,581.20	148,186.2	301,823.7	1,321,680.2
BIOGENIC SOURCES:	55,311.84	527.18	5,934.55	624,395.0	6,231.7	62,584.2
TOTAL, ALL SOURCE CATEGORIES:	129,128.91	85,927.54	370,870.31	1,117,143.4	496,726.7	2,711,918.6

Pre-1990 Reasonably Available Control Technology Corrections - CAA Section 182(a)(2)(A)

In accordance with Section 182(a)(2)(A), the State is required to submit a revision that includes provisions to correct requirements in (or add requirements to) the plan concerning reasonably available control technology as required under Section 172(b) in effect before the 1990 amendments to the Clean Air Act. The source categories subject to the Reasonably Available Control Technology corrections may be found in Chapter 2 of the Final Serious Area Ozone State Implementation Plan for Maricopa County. The source categories are summarized below.

- Architectural Coatings. EPA approved Maricopa County Rule 335 as a SIP revision effective on March 6, 1992.
- Surface Coating Operations. EPA approved Maricopa County Rule 336 as a SIP revision effective on November 19, 1999.
- Solvent Cleaning. EPA approved Maricopa County Rule 331 as a SIP revision effective on January 20, 2005.
- Petroleum Solvent Dry Cleaning. EPA approved revisions to Maricopa County Rule 333 as a SIP revision effective on March 11, 1998.
- Cutback and Emulsified Asphalt. EPA approved Maricopa County Rule 340 as a SIP revision effective on March 4, 1996.
- Storage of Organic Liquids at Bulk Plants. EPA approved Maricopa County Rule 350 as a SIP revision effective on October 5, 1995.
- Loading Organic Liquids. EPA approved Maricopa County Rule 351 as a SIP revision effective October 5, 1995.
- Transfer of Gasoline into Stationary Dispensing Tanks. EPA approved Maricopa County Rule 353 as a SIP revision effective March 4, 1996.
- Gasoline Delivery Vessel Testing and Use. EPA approved Maricopa County Rule 352 as a SIP revision effective October 5, 1995.
- Graphic Arts. EPA approved revisions to Maricopa County Rule 337 as a SIP revision effective March 11, 1998.

On June 14, 2005, EPA approved the One-hour Ozone Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area, including the RACT demonstration under Sections 182(a)(2)(A) and (b)(2).

A Nonattainment Area Preconstruction Permit Program - CAA Section 182(a)(2)(C)

Section 182(a)(2)(C) requires the State to submit a revision that requires permits, in accordance with Sections 172(c)(5) and 173 of the Clean Air Act, for the construction and operation of each new or modified major stationary source (with respect to ozone) located within the Marginal nonattainment area. Except as noted below, the nonattainment area preconstruction permit program for the portions of the Marginal ozone nonattainment area located in Maricopa County is administered by the Maricopa County Air Quality Department. On August 15, 1994, the Arizona Department of Environmental Quality submitted to EPA the State Implementation Plan - *Maricopa County New Source Review and Prevention of Significant Deterioration (NSR/PSD) Program for Major Sources and Major Modifications, and New Source Review (NSR) for Minor Sources*. The submission included new or amended Maricopa County Air Quality Rules 100, 200, 210, 220, 240, 241, 245, 270, 500 and Appendix B as revisions to the County's approved nonattainment new source review program. These new and amended rules were designed in part to satisfy the requirements of Title I, Part D, Subpart 2 of the Clean Air Act Amendments of 1990 for nonattainment new source review in ozone nonattainment areas as well as all of the requirements of sections 172(c)(5) and 173 of the Clean Air Act. The Arizona Department of Environmental Quality submitted supplemental documentation, amendments to these rules and additional rules implementing the County's new source review program (County Rules 242 and 510) on August 30, 1994, August 31, 1995, February 26, 1997, June 7, 2007 and July 5, 2007.

The nonattainment area preconstruction permit program for the portions of the Marginal ozone nonattainment area located in Pinal County is administered by the Pinal County Air Quality Control District under a delegation agreement with the Arizona Department of Environmental Quality. Pinal County does not have an approved nonattainment new source review program. Under A.R.S. Section 49-402 A.1., the Arizona Department of Environmental Quality therefore has original jurisdiction over major sources located in the County, and the Department's permitting rules, rather than Pinal County's, apply to these sources. Except as noted below, the Department has delegated responsibility for administering the permitting program for major sources in Pinal County to the District. On October 29, 2012, the Department submitted to EPA the State Implementation Plan Revision - New Source Review, as a revision to the Arizona State Implementation Plan. The submitted revision included amended State new source review rules (such as Rule R18-2-403, Permits for Sources Located in Nonattainment Areas) that meet current federal requirements. A copy of the State Implementation Plan Revision letter submitted to EPA by the State is included in Appendix A, Exhibit 2. A copy of A.R.S. Section 49-402 and relevant pages from the delegation agreement between the Department and the District is included in Appendix A, Exhibit 3.

Under A.R.S. Section 49-402 A.1., the Arizona Department of Environmental Quality has original jurisdiction throughout the State, including Maricopa and Pinal Counties, over the following stationary source types: smelting of metal ore, petroleum refineries, coal fired electric generating stations, Portland cement plants and portable sources. In its delegation

agreement with Pinal County, the Department retained jurisdiction over these source types. The Department therefore administers the nonattainment area preconstruction permit program in both Maricopa and Pinal County with respect to sources falling within these categories. As noted above, the Department has submitted a revision to the Arizona State Implementation Plan for new source review that meets current federal requirements.

New Source Review - CAA Title I, Part D

See discussion in prior Section, A Nonattainment Area Preconstruction Permit Program - CAA Section 182(a)(2)(C).

Offset Requirements: 1.1 to 1 (Ratio of Total Emission Reductions of Volatile Organic Compounds to Total Increased Emissions) - CAA Section 182(a)(4)

Section 182(a)(4) requires emission offsets in the form of a ratio of total emission reductions of volatile organic compounds to total increased volatile organic compound emissions of at least 1.1 to 1. Both the Maricopa County and State rules referenced in the prior Section, A Nonattainment Area Preconstruction Permit Program - CAA Section 182(a)(2)(C), satisfy this requirement. See A.A.C. R18-2-404(J); Maricopa County Air Pollution Control Regulations, Rule 240, Section 306.3.

Pre-1990 Corrections to Previously Required Vehicle Inspection and Maintenance Programs - CAA Section 182(a)(2)(B)

The State Vehicle Inspection Maintenance Program established in 1976 is designed to promote the clean operation of motor vehicles by controlling vehicle exhaust emissions. The program is operated by the Arizona Department of Environmental Quality and contains the provisions listed in Section 182(a)(2)(B) of the Clean Air Act for a Vehicle Inspection and Maintenance (I/M) Program.

An Enhanced Vehicle Emissions Inspection and Maintenance Program is operated in Area A of Maricopa and Pinal Counties by the Arizona Department of Environmental Quality. The program contains the provisions in Section 182(c)(3) of the Clean Air Act for an Enhanced Vehicle Inspection and Maintenance Program. The State's complete inspection and maintenance program is documented in the Final Arizona State Implementation Plan Revision, Basic and Enhanced Vehicle Emissions Inspection/Maintenance Programs, Volumes 1 and 2, Air Quality Division, Arizona Department of Environmental Quality, June 2001. EPA proposed approval of the Arizona I/M program in August 2002 and signed the final approval notice on October 31, 2002. The final approval notice was published in the Federal Register on January 22, 2003.

On December 21, 2009, EPA approved a final rule that included a statutory provision extending the life of the State's enhanced vehicle emissions inspection and maintenance program through January 1, 2017. Documentation submitted by the Arizona Department of Environmental Quality to EPA that includes the Arizona State Legislature's authorization

to extend the vehicle emissions inspection and maintenance program through January 1, 2017, is included in Appendix A, Exhibit 4.

Meet Transportation Conformity Requirements - CAA Section 176(c)

Clean Air Act Section 176(c)(1) states that the Federal Government can not support, finance, or approve any activity which does not conform to an EPA-approved or promulgated State Implementation Plan. This same section of the Clean Air Act also indicates that metropolitan planning organizations can not approve any project, program or plan that does not conform to an EPA-approved or promulgated State Implementation Plan. The next two subsections summarize the EPA general conformity and transportation conformity requirements.

General Conformity - 40 CFR Part 93, Subpart B, describes the general conformity requirements for Federal Government supported, financed, or approved activities which are located in the Maricopa eight-hour ozone nonattainment area. The requirements documented in 40 CFR 93, Subpart B, are also included in R18-2-1438 of the Arizona Administrative Code, adopted as of July 1, 1994. There are currently no known federal plans or actions affecting ozone in the Maricopa nonattainment area. The Arizona Department of Environmental Quality commits to review and comment on, as appropriate, any federal agency draft general conformity determination it receives pursuant to 40 CFR §93.155 for activities planned for the Maricopa eight-hour ozone nonattainment area.

Transportation Conformity - 40 CFR Part 93, Subpart A, identifies the conformity requirements for plans, programs and projects developed, funded, or approved under federal highway and transit laws. There are also requirements in 40 CFR §93.105 regarding the consultation process for transportation conformity determinations. Metropolitan planning organizations are required to provide the opportunity for consultation with local and state air quality and transportation agencies, in addition to the U.S. Department of Transportation and EPA. There are also requirements to establish a proactive public involvement process that provides for a public review and comment period prior to formal action on a conformity determination.

The Maricopa Association of Governments (MAG) is the designated metropolitan planning organization for Maricopa County and portions of Pinal County, including the City of Apache Junction, the Town of Florence, and the City of Maricopa. MAG is responsible for preparing the Transportation Improvement Program, Regional Transportation Plan, and the associated transportation conformity analyses.

The MAG 2007 Eight-Hour Ozone Plan for the Maricopa Nonattainment Area was submitted to EPA in June 2007. This plan demonstrated attainment of the 1997 eight-hour ozone standard of 0.08 parts per million and established conformity budgets for ozone precursor emissions, volatile organic compounds (VOC) and nitrogen oxides (NO_x), in the attainment year of 2008. EPA approved the MAG 2007 Eight-Hour Ozone Plan, including the emissions budgets, effective July 13, 2012.

On May 21, 2012, EPA published the final rule implementing the 2008 eight-hour ozone standard of 0.075 parts per million. This rule also revoked the 1997 eight-hour ozone standard for transportation conformity purposes, one year after the effective date for nonattainment area designations for the 2008 ozone standard (i.e., July 20, 2013). No back-sliding will result from the revocation of the 1997 standard for transportation conformity purposes, as areas designated nonattainment for the 2008 ozone standard are required to use existing adequate or approved mobile source emissions budgets for prior ozone standards, until budgets for the new 2008 ozone standard are found to be adequate or approved by EPA.

For the new 2008 ozone standard, the Maricopa nonattainment area boundary was expanded to the west and southwest. To meet the transportation conformity requirements documented in 40 CFR §93.109(c)(2)(iii)(B), projected emissions for the larger nonattainment area must be less than or equal to the VOC and NO_x budgets in the EPA-approved MAG 2007 Eight-Hour Ozone Plan. Consistency with the EPA-approved budgets from the MAG 2007 Eight-Hour Ozone Plan was demonstrated in the most recent transportation conformity analysis for the Maricopa Eight-Hour Ozone Nonattainment Area that was approved by the U.S. Department of Transportation on February 12, 2014.

On September 10, 2013, EPA advised MAG to include conformity test results in the most recent conformity analysis for mobile source emissions budgets that had been submitted in air quality plans, but were not yet approved or found to be adequate by EPA. To comply with this request, the most recent conformity analysis also demonstrates that the projected 2025 and 2035 VOC and NO_x emissions are less than the 2025 budgets in the MAG Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa Nonattainment Area, submitted to EPA in March 2009.

On March 14, 2014, EPA signed a notice proposing approval of the MAG 2009 Eight-Hour Ozone Redesignation Request and Maintenance Plan, including the 2025 conformity budgets for VOC and NO_x. When EPA-approval of the MAG 2009 Eight-Hour Ozone Redesignation Request and Maintenance Plan is finalized, the new 2025 budgets, as well as the 2008 budgets, will be utilized to demonstrate transportation conformity for ozone precursor emissions.

**MAG 2014 EIGHT-HOUR OZONE PLAN – SUBMITTAL
OF MARGINAL AREA REQUIREMENTS FOR THE
MARICOPA NONATTAINMENT AREA**

APPENDICES

JUNE 2014



**MAG 2014 EIGHT-HOUR OZONE PLAN – SUBMITTAL OF
MARGINAL AREA REQUIREMENTS FOR THE
MARICOPA NONATTAINMENT AREA**

APPENDICES

APPENDIX A

- Exhibit 1: 2011 Periodic Emissions Inventory for Ozone Precursors for the Maricopa County, Arizona, Eight-Hour Ozone Nonattainment Area. Maricopa County Air Quality Department. February 2014.
- Exhibit 2: Letter from the Arizona Department of Environmental Quality to EPA Submitting the 2012 New Source Review State Implementation Plan Revision. October 29, 2012.
- Exhibit 3. Arizona Revised Statute Section 49-402 and Delegation Agreement # EV12-0061 Between Arizona Department of Environmental Quality and Pinal County.
- Exhibit 4. Documentation from the Arizona Department of Environmental Quality Submitted to EPA that Includes the Arizona State Legislature Authorization of the Vehicle Emissions Inspection Program through January 1, 2017. June 22, 2009.

APPENDIX B

- Exhibit 1: Public Hearing Process Documentation.
- Exhibit 2: Certification of Adoption.

APPENDIX A

APPENDIX A

EXHIBIT 1:

**2011 Periodic Emissions Inventory for Ozone
Precursors for the Maricopa County, Arizona,
Eight-Hour Ozone Nonattainment Area.
Maricopa County Air Quality Department.
February 2014.**



Maricopa County

Air Quality Department

2011 Periodic Emissions Inventory for Ozone Precursors

for the
Maricopa County, Arizona, Eight-Hour Ozone Nonattainment Area

February 2014

Foreword

Maricopa County Air Quality Department released a draft version of this document, its 2011 emission inventory of ozone precursors, for a 30-day public review period on January 22, 2014. (The department's news release to announce the availability of the draft report, which outlines the schedule for public review and comment, is contained in Appendix D, along with a copy of the department's calendar item providing details on the workshop). The department held a public workshop on February 14, 2014 to discuss the draft inventory. No formal comments were received during the 30-day public review period.

Maricopa County Air Quality Department
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2011 Periodic Emissions Inventory for Ozone Precursors for the Maricopa County, Arizona Eight-Hour Ozone Nonattainment Area

February 2014

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Appendices

Appendix A Instructions for Reporting 2011 Annual Air Pollution Emissions

Appendix B Rule Effectiveness Studies

B.1 Introduction

B.2 Calculating Rule Effectiveness Rates for Title V Facilities and Non-Title V Facilities

B.3 References

Appendix C MOVES2010b Local Input Data and RunSpecs

MOVES2010b RunSpec Summary (Maricopa County, December 2011)

MOVES2010b RunSpec (Maricopa County, December 2011)

MOVES2010b Local Input Data (Maricopa County, December 2011)

Appendix D Public Comment Period Documentation

1. Introduction

1.1 Overview

This 2011 periodic ozone emissions inventory was developed to meet requirements set forth in Title I of the Clean Air Act Amendments of 1990 (CAAA). The CAAA require development of a baseline emissions inventory and periodic revisions for areas that fail to meet the National Ambient Air Quality Standards (NAAQS). A portion of Maricopa County is classified as nonattainment for the eight-hour ozone standard.

This inventory includes emission estimates for three ozone precursors: volatile organic compounds (VOCs), carbon monoxide (CO) and nitrogen oxides (NO_x). VOC is defined by Maricopa County's Rule 100 as "any organic compound, which participates in atmospheric photochemical reactions, except the non-precursor organic compounds". The inventory provides emission estimates from point, area, nonroad mobile, onroad mobile, and biogenic sources. Note that totals shown in tables may not equal the sum of individual values due to independent rounding.

1.2 Agencies responsible for the emissions inventory

Maricopa County Air Quality Department (MCAQD) has primary responsibility for preparing and submitting the 2011 Periodic Emissions Inventory for Ozone Precursors for Maricopa County. Point, area, and some nonroad mobile source emission estimates were prepared by MCAQD. The Maricopa Association of Governments (MAG) prepared the emission estimates for onroad mobile, biogenic, and the majority of nonroad mobile sources. Table 1.2-1 lists those responsible for inventory preparation and quality assurance/quality control activities, which are described in the respective chapters.

Table 1.2-1. Chapter authors and QA/QC contacts for this report.

Chapter	Author(s)	QA/QC contact persons
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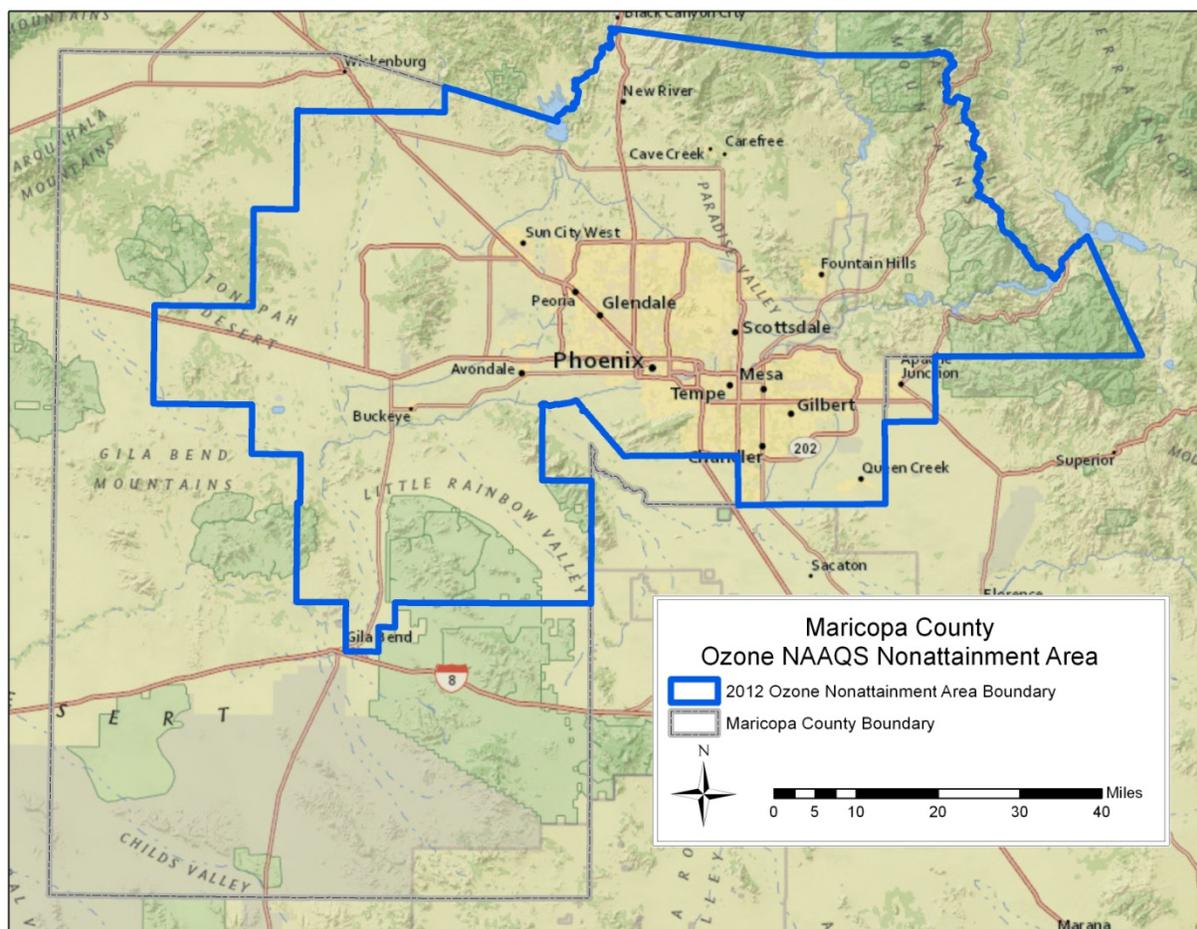
1.3 Temporal scope

Annual and ozone season-day emissions were estimated for the year 2011, for Maricopa County and the Maricopa County eight-hour ozone nonattainment area (NAA). The three-month peak ozone season for the Maricopa County nonattainment area has been defined as July 1 through September 30, based on the 1981–1991 pattern of ozone exceedances.

1.4 Geographic scope

This inventory includes emission estimates for Maricopa County and for the Maricopa County eight-hour ozone nonattainment area. Maricopa County encompasses approximately 9,223 square miles of land area, while the Maricopa County eight-hour ozone nonattainment area is approximately 5,018 square miles or about 54 percent of the Maricopa County land area.¹ A portion of the southeastern boundary of the eight-hour ozone nonattainment area includes areas of Pinal County totaling 48 square miles or 0.96% of the nonattainment area. A map of Maricopa County and the eight-hour ozone nonattainment area is provided in Figure 1.4–1.

Figure 1.4–1. Map of Maricopa County and the eight-hour ozone nonattainment area.



1. In May 2012, EPA designated a new eight-hour ozone nonattainment area based on the 2008 eight-hour ozone NAAQS (77 FR 30088, May 12, 2012). The previous eight-hour ozone nonattainment area was based on the 1997 eight-hour ozone NAAQS. The 2012 nonattainment area boundary was used for this 2011 inventory, as it is expected to be used as a base-year inventory for a future state implementation plan.

1.5 Overview of local demographic and land use data

Many of the emissions estimates generated in this report were calculated using demographic and land use data provided by the Maricopa Association of Governments (MAG). These data were used to apportion and/or scale Maricopa County emissions estimates to the nonattainment area and vice versa. (For example, county-level emissions from residential natural gas usage in Maricopa County were apportioned to the nonattainment area using the ratio of total population in each area). Detailed explanations of how emission estimates were apportioned or scaled are presented in each of the following chapters, along with the data sources used.

1.5.1 Demographic profile

The demographic data provided by MAG included population, employment data, and single family/multi-family splits for calendar year 2011, for both Maricopa County and the eight-hour ozone nonattainment area. Table 1.5–1 provides an overview of the key demographic data used in this report. As noted throughout the text, these data are frequently used to derive estimates of activity or emissions within the eight-hour ozone nonattainment area from county-level calculations. It is important to note, however, that the nonattainment area includes a portion of Pinal County, AZ as shown in Figure 1.4–1. Thus in some cases (e.g., those source categories calculated based on total population), the multiplier used to derive nonattainment area estimates from County-level values may be greater than 1, and thus the resulting NAA emission totals are larger than the County-level estimates from which they are derived.

Table 1.5–1. Demographic profile of Maricopa County and the eight-hour ozone NAA.

Demographic variable	Maricopa County	8-hr ozone NAA	Percentage within 8-hr ozone NAA
Total resident population	3,843,370	3,873,528	100.78%
Total non-resident population	286,276	303,342	105.96%
Total population:	4,129,646	4,176,870	101.14%
Retail employment	414,477	415,672	100.29%
Office employment	320,536	320,189	99.89%
Industrial employment	374,338	372,731	99.57%
Public employment	240,952	241,429	100.20%
Other employment	261,769	258,963	98.93%
Construction	24,026	24,791	103.18%
Work at home	100,016	100,617	100.60%
Total employment:	1,736,114	1,734,392	99.90%
Single-family/multi-family household split:			
Single-family	77%	77%	
Multi-family	23%	23%	

1.5.2 Land use data

MAG provided draft 2010 land use data. The 2010 land use data was assumed to be representative of 2011. Table 1.5–2 presents a summary of the land use categories and acreage used to develop emission estimates for this inventory.

Table 1.5–2. Land use categories used to apportion emissions.

Land use category	Acreage within Maricopa County	Acreage within 8-hour ozone NAA	Percentage within 8-hour ozone NAA
General/active open space/golf course (e.g., parks)	210,159	211,297	100.54%
Passive/restricted open space, washes	2,614,870	1,188,251	45.44%
Lakes	12,525	12,525	100.00%
Agriculture	276,016	161,371	58.46%
Vacant (e.g., developable land)	2,045,587	911,304	44.55%

1.6 Emissions overview by source category

1.6.1 Point sources

The point source category includes those stationary sources that emit a significant amount of pollution into the air such as power plants, petroleum product storage and transfer facilities, and large industrial facilities. MCAQD utilizes the US EPA’s Annual Emissions Reporting Requirements (AERR) rule to define which stationary sources are listed as point sources. A detailed definition of a point source can be found in Section 2.1 of Chapter 2.

Table 1.6–1 summarizes annual and season-day emissions from point sources (including emission reduction credits) in Maricopa County and the eight-hour ozone nonattainment area, respectively. A detailed breakdown of emissions calculations for all point sources is contained in Chapter 2.

Table 1.6–1. Annual and season-day emissions from point sources.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO_x	CO	VOC	NO_x	CO
Maricopa County	768.54	1,754.12	1,078.48	4,908.3	15,407.1	9,715.8
8-hour ozone NAA	768.54	1,754.12	1,078.48	4,908.3	15,407.1	9,715.8

1.6.2 Area sources

Area sources are facilities or activities whose individual emissions do not qualify them as point sources. Area sources represent numerous facilities or activities that individually release small amounts of a given pollutant, but collectively they can release significant amounts of a pollutant. Emissions from stationary sources that were not identified as point sources in this report have been included in the area source inventory. Examples of area source categories include residential wood burning, commercial cooking, waste incineration and wildfires.

Tables 1.6–2 and 1.6–3 summarize annual and season-day emissions of the chief area source categories, for Maricopa County and the eight-hour ozone nonattainment area, respectively. A detailed breakdown of emissions calculations for each area source category is contained in Chapter 3.

Table 1.6–2. Annual and season-day emissions from area sources in Maricopa County.

Source category	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Fuel combustion	653.61	4,675.41	4,866.67	593.3	23,544.5	9,255.2
Industrial processes	2,284.00	263.41	585.79	17,516.5	1,489.5	3,396.2
Solvent use	28,153.45			167,043.9		
Storage/transport	5,176.39			28,577.9		
Waste treatment/disposal	115.61	56.21	193.56	842.6	320.7	1,227.1
Misc. area sources	271.58	166.54	4,765.93	13,982.3	6,680.5	281,693.1
All area sources:	36,654.65	5,161.56	10,411.95	228,556.4	32,035.2	295,571.5

Table 1.6–3. Annual and season-day emissions from area sources in the eight-hour ozone NAA.

Source category	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Fuel combustion	659.63	4,670.68	4,898.99	593.0	23,483.5	9,235.4
Industrial processes	2,276.48	263.41	590.27	17,452.4	1,489.5	3,420.8
Solvent use	28,139.77			166,557.4		
Storage/transport	5,211.35			28,766.2		
Waste treatment/disposal	116.10	56.04	190.06	837.8	315.6	1,119.6
Misc. area sources	261.09	161.70	4,664.71	13,650.0	6,531.8	278,544.9
All area sources:	36,664.42	5,151.83	10,344.03	227,856.8	31,820.5	292,320.7

1.6.3 Nonroad mobile sources

Nonroad mobile sources include off-highway vehicles and engines that move or are moved within a 12-month period. Tables 1.6–4 and 1.6–5 summarize annual and season-day emissions from nonroad mobile sources, for Maricopa County and the eight-hour ozone nonattainment area, respectively. A detailed breakdown of emissions calculations for each source category is contained in Chapter 4.

Table 1.6–4. Annual and season-day emissions from nonroad mobile sources in Maricopa County.

Source category	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Agricultural equipment	38.53	330.49	303.71	329.3	2,762.6	2,584.4
Airport GSE (+APU)	111.98	406.04	3,275.98	587.3	2,136.6	17,155.0
Commercial equipment	1,924.41	1,361.42	30,224.21	14,537.1	8,334.7	203,404.4
Construction & mining	1,881.88	12,937.30	14,396.92	13,116.9	87,972.9	99,942.8
Industrial equipment	341.25	1,839.35	7,140.99	2,212.6	11,763.4	46,138.5
Lawn & garden	4,913.96	866.64	54,798.41	51,990.4	6,998.4	523,235.5
Pleasure craft	530.39	96.56	1,249.66	11,527.0	1,996.8	26,738.3
Railway maintenance	1.94	8.55	16.48	14.2	59.0	117.8
Recreational equipment	1,518.97	66.10	6,373.46	17,804.4	679.3	74,424.8
Aircraft	1,719.33	2,588.82	11,781.38	8,451.0	12,548.2	65,325.4
Locomotives	77.60	1,406.08	245.74	425.2	7,704.5	1,346.5
All nonroad mobile sources:	13,060.24	21,907.35	129,806.94	120,995.4	142,956.4	1,060,413.4

Table 1.6–5. Annual and season-day emissions from nonroad mobile sources in the eight-hour ozone NAA.

Source category	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Agricultural equipment	22.52	193.22	177.56	192.5	1,615.1	1,510.9
Airport GSE (+APU)	111.43	404.49	3,259.08	584.5	2,128.9	17,071.7
Commercial equipment	1,916.15	1,355.57	30,094.46	14,474.7	8,299.0	202,531.2
Construction & mining	1,941.80	13,349.23	14,855.32	13,534.5	90,774.0	103,125.0
Industrial equipment	339.78	1,831.45	7,110.33	2,203.1	11,712.9	45,940.4
Lawn & garden	4,970.15	876.55	55,425.05	52,584.9	7,078.4	529,218.9
Pleasure craft	530.39	96.56	1,249.66	11,527.0	1,996.8	26,738.3
Railway maintenance	1.96	8.64	16.67	14.4	59.7	119.1
Recreational equipment	684.30	29.78	2,871.27	8,020.9	306.0	33,528.7
Aircraft	1,705.43	2,585.98	11,719.36	8,385.8	12,535.3	64,993.6
Locomotives	50.15	901.12	153.29	274.8	4,937.7	839.9
All nonroad mobile sources:	12,274.06	21,632.59	126,932.05	111,797.1	141,443.8	1,025,617.7

1.6.4 Onroad mobile sources

Emissions from onroad mobile sources were calculated for Maricopa County and the eight-hour ozone nonattainment area. A detailed description of emissions calculations is contained in Chapter 5.

Table 1.6–6 summarizes annual and season-day emissions from onroad mobile sources in Maricopa County and the eight-hour ozone nonattainment area, respectively.

Table 1.6–6. Annual and season-day emissions from onroad mobile sources in Maricopa County and the eight-hour ozone NAA.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	24,556.85	60,269.94	235,088.25	150,603.7	319,470.2	1,378,165.5
8-hour ozone NAA	24,110.04	56,861.82	226,581.20	148,186.2	301,823.7	1,321,680.2

1.6.5 Biogenic sources

The biogenic source category includes emissions from all vegetation (e.g., crops, indigenous vegetation, landscaping, etc.) in Maricopa County and the eight-hour ozone nonattainment area. Emissions were estimated using the Model of Emissions of Gases and Aerosols from Nature (MEGAN). MEGAN is a state-of-the-art biogenic emissions model developed by the National Center for Atmospheric Research (NCAR). Some corrections and improvements were made in the latest version of MEGAN2.1. MEGAN2.1 was used to compute biogenic emissions in Maricopa County and the eight-hour ozone nonattainment area. Annual and season-day emissions from biogenic sources are shown in Table 1.6–7 for Maricopa County and the eight-hour ozone nonattainment area.

Table 1.6–7. Annual and season-day emissions from biogenic sources in Maricopa County and the eight-hour ozone NAA.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	79,714.87	779.52	11,548.84	895,860.0	9,199.0	122,186.2
8-hour ozone NAA	55,311.84	527.18	5,934.55	624,395.0	6,231.7	62,584.2

1.6.6 Summary of all source categories

Tables 1.6–8 and 1.6–9 provide summary totals of annual and season-day emissions from all emission sources in Maricopa County and the eight-hour ozone nonattainment area, respectively.

Table 1.6–8. Annual and season-day emissions from all sources in Maricopa County.

Section	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
POINT SOURCES:	768.54	1,754.12	1,078.48	4,908.3	15,407.1	9,715.8
AREA SOURCES:						
<i>Fuel combustion:</i>						
Industrial distillate oil: Boilers	0.61	60.87	15.22	3.9	390.2	97.5
Industrial distillate oil: Engines	0.00	1,838.26	395.65	0.0	11,783.7	2,536.2
Industrial natural gas	36.99	730.94	455.30	217.8	4,303.8	2,680.8
Comm./inst. distillate oil: Boilers	0.00	0.12	0.03	0.0	0.8	0.2
Comm./inst. distillate oil: Engines	0.00	3.72	0.80	0.0	23.8	5.1
Comm./inst. natural gas	54.48	1,080.73	662.84	252.0	4,998.0	3,065.4
Residential distillate oil	0.01	0.35	0.10	0.0	0.0	0.0
Residential natural gas	49.81	851.32	362.26	119.6	2,044.2	869.9
Residential LPG	2.00	51.35	14.56	0.0	0.0	0.0
Residential wood combustion	509.7	57.72	2,959.91	0.0	0.0	0.0
Residential kerosene	0.00	0.03	0.01	0.0	0.0	0.0
All Fuel Combustion	653.61	4,675.41	4,866.67	593.3	23,544.5	9,255.2
<i>Industrial Processes:</i>						
Chemical manufacturing	77.42			599.0		
Commercial cooking	149.33		392.60	820.5		2,157.1
Bakeries	78.18			547.8		
Secondary metal production	41.01	15.02	98.36	306.4	107.9	697.4
Rubber/plastic product mfg.	1,766.75			14,171.0		
Electrical equipment mfg.	122.80	23.47	2.98	746.2	135.8	16.4
Industrial processes, NEC	48.51	224.92	91.84	325.6	1,245.8	525.2
All Industrial Processes	2,284.00	263.41	585.79	17,516.5	1,489.5	3,396.2
<i>Solvent Use:</i>						
Architectural coatings	4,976.22			30,622.9		
Auto refinishing	1,333.26			10,255.9		
Traffic markings	179.60			1,823.6		
Factory finished wood	137.72			1,396.7		
Wood furniture	416.56			3,434.7		
Aircraft surface coating	65.84			473.1		
Miscellaneous surface coating	316.38			2,450.5		
Degreasing	217.55			1,451.4		
Dry cleaning	23.15			178.1		
Graphics arts	290.98			2,225.7		
Miscellaneous industrial solvent use	721.85			5,126.6		
Consumer and commercial products	17,406.46			95,377.9		
Cutback asphalt	835.84			4,567.4		
Emulsified asphalt	866.06			4,732.6		
Roofing asphalt	3.04			23.4		
Agricultural pesticides	362.93			2,903.4		
All Solvent Use	28,153.45			167,043.9		

Table 1.6–8. Annual and season-day emissions from all sources in Maricopa County (continued).

Section	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
	VOC	NOx	CO	VOC	NOx	CO
<i>Storage/Transport:</i>						
Residential portable gas cans	2,935.09			16,126.8		
Commercial portable gas cans	564.43			3,101.2		
Bulk plants	120.91			659.3		
Gas stations Stage I: Submerged fill	85.08			528.7		
Gas stations Stage I: Bal. submerged fill	229.60			1,426.8		
Gas stations Stage II	0.00			0.0		
Underground tanks: Breathing/emptying	777.00			4,138.6		
Airports: aviation gasoline Stage I	347.57			1,904.5		
Airports: aviation gasoline Stage II	18.04			98.8		
Truck: gasoline (tank trucks in transit)	50.82			315.8		
Pipeline gasoline	17.32			94.5		
Volatile organic liquids storage/transport	30.54			182.7		
All Storage/Transport	5,176.39			28,577.9		
<i>Waste Treatment/Disposal:</i>						
On-site incineration	0.17	3.31	0.79	1.1	21.4	5.3
Open burning: Land clearing debris	0.67	0.30	6.30	20.5	9.1	193.8
Landfills	36.59	30.40	108.55	200.7	167.4	596.4
Publicly owned treatment works	75.02			577.1		
Leaking underground storage tanks	1.05			32.3		
Other waste	2.12	22.19	77.93	10.9	122.8	431.4
All Waste Treatment/Disposal	115.61	56.21	193.56	842.6	320.7	1,227.1
<i>Miscellaneous Area Sources:</i>						
Agricultural field burning	26.14	11.62	246.85	804.2	357.4	7,595.5
Structure fires	14.78	1.88	80.63	72.4	9.2	395.2
Aircraft engine testing	4.72	46.36	16.16	26.1	259.3	91.2
Vehicle fires	9.27	1.16	36.23	50.8	6.4	198.5
Crematories	1.18	11.19	2.23	51.1	88.5	17.3
Accidental releases	0.45	0.00	0.00	2.1	0.0	0.0
Hospitals	8.57			52.3		
Wildfires	206.08	93.95	4,379.29	12,794.0	5,832.6	271,872.2
Prescribed fires	0.39	0.38	4.54	129.2	127.1	1,523.2
All Misc. Area Sources	271.58	166.54	4,765.93	13,982.3	6,680.5	281,693.1
ALL AREA SOURCES	36,654.65	5,161.56	10,411.95	228,556.4	32,035.2	295,571.5
NONROAD MOBILE SOURCES:						
Agricultural equipment	38.53	330.49	303.71	329.3	2,762.6	2,584.4
Airport GSE (+APU)	111.98	406.04	3,275.98	587.3	2,136.6	17,155.0
Commercial equipment	1,924.41	1,361.42	30,224.21	14,537.1	8,334.7	203,404.4
Construction & mining equipment	1,881.88	12,937.30	14,396.92	13,116.9	87,972.9	99,942.8
Industrial equipment	341.25	1,839.35	7,140.99	2,212.6	11,763.4	46,138.5
Lawn and garden equipment	4,913.96	866.64	54,798.41	51,990.4	6,998.4	523,235.5
Pleasure craft	530.39	96.56	1,249.66	11,527.0	1,996.8	26,738.3
Railway maintenance equipment	1.94	8.55	16.48	14.2	59.0	117.8
Recreational equipment	1,518.97	66.10	6,373.46	17,804.4	679.3	74,424.8
Aircraft	1,719.33	2,588.82	11,781.38	8,451.0	12,548.2	65,325.4
Locomotives	77.60	1,406.08	245.74	425.2	7,704.6	1,346.5
ALL NONROAD MOBILE	13,060.24	21,907.35	129,806.94	120,995.4	142,956.4	1,060,413.4
ONROAD MOBILE SOURCES	24,556.85	60,269.94	235,088.25	150,603.7	319,470.2	1,378,165.5
BIOGENIC SOURCES	79,714.87	779.52	11,548.84	895,860.0	9,199.0	122,186.2
TOTAL, ALL SOURCE CATEGORIES	154,755.15	89,872.48	387,934.46	1,400,923.9	519,067.9	2,866,052.4

Table 1.6–9. Annual and season-day emissions from all sources in the eight-hour ozone nonattainment area.

Section	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
POINT SOURCES:	768.54	1,754.12	1,078.48	4,908.3	15,407.1	9,715.8
AREA SOURCES:						
<i>Fuel combustion:</i>						
Industrial distillate oil: Boilers	0.61	60.61	15.15	3.9	388.5	97.1
Industrial distillate oil: Engines	0.00	1,830.35	393.95	0.0	11,733.0	2,525.3
Industrial natural gas	36.83	727.80	453.34	216.9	4,285.3	2,669.3
Comm./inst. distillate oil: Boilers	0.00	0.12	0.03	0.0	0.8	0.2
Comm./inst. distillate oil: Engines	0.00	3.70	0.80	0.0	23.7	5.1
Comm./inst. natural gas	54.42	1,079.44	662.05	251.7	4,992.0	3,061.7
Residential distillate oil	0.01	0.35	0.10	0.0	0.0	0.0
Residential natural gas	50.20	857.96	365.09	120.5	2,060.1	876.7
Residential LPG	2.02	51.93	14.73	0.0	0.0	0.0
Residential wood combustion	515.53	58.38	2,993.75	0.0	0.0	0.0
Residential kerosene	0.00	0.03	0.01	0.0	0.0	0.0
All Fuel Combustion:	659.63	4,670.68	4,898.99	593.0	23,483.5	9,235.4
<i>Industrial processes:</i>						
Chemical manufacturing	77.09			596.5		
Commercial cooking	151.03		397.07	829.8		2,181.7
Bakeries	77.85			545.4		
Secondary metal production	41.01	15.02	98.36	306.4	107.9	697.4
Rubber/plastic product manufacturing	1,759.15			14,110.1		
Electrical equipment manufacturing	122.80	23.47	2.98	746.2	135.8	16.4
Industrial processes, NEC	47.55	224.92	91.84	318.0	1,245.8	525.2
All Industrial Processes:	2,276.48	263.41	590.27	17,452.4	1,489.5	3,420.8
<i>Solvent use:</i>						
Architectural coatings	5,033.13			30,973.1		
Auto refinishing	1,327.53			10,211.8		
Traffic markings	171.12			1,737.5		
Factory finished wood	137.12			1,390.7		
Wood furniture	414.77			3,419.9		
Aircraft surface coating	65.84			473.1		
Miscellaneous surface coating	315.02			2,440.0		
Degreasing	216.62			1,445.1		
Dry cleaning	23.42			180.1		
Graphics arts	289.73			2,216.1		
Miscellaneous industrial solvent use	718.75			5,104.6		
Consumer and commercial products	17,605.51			96,468.5		
Cutback asphalt	788.72			4,309.9		
Emulsified asphalt	817.24			4,465.8		
Roofing asphalt	3.08			23.7		
Agricultural pesticides	212.18			1,697.5		
All Solvent Use:	28,139.77			166,557.4		

Table 1.6–9. Annual and season-day emissions from all sources in the eight-hour ozone nonattainment area (continued).

Section	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
	VOC	NOx	CO	VOC	NOx	CO
Storage/transport:						
Residential portable gas cans	2,968.67			16,311.39		
Commercial portable gas cans	570.89			3,136.73		
Bulk plants	120.91			659.3		
Gas stations Stage I: Submerged fill	85.08			528.7		
Gas stations Stage I: Bal. submerged fill	229.60			1,426.8		
Gas stations Stage II	0.00			0.0		
Underground tanks: Breathing/emptying	777.00			4,138.6		
Airports: Aviation gasoline Stage I	344.41			1,887.2		
Airports: Aviation gasoline Stage II	17.87			97.9		
Truck: Gasoline (tank trucks in transit)	50.82			315.8		
Pipeline gasoline	17.32			94.5		
Volatile organic liquids storage/transport	28.80			169.3		
All Storage/Transport:	5,211.35			28,766.2		
Waste treatment/disposal:						
On-site incineration	0.17	3.31	0.79	1.1	21.4	5.3
Open Burning: Land clearing debris	0.30	0.13	2.81	9.1	4.1	86.4
Landfills	36.59	30.40	108.55	200.7	167.4	596.4
Publicly owned treatment works	75.88			583.7		
Leaking underground storage tanks	1.05			32.3		
Other waste	2.12	22.19	77.93	10.9	122.8	431.4
All Waste Treatment/Disposal:	116.10	56.04	190.06	837.8	315.6	1,119.6
Misc. area sources:						
Agricultural field burning	15.28	6.79	144.32	470.2	209.0	4,440.7
Structure fires	14.95	1.90	81.55	73.3	9.3	399.7
Aircraft engine testing	4.72	46.36	16.16	26.1	259.3	91.2
Vehicle fires	9.38	1.17	36.64	51.4	6.4	200.8
Crematories	1.18	11.14	2.22	50.9	88.1	17.2
Accidental releases	0.45	0.00	0.00	2.1	0.0	0.0
Hospitals	8.66			52.9		
Wildfires	206.08	93.95	4,379.28	12,794.0	5,832.6	271,872.2
Prescribed fires	0.39	0.38	4.54	129.2	127.1	1,523.2
All Misc. Area Sources	261.09	161.70	4,664.71	13,650.0	6,531.8	278,544.9
ALL AREA SOURCES:	36,664.42	5,151.83	10,344.03	227,856.8	31,820.5	292,320.7
NONROAD MOBILE SOURCES:						
Agricultural equipment	22.52	193.22	177.56	192.5	1,615.1	1,510.9
Airport ground support equipment (+APU)	111.43	404.49	3,259.08	584.5	2,128.9	17,071.7
Commercial equipment	1,916.15	1,355.57	30,094.46	14,474.7	8,299.0	202,531.2
Construction & mining equipment	1,941.80	13,349.23	14,855.32	13,534.5	90,774.0	103,125.0
Industrial equipment	339.78	1,831.45	7,110.33	2,203.1	11,712.9	45,940.4
Lawn and garden equipment	4,970.15	876.55	55,425.05	52,584.9	7,078.4	529,218.9
Pleasure craft	530.39	96.56	1,249.66	11,527.0	1,996.8	26,738.3
Railway maintenance equipment	1.96	8.64	16.67	14.4	59.7	119.1
Recreational equipment	684.30	29.78	2,871.27	8,020.9	306.0	33,528.7
Aircraft	1,705.43	2,585.98	11,719.36	8,385.8	12,535.3	64,993.6
Locomotives	50.15	901.12	153.29	274.8	4,937.7	839.9
ALL NONROAD MOBILE SOURCES:	12,274.06	21,632.59	126,932.05	111,797.1	141,443.8	1,025,617.7
ONROAD MOBILE SOURCES:	24,110.04	56,861.82	226,581.20	148,186.2	301,823.7	1,321,680.2
BIOGENIC SOURCES:	55,311.84	527.18	5,934.55	624,395.0	6,231.7	62,584.2
TOTAL, ALL SOURCE CATEGORIES:	129,128.91	85,927.54	370,870.31	1,117,143.4	496,726.7	2,711,918.6

2. Point Sources

2.1 Introduction and scope

This inventory of ozone precursors (VOC, NO_x, and CO) is one of two 2011 emissions inventory reports being prepared to meet US EPA reporting requirements. This inventory has been developed concurrently with a similar inventory for PM₁₀ and related pollutants (PM_{2.5}, NO_x, SO_x, and NH₃) as part of Maricopa County's requirements under the respective SIPs.

In addition to preparing a periodic emissions inventory for the eight-hour ozone nonattainment area (NAA) as a commitment under the current ozone State Implementation Plan (SIP), the federal Air Emission Reporting Requirements (AERR) rule requires that state and local agencies prepare emissions estimates on a county basis, and submit data electronically to the US EPA for inclusion in the National Emissions Inventory (NEI) for 2011.

In order to provide consistency among all these inventories, it was decided to standardize the definition of a “point source” by adopting the designation of point sources as outlined in the AERR:

We are basing the requirement for point source format reporting on whether the source is major under 40 CFR part 70 for the pollutants for which reporting is required, i.e., CO, VOC, NO_x, SO₂, PM_{2.5}, PM₁₀, lead and NH₃ but without regard to emissions of HAPs... [T]his approach will result in a more stable universe of reporting point sources, which in turn will facilitate elimination of overlaps and gaps in estimating point source emissions, as compared to nonpoint source emissions. Under this requirement, states will know well in advance of the start of the inventory year which sources will need to be reported. (US EPA, 2008)

This chapter contains several tables that provide information on point source emissions. Table 2.2–1 provides an alphabetical listing of all point sources and their location. Table 2.4–1 shows the annual and ozone season-day emissions of VOC, NO_x, and CO for those point sources which reported emissions of one or more of these pollutants in 2011. Table 2.5–1 lists emission reduction credits for the area, while Table 2.6–1 summarizes point source emission totals for both Maricopa County and the eight-hour ozone nonattainment area. Note that the totals shown in tables may not equal the sum of individual values due to independent rounding.

2.2 Identification of point sources

The Maricopa County Air Quality Department (MCAQD) identified point sources within Maricopa County through its electronic permit system database, EMS, and the 2011 annual emissions reports submitted to the department. A total of 18 stationary sources were identified as point sources using the definition described in Section 2.1. While the Arizona Department of Environmental Quality (ADEQ) retains permitting authority for a limited number of industrial source categories in Maricopa County, no ADEQ-permitted facilities are considered point sources, and are addressed instead as area sources.

Table 2.2–1 contains an alphabetical listing of all point sources, including a unique business identification number, NAICS industry classification code, business name, and physical address.

Table 2.2–1. Name and location of all point sources in Maricopa County.

ID #	NAICS	Business name	Address	City	ZIP
3313	221112	APS West Phoenix Power Plant	4606 W Hadley St	Phoenix	85043
43063	221112	Arlington Valley LLC	39027 W Elliot Rd	Arlington	85322
127771	331111	CMC Steel Fabricators Inc	11444 E Germann Rd	Mesa	85212
44439	221112	Gila River Power Station	1250 E Watermelon Rd	Gila Bend	85337
3300	92811	Luke AFB – 56th Fighter Wing	14002 W Marauder St	Glendale	85309
44186	221112	Mesquite Generating Station	37625 W Elliot Rd	Arlington	85322
43530	221112	New Harquahala Generating Co	2530 N 491st Ave	Tonopah	85354
20706	32614	New Wincup Holdings Inc	7980 W Buckeye Rd	Phoenix	85043
1879	562212	Northwest Regional Landfill	19401 W Deer Valley Rd	Surprise	85387
1331	337122	Oak Canyon Manufacturing Inc	3021 N 29th Dr	Phoenix	85017
52382	221112	Ocotillo Power Plant	1500 E University Dr	Tempe	85281
42956	221112	Redhawk Generating Facility	11600 S 363rd Ave	Arlington	85322
303	332431	Rexam Beverage Can Company	211 N 51st Ave	Phoenix	85043
3315	221112	Santan Generating Station	1005 S Val Vista Rd	Gilbert	85296
4175	424710	SFPP LP Phoenix Terminal	49 N 53rd Ave	Phoenix	85043
3316	221112	SRP Agua Fria Generating Station	7302 W Northern Ave	Glendale	85303
3317	221112	SRP Kyrene Generating Station	7005 S Kyrene Rd	Tempe	85283
1210	337122	Trendwood Inc	2402 S 15th Ave	Phoenix	85007

2.3 Procedures for estimating emissions from point sources

Annual and season-day emission estimates were determined from annual source emissions reports, MCAQD investigation reports, permit files and logs, or telephone contacts with sources. For most of the sources, material balance methods were used for determining emissions. Emissions were estimated using the emission factors from AP-42, source tests, engineering calculations, or manufacturers' specifications.

MCAQD distributes annual emissions survey forms to nearly all facilities for which MCAQD has issued an operating permit. Facilities are required to report detailed information on stacks, control devices, operating schedules, and process-level information concerning their annual activities. (See Appendix A for a copy of the instructions to complete the emissions inventory.) These instructions include examples and explanations on how to complete the annual emissions reporting forms that facilities must submit to MCAQD.

After a facility has submitted an annual emissions report to MCAQD, emissions inventory staff check all reports for missing and questionable data, and check the accuracy and reasonableness of all emissions calculations with AP-42, the Factor Information and REtrieval (*webFIRE*) software, and other EPA documentation. Control efficiencies are determined by source tests when available, or by AP-42 factors, engineering calculations, or manufacturers' specifications. MCAQD has conducted annual emissions surveys for permitted facilities since 1988, and the department's database system, EMS, contains numerous automated quality assurance/quality control checks for data input and processing.

2.3.1 Application of rule effectiveness

Rule effectiveness reflects the actual ability of a regulatory program to achieve the emission reductions required by regulation. The concept of applying rule effectiveness in a SIP emissions inventory has evolved from the observation that regulatory programs may be less than 100 percent effective for some source categories. Rule effectiveness (“RE”) is applied to those sources affected by a regulation and for which emissions are determined by means of emission factors and control efficiency estimates.

For processes that claimed emissions reductions through the use of a control device, RE calculations were performed separately for Title V and non-Title V sources. Overall RE values of 91.81% (for Title V processes) and 87.81% (for non-Title V processes) were calculated.

Appendix B contains further details on the methods and data used in computing the above RE rates.

2.4 Detailed overview of point source emissions

Table 2.4–1 provides a summary of annual and season-day emissions from all point sources. All point sources are located within the eight-hour ozone nonattainment area, therefore, county and nonattainment area emissions are equal. Sources for which rule effectiveness has been applied are noted. Values of “0.00” and “0.0” for annual and daily emissions denote a value below the level of significance (0.005 tons/yr and 0.05 lbs/day, respectively).

Table 2.4–1. Annual and season-day point source emissions, by facility.

ID #	Business name		Annual emissions (tons/yr)			Ozone season day (lbs/day)		
			VOC	NO _x	CO	VOC	NO _x	CO
3313	APS West Phoenix Power Plant	*	28.43	596.56	80.92	163.6	4,162.0	422.6
43063	Arlington Valley LLC		0.52	38.68	24.12	8.7	605.4	377.5
127771	CMC Steel Fabricators Inc	*	23.63	34.05	455.94	226.7	318.6	4,376.6
44439	Gila River Power Station		10.40	194.22	53.43	93.9	1,777.7	501.0
3300	Luke AFB – 56th Fighter Wing	*	8.07	10.04	5.36	53.1	52.2	22.5
44186	Mesquite Generating Station	*	22.53	192.49	22.99	134.0	1,146.1	137.2
43530	New Harquahala Generating Co	*	15.50	23.24	35.24	169.0	251.0	386.3
20706	New Wincup Holdings Inc		125.98	11.82	2.10	684.0	65.1	12.9
1879	Northwest Regional Landfill		2.47	9.74	5.18	13.6	53.5	28.5
1331	Oak Canyon Manufacturing Inc		62.86			483.5		
52382	Ocotillo Power Plant		4.79	82.96	15.54	51.1	1,087.8	203.7
42956	Redhawk Generating Facility		5.61	150.82	168.87	26.6	813.2	890.8
303	Rexam Beverage Can Company		99.49	4.35	3.65	481.1	21.0	17.7
3315	Santan Generating Station	*	8.78	257.77	150.24	87.7	2,817.6	1,648.7
4175	SFPP LP Phoenix Terminal		101.15	4.89	5.53	556.6	36.2	47.4
3316	SRP Agua Fria Generating Station	*	1.88	104.92	25.55	32.2	1,900.1	481.8
3317	SRP Kyrene Generating Station		3.16	27.77	8.51	25.2	245.8	76.9
1210	Trendwood Inc		128.59			989.1		
TOTAL:			653.84	1,744.32	1,063.18	4,279.8	15,353.4	9,632.0

* = Facility for which rule effectiveness has been applied.

2.5 Emission reduction credits

A major source or major modification planned in a nonattainment area must obtain emissions reductions as a condition for approval. These emissions reductions, generally obtained from

existing sources located in the vicinity of a proposed source, must offset the emissions increase from the new source or modification. The obvious purpose of acquiring offsetting emissions decreases is to allow an area to move towards attainment of the national ambient air quality standards while still allowing some industrial growth.

In order for these emission reductions to be available in the future for offsetting, they must be: 1) explicitly included and quantified as growth in projection-year inventories required in rate of progress plans or attainment demonstrations that were based on 1990 actual inventories, and 2) meet the requirements outlined in MCAQD Rule 240 (Permit Requirements for New Major Sources and Major Modification to Existing Major Sources).

Table 2.5–1 provides a list of emission reduction credits for VOC, NO_x, and CO.

Table 2.5–1. Emission reduction credits as of December 31, 2011.

ID	Facility/ Owner	Reduction Date	Emission reduction credits (tons/yr)		
			VOC	NO _x	CO
1151	Freescale Semiconductor, Inc.	3/1/2004	17.1	9.8	15.3
	Grey K Envl Fund, NYC	12/11/2006	80.0		
	Woodstuff Mfg	11/30/2007	17.6		
TOTAL:			114.7	9.8	15.3

2.6 Summary of point source emissions

Table 2.6–1 provides a summary of point source emissions for Maricopa County and the eight-hour ozone nonattainment area, including emission reduction credits.

Table 2.6–1. Annual and season-day point source emissions (including emission reduction credits).

Geographic Area	Annual (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	768.54	1,754.12	1,078.48	4,908.3	15,407.1	9,715.8
8-hr ozone NAA	768.54	1,754.12	1,078.48	4,908.3	15,407.1	9,715.8

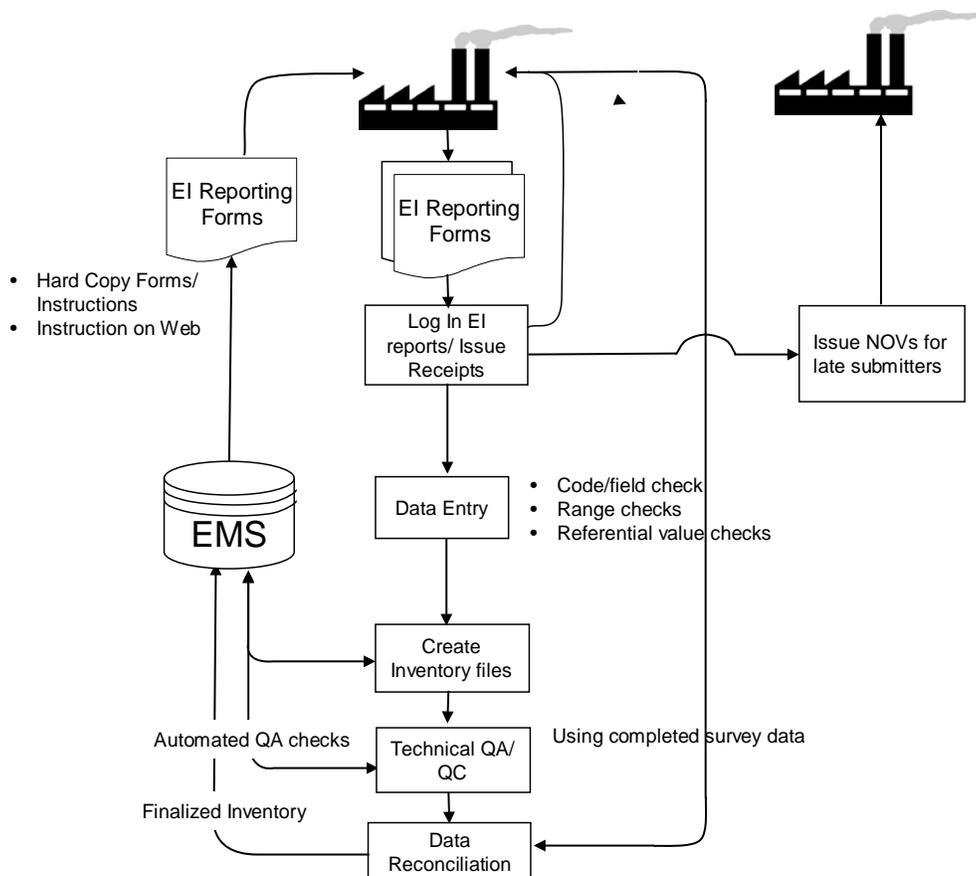
2.7 Quality assurance/quality control procedures

2.7.1 Emission survey preparation and data collection

The MCAQD's Emissions Inventory (EI) Unit annually collects point source criteria pollutant emission data from sources in the county. MCAQD annually reviews EPA guidance, documents from the Emissions inventory Improvement Program (EIIP), and other source materials to ensure that the most current emission factors and emission calculation methods are used for each year's survey. Each January, the EI Unit prepares a pre-populated hard copy of the preceding year's submissions and mails reporting forms to permitted sources, along with detailed instructions for completing the forms. (A copy of these instructions is included as Appendix A). The EI Unit asks sources to verify and update the data. The EI Unit also holds numerous workshops each spring to assist businesses in completing EI forms.

The general data flow for data collection and inventory preparation is shown in Figure 2.7–1.

Figure 2.7–1. Data flow for annual point source emissions inventory reporting.



2.7.2 Submission processing

Submitted EI reports are logged in as they are received, and receipts are issued for emissions fees paid. The data are input “as received” into the department's data base. During data entry, a variety of automated quality control (QC) checks are performed, including:

- pull-down menus to minimize data entry errors (e.g., city, pollutant, emission factor unit, etc.)
- mandatory data field requirement checks (e.g., a warning screen appears if a user tries to save an emission record with a missing emission factor).
- range checks (e.g., were valid SCC, Tier, SIC, and NAICS codes entered?)
- referential value checks (e.g., emission factor units, annual throughput units)
- automatic formatting of date, time, telephone number fields, etc.

Automated quality assurance (QA) checks on the report that has been entered include the following:

- Comparing reported emission factors to SCC reference lists
- Comparing reported emission factors to material name reference list

- Checking the report for calculation errors. This includes annual throughput, emission factors, unit conversion factors (e.g., BTU to therms), capture efficiency, primary / secondary control device efficiency, and any offsite recycling credits claimed.
- Checking the report for completeness of required data.

When data entry is complete, an electronic version of the original data is preserved separately to document changes made during the technical review and QA/QC process.

When errors are flagged, the businesses are contacted and correct information is obtained and input to the EMS. Outstanding reporting issues are documented. Confidential business information (CBI) is identified by a checkbox on the form, and these data elements are flagged during data entry and are not transmitted to the EPA.

To prepare the inventory for submittal to the National Emissions Inventory (NEI), the EI Unit has developed a series of MS-Access queries to extract data from EMS; and to append or convert codes, units of measure, etc., in order to create staging tables that adhere to the EPA's Consolidated Emissions Reporting Schema (CERS). These tables are then converted to XML files using EPA's Bridge conversion tool for submittal to the EPA's Emissions inventory System (EIS).

2.7.3 Analysis of annual point source emissions data for this inventory

Two air quality planners checked inventory accuracy and reasonableness, and assured that all point sources had been identified and that the methodology applied to calculate emissions was appropriate and that the calculations were correct. Other reasonableness checks were conducted by recalculating emissions using methods other than those used to make the initial emissions calculations and then comparing results. QA was conducted by checking all emissions reports submitted to MCAQD for the year 2011 for missing and questionable data and by checking the accuracy and reasonableness of all emissions calculations made for such reports. Notes concerning follow-up calls and corrections to calculations were documented on each 2011 annual emissions report.

The QA point source coordinator reviewed and checked calculations, identified errors, and performed completeness, reasonableness and accuracy checks.

2.8 References

US EPA, 2008. Air Emissions Reporting Requirements: Final Rule. 73 Fed. Reg. 76539.
Available at: http://www.epa.gov/ttn/chief/aerr/final_published_aerr.pdf.

3. Area Sources

3.1 Scope and methodology

This chapter considers all stationary sources which are too small or too numerous to be treated as point sources. US EPA guidance documents, including “Introduction to Area Source Inventory Development” (US EPA, 2001a) as well as permit and emissions data in the MCAQD’s Environmental Management System (EMS) database, and previous SIP inventories, were evaluated to develop the list of area source categories for inclusion. Some source categories were deemed “insignificant” because there are no large production facilities and/or very few small sources, and therefore emissions were not quantified. MCAQD prepared the emission estimates for all area sources and provided quality assurance checks on all data. Table 3.1–1 contains a list of all area source categories, with Source Classification Codes (SCCs), addressed in this chapter.

Table 3.1–1. List of area source categories included in this ozone precursor inventory.

SCC code	Area source description	Section
	<i>Fuel combustion:</i>	3.2
2102004001	Industrial distillate oil: Boilers	3.2.1
2102004002	Industrial distillate oil: Engines	3.2.1
2102006000	Industrial natural gas	3.2.2
2103004001	Commercial/institutional distillate oil: Boilers	3.2.3
2103004002	Commercial/institutional distillate oil: Engines	3.2.3
2103006000	Commercial/institutional natural gas	3.2.4
2104004000	Residential distillate oil	3.2.5
2104006000	Residential natural gas	3.2.6
2104007000	Residential liquefied petroleum gas (LPG)	3.2.7
2104011000	Residential kerosene	3.2.8
2104008100	Residential Wood Combustion (RWC): Fireplace	3.2.9
2104008210	RWC: Woodstove: fireplace inserts: Non-EPA certified	3.2.9
2104008220	RWC: Woodstove: fireplace inserts: EPA certified; non-catalytic	3.2.9
2104008230	RWC: Woodstove: fireplace inserts: EPA certified; catalytic	3.2.9
2104008310	RWC: Woodstove: freestanding: Non-EPA certified	3.2.9
2104008320	RWC: Woodstove: freestanding: EPA certified, non-catalytic	3.2.9
2104008330	RWC: Woodstove: freestanding: EPA certified, catalytic	3.2.9
2104008400	RWC: Woodstove: Pellet-fired	3.2.9
2104008610	RWC: Hydronic heater: Outdoor	3.2.9
2104008700	RWC: Outdoor wood burning device, NEC	3.2.9
2104009000	RWC: Residential firelog	3.2.9
	<i>Industrial processes:</i>	3.3
2301000000	Chemical manufacturing	3.3.1
2302002100	Commercial cooking: Conveyorized charbroiling	3.3.2.1
2302002200	Commercial cooking: Under-fired charbroiling	3.3.2.1
2302003000	Commercial cooking: Deep fat frying	3.3.2.1
2302003100	Commercial cooking: Flat griddle frying	3.3.2.1
2302003200	Commercial cooking: Clamshell griddle frying	3.3.2.1
2302050000	Bakeries	3.3.2.2
2304000000	Secondary metal production	3.3.3
2308000000	Rubber/plastics product manufacturing	3.3.4
2312000000	Electrical equipment manufacturing	3.3.5
2399000000	Industrial processes not elsewhere classified (NEC)	3.3.6
	<i>Solvent use:</i>	3.4
2401001000	Architectural coatings	3.4.1.1
2401005000	Auto refinishing	3.4.1.2
2401008000	Traffic markings	3.4.1.3
2401015000	Factory-finished wood	3.4.1.4

Table 3.1-1. List of area source categories included in this inventory (continued).

AMS code	Area source description	Section
2401020000	Wood furniture	3.4.1.5
2401075000	Aircraft surface coating	3.4.1.6
2401090000	Miscellaneous surface coating	3.4.1.7
2415000000	Degreasing	3.4.2
2420000000	Dry cleaning	3.4.3
2425000000	Graphic arts	3.4.4
2440000000	Miscellaneous industrial solvent use	3.4.5
2460100000	Consumer & commercial products (C&CP): Personal care products	3.4.6
2460200000	C&CP: Household products	3.4.6
2460400000	C&CP: Automotive aftermarket products	3.4.6
2460500000	C&CP: Coatings and related products	3.4.6
2460600000	C&CP: Adhesives and sealants	3.4.6
2460800000	C&CP: FIFRA related products	3.4.6
2460900000	C&CP: Miscellaneous products, NEC	3.4.6
2461021000	Cutback asphalt	3.4.7
2461022000	Emulsified Asphalt	3.4.7
2461023000	Roofing Asphalt	3.4.7
2461850000	Agricultural pesticides	3.4.8
	<i>Storage and transport:</i>	3.5
2501011011	Residential portable gas cans (RPG): Permeation	3.5.1
2501011012	RPG: Evaporation	3.5.1
2501011013	RPG: Spillage during transport	3.5.1
2501011014	RPG: Refilling at the pump - vapor displacement	3.5.1
2501011015	RPG: Refilling at the pump - spillage	3.5.1
2501012011	Commercial portable gas cans (CPG): Permeation	3.5.1
2501012012	CPG: Evaporation	3.5.1
2501012013	CPG: Spillage during transport	3.5.1
2501012014	CPG: Refilling at the pump - vapor displacement	3.5.1
2501012015	CPG: Refilling at the pump - spillage	3.5.1
2501055120	Bulk plants	3.5.2
2501060051	Gasoline service stations Stage I: Submerged filling	3.5.3
2501060053	Gasoline service stations Stage I: Balanced submerged filling	3.5.3
2501060201	Gasoline service stations: Underground tank, breathing/emptying	3.5.5
2501080050	Airports: Aviation gasoline Stage I: Total	3.5.6
2501080100	Airports: Aviation gasoline Stage II: Total	3.5.6
2505030120	Gasoline tank trucks in transit	3.5.7
2505040120	Pipeline gasoline	3.5.8
2510000000	Volatile organic liquid (VOL) storage and transport	3.5.9
	<i>Waste treatment and disposal:</i>	3.6
2601000000	On-site incineration	3.6.1
2610000500	Open burning: Land clearing debris	3.6.2
2620000000	Landfills	3.6.3
2630020000	Publicly owned treatment works	3.6.4
2660000000	Leaking underground storage tanks	3.6.5
2650000000	Other waste	3.6.6
	<i>Miscellaneous area sources:</i>	3.7
2801500000	Agricultural field burning	3.7.1
2810030000	Structure fires	3.7.2
2810040000	Aircraft engine testing	3.7.3
2810050000	Vehicle fires	3.7.4
2810060100	Crematories	3.7.5
2830001000	Accidental releases	3.7.6
2850000000	Hospitals	3.7.7
n/a	Wildfires	3.7.8
n/a	Prescribed fires	3.7.9

For nearly all categories, emissions were calculated in one of the following ways:

- Emissions estimates for some categories were developed by conducting surveys on local usage (e.g., natural gas consumption) or derived from state-wide data (e.g., fuel oil use).
- For some widespread or diverse categories (e.g., consumer solvent use), emissions were calculated using published per-capita or per-employee emission factors.
- For source categories with some information available from annual emissions reports (e.g., bakeries), these data were combined with employment data to “scale up” reported emissions to reflect the entire source category.
- For those source categories with detailed emissions data available from most or all of the significant sources in the category, emissions were calculated based on detailed process-level and operational data provided by these sources.

The specific emissions estimation methodologies used for each source category (including the derivation and application of rule effectiveness) are described in greater detail in the respective sections.

3.2 Fuel combustion

Area-source emission estimates are provided in this section for the following categories of fuel consumption: Industrial distillate oil, industrial natural gas, commercial/institutional distillate oil, commercial/institutional natural gas, residential distillate oil, residential natural gas, residential liquefied petroleum gas, residential kerosene, and residential wood.

Data for natural gas combustion emission estimates came from a survey of the three natural gas suppliers in Maricopa County. Table 3.2–1 summarizes the natural gas sales data received from Maricopa County natural gas suppliers.

Table 3.2–1. Maricopa County natural gas sales by end-user category and supplier.

Natural gas supplier	Sales by end-user category (in MMCF/yr)					
	Electric Utilities	Industrial	Commercial/Institutional	Residential	Transport*	Other*
Southwest Gas	n/a	592.74	13,303.23	17,083.04	9,288.47	406.92
City of Mesa	n/a	91.17	1,631.61	1,030.07	175.13	n/a
El Paso	112,963.97	150.78	n/a	n/a	n/a	n/a
Total:	112,963.97	834.68	14,934.84	18,113.11	9,463.60	406.92

*For emissions calculations, sales from transport and other were grouped with industrial sales.

3.2.1 Industrial distillate oil

Annual emissions from industrial distillate oil combustion were derived from EPA NEI (US EPA, 2012c) calculations. Emissions come from two different sources, boilers and engines burning distillate oil.

Ozone season-day emissions for the county are calculated by first multiplying annual emissions by 25% to estimate ozone season totals. Ozone season emission totals are then divided by the number of days that activity occurs during the ozone season (6 days/week and 13 weeks), as recommended by EIIP guidance (US EPA, 2001a). Annual and season-day emissions in the eight-hour ozone nonattainment area were calculated by applying the ratio of industrial

employment in the nonattainment area to county-level emission calculations (99.57%). (See Section 1.5.1 for a discussion of the employment data used). Results for boilers and engines are shown in Tables 3.2–2 and 3.2–3, respectively.

Table 3.2–2. Annual and season-day emissions from area-source industrial distillate oil combustion for boilers.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	0.61	60.87	15.22	3.9	390.2	97.5
8-hr ozone NAA	0.61	60.61	15.15	3.9	388.5	97.1

Table 3.2–3. Annual and season-day emissions from area-source industrial distillate oil combustion for engines.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	0.00	1,838.26	395.65	0.0	11,783.7	2,536.2
8-hr ozone NAA	0.00	1,830.35	393.95	0.0	11,733.0	2,525.3

3.2.2 Industrial natural gas

All natural gas suppliers in Maricopa County were surveyed to gather information on the volume of natural gas distributed, by user category, within the county in 2011. Area-source industrial natural gas usage for the county is based on the reported total volume of natural gas sold to industrial sources (10,705.20 MMCF), minus natural gas used by industrial point sources (463.95 MMCF).

Natural gas is used for both external combustions (boilers and heaters) and internal combustion (generators), each of which have different emission factors. Thus the area-source natural gas usage derived above must be divided between these two categories. This apportionment was based on the percentages of external and internal natural gas combustion reported by all industrial area sources in 2008. A 2008 apportionment was used because 2011 data were not available for all industrial area sources at the time that these emission estimates were developed.

Annual emissions for the county were calculated by multiplying natural gas usage by the respective emission factors for external (SCC=102006* & 103006*) and internal (SCC=2020020*) combustion obtained from EPA’s WebFIRE database (US EPA, 2012a).

Table 3.2–4. Natural gas usage, emission factors, and annual emissions from area-source industrial natural gas consumption, by combustion type.

Combustion type	% of total	Natural gas usage (MMCF)	Emission factors (lb/MMCF)			Annual emissions (tons/yr)		
			VOC	NO _x	CO	VOC	NO _x	CO
External	98.44	10,081.49	5.5	100	84	27.72	504.07	423.42
Internal	1.56	159.76	116	2,840	399	9.27	226.86	31.87
Total:	100.00	10,241.25				36.99	730.94	455.30

Ozone season-day emissions for the county are calculated by first multiplying annual emissions by the percentage of industrial natural gas sold used during the ozone season (22.96%). (Figures reported by natural gas suppliers for the June–August time period are assumed to be representative for the July–September ozone season.) Ozone season emission totals are then divided by the number of days that activity occurs during the ozone season (6 days/wk × 13 wks/season).

Annual and season-day emissions within the eight-hour ozone nonattainment area were calculated by applying the ratio of industrial employment in the nonattainment area to county-level emission calculations (99.57%). (See Section 1.5.1 for a discussion of the employment data used).

Table 3.2–5. Annual and season-day emissions from area-source industrial natural gas combustion.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	36.99	730.94	455.30	217.8	4,303.8	2,680.8
8-hr ozone NAA	36.83	727.80	453.34	216.9	4,285.3	2,669.3

3.2.3 Commercial/institutional distillate oil

Annual emissions from commercial/institutional distillate oil combustion were derived from EPA NEI (US EPA, 2012c) calculations. Emissions come from two different sources, boilers and engines burning distillate oil.

Ozone season-day emissions for the county are calculated by first multiplying annual emissions by 25% to estimate ozone season totals. Ozone season emission totals are then divided by the number of days that activity occurs during the ozone season (6 days/week and 13 weeks), as recommended by EIP guidance (US EPA, 2001a). Annual and season-day emissions in the eight-hour ozone nonattainment area were calculated by applying the ratio of industrial employment in the nonattainment area to county-level emission calculations (99.57%). (See Section 1.5.1 for a discussion of the employment data used.) Emissions estimates for boilers and engines are shown in Tables 3.3–6 and 3.3–7, respectively.

Table 3.2–6. Annual and season-day emissions from area-source commercial/institutional distillate oil combustion for boilers.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	0.00	0.12	0.03	0.0	0.8	0.2
8-hr ozone NAA	0.00	0.12	0.03	0.0	0.8	0.2

Table 3.2–7. Annual and season-day emissions from area-source commercial/institutional distillate oil combustion for engines.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	0.00	3.72	0.80	0.0	23.8	5.1
8-hr ozone NAA	0.00	3.70	0.80	0.0	23.7	5.1

3.2.4 Commercial/institutional natural gas

All natural gas suppliers in Maricopa County were surveyed to gather information on the volume of natural gas distributed, by user category, within the county in 2011. Area-source commercial and institutional (C&I) natural gas usage for the county is based on the reported total volume of natural gas sold to C&I sources (14,934.84 MMCF), minus natural gas used by C&I point sources (77.80 MMCF).

Natural gas is used for both external combustion (boilers, heaters) and internal combustion (generators), each of which have different emission factors. Thus the area-source natural gas usage derived above must be apportioned between these two categories. This apportionment was

based on the percentages of external and internal natural gas combustion reported by all C&I area sources in 2008. A 2008 apportionment was used because 2011 data were not available for all C&I area sources at the time that these emission estimates were developed.

Annual emissions for the county were calculated by multiplying natural gas usage by the respective emission factors for external (SCC=1020060*) and internal (SCC=2020020*) combustion obtained from EPA's WebFIRE database (US EPA, 2012a).

Table 3.2–8. Emission factors and annual emissions from area-source commercial/institutional natural gas combustion, by combustion type.

Combustion type	% of total	Natural gas usage (MMCF)	Emission factors (lb/MMCF)			Annual emissions (tons/yr)		
			VOC	NO _x	CO	VOC	NO _x	CO
External	98.34	14,610.42	5.5	100	84	40.18	730.52	613.64
Internal	1.66	246.63	116	2,840	399	14.30	350.21	49.20
Total:	100.00	14,857.04				54.48	1,080.73	662.84

Ozone season-day emissions for the county were calculated by first multiplying annual emissions by the percentage of C&I natural gas used during the ozone season (18.04%). (Figures reported by natural gas suppliers for the June–August time period are assumed to be representative of the July–September ozone season.) Ozone season emission totals are then divided by the number of days that activity occurs during the ozone season (6 days/wk × 13 wks/yr).

Annual and season-day emissions within the eight-hour ozone nonattainment area were calculated by applying the combined ratio of retail, office, public and other employment in the nonattainment area to county-level emission calculations (99.88%). (See Section 1.5.1 for a discussion of the employment data used).

Table 3.2–9. Annual and season-day emissions from area-source commercial/institutional natural gas combustion.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	54.48	1,080.73	662.84	252.0	4,998.0	3,065.4
8-hr ozone NAA	54.42	1,079.44	662.05	251.7	4,992.0	3,061.7

3.2.5 Residential distillate oil

Annual emissions from residential distillate oil were derived from EPA NEI (US EPA, 2012c) calculations. Ozone season-day emissions would normally be calculated by dividing ozone season emissions by heating degree days (i.e. the number of degrees per day that the daily average temperature is below 65°F). However, data obtained from Arizona Energy Statistics (GOEP, 2013) indicated that there were no heating degree days reported during the 2011 ozone season (July–September). Thus, ozone season-day emissions from residential distillate oil combustion are assumed to be zero.

Annual and season-day emissions within the eight-hour ozone nonattainment area were calculated by multiplying county totals by the ratio of total population in the nonattainment area to the total population in the county (101.14%). See Section 1.5.1 for a further discussion of the population used. Table 3.2–10 summarizes annual and ozone season-day emissions from residential distillate oil combustion for both the county and the eight-hour ozone nonattainment area.

Table 3.2–10. Annual and season-day emissions from residential distillate oil combustion.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	0.01	0.35	0.10	0.0	0.0	0.0
8-hr ozone NAA	0.01	0.35	0.10	0.0	0.0	0.0

3.2.6 Residential natural gas

All natural gas suppliers in Maricopa County were surveyed to gather information on the volume of natural gas sold, by user category, within the county. Annual emissions from residential natural gas combustion emissions were calculated by multiplying 2011 residential natural gas sales (18,113.11 MMCF) by emission factors for residential natural gas combustion summarized in the table below (US EPA, 1998).

Table 3.2–11. Residential natural gas combustion emission factors.

Pollutant	Emission Factor (lb/MMCF)
VOC	5.5
NO _x	94.0
CO	40.0

Ozone season-day emissions were calculated by first multiplying reported natural gas usage during the ozone season (1,978.95 MMCF) by the AP-42 emission factors for residential natural gas combustion to produce ozone season emissions. (Natural gas usage reported for the months of June–August is assumed to represent ozone season usage). Ozone season emissions were then divided by days during the ozone season that residential natural gas combustion occurs (7 days/wk × 13 wks/yr) (US EPA, 2001a).

Annual and season-day residential natural gas emissions in the eight-hour ozone nonattainment area were calculated by multiplying county-level emissions by the percentage of total resident population in the eight-hour ozone nonattainment area (100.78%).

Table 3.2–12. Annual and season-day emissions from residential natural gas combustion.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	49.81	851.32	362.26	119.6	2,044.2	869.9
8-hr ozone NAA	50.20	857.96	365.09	120.5	2,060.1	876.7

3.2.7 Residential liquefied petroleum gas (LPG)

Annual emissions from residential liquefied petroleum gas (LPG) were derived from EPA NEI (US EPA, 2012c) calculations.

Ozone season-day emissions would normally be calculated by dividing ozone season emissions by heating degree days (i.e. the number of degrees per day that the daily average temperature is below 65°F). However, data obtained from Arizona Energy Statistics (GOEP, 2013) indicated that there were no heating degree days reported during the 2011 ozone season (July–September). Thus, ozone season-day emissions from residential liquefied petroleum gas (LPG) combustion are assumed to be zero.

Annual and season-day emissions within the eight-hour ozone nonattainment area were calculated by multiplying county totals by the ratio of total population in the nonattainment area to the total population in the county (101.14%). See Section 1.5.1 for a further discussion of the population used.

Table 3.2–13 summarizes annual and ozone season-day emissions from residential liquefied petroleum gas (LPG) combustion for both the county and the eight-hour ozone nonattainment area.

Table 3.2–13. Annual and season-day emissions from residential liquefied petroleum gas (LPG) combustion.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	2.00	51.35	14.56	0.0	0.0	0.0
8-hr ozone NAA	2.02	51.93	14.73	0.0	0.0	0.0

3.2.8 Residential kerosene

Annual emissions from residential kerosene were derived from EPA NEI (US EPA, 2012c) calculations.

Ozone season-day emissions would normally be calculated by dividing annual emissions by heating degree days (i.e. the number of degrees per day that the daily average temperature is below 65°F). However, data obtained from Arizona Energy Statistics (GOEP, 2013) indicated that there was no heating degree days reported during the 2011 ozone season (July–September). Thus, ozone season-day emissions from residential kerosene combustion are assumed to be zero.

Annual and season-day emissions within the eight-hour ozone nonattainment area were calculated by multiplying county totals by the ratio of total population in the nonattainment area to the total population in the county (101.14%). See Section 1.5.1 for a further discussion of the population used.

Table 3.2–14 summarizes annual and season-day emissions from residential kerosene combustion for both the county and the eight-hour ozone nonattainment area.

Table 3.2–14. Annual and season-day emissions from residential kerosene combustion.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	0.00	0.03	0.01	0.0	0.0	0.0
8-hr ozone NAA	0.00	0.03	0.01	0.0	0.0	0.0

3.2.9 Residential wood combustion

Annual emissions from residential wood combustion for Maricopa County were obtained from the US Environmental Protection Agency’s Residential Wood Combustion Estimation Tool (US EPA, 2012b). County-level annual emissions by appliance type are shown below in Table 3.2–15.

Table 3.2–15. Annual emissions by appliance type for Maricopa County from EPA’s residential wood combustion estimation tool.

SCC	Appliance Type	Annual emissions (tons/yr)		
		VOC	NO _x	CO
2104008100	Fireplace	191.08	26.29	1,506.38
2104008210	Woodstove: fireplace inserts; non-EPA certified	147.35	7.78	641.66
2104008220	Woodstove: fireplace inserts; EPA certified; non-catalytic	10.70	2.03	125.54
2104008230	Woodstove: fireplace inserts; EPA certified; catalytic	4.46	0.59	31.02
2104008310	Woodstove: freestanding, non-EPA certified	71.45	3.77	311.15
2104008320	Woodstove: freestanding, EPA certified, non-catalytic	5.18	0.99	60.83
2104008330	Woodstove: freestanding, EPA certified, catalytic	2.16	0.29	15.04
2104008400	Woodstove: pellet-fired, general	0.01	1.19	4.97
2104008610	Hydronic heater: outdoor	0.00	0.00	0.00
2104008700	Outdoor wood burning device, NEC	3.99	0.55	31.49
2104009000	Residential firelog	73.32	14.24	231.82
Total		509.70	57.72	2,959.91

Ozone season-day emissions would normally be calculated by dividing ozone season emissions by heating degree days (i.e. the number of degrees per day that the daily average temperature is below 65°F). However, data obtained from Arizona Energy Statistics (GOEP, 2013) indicated that there was no heating degree days reported during the 2011 ozone season (July–September). Thus, ozone season-day emissions from residential wood combustion are assumed to be zero.

Annual and season-day emissions within the eight-hour ozone nonattainment area were calculated by multiplying county totals by the ratio of total population in the nonattainment area to the total population in the county (101.14%). See Section 1.5.1 for a further discussion of the population used.

Table 3.2–16 summarizes annual and season-day emissions from residential wood combustion for both the county and the eight-hour ozone nonattainment area.

Table 3.2–16. Annual and season-day emissions from residential wood combustion.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	509.70	57.72	2,959.91	0.0	0.0	0.0
8-hr ozone NAA	515.53	58.38	2,993.75	0.0	0.0	0.0

3.3 Industrial processes

3.3.1 Chemical manufacturing

Emissions from area-source chemical manufacturing were calculated by the “scaling up” method as described in EPA emissions inventory guidance (US EPA, 2001a). This method combines detailed emissions data from a subset of sources, and county-level employment data from the US Census Bureau (2012) to develop a per-employee emission factor that is then used to estimate emissions from all sources in an industry category.

The most recent data from the US Census Bureau’s County Business Patterns (CBP), representing 2010 employment, were used. Table 3.3–1 shows the NAICS codes and employment data used to calculate emissions from chemical manufacturing.

Table 3.3–1. County-level employment estimates for chemical manufacturing, by NAICS code.

NAICS code	NAICS description (and employment range)	Estimated employment
325	Chemical manufacturing	4,605
42469	Other chemical & allied products merchant wholesalers	1,484
424910	Farm supplies merchant wholesalers	904
33312	Construction machinery manufacturing (250–499)	375
Total:		7,368

Since there were no point sources in this category, an area-source employment estimate is used to “scale up” emissions reported from those facilities surveyed in 2011.

Ozone season-day emissions were calculated in the same method as annual emissions, only using surveyed daily emissions instead of annual totals. Annual and season-day emissions for the eight-hour ozone nonattainment area were calculated by multiplying the Maricopa County emission totals by the percentage industrial employment within the nonattainment area. See Section 1.5.1 for a discussion of the employment data used.

Table 3.3–2 summarizes annual and season-day emissions from chemical manufacturing in both Maricopa County and the eight-hour ozone nonattainment area.

Table 3.3–2. Annual and season-day emissions from area-source chemical manufacturing.

Geographic area	Annual emissions (tons/yr)	Season-day emissions (lbs/day)
Maricopa County	77.42	599.0
8-hr ozone NAA	77.09	596.5

3.3.2 Food and kindred products

3.3.2.1 Commercial cooking

Emissions from commercial cooking were estimated for five types of commercial cooking equipment using per capita emissions factors developed by EPA for the 2008 National Emissions Inventory (NEI) (Pechan, 2012a). The per capita emission factors for each equipment type are contained in Table 3.3–3. EPA created the emission factors listed in Table 3.3–3 by taking 2002 emissions in the NEI and dividing by the 2002 population to develop per capita emission factors. The equipment types include: chain-driven charbroilers, under-fired charbroilers, deep-fat fryers, flat griddles, and clamshell griddles.

Table 3.3–3. Emission factors for commercial cooking equipment, by device type.

Equipment type	Emission Factor (lb/person)	
	VOC	CO
Chain-driven charbroilers	0.012056010	0.042446624
Under-fired charbroilers	0.041480307	0.135002176
Deep-fat fryers	0.012608151	0.000000000
Flat griddle fryers	0.005943281	0.012687330
Clamshell griddles	0.000231564	0.000000000

Annual commercial cooking emissions for Maricopa County were estimated by multiplying the MAG-estimated county population (4,129,646) by the per capita emission factors for each type of cooking equipment. See Section 1.5.1 for a discussion of the population data used.

Commercial cooking is assumed to occur uniformly throughout the year, therefore, it was assumed that 25% of annual activity occurs during the ozone season, and that activity occurs 7 days/week. Thus, season-day emissions were estimated by multiplying annual emissions by 25% then dividing the result by 91 (7 days/wk × 13 wks/ozone season). The results are shown in Table 3.3–4 below.

Table 3.3–4. Annual and daily emissions from commercial cooking equipment in Maricopa County.

Equipment type	Annual Emissions (tons/yr)		Season-day emissions (lbs/day)	
	VOC	CO	VOC	CO
Chain-driven charbroilers	24.89	87.64	136.8	481.6
Under-fired charbroilers	85.65	278.76	470.6	1,531.6
Deep-fat fryers	26.03	—	143.0	0.0
Flat griddles	12.27	26.20	67.4	143.9
Clamshell griddles	0.48	—	2.6	0.0
Total:	149.33	392.60	820.5	2,157.1

Annual and season-day emissions for the eight-hour ozone nonattainment area were calculated by multiplying the county totals by the ratio of total population in the nonattainment area to the total population in the county (101.14%). See Section 1.5.1 for a discussion of the population data used. Table 3.3–5 summarizes the annual and season-day emissions from commercial cooking for the eight-hour ozone nonattainment area.

Table 3.3–5. Annual and daily emissions from commercial cooking equipment in the eight-hour ozone NAA.

Equipment type	Annual emissions (tons/yr)		Season-day emissions (lbs/day)	
	VOC	CO	VOC	CO
Chain-driven charbroilers	25.18	88.64	138.3	487.1
Under-fired charbroilers	86.63	281.93	476.0	1,549.1
Deep-fat fryers	26.33	0.00	144.7	0.0
Flat griddles	12.41	26.50	68.2	145.6
Clamshell griddles	0.48	0.00	2.7	0.0
Total:	151.03	397.07	829.8	2,181.7

3.3.2.2 Bakeries

Emissions from area-source bakeries were calculated by the “scaling up” method as described in EPA emissions inventory guidance (US EPA, 2001a). This method combines detailed emissions data from a subset of sources and County-level employment data from the US Census Bureau (2012) to develop a per-employee emission factor that is then used to estimate emissions from all sources in an industry category.

The most recent data from the US Census Bureau’s County Business Patterns (CBP) for 2010 employment were used. (Where employment estimates were provided as a range of values, the midpoint was used.) CBP estimates for Maricopa County employment in NAICS codes 311812 and 31183 (Commercial bakeries and Tortilla manufacturing) to total 2,491 persons. There were no point sources in this category, thus all emissions from this source category are reported as area sources. Ozone season-day emissions were calculated in the same method as annual emissions, only using surveyed daily emissions instead of annual totals.

Annual and season-day emissions for the eight-hour ozone nonattainment area were calculated by multiplying the Maricopa County emission totals by the ratio of industrial employment in the nonattainment area to industrial employment in the county. Results are summarized in Table 3.3–6. See section 1.5.1 for a discussion of the employment data used.

Table 3.3–6. Annual and season-day emissions from area-source bakeries.

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County	78.18	547.8
8-hr ozone NAA	77.85	545.4

3.3.3 Secondary metal production

Annual emissions from secondary metal production facilities were derived from annual emissions reports from permitted sources. As this category consists primarily of foundries, it was assumed that there were no significant unpermitted sources within Maricopa County. Since all facilities considered in this section are located within the eight-hour ozone nonattainment area, total emission values for the county and the nonattainment area from secondary metal production are equal. Annual and season-day emissions are shown in Table 3.3–7.

Table 3.3–7. Annual and season-day emissions from area-source secondary metal production.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO_x	CO	VOC	NO_x	CO
Maricopa County	41.01	15.02	98.36	306.4	107.9	697.4
8-hr ozone NAA	41.01	15.02	98.36	306.4	107.9	697.4

3.3.4 Rubber/plastics product manufacturing

Emissions from area-source rubber and plastic manufacturing facilities were calculated by the “scaling up” method as described in EPA emissions inventory guidance (US EPA, 2001a). This method combines detailed emissions data from a subset of sources, and county-level employment data from the US Census Bureau (2012) to develop a per-employee emission factor that is then used to estimate emissions from all sources in an industry category. The most recent data from the US Census Bureau’s County Business Patterns (CBP) for 2010 employment were used. Where CBP employment estimates were presented as a range, the midpoint values were chosen for these calculations. Table 3.3–8 shows the NAICS codes and employment data used to calculate emissions from rubber and plastic manufacturing facilities.

Table 3.3–8. County-level employment estimates for rubber and plastic product manufacturing, by NAICS code.

NAICS code	NAICS description (and employment range)	Estimated employment
325211	Plastic material and resin manufacturing (0–19)	10
325991	Custom compounding of purchased resins (100–249)	175
326140	Polystyrene foam product manufacturing	164
326199	All other plastics product manufacturing	3,027
326212	Tire retreading	135
326299	All other rubber product manufacturing	92
332313	Plate work manufacturing	151
336413	Other aircraft parts and aux. equipment manufacturing	2,086
337920	Blind and shade manufacturing (250–499)	375
339115	Ophthalmic goods manufacturing	97
423830	Industrial machinery & equip. merchant wholesalers	2,634
423930	Recyclable material merchant wholesalers	1,268
441310	Automotive parts and accessories stores	3,392
441320	Tire dealers	2,095
Total:		15,701

Some facilities in this category are considered point sources, and have been addressed in Chapter 2. To avoid double-counting, employment at point sources is subtracted from total employment.

Ozone season-day emissions were calculated in the same method as annual emissions, only using surveyed daily emissions instead of annual totals. Annual and season-day emissions for the eight-hour ozone nonattainment area were calculated by multiplying the Maricopa County emission totals by the ratio of industrial employment in the nonattainment area to industrial employment in the county. See Section 1.5.1 for a discussion of the employment data used.

Table 3.3–9 summarizes annual and season-day emissions from area source rubber and plastic products manufacturing in Maricopa County and the eight-hour ozone nonattainment area.

Table 3.3–9. Annual and season-day emissions from area-source rubber/plastic product manufacturing.

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County	1,766.75	14,171.0
8-hr ozone NAA	1,759.15	14,110.1

3.3.5 *Electrical equipment manufacturing*

Annual and season-day emissions from electric equipment manufacturing were derived from annual emissions reports submitted by permitted sources. It was assumed that there were no significant unpermitted sources within Maricopa County and all electrical equipment manufacturing permitted sources are reported here as area-sources.

As all facilities addressed in this source category are located within the eight-hour ozone nonattainment area, emission totals for both areas are equal. Annual and season-day emissions are shown in Table 3.3–10.

Table 3.3–10. Annual and season-day emissions from area-source electric equipment manufacturing.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	122.80	23.47	2.98	746.2	135.8	16.4
8-hr ozone NAA	122.80	23.47	2.98	746.2	135.8	16.4

3.3.6 Industrial processes not elsewhere classified (NEC)

Annual area-source emissions from other industrial processes not elsewhere classified (NEC) were derived primarily from annual emissions reports from permitted facilities. Other industrial processes include a wide array of industrial activities that are often specific to the permitted facility that reported the process. For this reason, it is assumed there are no significant emissions from other industrial processes, other than those reported by permitted facilities on their annual emissions reports. Ozone season-day emissions were calculated based on operating schedule information provided by individual facilities through MCAQD’s annual emissions reporting program. Emissions estimates for the eight-hour ozone nonattainment area were derived using data on the location of the facilities that report other industrial processes.

In addition, emissions from ADEQ-permitted sources are included in this category due to a lack of specificity regarding the nature of the reported emissions. As a conservative estimate, all of these emissions were assumed to occur within the eight-hour ozone nonattainment area. Estimates of total emissions from this source category are presented in Table 3.3–11.

Table 3.3–11. Annual and season-day emissions from industrial processes not elsewhere classified.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	48.51	224.92	91.84	325.6	1,245.8	525.2
8-hr ozone NAA	47.55	224.92	91.84	318.0	1,245.8	525.2

3.4 Solvent use

3.4.1 Surface coating

3.4.1.1 Architectural coatings

VOC emissions from architectural coatings were calculated using a per-capita emission factor developed and used by EPA for the 2008 NEI (Pechan, 2012). Because Maricopa County Rule 335 contains an emission limit for coatings, the “controlled” VOC emission factor (2.41 lbs/person) was used.

Annual VOC emissions for architectural coating for both Maricopa County and the eight-hour ozone nonattainment area were calculated by multiplying the per-capita emission factor by the county and nonattainment area populations (4,129,646 and 4,176,870, respectively). See Section 1.5.1 for a discussion of the population data used.

Ozone season-day emissions were developed using default assumptions from EIIP (US EPA, 1995a). The seasonal factor for ozone season architectural coating activity was assumed to be 28 percent of annual activity. In addition, it was assumed that coating use may take place 7 days a week during the ozone season (13 wks/season). Thus, season-day emissions were calculated by multiplying annual VOC emissions by the seasonal factor and then dividing the results by 91 days per season. Table 3.4–1 presents the assumptions used as well as annual and season-day

VOC emissions from architectural coatings for Maricopa County and the eight-hour ozone nonattainment area.

Table 3.4–1. Annual and season-day emissions from architectural coating.

Geographic area	Population	Annual VOC emissions (tons/yr)	% annual activity in ozone season	Activity level (days/wk)	Season-day VOC emissions (lbs/day)
Maricopa County	4,129,646	4,976.22	28 %	7	30,622.9
8-hr ozone NAA	4,176,870	5,033.13	28 %	7	30,973.1

3.4.1.2 Auto refinishing

VOC emissions from auto refinishing were calculated using the per employee emission factor (89.0 lbs of VOC/employee) developed and reviewed by the Eastern Regional Technical Advisory Committee (ERTAC) advisory panel for the 2008 NEI (Pechan, 2012).

The most recent employment estimates (for the year 2010) from the US Census Bureau’s County Business Patterns (CBP) were used (US Census Bureau, 2012). Employment data is listed by the North American Industry Classification System (NAICS) code(s). Table 3.4–2 shows the NAICS codes and employment estimates used to calculate emissions from auto refinishing.

Table 3.4–2. County-level employment estimates for auto refinishing, by NAICS code.

NAICS code	NAICS description	Estimated employment
81112	Auto body, paint, interior, & glass repair	4,236
4411	Auto dealers	22,632
4412	Other motor vehicle dealers	3,093
Total:		29,961

The seasonal activity factor for ozone season auto refinishing was assumed to be 25 percent of annual activity. In addition, it was assumed that auto refinishing occurs evenly throughout the year, 5 days/wk (US EPA, 2001a). Thus, ozone season-day emissions were calculated by multiplying annual VOC emissions by the seasonal factor and then dividing the results by 65 days per season (5 days/wk × 13 wks/season).

Annual and season-day emissions for the eight-hour ozone nonattainment area were derived by multiplying Maricopa County annual and season-day emissions by the ratio of industrial employment in the nonattainment area to industrial employment in the county (99.57%). See Section 1.5.1 for a discussion of the employment data used.

Table 3.4–3. Annual and season-day emissions from auto refinishing.

Geographic area	Annual VOC emissions (tons/yr)	% annual activity in ozone season	Activity level (days/wk)	Season-day VOC emissions (lbs/day)
Maricopa County	1,333.26	25 %	5	10,255.9
8-hr ozone NAA	1,327.53	25 %	5	10,211.8

3.4.1.3 Traffic markings

VOC emissions from traffic markings were calculated using the emissions factor developed by EPA for the 2008 NEI (22.1 lbs of VOC/road mile) (Pechan, 2012). Annual VOC emissions for

the county were calculated by multiplying the VOC emission factor by 2010 Maricopa County public road and street mileage obtained from the Arizona Department of Transportation Highway Performance Monitoring System (HPMS). ADOT reported 16,253 miles of public roads and streets in Maricopa County in 2010, which was assumed to be representative of 2011 (M. Catchpole, pers. commun., August 9, 2012).

Annual VOC emissions for the eight-hour ozone nonattainment area were estimated by multiplying the 2010 Maricopa County public road and street mileage by the percentage of miles within the nonattainment area (95.28%) and then multiplying by the VOC emission factor.

MAG estimated the percentage of miles within the eight-hour ozone nonattainment area as compared to Maricopa County based on 2012 GIS highways and streets data (M. Poppen, pers. commun., October 1, 2012). The 2012 mileage data was assumed to be representative of 2011.

Ozone season-day emissions during the ozone season for Maricopa County and the eight-hour ozone nonattainment area were calculated assuming 33 percent of annual activity occurred during the ozone season (13 wks per year) and a typical activity level of 5 days per week (US EPA, 1997).

Table 3.4-4. Annual and season-day emissions from traffic markings.

Geographic area	Annual VOC emissions (tons/yr)	% annual activity in ozone season	Activity level (days/wk)	Season-day VOC emissions (lbs/day)
Maricopa County	179.60	33 %	5	1,823.6
8-hr ozone NAA	171.12	33 %	5	1,737.5

3.4.1.4 Factory-finished wood

Emissions from factory-finished wood coating were calculated by the “scaling up” method as described in EPA emissions inventory guidance (US EPA, 2001a). This method combines detailed emissions data from a subset of sources, and county-level employment data from the US Census Bureau (2012) to develop a per-employee emission factor that is then used to estimate emissions from all sources in an industry category.

The most recent data from the US Census Bureau’s County Business Patterns (CBP) for 2011 employment were used. Where CBP employment estimates were presented as a range, the midpoint value was chosen for these calculations. Table 3.4-5 shows the NAICS codes and employment data used to calculate emissions from factory-finished wood surface coating.

Table 3.4-5. County-level employment estimates for factory-finished wood coating, by NAICS code.

NAICS code	NAICS description (and employment range)	Estimated employment
321911	Wood window & door manufacturing	299
321918	Other millwork	163
337212	Custom architectural woodwork & millwork manufacturing	368
337215	Showcase, partition, shelving & locker manufacturing	163
337920	Blind & shade manufacturing (250-499)	375
Total:		1,368

Since there were no point sources in this category, an area-source employment estimate was used to “scale up” emissions reported from those facilities surveyed in 2011.

Ozone season-day emissions were calculated in the same method as annual emissions, only using surveyed daily emissions instead of annual totals. Annual and season-day emissions for the eight-hour ozone nonattainment area were calculated by multiplying the Maricopa County emission totals by the ratio of industrial employment in the nonattainment area to industrial employment in the county (99.57%). See Section 1.5.1 for a discussion of the employment data used. Table 3.4–6 summarizes annual and season-day VOC emissions from factory-finished wood surface coating in both Maricopa County and the eight-hour ozone nonattainment area.

Table 3.4–6. Annual and season-day emissions from area-source factory-finished wood surface coating.

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County	137.72	1,396.7
8-hr ozone NAA	137.12	1390.7

3.4.1.5 Wood furniture

Emissions from wood furniture surface coating were calculated by the “scaling up” method as described in EPA emissions inventory guidance (US EPA, 2001a). This method combines detailed emissions data from a subset of sources, and county-level employment data from the US Census Bureau (2012) to develop a per-employee emission factor that is then used to estimate emissions from all sources in an industry category.

The most recent data from the US Census Bureau’s County Business Patterns (CBP) for 2010 employment were used. Where CBP employment estimates were presented as a range, the midpoint values was chosen for these calculations. Table 3.4–7 shows the NAICS codes and employment data used to calculate emissions from wood furniture surface coating.

Table 3.4–7. County-level employment estimates for wood furniture surface coating, by NAICS code.

NAICS code	NAICS code description	Estimated employment
337110	Wood kitchen cabinet & countertop manufacturing	693
337121	Upholstered household furniture manufacturing	72
337122	Non-upholstered wood household furniture manufacturing	1,303
337129	Wood television, radio & sewing machine cabinet mfg. (0–19)	10
337211	Wood office furniture manufacturing (0–19)	10
811420	Re-upholstery & furniture repair	132
Total:		2,220

Some facilities in this category are considered point sources and have been addressed in Chapter 2. To avoid double-counting, employment at point sources was subtracted from total employment.

Annual emissions were calculated by “scaling up” area-source emissions reported from those facilities surveyed in 2011.

Ozone season-day emissions were calculated in the same method as annual emissions, only using surveyed daily emissions instead of annual totals. Annual and season-day emissions for the eight-hour ozone nonattainment area were calculated by multiplying the Maricopa County emission totals by the ratio of industrial employment in the nonattainment area to industrial

employment in the county (99.57%). See Section 1.5.1 for a discussion of the employment data used.

Table 3.4–8 summarizes annual and season-day VOC emissions from wood furniture surface coating in both Maricopa County and the eight-hour ozone nonattainment area.

Table 3.4–8. Annual and season-day emissions from area-source wood furniture surface coating.

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County	416.56	3,434.7
8-hr ozone NAA	414.77	3,419.9

3.4.1.6 Aircraft surface coating

Annual emissions from aircraft surface coating facilities were derived from annual emissions reports from permitted sources. It is assumed that all aircraft surface coating facilities were surveyed in 2011 based on a comparison of county-level employment data (US Census Bureau, 2012) and annual emissions report employment data. Ozone season-day emissions were calculated based on operating schedule information provided in the facilities’ annual emissions reports. Since all facilities considered in this section are located within the eight-hour ozone nonattainment area, total emission values for the county and the nonattainment area are equal.

Table 3.4–9. Annual and season-day VOC emissions from area-source aircraft surface coating.

Geographic area	Annual emissions (tons/yr)	Season-day emissions (lbs/day)
Maricopa County	65.84	473.1
8-hr ozone NAA	65.84	473.1

3.4.1.7 Miscellaneous surface coating

Area-source VOC emissions from miscellaneous surface coating were estimated by a “scaling up” method as described in EPA emissions inventory guidance (US EPA, 2001a). This method combines detailed emissions and employment data from Maricopa County permitted facilities to develop a per-employee emission factor that is then used to estimate emissions from all sources in an industry category

The typical “scale-up” methodology was revised slightly for this source category for a number of reasons. First, miscellaneous surface coating activity occurs, at some level, across an exceptionally broad spectrum of industries, both industrial and commercial/institutional. Additionally, annual emissions reports may be inconsistent in how activities are reported, and it is uncertain if all relevant activities are categorized as “miscellaneous surface coating” vs. some other category (e.g., manufacturing). Estimating total emissions from miscellaneous surface coating based on county employment by NAICS code (for which employment data are often presented only as a broad range), or all industrial employment (including industries which have little or no miscellaneous surface coating activities) would therefore be misleading and lead to an over-estimate of area-source emissions from this source category. Instead, the list of SIC codes used by facilities that reported miscellaneous surface coating activities was conservatively assumed to represent the “universe” of businesses that could possibly have significant miscellaneous surface coating activity. To avoid double-counting, employment at point sources was subtracted from total employment within these SIC categories.

Ozone season-day emissions were calculated in the same method as annual emissions, only using surveyed daily emissions instead of annual totals. Annual and season-day emissions for the eight-hour ozone nonattainment area were calculated by multiplying the Maricopa County emission totals by the ratio of industrial employment in the nonattainment area to industrial employment in the county (99.57%). See Section 1.5.1 for a discussion of the employment data used.

Table 3.4–10 summarizes annual and season-day VOC emissions from area-source miscellaneous surface coating in both Maricopa County and the eight-hour ozone nonattainment area.

Table 3.4–10. Annual and season-day emissions from miscellaneous surface coating.

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County	316.38	2,450.5
8-hr ozone NAA	315.02	2,440.0

3.4.2 Degreasing

Area-source VOC emissions from degreasing were estimated by a “scaling up” method as described in EPA emissions inventory guidance (US EPA, 2001a). This method combines detailed emissions and employment data from Maricopa County permitted facilities to develop a per-employee emission factor that is then used to estimate emissions from all sources in an industry category.

The typical “scale-up” methodology was revised slightly for this source category for a number of reasons. First, degreasing activity occurs at some level across a wide spectrum of industries, both industrial and commercial/ institutional. Additionally, annual emissions reports may be inconsistent in how activities are reported and it is uncertain if all relevant activities are categorized as “degreasing” vs. some other category (e.g., manufacturing). Estimating total emissions from degreasing based on county employment by NAICS code (for which employment data are often presented only as a broad range), or all industrial employment (including industries which have little or no degreasing activities) would therefore be misleading and lead to an over-estimate of area-source emissions from this source category.

Instead, the list of SIC codes used by businesses that reported degreasing activities was conservatively assumed to represent the “universe” of businesses that could possibly have significant degreasing activity. To avoid double-counting, employment at point sources was subtracted from total employment within these SIC.

Ozone season-day emissions were calculated in the same method as annual emissions, only using surveyed daily emissions instead of annual totals. Annual and season-day emissions for the eight-hour ozone nonattainment area were calculated by multiplying the Maricopa County emission totals by the percentage of industrial employment within the nonattainment area. (See Section 1.5.1 for a discussion of the employment data used.)

Table 3.4–11 summarizes annual and season-day emissions from area-source degreasing in both Maricopa County and the eight-hour ozone nonattainment area.

Table 3.4–11. Annual and season-day VOC emissions from area-source degreasing.

Geographic area	Annual emissions (tons/yr)	Season-day emissions (lbs/day)
Maricopa County	217.55	1,451.1
8-hr ozone NAA	216.62	1,445.1

3.4.3 Dry cleaning

Dry cleaning facilities are identified as one of two types: those that use perchloroethylene and those that use a petroleum solvent (140 or Stoddard solvent) or other VOC-based solvent. Perchloroethylene is a synthetic solvent that is not considered photochemically reactive and therefore is not included in this inventory. Data from the 2008 periodic emissions inventory were grown to 2011 based on total population.

Based on operating schedule information provided in the facilities' historic annual emissions reports, it is assumed that operations occur evenly throughout the year, 5 days per week, thus season-day emissions were derived by dividing the annual total emissions by 260 (= 5 days/ wk × 52 weeks/yr).

Annual and season-day emissions estimates for the eight-hour ozone nonattainment area were calculated by multiplying county-level emissions by the ratio of Maricopa County population to nonattainment area population. See Section 1.5.1 for a discussion of the population data used.

Table 3.4–12 summarizes the annual and season-day VOC emissions from dry cleaning.

Table 3.4–12. Annual and season-day emissions from dry cleaning.

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County	23.15	178.1
8-hr ozone NAA	23.42	180.1

3.4.4 Graphic arts

Emissions from graphic arts were calculated by the “scaling up” method as described in EPA emissions inventory guidance (US EPA, 2001a). This method combines detailed emissions data from a subset of sources, and county-level employment data from the US Census Bureau (2012) to develop a per-employee emission factor that is then used to estimate emissions from all sources in an industry category.

The most recent data from the US Census Bureau's County Business Patterns (CBP) for 2010 employment were used. Table 3.4–13 shows the NAICS codes and employment data used to calculate emissions from graphic arts.

Table 3.4–13. County-level employment estimates for graphic arts, by NAICS code.

NAICS code	NAICS description	Estimated employment
323	Printing & related support activities	3,892
5111	Newspaper, periodical, book & database publishers	3,800
Total:		7,692

There were no point sources in this category. An area-source employment estimate was used to “scale up” emissions reported from those facilities surveyed in 2011.

Ozone season-day emissions were calculated in the same method as annual emissions, only using surveyed daily emissions instead of annual totals. Annual and season-day emissions for the eight-hour ozone nonattainment area were calculated by multiplying the Maricopa County emission totals by the ratio of industrial employment in the nonattainment area to industrial employment in the county (99.57%). See Section 1.5.1 for a discussion of the employment data used.

Table 3.4–14 summarizes annual and season-day emissions from graphic arts in both Maricopa County and the eight-hour ozone nonattainment area.

Table 3.4–14. Annual and season-day VOC emissions from area-source graphic arts sources.

Geographic area	Annual emissions (tons/yr)	Season-day emissions (lbs/day)
Maricopa County	290.98	2,225.7
8-hr ozone NAA	289.73	2,216.1

3.4.5 Miscellaneous industrial solvent use

Area-source VOC emissions from miscellaneous industrial solvent use were estimated by a “scaling up” method as described in EPA emissions inventory guidance (US EPA, 2001a). This method combines detailed emissions and employment data from Maricopa County permitted facilities to develop a per-employee emission factor that is then used to estimate emissions from all sources in an industry category.

The typical “scale-up” methodology was revised slightly for this source category for a number of reasons. First, miscellaneous industrial solvent use occurs at some level across a wide spectrum of industries. Additionally, annual emissions reports may be inconsistent in how activities are reported, and it is uncertain if all relevant activities are categorized as “miscellaneous industrial solvent use” vs. some other category (e.g., manufacturing). Estimating total emissions from miscellaneous industrial solvent use based on county employment by NAICS code (for which employment data are often presented only as a broad range), or all industrial employment (including industries which have little or no solvent use activities) would therefore be misleading and lead to an overestimate of area-source emissions from this source category.

Instead, the list of SIC codes used by businesses that reported miscellaneous industrial solvent use activities was conservatively assumed to represent the “universe” of businesses that could possibly have significant miscellaneous industrial solvent use activity. To avoid double-counting, employment at point sources (addressed in Chapter 2) was subtracted from total employment within these SICs.

Ozone season-day emissions were calculated in the same method as annual emissions, only using surveyed daily emissions instead of annual totals. Annual and season-day emissions for the eight-hour ozone nonattainment area were calculated by multiplying the Maricopa County emission totals by the ratio of industrial employment in the nonattainment area to industrial employment in the county. See Section 1.5.1 for a discussion of the employment data used.

Table 3.4–15 summarizes annual and season-day VOC emissions from area-source miscellaneous industrial solvent use in both Maricopa County and the eight-hour ozone nonattainment area.

Table 3.4–15. Annual and season-day emissions from area-source miscellaneous industrial solvent use.

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County	721.85	5,126.6
8-hr ozone NAA	718.75	5,104.6

3.4.6 Consumer and commercial products

Consumer and commercial products emissions include emissions from the following seven product categories: personal care products, household products, automotive aftermarket products, adhesives and sealants, FIFRA-regulated products, coatings and related products, and miscellaneous products.

Annual area-source VOC emissions from consumer and commercial products were calculated by multiplying per-capita emission factors recommended by the Eastern Regional Technical Advisory Committee (Pechan, 2012c) by the population estimates for Maricopa County and the eight-hour ozone nonattainment area (see Section 1.5.1 for a discussion of population data). Ozone season-day emissions for the county and the eight-hour ozone nonattainment area were calculated by dividing annual emissions by 365 days as activity is assumed to occur uniformly throughout the year according to EIIP guidance (US EPA, 2001a).

Table 3.4–16. Annual and season-day emissions from consumer and commercial products.

Product category	Emission factor (lbs/person)	Maricopa County		8-hr ozone NAA	
		Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Personal care	1.9	3,923.16	21,496.8	3,968.03	21,742.6
Household	1.8	3,716.68	20,365.4	3,759.18	20,598.3
Automotive aftermarket	1.36	2,808.16	15,387.2	2,840.27	15,563.1
Coatings and related	0.95	1,961.58	10,748.4	1,984.01	10,871.3
Adhesives/sealants	0.57	1,176.95	6,449.0	1,190.41	6,522.8
FIFRA-regulated	1.78	3,675.38	20,139.1	3,717.41	20,369.4
Miscellaneous	0.07	144.54	792.0	146.19	801.0
Total:	8.43	17,406.46	95,377.9	17,605.51	96,468.5

3.4.7 Asphalt application

Asphalt is applied to pave, seal, and repair surfaces such as roads, parking lots, drives, walkways, roofs, and airport runways. In the past, MCAQD estimated emissions from asphalt application by allocating state-level asphalt usage data obtained from the Asphalt Institute to Maricopa County by the use of two surrogates: vehicle miles traveled (VMT) and population. However, the Asphalt Institute no longer compiles asphalt usage data by state. Therefore, 2011 emissions from asphalt application were calculated by growing 2008 asphalt emissions to 2011 based on VMT and population.

Asphalt emissions were grown for three categories of asphalt application: roofing, cutback and emulsified. A population-based growth factor was used to grow 2008 roofing asphalt emissions

to 2011, while a VMT-based growth factor was used to grow 2008 cutback and emulsified asphalt emissions to 2011.

Table 3.4–17 shows 2008 and 2011 VMT and population for Maricopa County and the eight-hour ozone nonattainment area.

Table 3.4–17. 2008 and 2011 population and VMT, by geographic area.

Total population	Maricopa County	8-hr ozone NAA
2008	4,279,760	4,322,710
2011	4,129,646	4,176,870
Change, 2008–2011	–3.51%	–3.37%
Vehicle miles traveled (mi/day)		
2008	91,257,000	88,713,000
2011	88,885,000	83,874,000
Change, 2008–2011	–2.60%	–5.45%

Table 3.4–18 details county VOC emissions from asphalt application by asphalt type and the growth factors used to estimate 2011 emissions.

Table 3.4–18. Emissions from asphalt use, by type, in Maricopa County.

Asphalt type	2008		2008:2011 growth factor	2011	
	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)		Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Cutback	858.15	4,689.3	–2.60%	835.84	4,567.4
Emulsified	889.17	4,858.9	–2.60%	866.06	4,732.6
Roofing	3.15	24.3	–3.51%	3.04	23.4
Total:	1,750.47	9,572.5		1,704.94	9,323.5

Annual and season-day emissions for the eight-hour ozone nonattainment area were also grown from 2008 by multiplying the 2008 nonattainment area emission by a 2008:2011 growth factor for VMT within the nonattainment area (for cutback and emulsified asphalt) and population within the nonattainment area (for roofing asphalt). Table 3.4–19 details nonattainment area asphalt emissions by type and the factors used to grow 2008 nonattainment area emissions to 2011.

Table 3.4–19. Emissions from asphalt use, by type, in the eight-hour ozone NAA.

Asphalt type	2008		2008:2011 growth factor	2011	
	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)		Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Cutback	834.22	4,558.6	–5.45%	788.72	4,309.9
Emulsified	864.39	4,723.4	–5.45%	817.24	4,465.8
Roofing	3.19	24.5	–3.37%	3.08	23.7
Total:	1,701.80	9,306.5		1,609.04	8,799.4

3.4.8 Agricultural pesticides

Annual emissions from agricultural pesticide usage within Maricopa County were obtained from the US Environmental Protection Agency's 2011 National Emissions Inventory data and documentation (US EPA, 2012c). US EPA estimated 362.93 tons of VOCs were emitted from agricultural pesticide usage in Maricopa County in 2011.

Agricultural pesticide data for 2011 were obtained from the Arizona Department of Agriculture's 1080 Investigative Search website (ADA, 2013). This data was used to determine ozone season emissions from agricultural pesticide applications. The data included quantities of pesticides applied and the date of pesticide application. Quantities reported in gallons were converted to pounds assuming 8.33 lbs per gallon.

The data showed approximately 2,086,356 lbs of agricultural pesticides were applied in Maricopa County in 2011. Based on the date of pesticide application, approximately, 36.4% (759,349 lbs.) of agricultural pesticides were applied during the ozone season. Ozone season-day emissions for Maricopa County were calculated by multiplying annual emissions (362.93 tons) by 36.4% and then dividing the result by 91 days/season (7 days/wk × 13 wks/ozone season).

Annual and season-day emissions for the eight-hour ozone nonattainment area were calculated by multiplying county totals by the ratio of agricultural land located in the nonattainment area to the agricultural land in the county (58.46%). See Section 1.5.1 for a further discussion of the land use data used.

Table 3.4-20. Annual and season-day emissions from agricultural pesticide application.

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County	362.93	2,903.4
8-hr ozone NAA	212.18	1,697.5

3.5 Storage and transport

3.5.1 Portable fuel containers

Annual Maricopa County emissions from area-source portable fuel containers (PFCs) were obtained from the US Environmental Protection Agency's 2011 National Emissions Inventory (US EPA, 2012c). These calculations identify a total of seven mechanisms by which emissions can be generated from portable fuel containers:

- Emissions associated with filling the gas can at the gas pump:
 - Displacement of the vapor within the can, and
 - Spillage of gasoline while filling the can
- Emissions associated with transporting the gas can:
 - Spillage of gasoline during transport
- Emissions (adjusted for changes in ambient temperature) associated with storage of the gasoline in the PFCs:
 - Emissions due to evaporation (i.e., diurnal emissions), and
 - Emissions due to permeation.

Two additional sources of emissions associated with using PFCs to refuel pieces of nonroad equipment are considered by the NONROAD model (described in Chapter 4) and thus not addressed here:

- Displacement of the vapor within nonroad equipment, and
- Spillage of gasoline while filling nonroad equipment.

Ozone season-day emissions for the county were calculated by dividing annual emissions by 365 days as activity is assumed to occur uniformly throughout the year.

Annual and ozone season-day emissions for the eight-hour ozone nonattainment area were calculated by multiplying the county totals by the ratio of total population in the nonattainment area to total population in the county (101.14%). See Section 1.5.1 for a discussion of the employment data used.

Table 3.5–1 summarizes annual and season-day VOC emissions from portable fuel containers in both Maricopa County and the eight-hour ozone nonattainment area.

Table 3.5–1. Annual and season-day emissions from portable fuel containers (PFCs).

Emissions source	Maricopa County		Eight-hour ozone NAA	
	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Permeation: Residential	887.25	4,875.0	897.40	4,930.8
Evaporation/diurnal: Residential	1,732.33	9,518.3	1,752.15	9,627.2
Spillage during transport: Residential	226.04	1,242.0	228.63	1,256.2
Vapor displacement in PFCs: Residential	82.87	455.3	83.82	460.5
Spillage at pump: Residential	6.60	36.2	6.67	36.7
Permeation: Commercial	28.34	155.7	28.66	157.5
Evaporation/diurnal: Commercial	55.33	304.0	55.96	307.5
Spillage during transport: Commercial	308.36	1,694.3	311.89	1,713.7
Vapor displacement in PFCs: Commercial	159.71	877.5	161.54	887.6
Spillage at pump: Commercial	12.69	69.7	12.84	70.5
Displacement during refueling of nonroad equipment*				
Spillage during refueling of nonroad equipment*				
Total:	3,499.52	19,228.2	3,539.56	19,448.1

*These activities are included in the NONROAD model emissions calculations, described in Chapter 4.

3.5.2 Bulk plants

Emissions from this source category were calculated from annual emissions inventory reports from all bulk plants located within the county. It is assumed that there are no unpermitted bulk plants in Maricopa County. To avoid double-counting, emissions from bulk terminals are treated as point sources (totaling 105.94 tons/yr) and thus are reported in Chapter 2. Ozone season-day emissions were calculated based on operating schedule information provided in the facilities annual emissions reports. Since all facilities considered in this section are located within the eight-hour ozone nonattainment area, total emission values for the county and the eight-hour ozone nonattainment area are equal.

Table 3.5–2. Annual and season-day emissions from bulk plants.

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County	120.91	659.3
8-hr ozone NAA	120.91	659.3

3.5.3 Gasoline stations (Stage I)

Stage I gasoline distribution emissions occur when gasoline vapors are displaced from storage tanks during unloading of gasoline from tank trucks at service stations.

Following EPA methodologies (US EPA, 2001b), annual VOC emissions from gasoline service station unloading were calculated by multiplying gasoline sales (1,553,993 Mgals) (B. Steen, pers. commun., September 13, 2012) by emission factors provided in AP-42 (US EPA, 1995b) for each filling technology. Based on annual emissions reports from 2002, 98.5% of gasoline is delivered using balanced submerged filling with the remaining 1.5% delivered by submerged filling. Table 3.5–3 below shows the emission factors used.

Table 3.5–3. Emission factors for gasoline service stations (Stage I).

Emission source	VOC emission factors (lbs of VOC/Mgal throughput)
Submerged filling	7.3
Balanced submerged filling	0.3

Ozone season-day emissions were calculated by multiplying ozone-season (July–September) gasoline sales (376,616 Mgal) by the emission factors listed above, then dividing by 78 days (13 weeks in the ozone season \times 6 days/week).

As a conservative assumption, annual and season-day emissions for the eight-hour ozone nonattainment area are assumed to be equal to Maricopa County emissions.

Table 3.5–4. Annual and season-day emissions from gasoline service stations (Stage I).

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County and 8-hr ozone NAA:		
–Submerged filling	85.08	528.7
–Balanced submerged filling	229.60	1,426.8
Total:	314.68	1,955.5

3.5.4 Gasoline stations (Stage II)

Stage II gasoline service station emissions are the refueling emissions that occur during the transfer of gasoline from storage tanks at service stations to vehicle fuel tanks (i.e. vehicle refueling and spillage emissions). The MOVES2010b model that was used to calculate onroad emissions captures stage II emissions. Therefore, these emissions are addressed in Chapter 5 as part of the onroad mobile sources emissions and are no longer reported as an area source.

3.5.5 Gasoline stations underground tanks, breathing/emptying

Breathing losses are the expulsion of vapor from a tank vapor space that has expanded or contracted because of daily changes in temperature and barometric pressure; these emissions occur in the absence of any liquid level change in the tank. Emptying losses occur when the air that is drawn into the tank during liquid removal saturates with hydrocarbon vapor and expands, thus exceeding the fixed capacity of the vapor space and overflowing through the pressure vacuum valve.

Following EPA methodologies (US EPA, 2001b), annual VOC emissions from storage tank breathing and emptying were calculated by multiplying annual gasoline throughput (1,553,993 Mgal [B. Steen, ADOT, pers. commun., September 13, 2012]) by the emission factor for underground tank breathing and emptying (1.0 lb/Mgal) found in AP-42 Table 5.2-7 (US EPA, 1995b).

Ozone season-day VOC emissions were calculated using the same formula as above, using only the gasoline distributed during the ozone season (July–September, 376,616 Mgal) and dividing by the 91 days (13 weeks in the ozone season \times 7 days per week that gasoline storage occurs).

As a conservative estimate, all activity was assumed to occur within the nonattainment area; thus annual and season-day emissions estimates for the nonattainment area are equal to county totals.

Table 3.5-5. Annual and season-day emissions from gasoline service stations underground tank, breathing and emptying.

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County	777.00	4,138.6
8-hr ozone NAA	777.00	4,138.6

3.5.6 Airports: Aviation gasoline

Aviation gasoline is used by small reciprocating, piston-engine aircraft in civil aviation. Commercial and military aviation rarely use aviation gasoline. Aviation gasoline is shipped to airports and is filled into bulk terminals, and then into tanker trucks. The displacement vapors during the transfer of gasoline from tank trucks to storage tanks, and vice versa falls under the definition of stage I. Stage II involves the transfer of fuel from the tanker trucks into general aviation aircraft.

Annual emissions from aviation gasoline Stage I and Stage II were obtained from the US Environmental Protection Agency's 2011 National Emissions Inventory (US EPA, 2012c). Table 3.5-6 shows US EPA 2011 estimated VOC emissions from aviation gasoline for Maricopa County.

Table 3.5-6. Annual emissions from aviation gasoline for Maricopa County.

	VOC Emissions (tons/yr)
Aviation Gasoline Stage I	347.57
Aviation Gasoline Stage II	18.04

Due to lack of data, daily emissions were assumed to be equal throughout the year and were calculated by dividing annual emissions by 365 days/year.

Annual and season-day emission in the eight-hour ozone nonattainment area were calculated by multiplying county totals by the percentage of general aviation operations that occurred within the nonattainment area in 2011 (99.1%) (See Table 4.11–1 for general aviation aircraft operational data used).

Table 3.5–7. Annual and season-day emissions from aviation gasoline.

	Maricopa County		8-hr ozone NAA	
	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Aviation Gasoline Stage I	347.57	1904.5	344.41	1,887.2
Aviation Gasoline Stage II	18.04	98.8	17.87	97.9

3.5.7 Gasoline tank trucks in transit

Emissions from tank trucks in transit occur when gasoline vapor evaporates from (1) loaded tank trucks during transportation of gasoline from bulk terminals/plants to service stations, and (2) empty tank trucks returning from service stations to bulk terminals/plants. Annual VOC emissions from gasoline trucks in transit were calculated by multiplying county-level tank truck gasoline throughput by a 0.06 lb of VOC per 1,000 gallon emission factor (Pechan, 2012b).

Gasoline consumption for Maricopa County was determined from gasoline tax sales reports obtained from the Arizona Department of Transportation for 2011 (ADOT, 2012). Gasoline throughput for tank trucks was computed by multiplying the Maricopa County gasoline sales (1,553,992,539 gallons) by a transportation adjustment factor of 1.09 to account for gasoline that is transported more than once in a given area (i.e., transported from bulk terminals to bulk plant and then from bulk plant to service station) (Pechan, 2012b).

Ozone season gasoline throughput for tank trucks was estimated by multiplying the gallons of gasoline sold (376,615,906 gallons) during the ozone-season (July-September) in Maricopa County by the 1.09 transportation adjustment factor noted above to account for gasoline that is transported more than once. Ozone season-day VOC emissions were calculated by multiplying the estimated ozone season gasoline throughput for tank trucks by the 0.06 lb of VOC per 1,000 gallon emission factor noted above and then dividing by 78 days (13 weeks × 6 days/wk).

As a conservative estimate, all activity was assumed to occur within the nonattainment area; thus annual and season-day emissions estimates for the nonattainment area are equal to county totals.

Table 3.5–8. Annual and season-day emissions from gasoline trucks in transit.

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County	50.82	315.8
8-hr ozone NAA	50.82	315.8

3.5.8 Pipeline gasoline

Pipeline emissions result from the valves and pumps found at pipeline pumping stations and from the valves, pumps, and storage tanks at pipeline breakout stations.

Annual VOC emissions from gasoline pipelines were derived based on the ratio of pipeline emissions to total emissions for bulk terminals, bulk plants, and pipelines as reported in the US Environmental Protection Agency’s 2011 National Emissions Inventory (NEI) (US EPA, 2012c). The NEI reported that 2011 pipeline emissions for Maricopa County were 12.53% of total emissions from bulk terminals, bulk plants, and pipelines.

Thus, annual pipeline emissions for the county were derived by multiplying annual emissions reported in bulk plant emissions reports by 12.53%.

Ozone season-day emissions were calculated in the same manner, by multiplying season-day emissions (derived from operating schedule information provided in the facilities annual emissions reports) by 12.53%.

Since all facilities considered in this section are located within the eight-hour ozone nonattainment area, emissions for the county and the eight-hour ozone nonattainment area are equal.

Table 3.5–9. Annual and season-day emissions from pipeline gasoline.

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County	17.32	94.5
8-hr ozone NAA	17.32	94.5

3.5.9 Volatile organic liquid (VOL) storage and transport

Emissions from this source category were calculated by summing reported VOC emissions from volatile organic liquid storage/transfer emissions inventory reports. It is assumed that there are no significant unpermitted volatile organic liquid storage/transfer facilities in Maricopa County. To avoid double-counting, emissions from those facilities treated as point sources (totaling 28.8 tons/yr) are addressed in Chapter 2. Ozone season-day emissions were calculated based on operating schedule information provided in the facilities annual emissions reports.

Table 3.5–10. Annual and season-day emissions from area-source volatile organic liquid storage/transport.

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County	30.54	182.7
8-hr ozone NAA	28.80	169.3

3.6 Waste treatment and disposal

3.6.1 On-site incineration

This section includes emissions from on-site industrial incinerators, primarily burn-off ovens used to reclaim electric wire or other materials. Emissions from human and animal crematories are addressed in Section 3.7.5. There were no incinerators at residential (e.g., apartment complexes) or commercial/institutional facilities (e.g., hospitals, service establishments) in operation during 2011.

Emissions from on-site incineration were determined from annual emissions inventory reports. It is assumed that all incinerator emissions are accounted for, since all permitted incinerators

received surveys in 2011. All surveyed facilities are located within the eight-hour ozone nonattainment area, thus total emissions for the county and nonattainment area are equal.

Table 3.6–1. Annual and season-day emissions from on-site incineration.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	0.17	3.31	0.79	1.1	21.4	5.3
8-hr ozone NAA	0.17	3.31	0.79	1.1	21.4	5.3

3.6.2 Open burning: Land clearing debris

Emissions from controlled open burning are regulated by Maricopa County Air Pollution Control Regulations Rule 314 (Open Outdoor Fires and Indoor Fireplaces at Commercial and Institutional Establishments), which requires a burn permit for open burning in Maricopa County. Burn permits are issued primarily for purposes of agricultural ditchbank and fence row burning, tumbleweed burning, land clearance, and firefighting training. Maricopa County’s burn permit data base was used to identify all burn permits issued in 2011. A total of 57 open burn permits were issued during the year. The quantity and reported activity for the open burn permits (except for firefighting burn permits) are shown in Table 3.6–2.

Table 3.6–2. Maricopa County burn permit activity.

Category	Number of permits	Unit of measure	Total reported activity
Annual ditchbank & fence row	41	Linear Feet	1,967,795
Land clearance	4	Acres	14.14
Fire hazard	1	Acres	2

Emissions from land clearance and fire hazard open burning are addressed in this section whereas ditchbank and fence row burning are addressed in Section 3.7.1.

The activity data for land clearance and fire hazard were converted to tons of material burned using fuel loading factor for “weeds, unspecified” from AP-42 (US EPA, 1992). The emission and loading factors used are shown in Table 3.6–3.

Table 3.6–3. Emission and fuel loading factors for open burning.

Category	Emission factors (lbs/ton burned)			Fuel loading factors (tons/acre)
	VOC	NO _x	CO	
Weeds, unspecified	9	4	85	3.2

Activity data were multiplied by the 3.2 tons/acre fuel loading factor to derive the total mass of material burned. Annual emissions were then calculated by multiplying the amount of material burned by the AP-42 emission factors for “weeds, unspecified” (shown in Table 3.6–3). Based on an analysis of complaints received in 2011 reporting suspected open or illegal outside burning, emissions estimates were multiplied by a factor of 2.87 to account for unpermitted illegal outdoor burning.

It was assumed that land clearance and fire hazard open burning occur 5 days per week (most burn permits are issued for weekdays but permits may be issued on weekends depending on

circumstances) and evenly during the ozone season months (July–September). Thus, season-day emissions for Maricopa County were derived by dividing annual emissions (lbs/year) by 65 (5 days/wk × 13 wks/yr).

Annual and season-day emissions for the nonattainment area were calculated by multiplying the percentage of vacant land use located in the eight-hour ozone nonattainment area (44.55%) by the Maricopa County emissions estimates. See Section 1.5.2 for a discussion of the land use data used.

Table 3.6–4 summarizes 2011 annual and season-day emissions for the Maricopa County and the eight-hour ozone nonattainment area from land clearance and fire hazard open burning activity.

Table 3.6–4. Annual and season-day emissions from land clearance and fire hazard open burning.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	0.67	0.30	6.30	20.5	9.1	193.8
8-hr ozone NAA	0.30	0.14	2.81	9.1	4.1	86.4

3.6.3 Landfills

Emissions from municipal solid waste (MSW) landfills come from uncontrolled landfill gas emissions as well as from combustion from control measures, such as a flare. Total emissions were calculated from annual emissions inventory reports from all landfills located within the county. Northwest Regional Landfill was considered a point source; all other MSW landfills are reported here as area source landfills.

Since there are no landfills located outside the eight-hour ozone nonattainment area, total emission values for the county and the eight-hour ozone nonattainment area are equal. Annual and season-day emissions are shown in Table 3.6–5.

Table 3.6–5. Annual and season-day emissions from landfills.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	36.59	30.40	108.55	200.7	167.4	596.4
8-hr ozone NAA	36.59	30.40	108.55	200.7	167.4	596.4

3.6.4 Publicly owned treatment works

Annual emissions from publicly owned treatment works (POTW) in Maricopa County were obtained from the US Environmental Protection Agency’s 2011 National Emissions Inventory (US EPA, 2012c). EPA estimated 75.02 tons of VOC were emitted from POTWs in Maricopa County in 2011. There were no point sources in this category that needed to be subtracted.

Ozone season-day emissions were calculated by multiplying annual emissions by a 35% season adjustment factor and then dividing by 91 days per season (US EPA, 2001a).

Annual and season-day emissions for the eight-hour ozone nonattainment area were calculated by multiplying the Maricopa County emission totals by the percentage of total population in the nonattainment area to the total population in the county (101.14%). See Section 1.5.1 for a discussion of the population data used.

Table 3.6–6. VOC emissions from publicly owned treatment works.

Geographic area	Annual emissions (tons/yr)	Season-day emissions (lbs/day)
Maricopa County	75.02	577.1
8-hr ozone NAA	75.88	583.7

3.6.5 Leaking underground storage tanks

Leaking underground storage tanks (LUST) are typically not considered a quantifiable source of air emissions until excavation and remediation efforts begin. The majority of air emissions from LUST site remediation occur during initial site action, which is typically tank removal.

Emissions from soil occur as the tank is being removed and when soil is deposited on the ground before treatment/disposal occurs (US EPA, 2001c).

A default emission rate of 28 lbs/day per remediation event was used to estimate VOC emissions from LUST remediation (US EPA, 2001c). Data obtained from the Arizona Department of Environmental Quality Leaking Underground Storage Tank Section indicated that 15 LUST opened in Maricopa County in 2011 (N. Giuntoli, pers. commun., March 19, 2013). Data were not available on the number or date of remediation that occurred in 2011; therefore, it was conservatively assumed that all 15 LUST were remediated in 2011 during the ozone season. It was also assumed that an initial site action (tank and soil removal) for an average LUST remediation lasts five days.

Ozone season-day emissions were calculated by dividing annual values by 65 (5 days/wk × 13 wks/ozone season). To be conservative, it was assumed that all gasoline retail outlets were located within the ozone nonattainment area and therefore, annual and season-day emissions for the eight-hour ozone nonattainment area were assumed to be equal to the Maricopa County totals.

Table 3.6–7. Annual and season-day emissions from remediation of leaking underground storage tanks.

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County	1.05	32.3
8-hr ozone NAA	1.05	32.3

3.6.6 Other waste

Annual area-source emissions from other industrial waste disposal were derived from annual emissions reports from permitted facilities. Other industrial waste disposal processes include a wide array of industrial activities that are often specific to the permitted facility that reported the process. For this reason, it is assumed there are no significant emissions from this category, other than those reported by permitted facilities on their annual emissions reports. Ozone season-day emissions were calculated based on operating schedule information provided by the facilities in their annual emissions report.

All surveyed facilities for this area source category are located inside the eight-hour ozone nonattainment area; therefore emissions for Maricopa County and the eight-hour ozone nonattainment area are equal. Table 3.6–8 summarizes annual and season-day emissions for Maricopa County and the nonattainment area.

Table 3.6–8. Annual and season-day emissions from other waste.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	2.12	22.19	77.93	10.9	122.8	431.4
8-hr ozone NAA	2.12	22.19	77.93	10.9	122.8	431.4

3.7 Miscellaneous area sources

3.7.1 Agricultural field burning

Agricultural ditchbank and fence row burning are regulated by Maricopa County Air Pollution Control Regulations Rule 314 (Open Outdoor Fires and Indoor Fireplaces at Commercial and Institutional Establishments) which requires a burn permit for open burning activity in Maricopa County. A total of 41 permits were issued during the year for ditchbank and fence row burning. The permit data indicated that a total of 1,967,795 linear feet of ditchbank and fence rows were burned in 2011.

To calculate the amount of material burned, MCAQD assumed that ditchbanks and fence rows in Maricopa County average 7 feet in width and are burned twice per year, based on a previous Maricopa County emissions inventory (MCESD, 1999).

MCAQD estimated 632.44 acres burned $[(1,967,795 \text{ linear ft.} \times 7 \text{ ft.} \times 2)/43,560 \text{ ft/acre}]$. Acres burned were converted to tons of material burned using a 3.2 tons/acre fuel loading factor for “weeds, unspecified” from AP-42 (US EPA, 1992). This resulted in an estimated 2,023.81 ton of material burned.

Annual emissions were then calculated by multiplying the amount of material burned by AP-42 emission factors for “weeds, unspecified” as shown in Table 3.7–1.

Table 3.7–1. Emission factors for open burning.

Category	Emission factors (lbs/ton burned)		
	VOC	NO _x	CO
Weeds, unspecified	9	4	85

Based on an analysis of 2011 complaints received reporting suspected open or illegal outside burning, emissions estimates were multiplied by a factor of 2.87 to account for unpermitted illegal outdoor burning.

It was assumed that ditchbank and fence row burning occurs 5 days per week. Thus, season-day emissions were calculated by dividing annual emissions (in lbs) by 65 (5 days/wk \times 13 wks/ozone season).

Annual and season-day emissions for the nonattainment area were calculated by multiplying the percentage of agricultural land use within the eight-hour ozone nonattainment area (58.46%) by the Maricopa County emissions estimates. See Section 1.5.2 for a discussion of the land use data used.

Table 3.7–2 summarizes annual and season-day emissions from ditchbank and fence row burning for Maricopa County and the eight-hour ozone nonattainment area.

Table 3.7–2. Annual and season-day emissions from ditchbank and fence row burning.

Category	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	26.14	11.62	246.85	804.2	357.4	7,595.5
8-hr ozone NAA	15.28	6.79	144.32	470.2	209.0	4,440.7

3.7.2 Structure fires

Structure fire emissions for Maricopa County were grown from 2008 based on county population growth from 2008 to 2011. Population data was provided by MAG and is shown in Table 3.7–3.

Table 3.7–3. Maricopa County population growth, 2008 to 2011.

	2008	2011	% change
Maricopa Co. Total Population	4,279,760	4,129,646	-3.51%

The 2008 annual emissions from structure fires in Maricopa County and the subsequently grown 2011 annual emissions are shown in Table 3.7–4.

Table 3.7–4. 2008 and 2011 annual emissions from structure fires in Maricopa County.

Year	Annual emissions (tons/yr)		
	VOC	NO _x	CO
2008	15.32	1.95	83.56
2011	14.78	1.88	80.63

Annual emissions for the eight-hour ozone nonattainment area were derived by multiplying annual county emissions by the percentage of total residential population within the nonattainment area (101.14%). See Section 1.5.1 for a discussion of the population data used.

It was assumed that structure fires occur 7 days a week; however, structure fires vary seasonally and may increase during cold weather. Because local season-specific data were not readily available, seasonal occurrences of residential and non-residential structure fires reported by the Federal Emergency Management Agency (FEMA) were used to derive a seasonal adjustment factor for the ozone season (US EPA, 2001d). FEMA reported that 20.9% of residential structure fires and 23.7% of non-residential structural fires occurred during July, August, and September 1994. Thus, an average occurrence of 22.3% $[(20.9\% + 23.7\%) \div 2]$ was used as a seasonal adjustment factor to estimate ozone season-day emissions.

Ozone season-day emissions for Maricopa County and the nonattainment area were derived by multiplying the annual emissions (in lbs) by the seasonal adjustment factor (22.3%) and then dividing by 91 (7 days/wk \times 13 wks/ozone season).

Table 3.7-5. Annual and season-day emissions from structure fires.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	14.78	1.88	80.63	72.4	9.2	395.2
8-hr ozone NAA	14.95	1.90	81.55	73.3	9.3	399.7

3.7.3 Aircraft engine testing

Annual emissions from engine testing facilities were derived from annual emissions reports from permitted sources that were not considered point sources in this inventory. It was assumed that there were no significant unpermitted sources within Maricopa County. Ozone season-day emissions were calculated based on operating schedule information provided in the facilities' annual emissions reports.

Since all facilities considered in this section are located within the eight-hour ozone nonattainment area, total emission values for the county and the nonattainment area are equal. Results are shown in Table 3.7-6.

Table 3.7-6. Annual and season-day emissions from aircraft engine testing.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	4.72	46.36	16.16	26.1	259.3	91.2
8-hr ozone NAA	4.72	46.36	16.16	26.1	259.3	91.2

3.7.4 Vehicle fires

Vehicle fire emissions for Maricopa County were grown from 2008 based on county population growth from 2008 to 2011. The population data used is shown in Table 3.7-3.

The 2008 annual emissions from vehicle fires in Maricopa County and the subsequently grown 2011 annual emissions are shown in Table 3.7-7.

Table 3.7-7. 2008 and 2011 annual emissions from vehicle fires in Maricopa County.

Year	Annual emissions (tons/yr)		
	VOC	NO _x	CO
2008	9.61	1.20	37.55
2011	9.27	1.16	36.23

Annual emissions for the eight-hour ozone nonattainment area were derived by multiplying annual county emissions by the percentage of total residential population within the nonattainment area (101.14%). See Section 1.5.1 for a discussion of the population data used.

It was assumed that vehicle fires occur evenly throughout the year. Thus, ozone season-day emissions were derived by dividing the Maricopa County and nonattainment area annual emissions (in lbs.) by 365 days/year. The results are shown in Table 3.7-8 below.

Table 3.7-8. Annual and season-day emissions from vehicle fires.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	9.27	1.16	36.23	50.8	6.4	198.5
8-hr ozone NAA	9.38	1.17	36.64	51.4	6.4	200.8

3.7.5 Crematories

Emissions from human and animal crematories were calculated by the “scaling up” method as described in EPA emissions inventory guidance (US EPA, 2001a). This method combines detailed emissions data from a subset of sources, and county-level employment data from the US Census Bureau (2012) to develop a per-employee emission factor that is then used to estimate emissions from all sources in an industry category.

The most recent data from the US Census Bureau’s County Business Patterns (CBP) for 2010 employment were used. Table 3.7–9 shows the NAICS code and employment data used to calculate emissions from crematories.

Table 3.7–9. County-level employment estimates for crematories, by NAICS code.

NAICS code	NAICS description	Estimated employment
81222	Cemeteries and crematories	251

There were no point sources in this category. Area-source employment estimate were used to “scale up” emissions reported from those facilities surveyed in 2011.

Ozone season-day emissions were calculated in the same method as annual emissions, only using surveyed daily emissions instead of annual totals. Annual and season-day emissions for the eight-hour ozone nonattainment area were calculated by multiplying the Maricopa County emission totals by the ratio of industrial employment in the nonattainment area to industrial employment in the county. See Section 1.5.1 for a discussion of the employment data used. Table 3.7–10 summarizes annual and season-day emissions from crematories in both Maricopa County and the eight-hour ozone nonattainment area.

Table 3.7–10. Annual and season-day emissions from crematories.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	1.18	11.19	2.23	51.1	88.5	17.3
8-hr ozone NAA	1.18	11.14	2.22	50.9	88.1	17.2

3.7.6 Accidental releases

As part of its air quality permit compliance program, MCAQD keeps an “upset log” for each calendar year that records excess emissions and accidental releases at permitted facilities. Annual emissions inventory reports also provide for recording of accidental releases. Data from these two sources documented the release of 0.45 tons of VOC for the year 2012.

Ozone season-day emissions were calculated based on the whether the reported release occurred during the ozone season. If emissions occurred during the ozone season, those emissions were summed and divided by the number of days in the ozone season to produce season-day emissions. Emissions within the eight-hour ozone nonattainment area are calculated based on locations of facilities that reported releases. Results are shown in Table 3.7–11.

Table 3.7–11. Annual and season-day emissions from accidental releases.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	0.45	0.0	0.0	2.1	0.0	0.0
8-hr ozone NAA	0.45	0.0	0.0	2.1	0.0	0.0

3.7.7 Hospitals

Emissions from hospitals were calculated by the “scaling up” method as described in EPA emissions inventory guidance (US EPA, 2001a). This method combines detailed emissions data from a subset of sources and county-level employment data from the US Census Bureau (2012) to develop a per-employee emission factor that is then used to estimate emissions from all sources in an industry category. The most recent data from the US Census Bureau’s County Business Patterns (CBP) for 2010 employment were used. CBP employment data for NAICS code 662110 (general medical and surgical hospitals) indicated 59,646 employees in this industry in Maricopa County.

Ozone season-day emissions were calculated in the same method as annual emissions, only using surveyed daily emissions instead of annual totals. Annual and season-day emissions for the eight-hour ozone nonattainment area were calculated by multiplying the Maricopa County emission totals by the ratio of population in the nonattainment area to population in the county. See Section 1.5.1 for a discussion of the employment data used.

Table 3.7–12 summarizes annual and season-day emissions from hospitals in both Maricopa County and the eight-hour ozone nonattainment area.

Table 3.7–12. Annual and season-day emissions from hospitals.

Geographic area	Annual VOC emissions (tons/yr)	Season-day VOC emissions (lbs/day)
Maricopa County	8.57	52.3
8-hr ozone NAA	8.66	52.9

3.7.8 Wildfires

2011 Maricopa County wildfire data were obtained from the Arizona State Forestry Division (ASFD) (G. Buettner, pers. commun., December 17, 2012); the National Wildfire Coordinating Group (NWCG, 2012), and the US Fire Administration, National Fire Data Center (USFA, 2012).

The Arizona State Forestry Division (ASFD) provides for the prevention and suppression of wildfires on state trust land and private lands located outside of incorporated communities. The wildfire data provided by ASFD includes wildfires that occur outside of local fire districts and municipalities on State, private, and U.S. Bureau of Land Management (BLM) land. In 2011, the (ASFD) reported 5 wildfires in Maricopa County, encompassing 15.2 acres.

Wildfire data provided by ASFD were compared to 2011 Incident Status Summary reports (ICS-209) to identify wildfires that may have occurred outside of ASFD jurisdiction. ICS-209 reports only include large wildfires, generally fires greater than 100 acres. ICS-209 reports showed two additional Maricopa County wildfires in 2011, totaling 2,006 acres (NWCG, 2012).

Lastly, 2011 National Fire Incident Reporting System (NFIRS) data were obtained from the US Fire Administration (USFA, 2012). NFIRS is a voluntary national reporting system used by fire departments to report fires and other incidents to which they respond and to maintain records of these incidents in a uniform manner. However, not all fire departments report to NFIRS and they may not report all of their fire incidents. The 2011 NFIRS data was culled for wildland fires greater than 1 acre that contained either latitude and longitude or township and range information. Wildfire data for Arizona included 18 fires which met these criteria; however, only 2 of these fires were located within Maricopa County, encompassing 7 acres. The NFIRS data was compared to the ASFD data to identify duplicates by comparing the incident dates and locations. One NFIRS fire was excluded from the combined dataset because it may have been a duplicate already captured in the ASFD data. Table 3.7–13 summarizes fire data obtained from each data source.

Table 3.7–13. 2011 wildfire activity in Maricopa County.

Data source	Number of fires in 2011	Acres burned
Arizona State Forestry Division	5	15.2
2011 NFIRS data	1	1.5
ICS-209	2	2,006.0
Total:	8	2,022.7

Estimates for fuel loading rates were assigned using fuel model codes from the National Fire Danger Rating System (NFDRS) and a table of fuel loading values for NFDRS fuel model categories (WGA/WRAP, 2005). The department used the NFDRS Fuel Model map in ArcGIS to identify NFDRS fuel types for fires with latitude and longitude data.

Table 3.7–14. Data used to estimate 2011 wildfire emissions.

NFDRS model category	Number of fires in 2011	Acres burned	Fuel loading factor (tons/acre)
Agriculture*	1	1.5	4.5
Barren*	1	0.1	0.75
Intermediate brush	4	2,019.5	15.0
Sagebrush grass	2	1.6	4.5
Total:	8	2,022.7	—

* “Agriculture” and “barren” NFDRS model descriptions were not included in WGA/WRAP 2002 fuel loading values for NFDRS fuel model categories. Therefore, it was assumed that “Agriculture” is similar to “sagebrush grass” and “Barren” is similar to “western grasses (annual)” and fuel loadings were assigned accordingly.

Estimates of the material burned were derived by multiplying the acres burned for each category by the applicable fuel loading factor.

Latitude and longitude data were used to determine the number of acres burned inside of the nonattainment area. Only one wildfire (=0.1 acre) occurred outside of the eight-hour ozone nonattainment area. Table 3.7–15 shows the number of wildfires and acres burned for Maricopa County and the eight-hour ozone nonattainment area and an estimate of material burned.

Table 3.7–15. Summary of 2011 wildfires, acres burned, and estimate of material burned.

Geographic Area	No. of fires	Acres burned	Material burned annually (tons/yr)	Material burned in 8-hr ozone season (tons/season)
Maricopa County	8	2,023	30,307	30,104
8-hr ozone NAA	7	2,023	30,306	30,104

Annual emissions from wildfires for each geographic area were calculated by multiplying the material burned for each area by the emission factor shown in Table 3.7–16 below. Emission factors were obtained from the Western Regional Air Partnership's (WRAP) 2002 Fire Emissions Inventory (WGA/WRAP, 2005).

Table 3.7–16. Emission factors for wildfires and prescribed broadcast burning.

Activity	Emission factors (lb/ton)		
	VOC	NO _x	CO
Wildfires and prescribed broadcast burning	13.6	6.2	289

Annual emissions from wildfires for Maricopa County and the nonattainment area are shown in Table 3.7–17.

Table 3.7–17. Annual emissions from wildfires.

Geographic Area	Annual emissions (tons/yr)		
	VOC	NO _x	CO
Maricopa County	206.08	93.95	4,379.29
8-hr ozone NAA	206.08	93.95	4,379.28

Because all fires that occurred during ozone season were within the nonattainment area, season-day emissions for the county and the nonattainment area were the same. Ozone season-day emissions were estimated by multiplying the material burned during ozone season by the appropriate emission factor and dividing the result by the number of ozone season burn days. In 2011, 32 burn days occurred during the ozone season in Maricopa County. Table 3.7–18 shows season-day emissions from wildfires in Maricopa County and the nonattainment area.

Table 3.7–18. Season-day emissions from wildfires.

Geographic Area	Ozone-season burn days	Season-day emissions (lbs/day)		
		VOC	NO _x	CO
Maricopa County	32	12,794.0	5,832.6	271,872.2
8-hr ozone NAA		12,794.0	5,832.6	271,872.2

3.7.9 Prescribed fires

Prescribed fire data were obtained from the Arizona Department of Environmental Quality (ADEQ) (B. Busby, pers. commun., November 8, 2012). The ADEQ reported that fourteen prescribed fires occurred in Maricopa County in 2011. Sixty-two acres of piled fuels were burned. All fourteen prescribed fires occurred inside the eight-hour ozone nonattainment area. Because all 2011 prescribed fires were piled fuels, material burned was derived by multiplying the number of acres burned by tons of piles per acre for each fire. Table 3.7–19 shows the data provided by the ADEQ, the amount of material burned for each fire, whether the fire occurred within the nonattainment area and during the ozone season.

Table 3.7–19. 2011 prescribed fire activity in Maricopa County.

Date	Burn number	Burn location	Tons/acre	Acres burned	Material burned (tons)	Within 8-hr NAA?	During ozone season?
01/05/2011	TNF0301	T7N,R8E,S36	1	5	5	Y	N
04/06/2011	TNF0301	T2N,R7E,S18	1	1	1	Y	N
04/13/2011	TNF0106	T6N,R7E,S33	1	1	1	Y	N
04/14/2011	TNF0106	T7N,R5E,S7	1	1	1	Y	N
04/19/2011	TNF0301	T3N,R8E,S27	1	10	10	Y	N
07/23/2011	TNF0611	T3N,R11E,S2	5	15	75	Y	Y
08/10/2011	TNF0301	T3N,R8E,S27	0.25	6	1.5	Y	Y
08/11/2011	TNF0301	T3N,R8E,S27	0.25	6	1.5	Y	Y
08/16/2011	TNF0301	T3N,R8E,S25	1	4	4	Y	Y
10/20/2011	TNF0301	T2N,R9E,S31	1	5	5	Y	N
11/08/2011	TNF0301	T2N,R9E,S31	3	5	15	Y	N
11/15/2011	TNF0106	T6N,R7E,S15	1	1	1	Y	N
11/16/2011	TNF0106	T7N,R6E,S1	1	1	1	Y	N
12/20/2011	TNF0301	T2N,R9E,S11	0.25	1	0.25	Y	N
Total:				62	122.25		

Prescribed fire emission factors for “piled fuels” were obtained from the Western Regional Air Partnership’s (WRAP) 2002 Fire Emissions Inventory (WGA/WRAP, 2005). The emission factors are listed below in Table 3.7–20.

Table 3.7–20. Emission factors for prescribed fire (piled fuels).

Type of fire	Emission factors (lbs/ton burned)		
	VOC	NO _x	CO
Prescribed fire (piled fuels)	6.3	6.2	74.3

Annual emissions from prescribed fires in Maricopa County were derived by multiplying material burned by the emission factor then dividing by 2000 lbs/ton.

Four prescribed fires occurred during the ozone season. The fires resulted in 82 tons of material burned. It was assumed the prescribed fires lasted one day. Ozone-season day emissions were derived by multiplying 82 tons of material burned by the emission factor (lbs/ton) and then dividing the resulting emissions by four burn days.

Since the prescribed fire data provided by ADEQ included burn location, GIS was used to determine the fires that burned inside the nonattainment area. All the 2011 prescribed fires burned within the eight-hour nonattainment area; therefore, annual and season-day emissions estimates for the nonattainment area are equal to county totals. Table 3.7–21 shows the annual and season-day from prescribed fires for Maricopa County and the nonattainment area.

Table 3.7–21. Annual and season-day emissions from prescribed fires.

Geographic Area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	0.39	0.38	4.54	129.2	127.1	1,523.2
8-hr ozone NAA	0.39	0.38	4.54	129.2	127.1	1,523.2

3.8 Summary of all area sources

Tables 3.8–1 and 3.8–2 summarize the total annual and average season-day emissions from all area sources addressed in this chapter, for both Maricopa County and the eight-hour ozone NAA, respectively.

Table 3.8–1. Annual and season-day emissions from all area sources in Maricopa County.

Source Category	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
<i>Fuel combustion:</i>						
Industrial distillate oil: Boilers	0.61	60.87	15.22	3.9	390.2	97.5
Industrial distillate oil: Engines	0.00	1,838.26	395.65	0.0	11,783.7	2,536.2
Industrial natural gas	36.99	730.94	455.30	217.8	4,303.8	2,680.8
Comm./inst. distillate oil: Boilers	0.00	0.12	0.03	0.0	0.8	0.2
Comm./inst. distillate oil: Engines	0.00	3.72	0.80	0.0	23.8	5.1
Comm./inst. natural gas	54.48	1,080.73	662.84	252.0	4,998.0	3,065.4
Residential distillate oil	0.01	0.35	0.10	0.0	0.0	0.0
Residential natural gas	49.81	851.32	362.26	119.6	2,044.2	869.9
Residential LPG	2.00	51.35	14.56	0.0	0.0	0.0
Residential wood combustion	509.7	57.72	2,959.91	0.0	0.0	0.0
Residential kerosene	0.00	0.03	0.01	0.0	0.0	0.0
All Fuel Combustion:	653.61	4,675.41	4,866.67	593.3	23,544.5	9,255.2
<i>Industrial processes:</i>						
Chemical manufacturing	77.42			599.0		
Commercial cooking	149.33		392.60	820.5		2,157.1
Bakeries	78.18			547.8		
Secondary metal production	41.01	15.02	98.36	306.4	107.9	697.4
Rubber/plastic product mfg.	1,766.75			14,171.0		
Electrical equipment mfg.	122.80	23.47	2.98	746.2	135.8	16.4
Industrial processes, NEC	48.51	224.92	91.84	325.6	1,245.8	525.2
All Industrial Processes:	2,284.00	263.41	585.79	17,516.5	1,489.5	3,396.2
<i>Solvent use:</i>						
Architectural coatings	4,976.22			30,622.9		
Auto refinishing	1,333.26			10,255.9		
Traffic markings	179.60			1,823.6		
Factory finished wood	137.72			1,396.7		
Wood furniture	416.56			3,434.7		
Aircraft surface coating	65.84			473.1		
Miscellaneous surface coating	316.38			2,450.5		
Degreasing	217.55			1,451.4		
Dry cleaning	23.15			178.1		
Graphics arts	290.98			2,225.7		
Miscellaneous industrial solvent use	721.85			5,126.6		
Consumer and commercial products	17,406.46			95,377.9		
Cutback asphalt	835.84			4,567.4		
Emulsified asphalt	866.06			4,732.6		
Roofing asphalt	3.04			23.4		
Agricultural pesticides	362.93			2,903.4		
All Solvent Use	28,153.45			167,043.9		

Table 3.8-1. Annual and season-day emissions from all area sources in Maricopa County (continued).

Source Category	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
<i>Storage/transport:</i>						
Residential portable gas cans	2,935.10			16,126.9		
Commercial portable gas cans	564.43			3,101.3		
Bulk plants	120.91			659.3		
Gas stations Stage I: Submerged fill	85.08			528.7		
Gas stations Stage I: Bal. submerged fill	229.60			1,426.8		
Gas stations Stage II	0.00			0.0		
Underground tanks: Breathing/emptying	777.00			4,138.6		
Airports: aviation gasoline Stage I	347.57			1,904.5		
Airports: aviation gasoline Stage II	18.04			98.8		
Truck: gasoline (tank trucks in transit)	50.82			315.8		
Pipeline gasoline	17.32			94.5		
Volatile organic liquids storage/transport	30.54			182.7		
All Storage/Transport	5,176.39			28,577.9		
<i>Waste treatment/disposal:</i>						
On-site incineration	0.17	3.31	0.79	1.1	21.4	5.3
Open burning: Land clearing debris	0.67	0.30	6.30	20.5	9.1	193.8
Landfills	36.59	30.40	108.55	200.7	167.4	596.4
Publicly owned treatment works	75.02			577.1		
Other waste	2.12	22.19	77.93	10.9	122.8	431.4
Leaking underground storage tanks	1.05			32.3		
All Waste Treatment/Disposal	116.10	56.04	190.06	837.8	315.6	1,119.6
<i>Misc. area sources:</i>						
Agricultural field burning	26.14	11.62	246.85	804.2	357.4	7,595.5
Structure fires	14.78	1.88	80.63	72.4	9.2	395.2
Aircraft engine testing	4.72	46.36	16.16	26.1	259.3	91.2
Vehicle fires	9.27	1.16	36.23	50.8	6.4	198.5
Crematories	1.18	11.19	2.23	51.1	88.5	17.3
Accidental releases	0.45	0.00	0.00	2.1	0.0	0.0
Hospitals	8.57			52.3		
Wildfires	206.08	93.95	4,379.29	12,794.0	5,832.6	271,872.2
Prescribed fires	0.39	0.38	4.54	129.2	127.1	1,523.2
All Misc. Area Sources	271.58	166.54	4,765.93	13,982.3	6,680.5	281,693.1
TOTAL, ALL AREA SOURCES	36,654.65	5,161.56	10,411.95	228,556.4	32,035.2	295,571.5

Table 3.8–2. Annual and season-day emissions from all area sources in the eight-hour ozone NAA.

Source Category	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
<i>Fuel combustion:</i>						
Industrial distillate oil: Boilers	0.61	60.61	15.15	3.9	388.5	97.1
Industrial distillate oil: Engines	0.00	1,830.35	393.95	0.0	11,733.0	2,525.3
Industrial natural gas	36.83	727.80	453.34	219.9	4,285.3	2,669.3
Comm./inst. distillate oil: Boilers	0.00	0.12	0.03	0.0	0.8	0.2
Comm./inst. distillate oil: Engines	0.00	3.70	0.80	0.0	23.7	5.1
Comm./inst. natural gas	54.42	1,079.44	662.05	251.7	4,992.0	3,061.7
Residential distillate oil	0.01	0.35	0.10	0.0	0.0	0.0
Residential natural gas	50.20	857.96	365.09	120.5	2,060.1	876.7
Residential LPG	2.02	51.93	14.73	0.0	0.0	0.0
Residential wood combustion	515.53	58.38	2,993.75	0.00	0.00	0.00
Residential kerosene	0.00	0.03	0.01	0.0	0.0	0.0
All Fuel Combustion	659.63	4,670.68	4,898.99	593.0	23,483.5	9,235.4
<i>Industrial processes:</i>						
Chemical manufacturing	77.09			596.5		
Commercial cooking	151.03		397.07	829.8		2,181.7
Bakeries	77.85			545.4		
Secondary metal production	41.01	15.02	98.36	306.4	107.9	697.4
Rubber/plastic product manufacturing	1,759.15			14,110.1		
Electrical equipment manufacturing	122.80	23.47	2.98	746.2	135.8	16.4
Industrial processes, NEC	47.55	224.92	91.84	318.0	1,245.8	525.2
All Industrial Processes	2,276.48	263.41	590.27	17,452.4	1,489.5	3,420.8
<i>Solvent use:</i>						
Architectural coatings	5,033.13			30,973.1		
Auto refinishing	1,327.53			10,211.8		
Traffic markings	171.12			1,737.5		
Factory finished wood	137.12			1,390.7		
Wood furniture	414.77			3,419.9		
Aircraft surface coating	65.84			473.1		
Miscellaneous surface coating.	315.02			2,440.0		
Degreasing	216.62			1,445.1		
Dry cleaning	23.42			180.1		
Graphics arts	289.73			2,216.1		
Miscellaneous industrial solvent use	718.75			5,104.6		
Consumer and commercial products	17,605.51			96,468.5		
Cutback asphalt	788.72			4,309.9		
Emulsified asphalt	817.24			4,465.8		
Roofing asphalt	3.08			23.7		
Agricultural pesticides	212.18			1,697.5		
All Solvent Use	28,139.77			166,557.4		

Table 3.8–2. Annual and season-day emissions from all area sources in the eight-hour ozone NAA (continued).

Source Category	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NOx	CO	VOC	NOx	CO
Storage/transport:						
Residential portable gas cans	2,968.67			16,311.4		
Commercial portable gas can:	570.89			3,136.7		
Bulk plants	120.91			659.3		
Gas stations Stage I: Submerged fill	85.08			528.7		
Gas stations Stage I: Bal. submerged fill	229.60			1,426.8		
Gas stations Stage II	0.00			0.0		
Underground tanks: Breathing/emptying	777.00			4,138.6		
Airports : Aviation gasoline Stage I	344.41			1,887.2		
Airports : Aviation gasoline Stage II	17.87			97.9		
Truck: Gasoline (tank trucks in transit)	50.82			315.8		
Pipeline gasoline	17.32			94.5		
Volatile organic liquids storage/transport	28.80			169.3		
All Storage/Transport:	5,211.35			28,766.2		
Waste treatment/disposal:						
On-site incineration	0.17	3.31	0.79	1.1	21.4	5.3
Open burning: Land clearing debris	0.30	0.13	2.81	9.1	4.1	86.4
Landfills	36.59	30.40	108.55	200.7	167.4	596.4
Publicly owned treatment works	75.88			583.7		
Other waste	2.12	22.19	77.93	10.9	122.8	431.4
Leaking underground storage tanks	1.05			32.3		
All Waste Treatment/Disposal	116.10	56.04	190.06	837.8	315.6	1,119.6
Misc. area sources:						
Agricultural field burning	15.28	6.79	144.32	470.2	209.0	4,440.7
Structure fires	14.95	1.90	81.55	73.3	9.3	399.7
Aircraft engine testing	4.72	46.36	16.16	26.1	259.3	91.2
Vehicle fires	9.38	1.17	36.64	51.4	6.4	200.8
Crematories	1.18	11.14	2.22	50.9	88.1	17.2
Accidental releases	0.45	0.00	0.00	2.1	0.0	0.0
Hospitals	8.66			52.9		
Wildfires	206.08	93.95	4,379.28	12,794.0	5,832.6	271,872.2
Prescribed fires	0.39	0.38	4.54	129.2	127.1	1,523.2
All Misc. Area Sources	261.09	161.70	4,664.71	13,650.0	6,531.8	278,544.9
ALL AREA SOURCES:	36,664.42	5,151.83	10,344.03	227,856.8	31,820.5	292,320.7

3.9 Quality assurance / quality control procedures

Quality assurance and quality control (QA/QC) activities for the area source emissions inventory were designed to create a comprehensive, accurate, representative and comparable inventory of area source emissions for Maricopa County and the nonattainment area. During each step of creating, building and reviewing the area source emissions inventory, quality checks and assurances were performed to establish confidence in the inventory structure and data.

Area source categories were identified for inclusion in the inventory based on the latest Emissions Inventory Improvement Program (EIIP) guidance available. In addition, recent EPA activities to develop county-level emissions estimates for newly created source categories (such as portable fuel containers) or refined source classification codes were also reviewed, and incorporated where relevant. Prior-year inventories for the region were also examined to identify possible additional categories for inclusion in the present inventory. The list of area source

categories developed based on these guidance documents was modified to fit the characteristics of Maricopa County, with some area source categories determined to be insignificant (e.g., emissions from industrial coal combustion, or oil and natural gas production, and snowmobile use).

Data for area source emission calculations were gathered from a wide universe of resources. Whenever applicable, local surveyed data (such as annual emissions report) was used as this data best reflects activity in the county and the nonattainment area. When local data was not available, state data from state agencies (such as the Arizona Department of Transportation) and regional bodies (such as the Western Regional Air Partnership [WRAP]) were used. National level data (such as the US Census Bureau) was used when no local, state or regional data was available. In addition, the most recent EIIP guidance for area sources was consulted for direction in determining the most relevant data source for use in emissions calculations.

Emissions calculations for area sources were performed by three air quality planners and one unit manager. All area source emission estimates were calculated in spreadsheets to ensure the calculations could be verified and reproduced. Whenever possible or available, the “preferred method” described in the most recent EIIP guidance documents for area sources was used to calculate emissions. Emissions were estimated using emission factors from EIIP guidance, AP-42, and local source testing. Local seasonal and activity data were used when available, with EPA and EIIP guidance used when no local seasonal or activity data existed. All calculations were evaluated to ensure that emissions from point sources were not being double-counted and to determine if rule effectiveness applied.

Once area source emission estimates had been produced, several quality control checks were performed to substantiate the calculations. Most area source calculations were peer-reviewed by two other planners, with all area sources being reviewed by at least one other planner. Peer review ensured that all emission calculations were reasonable and could be reproduced. Sensitivity analyses and computational method checks were performed on area sources when emissions seemed to be outside the expected ranges. When errors were found, the appropriate changes were made by the author of the calculations to ensure consistency of the emissions calculations. The peer-reviewed emissions estimates were combined into a draft area source chapter. This draft chapter was read through in its entirety by the unit manager and the three air quality planners for final review, with any identified errors corrected by the author of the section.

The draft version of the area source chapter was sent to the Arizona Department of Environmental Quality, the Arizona Department of Transportation, and the Maricopa Association of Governments for a quality assurance review. These agencies provided comments which were addressed and incorporated into the final area source chapter. The QA/QC activities described here have produced high levels of confidence in the area source emissions estimates detailed in this chapter, and represent the best efforts of the inventory preparers.

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4. Nonroad Mobile Sources

4.1 Introduction

Nonroad mobile sources are defined as those that move or are moved within a 12-month period and are not licensed or certified as highway vehicles. Nonroad mobile sources are vehicles and engines that fall under the following categories:

- Agricultural equipment, such as tractors, combines and balers;
- Airport ground support equipment, such as baggage tugs and terminal tractors;
- Commercial equipment, such as generators and pumps;
- Industrial equipment, such as forklifts and sweepers;
- Construction and mining equipment, such as graders, back hoes and trenchers;
- Lawn and garden equipment, such as leaf blowers and lawn mowers;
- Logging equipment (not present in Maricopa County);
- Pleasure craft, such as power boats and personal watercraft;
- Railway maintenance equipment, such as rail straighteners;
- Recreational equipment, such as all-terrain vehicles and off-road motorcycles;
- Underground mining and oil field equipment (not present in Maricopa County);
- Aircraft, such as jet and piston engines; and
- Locomotives, such as switching and line haul trains.

Emission calculations for most nonroad mobile source categories except aircraft, airport ground support equipment (GSE) and locomotives were derived using EPA's NONROAD2008a model (Core version 2008a, July 2009). Aircraft and airport GSE emission estimates were made using the Federal Aviation Administration's EDMS (Emissions Dispersion Modeling System) model, ver. 5.1.1. Locomotive emission calculations were derived from surveys of the three railroad companies that have operations in the county.

County specific temperature and fuel-related inputs are required for the operation of the NONROAD2008a model. Monthly temperature and fuel data were provided by the Arizona Department of Weights and Measures. The following table lists the local county inputs used:

Table 4.1–1. NONROAD2008 model county temperature and fuel-related inputs.

Month	Temperatures (°F)			Fuel	Diesel	Gasoline	Ethanol Blend		
	Max.	Min.	Average	RVP (psi)	Sulfur (ppm)	Sulfur (ppm)	ETOH (vol %)	Market share (%)	Total Oxygen (wt %)
January	64	45	54.9	9	9	15	9.92	100	3.66
February	69	48	58.5	9	9	16	10.29	100	3.85
March	79	54	66.8	8	9	11	9.52	100	3.58
April	87	61	74.2	8	9	14	7.90	100	2.98
May	91	66	78.7	7	9	13	9.41	100	3.48
June	107	80	93.4	7	10	18	9.38	100	3.45
July	106	84	95.2	7	9	21	9.70	100	3.62
August	104	82	93.2	7	6	18	9.58	100	3.70
September	101	79	90.1	7	6	18	9.73	100	3.60
October	91	65	78.1	8	9	15	9.49	100	3.56
November	81	56	68.7	8	6	14	10.17	100	3.80
December	65	46	56.0	8	16	12	9.02	100	3.41

Note: All other required temperature and fuel-related inputs not listed assumed NONROAD2008 default values.

The US EPA recommends adjusting default NONROAD2008a model values (such as equipment

population, activity levels of equipment, growth factors, etc.) where local data is available, as the default values in the model are derived from national averages. The NONROAD2008a model defaults were adjusted in the following manner:

- Equipment population numbers and activity levels for commercial lawn and garden equipment were adjusted based on 2003 survey results of the commercial lawn and garden industry performed by ENVIRON as part of an inventory developed to study the impact of visibility impairing pollutants (ENVIRON et al., 2003). Survey results show that for most categories of lawn and garden equipment, the equipment populations for Maricopa County are significantly lower than EPA default values, while the average annual hours of operation for most equipment types are slightly higher than EPA's values. Using these new local data results in a considerable decrease in emissions from this category, compared with earlier results using EPA default data.

Spatial allocation factors were developed (based on EPA guidance documents) to apportion nonroad emissions to the eight-hour ozone nonattainment area. The approaches used are described in each section of this chapter.

Temporal allocations (used to calculate ozone season-day emissions) for nonroad equipment categories modeled in the NONROAD2008a model are based on EPA recommendations on weekday and weekend day activity levels for each nonroad equipment category (US EPA, 1999). Table 4.1–2 below lists the weighted activity level allocation fractions for each equipment class for weekdays and weekend days. For this report, the most conservative (highest) allocation fraction in each nonroad equipment class was used to calculate season-day emissions.

Table 4.1–2. Default weekday and weekend day activity allocation fractions.

Equipment category	Weekday	Weekend day
Agricultural	0.1666667	0.0833334
Airport ground support	0.1428571	0.1428571
Commercial	0.1666667	0.0833334
Construction and mining	0.1666667	0.0833334
Industrial	0.1666667	0.0833334
Lawn and garden (residential)	0.1111111	0.2222222
Lawn and garden (commercial)	0.1600000	0.1000000
Logging	0.1666667	0.0833334
Pleasure craft	0.0600000	0.3500000
Railway maintenance	0.1800000	0.0500000
Recreational	0.1111111	0.2222222

4.2 Agricultural equipment

Annual emissions from agricultural equipment in Maricopa County were calculated using EPA's NONROAD2008a model, as discussed above. Ozone nonattainment area annual emissions were calculated based on EIIP guidance (US EPA, 2002) which recommends using the ratio of agricultural land inside the nonattainment area (161,371 acres) to agricultural land inside the county (276,016 acres). See Section 1.5.2 for a discussion of land use data used.

$$\text{Ozone nonattainment area emissions from agricultural equipment} = \frac{\text{Total Maricopa County VOC emissions from agricultural equipment}}{\text{Total Maricopa County VOC emissions from agricultural equipment}} \times \text{Agricultural land use allocation factor}$$

$$= 38.53 \text{ tons} \quad \times \quad 58.46\%$$

$$= 22.52 \text{ tons VOC/yr}$$

County season-day emissions were calculated by multiplying ozone season emissions (generated by the NONROAD2008a model) by the most conservative weekday/weekend day activity allocation factor for agricultural equipment listed in Table 4.1–2, and dividing the product by the number of weeks (13) in the ozone season (US EPA, 1999), as follows:

$$\begin{aligned} \text{Maricopa County VOC season-day emissions (lbs/day)} &= \text{Ozone season VOC emissions (tons/season)} \times 2,000 \text{ (lb/ton)} \times \text{daily activity allocation factor for agricultural equipment expressed as (week/day)} \div 13 \text{ (weeks/season)} \\ &= 12.84 \times 2,000 \times 0.166667 \div 13 \\ &= 392.3 \text{ lbs/day} \end{aligned}$$

Ozone nonattainment area season-day emissions were calculated by multiplying County season-day emissions by the agricultural land use allocation factor:

$$\begin{aligned} \text{Ozone nonattainment area season-day emissions} &= \text{Maricopa County VOC season-day emissions} \times \text{Agricultural land use allocation factor} \\ &= 392.3 \text{ lbs/day} \times 58.46\% \\ &= 192.5 \text{ lbs/day} \end{aligned}$$

Table 4.2–1. Annual and season-day emissions from agricultural equipment.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	38.53	330.49	303.71	329.3	2,762.6	2,584.4
8-hr ozone NAA	22.52	193.22	177.56	192.5	1,615.1	1,510.9

4.3 Airport ground support equipment

Annual emissions from airport ground support equipment (GSE) and auxiliary power units (APUs) were calculated using the Emissions Dispersion Modeling System (EDMS, v. 5.1.3) from the U.S. Federal Aviation Administration (FAA). Activity data on 2011 aircraft operations and GSE use for eight major airports were obtained from FAA’s Air Traffic Activity Data System. In addition, activity data for 2011 for six small general aviation airports were assumed to be the same as those in 2008, which was included in MAG’s 2009 survey data. (Further details concerning the modeling input data and results are described in Section 4.11, Aircraft).

Emissions from GSE and APUs at Luke Air Force Base (AFB) for the year 2011 are assumed to be the same as those used in the 2008 PM₁₀ Periodic Emissions Inventory Report for the Maricopa County, Arizona, Nonattainment Area (MCAQD, 2011) based on input from Luke AFB.

Table 4.3–1. Annual emissions (tons/yr) from airport ground support equipment (GSE) and auxiliary power units (APUs).

	Maricopa County			8-hr ozone NAA		
	VOC	NO _x	CO	VOC	NO _x	CO
GSE	104.94	317.86	3,171.63	104.40	316.39	3,155.22
APU	7.04	88.18	104.36	7.03	88.10	103.86
Total:	111.98	406.04	3,275.99	111.43	404.49	3,259.08

Table 4.3–2. Season-day emissions (lbs/day) from airport GSE and APU.

	Maricopa County			8-hr ozone NAA		
	VOC	NO _x	CO	VOC	NO _x	CO
GSE	549.4	1,663.2	16,597.8	546.7	1,656.0	16,516.8
APU	37.8	473.4	557.3	37.8	473.0	554.8
Total:	587.3	2,136.6	17,155.0	584.5	2,128.9	17,071.7

4.4 Commercial equipment

Annual emissions from commercial equipment in Maricopa County were calculated using EPA’s NONROAD2008a model, as described in Section 4.1. Annual emissions for the eight-hour ozone nonattainment area for this category were derived by applying the ratio of industrial employment in the nonattainment area to Maricopa County totals, as data on the number of wholesale establishments recommended by EIIP guidance (US EPA, 2002) was not available. See Section 1.5.1 for a discussion of the industrial employment data used.

County season-day emissions were calculated by multiplying Maricopa County ozone season emissions (generated by the NONROAD2008a model) by the most conservative weekday/ weekend day activity allocation factor for commercial equipment (0.1666667) listed in Table 4.1–2, and dividing the product by the number of weeks (13) in the ozone season (US EPA, 1999). Ozone nonattainment area season-day emissions were calculated based on industrial employment ratios as described above.

Table 4.4–1. Annual and season-day emissions from commercial equipment.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	1,924.41	1,361.42	30,224.21	14,537.1	8,334.7	203,404.4
8-hr ozone NAA	1,916.15	1,355.57	30,094.46	14,474.7	8,299.0	202,531.2

4.5 Construction and mining equipment

Annual emissions from construction and mining equipment in Maricopa County were calculated using EPA’s NONROAD2008a model as described in Section 4.1. Annual emissions for the eight-hour ozone nonattainment area for this category were derived by applying the ratio of construction employment in the nonattainment area to Maricopa County totals as a conservative estimate, since the EIIP-recommended allocation factor of total dollar value of construction was unavailable (US EPA, 2002). See Section 1.5.1 for a discussion of the population data used.

County season-day emissions were calculated by multiplying Maricopa County ozone season emissions (generated by the NONROAD2008a model) by the most conservative weekday/ weekend day activity allocation factor for construction/mining equipment (0.1666667) listed in Table 4.1–2, and dividing the product by the number of weeks (13) in the ozone season (US

EPA, 1999). Ozone nonattainment area season-day emissions were calculated based on construction employment ratios as described above.

Table 4.5–1. Annual and season-day emissions from construction and mining equipment.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	1,881.88	12,937.30	14,396.92	13,116.9	87,972.9	99,942.8
8-hr ozone NAA	1,941.80	13,349.23	14,855.32	13,534.5	90,774.0	103,125.0

4.6 Industrial equipment

Annual emissions from industrial equipment in Maricopa County were calculated using EPA’s NONROAD2008a model, as described in Section 4.1. Annual emissions for the eight-hour ozone nonattainment area for this category were derived by applying the ratio of industrial employment in the nonattainment area to Maricopa County totals as a conservative estimate, since the number of employees in manufacturing, as recommended by EIIP guidance (US EPA, 2002), was not available. See Section 1.5.1 for a discussion of the industrial employment data used.

County season-day emissions were calculated by multiplying Maricopa County ozone season emissions (generated by the NONROAD2008a model) by the most conservative weekday/ weekend day activity allocation factor for industrial equipment (0.1666667) listed in Table 4.1–2, and dividing the product by the number of weeks (13) in the ozone season (US EPA, 1999). Ozone nonattainment area season-day emissions were calculated based on industrial employment ratios as described above.

Table 4.6–1. Annual and season-day emissions from industrial equipment.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	341.25	1,839.35	7,140.99	2,212.6	11,763.4	46,138.5
8-hr ozone NAA	339.78	1,831.45	7,110.33	2,203.1	11,712.9	45,940.4

4.7 Lawn and garden equipment

Annual emissions from lawn and garden equipment in Maricopa County were calculated using EPA’s NONROAD2008a model, as described in Section 4.1. These results reflect new equipment population and usage estimates from survey work done in early 2003 for the Arizona Department of Environmental Quality (discussed further in Section 4.1). Annual emissions for the eight-hour ozone nonattainment area for this category were derived by applying the ratio of population in the nonattainment area to Maricopa County totals, since the number of housing units, as recommended by EIIP guidance, was not available (US EPA, 2002). See Section 1.5.1 for a discussion of the population data used.

County season-day emissions were calculated by multiplying Maricopa County ozone season emissions (generated by the NONROAD2008a model) by the most conservative weekday/ weekend day activity allocation factor for lawn and garden equipment (0.1600000 for the commercial segment, 0.2222222 for residential) listed in Table 4.1–2, and dividing the product by the number of weeks (13) in the ozone season (US EPA, 1999). Ozone nonattainment area season-day emissions were calculated based on population as described above.

Table 4.7–1. Annual and season-day emissions from lawn and garden equipment.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	4,913.96	866.64	54,798.41	51,990.4	6,998.4	523,235.5
8-hr ozone NAA	4,970.15	876.55	55,425.05	52,584.9	7,078.4	529,218.9

4.8 Pleasure craft

Annual emissions from pleasure craft equipment in Maricopa County were calculated using EPA’s NONROAD2008a model, as described in Section 4.1. Annual emissions for the eight-hour ozone nonattainment area for this category were derived by applying the ratio of lake surface area in the nonattainment area to Maricopa County totals, as recommended by EIIP guidance (US EPA, 2002). See Section 1.5.2 for a discussion of the land use data used.

County season-day emissions were calculated by multiplying Maricopa County ozone season emissions (generated by the NONROAD2008a model) by the most conservative weekday/ weekend day activity allocation factor for pleasure craft (0.350000) listed in Table 4.1–2, and dividing the product by the number of weeks (13) in the ozone season (US EPA, 1999). Ozone nonattainment area season-day emissions were calculated based on lake surface area as described above.

Table 4.8–1. Annual and season-day emissions from pleasure craft equipment.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	530.39	96.56	1,249.66	11,527.0	1,996.8	26,738.3
8-hr ozone NAA	530.39	96.56	1,249.66	11,527.0	1,996.8	26,738.3

4.9 Railway maintenance equipment

Annual emissions from railway maintenance equipment in Maricopa County were calculated using EPA’s NONROAD2008a model, as described in Section 4.1. Annual emissions for the eight-hour ozone nonattainment area for this category were derived by applying the ratio of population in the nonattainment area to Maricopa County totals, as recommended by EIIP guidance (US EPA, 2002). See Section 1.5.1 for a discussion of the population data used.

County season-day emissions were calculated by multiplying Maricopa County ozone season emissions (generated by the NONROAD2008a model) by the most conservative weekday/ weekend day activity allocation factor for railway maintenance equipment (0.1800000) listed in Table 4.1–2, and dividing the product by the number of weeks (13) in the ozone season (US EPA, 1999). Ozone nonattainment area season-day emissions were calculated based on the population ratio as described above.

Table 4.9–1. Annual and season-day emissions from railway maintenance equipment.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	1.94	8.55	16.48	14.2	59.0	117.8
8-hr ozone NAA	1.96	8.64	16.67	14.4	59.7	119.1

4.10 Recreational equipment

Annual emissions from recreational equipment in Maricopa County were calculated using EPA’s NONROAD2008a model, as described in Section 4.1. Annual emissions for the eight-hour ozone nonattainment area for this category were derived by applying the ratio of passive open space and vacant land use in the nonattainment area to Maricopa County totals, as recommended by EIIIP guidance (US EPA, 2002). See Section 1.5.2 for a discussion of the land use data used.

County season-day emissions were calculated by multiplying Maricopa County ozone season emissions (generated by the NONROAD2008a model) by the most conservative weekday/ weekend day activity allocation factor for recreational equipment (0.2222222) listed in Table 4.1–2, and dividing the product by the number of weeks (13) in the ozone season (US EPA, 1999). Ozone nonattainment area season-day emissions were calculated based on land use as described above.

Table 4.10–1. Annual and season-day emissions from recreational equipment.

Geographic area	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Maricopa County	1,518.97	66.10	6,373.46	17,804.4	679.3	74,424.8
8-hr ozone NAA	684.30	29.78	2,871.27	8,020.9	306.0	33,528.7

4.11 Aircraft

Emissions from aircraft at the largest airports in Maricopa County were estimated using the Federal Aviation Administration’s Emissions and Dispersion Model (EDMS, v. 5.1.3). The FAA EDMS model combines specified aircraft and activity levels with default emissions factors in order to estimate annual emissions inventories for a specific airport. The model calculates emissions of sulfur oxides (SO_x), oxides of nitrogen (NO_x), particulate matter (only for certain categories of airframes and engines), carbon monoxide (CO), and hydrocarbons (HC). The model can also estimate emissions from ground support equipment (GSE) and auxiliary power units (APUs), using either default profiles or user-specified activity of these components. The EDMS runs were executed by the Maricopa Association of Governments. The contact person for the EDMS emission estimates is Adam Xia (602-254-6300).

Aircraft emissions were estimated for four aircraft categories:

1. Air carriers (abbreviated “AC”): Larger commercial aircraft with at least 60 seats or 18,000 lbs payload capacity, used for scheduled service to transport passengers and/or freight;
2. Air taxis (“AT”): Smaller commercial turbine- or piston-powered aircraft with less than 60 seats or 18,000 lbs payload capacity;
3. General aviation (“GA”): Aircraft used on an unscheduled basis for recreational flying, personal transportation, and other activities, including business travel; and
4. Military (“ML”): Aircraft used to support military operations.

First, three databases from FAA’s website provide the year 2011 aircraft activity, fleet mix for the types of aircraft used, and hourly/weekly/monthly operational profiles for eight major airports (Chandler Municipal, Falcon Field, Glendale Municipal, Phoenix Deer Valley, Phoenix Goodyear, Phoenix-Mesa Gateway, Phoenix Sky Harbor, and Scottsdale airport). The three databases are (1) FAA’s Air Traffic Activity Data System (ATADS) (FAA, 2012a); (2)

Enhanced Traffic Management System Counts (ETMSC) database; and (3) FAA Aviation Performance Metrics (APM) database (FAA, 2012b).

To supplement the FAA's database for the eight major airports, MAG conducted a survey of six additional small general aviation airports (Buckeye Municipal, Gila Bend Municipal, Pleasant Valley, Sky Ranch at Carefree, Stellar Airpark, and Wickenburg Municipal airport) in Maricopa County to gather the year 2008 data on aircraft activity (landings and take-offs or LTOs) and estimated average taxi/idle times in 2009. The year 2008 data for these small general aviation airports are assumed to be the same as those in year 2011, since no updated aircraft activity data were available for the year 2011. Table 4.11-1 summarizes the activity level for each aircraft category for each airport included in the modeling, and indicates the data sources for each airport's activity (reported number of operations) and fleet mix.

One required meteorological input for EDMS is an atmospheric mixing height, which is defined as the height (or depth) above ground where relatively vigorous vertical mixing occurs due to convection. To calculate the time-varying mixing height, the latest version of the EPA AERMOD Meteorological Preprocessor (AERMET version 11059) was employed.

Table 4.11–1. Annual airport operations (by aircraft category) and related data sources.

Airport	Airport Code	Operations Data Source¹	Fleet Mix Data Source²	Aircraft Type³	2011 Operations
Buckeye Municipal	BXK	airnav.com	Generic GA profile	GA	53,070
Chandler Municipal	CHD	FAA/ATADS	FAA/ETMSC	AC	6
				AT	2,168
				GA	158,960
				ML	456
Falcon Field	FFZ	FAA/ATADS	FAA/ETMSC	AC	4
				AT	2,718
				GA	214,486
				ML	2,872
Gila Bend Municipal	E63	airnav.com	Generic GA profile	GA	3,536
Glendale Municipal	GEU	FAA/ATADS	FAA/ETMSC	AT	1,070
				GA	85,998
				ML	56
Luke Air Force Base	LUF	[2011 F-16 aircraft emissions were grown based on the total number of F-16 operations in 2008 vs. 2011]			
Phoenix Deer Valley	DVT	FAA/ATADS, Survey response	Survey response, FAA/ETMSC	AC	2
				AT	3,832
				GA	313,362 *
				ML	248
Phoenix Goodyear	GYR	FAA/ATADS, Survey response	Survey response, FAA/ETMSC	AC	146
				AT	312
				GA	132,566 *
				ML	5,582
Phoenix-Mesa Gateway (formerly Williams Gateway)	IWA	FAA/ATADS	FAA/ETMSC	AC	7,782
				AT	9,176
				GA	147,596
				ML	6,646
Phoenix Sky Harbor	PHX	FAA/ATADS	FAA/ETMSC	AC	375,104
				AT	63,796
				GA	20,582
				ML	2,506
Pleasant Valley	P48	airnav.com	Generic GA profile	GA	6,010
Scottsdale	SDL	FAA/ATADS	FAA/ETMSC	AC	6
				AT	12,970
				GA	127,924
				ML	740
Sky Ranch at Carefree	18AZ	Survey response	Generic GA profile	GA	3,030
Stellar Airpark	P19	airnav.com	Generic GA profile	GA	39,056
Wickenburg Municipal	E25	Survey responses	Generic GA profile	GA	12,000

1. FAA/ATADS: Federal Aviation Administration's Air Traffic Activity Data System (database); <http://aspm.faa.gov>.

2. FAA/ETMSC: Federal Aviation Administration's Enhanced Traffic Management System Counts (database); <http://aspm.faa.gov>.

3. AC: Air Commercial; AT: Air Taxi; GA: General Aviation; ML: Military

* includes touch-and-go operations reported by airport.

Both the 2011 hourly surface meteorological data and the 2011 one-minute Automated Surface Observing System (ASOS) wind data from the National Weather Service (NWS) station at the Phoenix Sky Harbor were used (NCDC, 2012). Full year upper air data in 2011 at the Tucson station (station number 23160) were obtained from the National Oceanic and Atmospheric Administration (NOAA) Earth System Research Laboratory (ESRL) Radiosonde Database (ESRL, 2012). Ultimately, a single mixing height dataset in 2011 is used for all airports, except Luke Air Force Base.

F-16 aircraft emissions estimates for Luke AFB for the year 2011 were scaled using a ratio of the number of F-16s in 2011 to the number of F-16s in 2008. The emissions from “transient” aircraft and on-wing engine testing in 2011 were assumed to be the same as those in 2008 based on input from Luke AFB. Emissions from the military aircraft, “transient” aircraft, and on-wing engine testing were summed into a single “ML” category for Luke AFB. This summation method is consistent with that used in the 2008 PM₁₀ Periodic Emissions Inventory Report for the Maricopa County, Arizona, Nonattainment Area (MCAQD, 2011).

As with all other airports included in this inventory, emissions from ground support equipment (GSE) at Luke AFB are addressed in Section 4.3, Airport ground support equipment and auxiliary power units.

The following section describes how activity and emissions were estimated for a representative airport, Falcon Field (FFZ). The FAA’s Air Traffic Activity System (ATADS, available at www.aspm.faa.gov) provided data on 2011 activity by aircraft type; these results are contained in Table 4.11–1. While ATADS reported a total of 214,486 general aviation operations at this airport in 2011, further information on the aircraft types comprising this activity was needed. The FAA’s Enhanced Traffic Management System Counts (ETMSC) database was used to “grow” available aircraft-specific operational data as described below.

The ETMSC database on general aviation activity at Falcon Field airport (FFZ) in 2011 comprises 145 different aircraft types, totaling 3,731 operations (See Table 4.11–2). To simplify modeling input requirements, this aircraft-specific activity data were ranked in order of decreasing frequency. Activity data for the most frequently reported aircraft was then grown to represent all general aviation activity. How this approach was applied for general aviation activity at Falcon Field airport is shown in Table 4.11–2.

This approach of ranking reported activity, and then growing this subset of data, typically resulted in a set of 10 to 30 aircraft types being modeled for each airport/aircraft class combination, representing 75 to 100% of all reported activity.

Ozone season-day emissions were calculated by dividing ozone season total emissions by 92 (the number of days in the ozone season). Tables 4.11–3 and 4.11–4 list the total annual emissions and season-day emissions, by airport and aircraft type for airports within and outside the eight-hour ozone nonattainment area, respectively.

Tables 4.11–3 and 4.11–4 list the total annual and seasonal daily emissions by aircraft type, for airports located inside and outside the eight-hour ozone nonattainment area, respectively.

Table 4.11–2. Growing aircraft-specific activity for EDMS modeling input.

Rank	Aircraft Type	ETMSC- Reported Operations	% of Total Reported Operations	Cumulative Percent	“Grown” Operations for EDMS Modeling
1	DA40 - Diamond Star DA40	536	14.37%	14.37%	40,796
2	BE9L - Beech King Air 90	350	9.38%	23.75%	26,640
3	P28R - Cherokee Arrow/Turbo	250	6.70%	30.45%	19,028
4	DA42 - Diamond Twin Star	163	4.37%	34.82%	12,406
5	BE20 - Beech 200 Super King	130	3.48%	38.30%	9,894
6	C25B - Cessna Citation CJ3	118	3.16%	41.46%	8,982
7	PC12 - Pilatus PC-12	110	2.95%	44.41%	8,372
8	C680 - Cessna Citation Sovereign	103	2.76%	47.17%	7,840
9	C441 - Cessna Conquest	99	2.65%	49.83%	7,536
10	B350 - Beech Super King Air 350	86	2.31%	52.13%	6,546
11	BE36 - Beech Bonanza 36	84	2.25%	54.38%	6,394
12	C172 - Cessna Skyhawk 172/Cutlass	83	2.22%	56.61%	6,318
13	CL60 - Bombardier Challenger 600/601/604	70	1.88%	58.48%	5,328
14	P46T - Piper Malibu Meridian	68	1.82%	60.31%	5,176
15	SR22 - Cirrus SR 22	67	1.80%	62.10%	5,100
16	P28A - Piper Cherokee	62	1.66%	63.76%	4,718
17	COL4 - Lancair LC-41 Columbia 400	52	1.39%	65.16%	3,958
18	TBM7 - Socata TBM-7	50	1.34%	66.50%	3,806
19	C182 - Cessna Skylane 182	48	1.29%	67.78%	3,654
20	C560 - Cessna Citation V/Ultra/Encore	47	1.26%	69.04%	3,578
21	M20P - Mooney M-20C Ranger	46	1.23%	70.28%	3,502
22	C210 - Cessna 210 Centurion	44	1.18%	71.46%	3,348
23	PAY2 - Piper Cheyenne 2	40	1.07%	72.53%	3,044
24	C525 - Cessna CitationJet/CJ1	38	1.02%	73.55%	2,892
25	BE35 - Beech Bonanza 35	37	0.99%	74.54%	2,816
26	C414 - Cessna Chancellor 414	37	0.99%	75.53%	2,814
⋮	⋮	⋮	⋮	⋮	
145	T34P - Beech T-34B Mentor	1	< 0.1%	100.00%	(n/a)
Total:		3,731			214,486

Table 4.11–3. Annual and season-day emissions, by aircraft type, for airports in the eight-hour ozone NAA.

Facility	Category	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
		VOC	NO _x	CO	VOC	NO _x	CO
Buckeye Municipal	GA	5.46	2.69	211.10	26.7	11.3	1,172.3
Chandler Municipal	AC	0.02	0.00	0.04	0.4	0.0	0.8
	AT	12.82	1.23	13.52	69.0	6.2	73.5
	GA	127.56	14.18	1,329.77	629.0	62.4	7,236.4
	ML	0.05	0.04	4.85	1.0	0.7	91.2
	Total	140.45	15.45	1,348.17	699.3	69.2	7,401.9
Falcon Field	AC	0.01	0.00	0.02	0.2	0.0	0.4
	AT	7.15	2.27	11.43	36.5	10.5	58.9
	GA	103.99	31.13	1,170.22	484.1	126.8	6,009.2
	ML	3.73	2.67	9.86	17.4	10.8	47.2
	Total	114.88	36.07	1,191.53	538.1	148.1	6,115.7
Gila Bend Municipal	GA	0.36	0.18	14.29	1.8	0.9	71.0
Glendale Municipal	AT	3.67	0.88	5.17	15.6	3.6	22.3
	GA	88.19	17.14	519.57	449.8	78.3	2,899.0
	ML	0.05	0.01	0.14	0.1	0.0	0.4
	Total	91.91	18.02	524.88	465.5	81.9	2,921.7
Luke Air Force Base	ML	154.13	347.83	601.72	844.5	1905.9	3,297.1
Phoenix Deer Valley	AC	0.00	0.00	0.00	0.0	0.0	0.0
	AT	13.65	3.00	17.69	60.0	11.9	78.4
	GA	93.34	52.99	2,382.41	525.7	278.4	15,313.0
	ML	0.20	0.11	0.70	1.2	0.5	3.9
	Total	107.19	56.10	2,400.81	586.9	290.8	15,395.2
Phoenix Goodyear	AC	0.12	0.40	0.92	0.5	1.6	4.4
	AT	0.53	1.01	1.49	2.4	4.5	6.9
	GA	43.39	13.80	1,224.97	234.8	62.9	7,380.0
	ML	3.55	1.31	17.22	25.8	8.6	132.6
	Total	47.60	16.52	1,244.61	263.6	77.6	7,523.9
Phoenix Sky Harbor Intl	AC	266.99	1,823.15	1,893.82	1,414.1	8,732.7	9,944.4
	AT	26.03	101.94	182.25	143.0	506.8	1,004.2
	GA	42.59	7.41	140.93	198.2	31.1	702.2
	ML	110.67	14.01	119.21	474.6	52.9	510.3
	Total	446.28	1,946.50	2,336.21	2,230.0	9,323.5	12,161.0
Phoenix-Mesa Gateway Airport	AC	2.25	27.46	33.32	12.3	138.9	179.9
	AT	56.62	3.53	58.50	285.8	16.2	298.1
	GA	146.94	9.81	713.40	666.4	39.8	3,512.1
	ML	47.87	25.62	100.88	202.6	95.6	428.0
	Total	253.68	66.42	906.11	1,167.2	290.5	4,418.1
Pleasant Valley	GA	0.21	1.61	2.69	1.1	7.6	14.6
Scottsdale	AC	0.02	0.00	0.04	0.0	0.0	0.0
	AT	57.90	8.19	69.79	242.1	31.8	295.1
	GA	274.72	67.08	650.51	1,271.3	283.6	3,082.5
	ML	1.33	0.35	3.64	5.3	1.2	14.6
	Total	333.96	75.63	723.98	1,518.7	316.5	3,392.1
Skyranch at Carefree	GA	1.63	0.58	16.13	4.9	1.6	55.5
Stellar Airpark	GA	7.69	2.38	197.13	37.5	9.9	1,053.5
8-hr ozone NAA total:		1,705.43	2,585.98	11,719.36	8,385.8	12,535.3	64,993.6

AC: Air Commercial; AT: Air Taxi; GA: General Aviation; ML: Military

Table 4.11–4. Annual and season-day emissions, by aircraft type, for airports outside the eight-hour ozone NAA.

Facility	Category	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
		VOC	NO _x	CO	VOC	NO _x	CO
Wickenburg Municipal	GA	13.90	2.84	62.02	65.2	12.9	331.8
Maricopa County total:		1,719.33	2,588.82	11,781.38	8,451.0	12,548.2	65,325.4

4.12 Locomotives

Annual emissions from locomotives were calculated based on diesel fuel usage provided by Burlington Northern/Santa Fe Railway (BNSF), Union Pacific Railway (UP) and Amtrak. Railway operations from these companies fall into three categories: Class I haul lines, yard/switching operations, and passenger trains. Annual emissions were calculated by multiplying diesel fuel usage by the emission factors listed in Table 4.12–1 (US EPA, 2009).

Table 4.12–1. Emission factors for locomotives.

Activity type	Emission factors (lbs/gal diesel)		
	VOC	NO _x	CO
Class I haul line	0.018	0.328	0.059
Yard/switch operations	0.032	0.517	0.060
Passenger trains	0.019	0.367	0.059

Fuel use reported by railroads and emission totals are summarized in Table 4.12–2.

Table 4.12–2. Fuel use and annual emissions from locomotives in Maricopa County.

Locomotive type	Diesel fuel used (gals)	Annual emissions (tons/yr)		
		VOC	NO _x	CO
Class I haul line	7,706,715	68.74	1,263.13	231.75
Yard/switch operations	520,076	8.43	134.44	12.63
Passenger trains	46,301	0.43	8.51	1.36
Total:	8,273,092	77.60	1,406.08	245.74

Eight-hour ozone nonattainment area emissions were calculated by multiplying Maricopa County emissions by the percentage of track miles inside the eight-hour ozone nonattainment area, determined by GIS mapping. Results are shown in Table 4.12–3.

Table 4.12–3. Annual emissions from locomotives in the eight-hour ozone NAA.

Locomotive type	Track in nonattainment area (%)	Annual emissions (tons/yr)		
		VOC	NO _x	CO
Class I haul line	60.65%	41.69	766.09	140.56
Yard/switch operations	100.00%	8.43	134.44	12.63
Passenger trains	6.98%	0.03	0.59	0.09
Total:		50.15	901.12	153.29

Ozone season-day emissions for both the county and the eight-hour ozone nonattainment area (shown in Table 4.12–4) were calculated by dividing annual totals by 365 days per year, as locomotive activity is assumed to be uniform throughout the year.

Table 4.12–4. Season-day emissions from locomotives in Maricopa County and the eight-hour ozone NAA.

Locomotive type	Maricopa County			8-hr ozone NAA		
	Season-day emissions (lbs/day)					
	VOC	NO _x	CO	VOC	NO _x	CO
Class I haul line	376.6	6,921.3	1,269.9	228.4	4,197.7	770.2
Yard/switch operations	46.2	736.7	69.2	46.2	736.7	69.2
Passenger trains	2.4	46.6	7.4	0.2	3.3	0.5
Total:	425.2	7,704.5	1,346.5	274.8	4,937.7	839.9

4.13 Summary of all nonroad mobile source emissions

Table 4.13–1 summarizes annual and season day emissions of VOC, NO_x, and CO from nonroad mobile sources in Maricopa County, respectively. Table 4.13–2 shows annual and season-day emissions for these pollutants for the eight-hour ozone nonattainment area.

Table 4.13–1. Annual and season-day emissions from nonroad mobile sources in Maricopa County.

Category	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Agricultural	38.53	330.49	303.71	329.3	2,762.6	2,584.4
Airport GSE & APUs	111.98	406.04	3,275.98	587.3	2,136.6	17,155.0
Commercial	1,924.41	1,361.42	30,224.21	14,537.1	8,334.7	203,404.4
Construction & mining	1,881.88	12,937.30	14,396.92	13,116.9	87,972.9	99,942.8
Industrial	341.25	1,839.35	7,140.99	2,212.6	11,763.4	46,138.5
Lawn & garden	4,913.96	866.64	54,798.41	51,990.4	6,998.4	523,235.5
Pleasure craft	530.39	96.56	1,249.66	11,527.0	1,996.8	26,738.3
Railway maintenance	1.94	8.55	16.48	14.2	59.0	117.8
Recreational	1,518.97	66.10	6,373.46	17,804.4	679.3	74,424.8
Aircraft	1,719.33	2,588.82	11,781.38	8,451.0	12,548.2	65,325.4
Locomotives	77.60	1,406.08	245.74	425.2	7,704.5	1,346.5
Total:	13,060.24	21,907.35	129,806.94	120,995.4	142,956.4	1,060,413.4

Table 4.13–2. Annual and season-day emissions from nonroad mobile sources in the eight-hour ozone NAA.

Category	Annual emissions (tons/yr)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
Agricultural	22.52	193.22	177.56	192.5	1,615.1	1,510.9
Airport GSE & APUs	111.43	404.49	3,259.08	584.5	2,128.9	17,071.7
Commercial	1,916.15	1,355.57	30,094.46	14,474.7	8,299.0	202,531.2
Construction & mining	1,941.80	13,349.23	14,855.32	13,534.5	90,774.0	103,125.0
Industrial	339.78	1,831.45	7,110.33	2,203.1	11,712.9	45,940.4
Lawn & garden	4,970.15	876.55	55,425.05	52,584.9	7,078.4	529,218.9
Pleasure craft	530.39	96.56	1,249.66	11,527.0	1,996.8	26,738.3
Railway maintenance	1.96	8.64	16.67	14.4	59.7	119.1
Recreational	684.30	29.78	2,871.27	8,020.9	306.0	33,528.7
Aircraft	1,705.43	2,585.98	11,719.36	8,385.8	12,535.3	64,993.6
Locomotives	50.15	901.12	153.29	274.8	4,937.7	839.9
Total:	12,274.06	21,632.59	126,932.05	111,797.1	141,443.8	1,025,617.7

4.14 Quality assurance procedures

Established procedures were used to check, and correct when necessary, the nonroad mobile sources emissions estimates. All NONROAD model input and output files, and Excel spreadsheets used to calculate the emissions, were checked by personnel who were not involved in the development of the modeling inputs/outputs and spreadsheets. In addition, the emissions estimates were reviewed for reasonableness by external agency staff.

4.15 References

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5. Onroad Mobile Sources

5.1 Introduction

Onroad mobile source emissions for ozone precursors, such as volatile organic compounds (VOCs), nitrogen oxides (NO_x), and carbon monoxide (CO), have been calculated for the eight-hour ozone nonattainment area (NAA) and Maricopa County for the 2011 Periodic Emissions Inventory (PEI).

Motor Vehicle Emission Simulator (MOVES2010b) is the latest model developed by the U.S. Environmental Protection Agency (EPA) for the purpose of estimating onroad and off-network motor vehicle emission factors.

The MOVES2010b modeling accounted for the oxygenated fuel and the Arizona Vehicle Inspection/Maintenance (I/M) programs applied in Maricopa County in 2011. The fuel use assumptions, including oxygen content and Reid Vapor Pressure (RVP), were derived from the 2011 fuel inspection results provided by the Arizona Department of Weights and Measures.

In order to develop the 2011 onroad mobile source emissions, the 2011 vehicle miles traveled (VMT) estimates by facility type and road type were derived from the 2011 Highway Performance Monitoring System (HPMS) data provided by the Arizona Department of Transportation (ADOT). The distribution of VMT by vehicle type is based on the July 2011 vehicle registration data for Maricopa County provided by ADOT. The VMT by vehicle type was provided as local input data for MOVES2010b to produce onroad emissions.

The main references for preparing the onroad mobile source portion of the 2011 emissions inventory were:

- Emission Inventory Requirements for Ozone State Implementation Plans (US EPA, 1991);
- Procedures for Emission Inventory Preparation Volume IV: Mobile Sources (US EPA, 1992a);
- Quality Review Guidelines for 1990 Base Year Emission Inventories (US EPA, 1992b);
- User's Guide for the SMOKE-MOVES Integration Tool (US EPA, 2010);
- Motor Vehicle Emission Simulator (MOVES) - User Guide Version, MOVES2010b (US EPA, 2012a);
- Policy Guidance on the Use of MOVES2010 and Subsequent Minor Revisions for State Implementation Plan Development, Transportation Conformity, and Other Purposes (US EPA, 2012b); and
- Using MOVES to Prepare Emissions Inventories in State Implementation Plans and Transportation Conformity: Technical Guidance for MOVES2010, 2010a and 2010b (US EPA, 2012c).

5.2 Onroad emissions

Vehicle exhaust and evaporative emission factors for VOC, NO_x, and CO were calculated using MOVES2010b. The MOVES2010b runs were executed by MAG. The contact person for the MOVES2010b emission estimates is Ieesuck Jung (602-254-6300).

5.2.1 MOVES2010b model

The emissions were calculated using MOVES2010b. MOVES2010b is EPA's state-of-the-art emissions modeling tool, which replaces EPA's previous mobile source emissions model, MOBILE6.2. MOVES2010b is intended for official use to estimate national, state, and county level inventories of criteria air pollutants from highway vehicles. The user of MOVES2010b is allowed to specify vehicle types, time periods, geographical areas, pollutants, vehicle operating characteristics, and road types for a particular scenario to be modeled by creating a Run Specification (RunSpec).

In order to calculate vehicle emissions for the calendar year 2011, MOVES2010b was executed using local input data for each month of the year and each geographical area (the eight-hour ozone nonattainment area and Maricopa County). Each scenario was created using the County Domain/Scale and the Inventory Calculation Type. The specific MOVES2010b model RunSpec and RunSpec summaries are described in Appendix C.

5.2.2 MOVES2010b local input data

Compared with MOBILE6.2, MOVES2010b requires a more detailed level of local data, including fuel data, I/M program, meteorological data, vehicle population, source type age distribution, annual VMT, monthly/daily/hourly VMT fractions, road type distribution, average speed distribution, ramp fraction, and Alternative Vehicle and Fuel Technologies (AVFT) strategy.

5.2.2.1 Fuel data

Regarding the fuel local input data, MOVES2010b provides two MOVES tables, which are [fuelsupply] and [fuelformulation]. The fuel data for each month were derived from the 2011 fuel inspection results in Maricopa County provided by the Arizona Department of Weights and Measures. The 2011 fuel inspection results reflected the committed control measure – California Phase 2 Reformulated Gasoline with (1) 3.5% Oxygen Content from November 1 through March 31 (MAG, 2003) and (2) 7 psi from May 1 through September 30 (MAG, 2009). The fuel data for Maricopa County were also applied to the eight-hour ozone nonattainment area. The specific MOVES tables for fuel data are presented in Appendix C.

5.2.2.2 I/M programs

MOVES2010b has an [IMCoverage] table for I/M programs; this table was prepared using MOBILE6.2 input. This table reflects the actual proportions of vehicles subject to the specified levels of inspection. The term "I/M vehicles" denotes vehicles which are required to undergo an emission test and/or inspection under the Vehicle Inspection/Maintenance Program. It is important to note that participation in the I/M program is required for all vehicles registered in Area A, with the exception of certain model years and vehicle classes. However, it is assumed that 91.6 percent of the vehicles operating within the eight-hour ozone nonattainment area and Maricopa County participate in the I/M program and the remaining 8.4 percent do not participate in the program. These percentages reflect the control measures "Tougher Enforcement of Vehicle Registration and Emissions Test Compliance" and "Expansion of Area A Boundaries," described in the MAG Eight-Hour Ozone Redesignation Request and Maintenance Plan for the

Maricopa Nonattainment Area (MAG, 2009). This percentage is directly applied to the Compliance Factor in the [IMCoverage] table. The same I/M programs were applied for the eight-hour ozone nonattainment area and Maricopa County. The specific MOVES table for I/M programs is presented in Appendix C.

5.2.2.3 *Meteorological data*

MOVES2010b requires hourly temperature and relative humidity data by specific month of the year. Meteorological data for the Phoenix Sky Harbor International Airport in 2011 were obtained from the National Climatic Data Center (<http://www.ncdc.noaa.gov/>). The same hourly average temperature and relative humidity data for each month were applied for the eight-hour ozone nonattainment area and Maricopa County. The specific MOVES table [ZoneMonthHour] for meteorological data is presented in Appendix C.

5.2.2.4 *Vehicle population*

In order to capture start, evaporative, and extended idle emissions, MOVES2010b introduced a new mobile source emission category called off-network emissions. In MOVES2010b, these off-network emissions are directly determined by population of vehicles in an area. The vehicle population in Maricopa County was obtained from the July 2011 vehicle registration data provided by ADOT. The vehicle population data were allocated to the 28 MOBILE6.2 vehicle types based on MOBILE6.2 VMT fractions for 2011. Then, the vehicle population data allocated to the 28 MOBILE6.2 vehicle types were assigned to the 13 MOVES source types using the match-up table (Table A.1) in EPA's technical guidance (EPA, 2012c). The vehicle population in the eight-hour ozone nonattainment area was estimated by applying the population ratio of the two geographical areas to the vehicle population in Maricopa County. The specific MOVES table [SourceTypeYear] for vehicle population is presented in Appendix C.

5.2.2.5 *Source type age distribution*

MOVES2010b categorizes vehicles according to vehicle classes and model years. The source type age distribution was prepared using EPA's data converter that takes the registration distribution input file created for MOBILE6.2 and converts it to the appropriate MOVES age distribution input table [SourceTypeAgeDistribution]. The same source type age distribution was applied for the eight-hour ozone nonattainment area and Maricopa County. The specific MOVES table for source type age distribution is presented in Appendix C.

5.2.2.6 *Annual VMT*

The 2011 daily VMTs by facility type were used to estimate onroad exhaust and evaporative emissions. The 2011 VMT distributions by facility type for the eight-hour ozone nonattainment area and Maricopa County were obtained from the 2011 Maricopa County Estimates of Daily Vehicle Travel by Highway Functional Classification provided by ADOT. The 2011 VMT distributions were multiplied by the 2011 HPMS VMT for the eight-hour ozone nonattainment area and Maricopa County. The resultant VMT estimates by facility type for the eight-hour ozone nonattainment area and Maricopa County are shown in Table 5.2-1.

Since MOVES2010b requires annual VMTs by HPMS vehicle type as a local input, the daily VMTs by HPMS vehicle type were derived from the 2011 traffic assignment data provided by

the MAG transportation modeling group in May 2011 and the daily VMTs by facility type and the estimated percentages of daily vehicle travel by vehicle type and highway functional classification provided by ADOT. Then, the daily VMTs by HPMS vehicle type were multiplied by 365 days to obtain the annual VMTs by HPMS vehicle type. The specific MOVES table [HPMSvTypeYear] for annual VMT is presented in Appendix C.

Table 5.2–1. 2011 daily VMT by facility type (annual average daily traffic).

Facility Type		8-hr ozone NAA (thousand miles/day)	Maricopa County (thousand miles/day)
Rural	Interstate	1,833	3,247
	Other Principal Arterial	897	1,589
	Minor Arterial	166	293
	Major Collector	734	1,301
	Minor Collector	95	168
	Local	149	264
Urban	Interstate	10,906	11,182
	Other Freeway/Expressway	19,263	19,750
	Other Principal Arterial	21,474	22,017
	Minor Arterial	13,767	14,115
	Collector	4,680	4,799
	Local	9,910	10,160
Total:		83,874	88,885

5.2.2.7 Road type distribution

MOVES2010b requires the distribution of VMTs by road type as a local input. The road type VMT distribution by HPMS vehicle type was derived from the 2011 traffic assignment data and the daily VMTs by HPMS vehicle type mentioned in the previous section. As suggested in EPA's technical guidance (US EPA, 2010), the same road type distribution by HPMS vehicle type was used for all MOVES source types within an HPMS vehicle class. The specific MOVES table [RoadTypeDistribution] for road type distribution is presented in Appendix C.

5.2.2.8 VMT fraction

Since VMT varies by month, day of week, and hour, MOVES2010b requires month/day/hour VMT fractions as a local input in order to derive hourly VMT for each weekday/weekend and month from the annual VMT. The month/day/hour VMT fractions were developed from data recorded by continuous traffic counters on freeways (ADOT Freeway Management System) and arterials (Phoenix Automatic Traffic Recorders) during the year 2007. The specific MOVES tables [MonthVMTFraction], [DayVMTFraction], and [HourVMTFraction] for VMT fractions are presented in Appendix C.

5.2.2.9 Average speed distribution

In MOVES2010b, vehicle power, speed, and acceleration have a significant effect on vehicle emissions for all pollutants. MOVES2010b estimates those emission effects by assigning activity to operating mode distributions, which are determined by the distribution of vehicle hours traveled (VHT) by average speed. As recommended in EPA's technical guidance (US EPA, 2010), estimates of local average speeds were developed by post-processing the output from the 2011 traffic assignment data provided by the MAG transportation modeling group in May 2011. To develop the average speed distribution, VHTs in sixteen speed bins were accumulated separately for each hour of the day, source type, and road type in Maricopa County. Then, the average speed distribution was calculated by normalizing VHTs in sixteen speed bins for each hour of the day, source type, and road type. The same methodology was applied to develop the speed estimates for the eight-hour ozone nonattainment area. The specific MOVES table [AvgSpeedDistribution] for the average speed distribution is presented in Appendix C.

5.2.2.10 Ramp fraction

MOVES2010b requires the ramp fraction, which represents the percent of VHT on ramps, on both rural restricted roads (road type 2) and urban restricted roads (road type 4). The fraction of VHT on ramps was derived by dividing the total VHTs on ramps by the total VHTs for each restricted road type. Those VHTs were obtained from the 2011 traffic assignment data provided by the MAG transportation modeling group in May 2011. The specific MOVES table [RoadType] for ramp fractions is presented in Appendix C.

5.2.2.11 AVFT strategy

MOVES2010b allows users to modify the fuel engine fraction using different fuels and technologies in each model year in order to reflect the local situation. The fleet information for transit buses for model years 1997 through 2011 was provided by Valley Metro and used to prepare the AVFT input file. Since the fleet data are available only for specific model years, MOVES2010b default values were obtained from the [fuelEngFraction] table in the MOVES default database and used for the rest of the model years. The specific MOVES table [AVFT] for AVFT strategy is presented in Appendix C.

5.2.2.12 Stage II refueling control programs

As an option, MOVES2010b allows to apply Stage refueling emission control programs. Since 1994, the Stage II refueling program has been implemented in Area A as one of committed control measures (MAG, 2009). The program efficiency of 46 percent for the refueling displacement vapor losses and the refueling spillage losses are assumed for LDGVs, LDGTs, and HDGVs (Yantorno, 2007). The same program efficiency was applied to the eight-hour ozone nonattainment area and Maricopa County. The specific MOVES table [CountyYear] for Stage II refueling control programs is presented in Appendix C.

5.2.3 MOVES2010b outputs

MOVES2010b was executed with the RunSpec files described in Appendix C to obtain exhaust and evaporative emissions for VOC, NO_x, and CO. These values were obtained for the following categories by month:

- Vehicle classes: light duty gasoline vehicles (LDGV), light duty gasoline trucks 1 and 2 (LDGT1), light duty gasoline trucks 3 and 4 (LDGT2), heavy duty gasoline vehicles 2B thru 8B and gasoline buses (HDGV), motorcycles (MC), light duty diesel vehicles (LDDV), light duty diesel trucks 1 thru 4 (LDDT), heavy duty diesel vehicles class 2B (2BHDDV), heavy duty diesel vehicles classes 3, 4, and 5 (LHDDV), heavy duty diesel vehicles classes 6 and 7 (MHDDV), heavy duty diesel vehicles classes 8A and 8B (HHDDV), and heavy duty diesel buses (BUSES)
- Facility types: rural interstate, rural principal arterial, rural minor arterial, rural major collector, rural minor collector, rural local, urban interstate, urban freeway/expressway, urban principal arterial, urban minor arterial, urban collector, urban local, and off-network, which was newly added in MOVES2010b
- Days: weekdays and weekend days

5.2.4 MOVES2010b emission estimates

MOVES2010b was used to generate onroad emissions by vehicle class, facility type, weekdays/weekend days, and month. By specifying the output time aggregate level as month, the model produces monthly emissions including weekday and weekend emissions for a given month. The annual emissions were calculated by aggregating monthly onroad emissions derived by MOVES2010b. The ozone season-day emissions were calculated by dividing the three-month peak ozone season emissions from July through September by 92 days.

Tables 5.2–2 and 5.2–3 show the calculated annual and ozone season-day VOC, NO_x, and CO emissions by facility type and vehicle class in the eight-hour ozone nonattainment area and Maricopa County, respectively.

Table 5.2–2. Annual and ozone season-day onroad mobile source emissions by facility type and vehicle class in the eight-hour ozone NAA.

Facility Type	Vehicle Class	SCC	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
			VOC	NO _x	CO	VOC	NO _x	CO
Rural Interstate	LDGV	2201001110	28.13	110.70	758.49	163.3	604.9	5,232.5
	LDGT1	2201020110	51.89	243.02	1,356.15	303.6	1,314.9	9,185.7
	LDGT2	2201040110	26.73	125.19	698.62	156.4	677.4	4,732.0
	HDGV	2201070110	13.02	72.48	319.37	74.6	369.0	1,921.9
	MC	2201080110	6.40	4.22	69.24	34.8	21.0	368.5
	LDDV	2230001110	0.05	0.84	0.40	0.3	4.6	2.7
	LDDT	2230060110	1.62	13.96	8.85	9.2	77.5	60.3
	2BHDDV	2230071110	0.71	6.18	3.89	4.0	34.4	26.5
	LHDDV	2230072110	3.85	32.92	20.87	21.8	182.4	141.9
	MHDDV	2230073110	10.86	164.12	45.16	57.2	807.2	237.2
	HHDDV	2230074110	23.31	570.60	116.92	123.1	2,806.7	614.3
BUSES	2230075110	1.20	23.68	6.14	6.3	116.5	32.3	
Rural Principal Arterial	LDGV	2201001130	20.73	70.04	387.68	119.5	403.2	2,614.6
	LDGT1	2201020130	18.86	76.50	363.07	109.6	434.4	2,408.3
	LDGT2	2201040130	9.72	39.41	187.04	56.5	223.8	1,240.7
	HDGV	2201070130	3.53	17.03	71.63	20.3	90.3	435.2
	MC	2201080130	11.93	6.20	105.39	64.6	31.0	561.0
	LDDV	2230001130	0.04	0.63	0.26	0.2	3.7	1.7
	LDDT	2230060130	0.66	5.13	3.60	3.7	29.9	24.0
	2BHDDV	2230071130	0.29	2.28	1.58	1.6	13.3	10.6
	LHDDV	2230072130	1.57	12.04	8.49	8.8	70.1	56.7
	MHDDV	2230073130	2.27	27.40	8.99	11.9	135.0	47.2
	HHDDV	2230074130	3.98	80.40	19.42	21.0	396.0	102.0
BUSES	2230075130	0.40	6.97	1.97	2.1	34.3	10.3	
Rural Minor Arterial	LDGV	2201001150	20.14	68.06	376.72	116.1	391.8	2,540.7
	LDGT1	2201020150	18.33	74.33	352.81	106.5	422.1	2,340.3
	LDGT2	2201040150	9.44	38.29	181.75	54.9	217.4	1,205.6
	HDGV	2201070150	3.43	16.55	69.61	19.7	87.8	422.9
	MC	2201080150	11.59	6.03	102.42	62.8	30.1	545.1
	LDDV	2230001150	0.04	0.61	0.26	0.2	3.6	1.7
	LDDT	2230060150	0.64	4.98	3.49	3.6	29.0	23.4
	2BHDDV	2230071150	0.28	2.21	1.54	1.6	12.9	10.3
	LHDDV	2230072150	1.53	11.70	8.25	8.6	68.1	55.1
	MHDDV	2230073150	2.20	26.63	8.73	11.6	131.1	45.9
	HHDDV	2230074150	3.87	78.12	18.87	20.4	384.8	99.1
BUSES	2230075150	0.39	6.77	1.91	2.1	33.4	10.0	
Rural Major Collector	LDGV	2201001170	3.75	12.69	70.22	21.6	73.0	473.5
	LDGT1	2201020170	3.42	13.86	65.76	19.9	78.7	436.2
	LDGT2	2201040170	1.76	7.14	33.88	10.2	40.5	224.7
	HDGV	2201070170	0.64	3.08	12.97	3.7	16.4	78.8
	MC	2201080170	2.16	1.12	19.09	11.7	5.6	101.6
	LDDV	2230001170	0.01	0.11	0.05	0.0	0.7	0.3
	LDDT	2230060170	0.12	0.93	0.65	0.7	5.4	4.4
	2BHDDV	2230071170	0.05	0.41	0.29	0.3	2.4	1.9
	LHDDV	2230072170	0.28	2.18	1.54	1.6	12.7	10.3
	MHDDV	2230073170	0.41	4.96	1.63	2.2	24.4	8.5
	HHDDV	2230074170	0.72	14.56	3.52	3.8	71.7	18.5
BUSES	2230075170	0.07	1.26	0.36	0.4	6.2	1.9	

Table 5.2–2. Annual and ozone season-day onroad mobile source emissions by facility type and vehicle class in the eight-hour ozone NAA (continued).

Facility Type	Vehicle Class	SCC	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
			VOC	NOx	CO	VOC	NOx	CO
Rural Minor Collector	LDGV	2201001190	0.87	2.94	16.26	5.0	16.9	109.6
	LDGT1	2201020190	0.79	3.21	15.22	4.6	18.2	101.0
	LDGT2	2201040190	0.41	1.65	7.84	2.4	9.4	52.0
	HDGV	2201070190	0.15	0.71	3.00	0.9	3.8	18.2
	MC	2201080190	0.50	0.26	4.42	2.7	1.3	23.5
	LDDV	2230001190	0.00	0.03	0.01	0.0	0.2	0.1
	LDDT	2230060190	0.03	0.21	0.15	0.2	1.3	1.0
	2BHDDV	2230071190	0.01	0.10	0.07	0.1	0.6	0.4
	LHDDV	2230072190	0.07	0.50	0.36	0.4	2.9	2.4
	MHDDV	2230073190	0.10	1.15	0.38	0.5	5.7	2.0
HHDDV	2230074190	0.17	3.37	0.81	0.9	16.6	4.3	
BUSES	2230075190	0.02	0.29	0.08	0.1	1.4	0.4	
Rural Local	LDGV	2201001210	9.08	30.68	169.82	52.3	176.6	1,145.3
	LDGT1	2201020210	8.26	33.51	159.04	48.0	190.3	1,055.0
	LDGT2	2201040210	4.26	17.26	81.93	24.7	98.0	543.5
	HDGV	2201070210	1.55	7.46	31.38	8.9	39.6	190.6
	MC	2201080210	5.22	2.72	46.17	28.3	13.6	245.7
	LDDV	2230001210	0.02	0.27	0.12	0.1	1.6	0.8
	LDDT	2230060210	0.29	2.25	1.58	1.6	13.1	10.5
	2BHDDV	2230071210	0.13	1.00	0.69	0.7	5.8	4.6
	LHDDV	2230072210	0.69	5.27	3.72	3.9	30.7	24.8
	MHDDV	2230073210	0.99	12.00	3.94	5.2	59.1	20.7
HHDDV	2230074210	1.74	35.22	8.51	9.2	173.5	44.7	
BUSES	2230075210	0.18	3.05	0.86	0.9	15.0	4.5	
Urban Interstate	LDGV	2201001230	315.59	1,122.85	8,542.12	1,828.0	6,198.7	58,613.4
	LDGT1	2201020230	389.33	1,602.91	9,784.95	2,271.6	8,744.6	65,893.5
	LDGT2	2201040230	200.56	825.74	5,040.73	1,170.2	4,504.8	33,945.1
	HDGV	2201070230	125.37	594.77	2,799.95	712.5	3,011.8	16,433.1
	MC	2201080230	128.88	73.37	1,238.82	698.9	365.4	6,593.8
	LDDV	2230001230	0.54	8.81	4.59	3.0	49.4	30.9
	LDDT	2230060230	13.00	102.99	71.45	73.3	575.8	483.3
	2BHDDV	2230071230	5.68	45.66	31.36	32.0	255.6	212.6
	LHDDV	2230072230	31.01	242.58	169.13	174.7	1,354.0	1,141.6
	MHDDV	2230073230	93.83	1,316.73	378.86	494.4	6,475.6	1,990.4
HHDDV	2230074230	173.92	3,747.08	854.68	918.0	18,429.4	4,490.3	
BUSES	2230075230	14.35	272.67	73.30	75.6	1,341.1	385.1	
Urban Freeway And Express- way	LDGV	2201001250	331.11	1,178.07	8,962.22	1,917.9	6,503.5	61,496.0
	LDGT1	2201020250	408.48	1,681.74	10,266.18	2,383.3	9,174.7	69,134.0
	LDGT2	2201040250	210.43	866.35	5,288.63	1,227.8	4,726.3	35,614.5
	HDGV	2201070250	131.53	624.02	2,937.66	747.5	3,160.0	17,241.3
	MC	2201080250	135.22	76.98	1,299.75	733.2	383.3	6,918.1
	LDDV	2230001250	0.56	9.25	4.82	3.2	51.9	32.4
	LDDT	2230060250	13.64	108.06	74.96	76.9	604.1	507.1
	2BHDDV	2230071250	5.96	47.91	32.90	33.6	268.2	223.0
	LHDDV	2230072250	32.53	254.51	177.45	183.3	1,420.6	1,197.8
	MHDDV	2230073250	98.44	1,381.48	397.49	518.7	6,794.1	2,088.3
HHDDV	2230074250	182.48	3,931.36	896.71	963.2	19,335.8	4,711.2	
BUSES	2230075250	15.05	286.08	76.90	79.3	1,407.1	404.0	

Table 5.2–2. Annual and ozone season-day onroad mobile source emissions by facility type and vehicle class in the eight-hour ozone NAA (continued).

Facility Type	Vehicle Class	SCC	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
			VOC	NOx	CO	VOC	NOx	CO
Urban Principal Arterial	LDGV	2201001270	867.65	2,461.71	14,822.61	4,980.2	14,626.5	98,722.0
	LDGT1	2201020270	723.35	2,268.85	11,877.79	4,187.4	13,305.9	77,666.8
	LDGT2	2201040270	372.63	1,168.80	6,118.85	2,157.1	6,854.6	40,010.1
	HDGV	2201070270	159.42	526.27	2,610.59	907.1	2,833.3	15,528.2
	MC	2201080270	364.35	120.97	2,387.52	1,968.4	603.7	12,707.9
	LDDV	2230001270	1.49	24.89	10.67	8.3	150.4	69.4
	LDDT	2230060270	25.26	203.10	142.81	141.2	1,229.5	939.0
	2BHDDV	2230071270	11.03	90.29	62.60	61.7	547.5	412.4
	LHDDV	2230072270	60.30	478.09	338.58	336.9	2,889.2	2,221.8
	MHDDV	2230073270	99.13	1,116.86	362.02	522.0	5,499.7	1,901.7
HHDDV	2230074270	167.56	2,988.26	778.64	883.9	14,715.7	4,090.3	
BUSES	2230075270	14.31	229.46	66.76	75.4	1,130.0	350.7	
Urban Minor Arterial	LDGV	2201001290	441.02	1,251.27	7,534.27	2,531.4	7,434.6	50,180.0
	LDGT1	2201020290	367.67	1,153.25	6,037.43	2,128.4	6,763.4	39,477.6
	LDGT2	2201040290	189.41	594.10	3,110.19	1,096.5	3,484.2	20,337.0
	HDGV	2201070290	81.03	267.50	1,326.95	461.1	1,440.2	7,892.9
	MC	2201080290	185.20	61.49	1,213.57	1,000.5	306.8	6,459.4
	LDDV	2230001290	0.76	12.65	5.42	4.2	76.4	35.3
	LDDT	2230060290	12.84	103.24	72.59	71.8	625.0	477.3
	2BHDDV	2230071290	5.61	45.89	31.82	31.4	278.3	209.6
	LHDDV	2230072290	30.65	243.01	172.10	171.2	1,468.6	1,129.3
	MHDDV	2230073290	50.39	567.70	184.01	265.3	2,795.5	966.6
HHDDV	2230074290	85.17	1,518.92	395.78	449.3	7,479.9	2,079.1	
BUSES	2230075290	7.27	116.63	33.93	38.3	574.4	178.3	
Urban Collector	LDGV	2201001310	86.13	244.37	1,471.39	494.4	1,451.9	9,799.8
	LDGT1	2201020310	71.80	225.22	1,179.07	415.7	1,320.8	7,709.7
	LDGT2	2201040310	36.99	116.02	607.40	214.1	680.4	3,971.7
	HDGV	2201070310	15.82	52.24	259.14	90.0	281.3	1,541.4
	MC	2201080310	36.17	12.01	237.00	195.4	59.9	1,261.5
	LDDV	2230001310	0.15	2.47	1.06	0.8	14.9	6.9
	LDDT	2230060310	2.51	20.16	14.18	14.0	122.1	93.2
	2BHDDV	2230071310	1.10	8.96	6.21	6.1	54.4	40.9
	LHDDV	2230072310	5.99	47.46	33.61	33.4	286.8	220.5
	MHDDV	2230073310	9.84	110.87	35.94	51.8	545.9	188.8
HHDDV	2230074310	16.63	296.63	77.29	87.7	1,460.8	406.0	
BUSES	2230075310	1.42	22.78	6.63	7.5	112.2	34.8	
Urban Local	LDGV	2201001330	415.75	1,179.56	7,102.48	2,386.3	7,008.5	47,304.1
	LDGT1	2201020330	346.60	1,087.15	5,691.42	2,006.4	6,375.7	37,215.2
	LDGT2	2201040330	178.55	560.05	2,931.94	1,033.6	3,284.5	19,171.4
	HDGV	2201070330	76.39	252.17	1,250.90	434.7	1,357.6	7,440.6
	MC	2201080330	174.58	57.96	1,144.02	943.2	289.2	6,089.2
	LDDV	2230001330	0.71	11.93	5.11	4.0	72.0	33.3
	LDDT	2230060330	12.11	97.32	68.43	67.7	589.1	449.9
	2BHDDV	2230071330	5.29	43.26	30.00	29.6	262.4	197.6
	LHDDV	2230072330	28.89	229.09	162.23	161.4	1,384.4	1,064.6
	MHDDV	2230073330	47.50	535.16	173.46	250.1	2,635.3	911.2
HHDDV	2230074330	80.29	1,431.87	373.10	423.5	7,051.3	1,960.0	
BUSES	2230075330	6.86	109.95	31.99	36.1	541.4	168.1	

Table 5.2–2. Annual and ozone season-day onroad mobile source emissions by facility type and vehicle class in the eight-hour ozone NAA (continued).

Facility Type	Vehicle Class	SCC	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
			VOC	NOx	CO	VOC	NOx	CO
	LDGV	220100100	9,402.26	4,424.20	43,163.97	61,052.9	23,759.3	183,525.8
	LDGT1	220102000	2,588.87	1,468.89	19,360.70	16,455.7	7,981.9	96,124.0
	LDGT2	220104000	1,333.66	756.70	9,973.69	8,477.2	4,111.9	49,518.4
	HDGV	220107000	372.55	217.03	4,052.96	2,338.4	1,182.2	20,958.3
	MC	220108000	547.02	2.43	83.60	4,271.9	9.8	208.1
Off- Network	LDDV	223000100	6.48	27.63	25.05	22.4	120.8	131.4
	LDDT	223006000	3.32	26.59	16.91	7.6	120.8	87.9
	2BHDDV	223007100	1.42	11.66	7.35	3.2	52.9	38.2
	LHDDV	223007200	7.79	62.35	39.03	17.8	283.1	202.6
	MHDDV	223007300	24.50	144.11	189.20	112.6	621.4	1,016.4
	HHDDV	223007400	418.93	2,672.32	1,119.58	2,179.6	12,161.2	5,908.3
	BUSES	223007500	1.63	4.45	96.15	0.1	0.0	522.5

Table 5.2–3. Annual and ozone season-day onroad mobile source emissions by facility type and vehicle class in Maricopa County.

Facility Type	Vehicle Class	SCC	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
			VOC	NOx	CO	VOC	NOx	CO
Rural Interstate	LDGV	2201001110	41.81	166.74	1,147.40	242.9	911.2	7,919.6
	LDGT1	2201020110	100.56	475.25	2,658.13	588.5	2,571.6	18,011.7
	LDGT2	2201040110	51.80	244.83	1,369.34	303.2	1,324.8	9,278.8
	HDGV	2201070110	21.52	118.92	538.20	123.8	610.0	3,301.0
	MC	2201080110	11.22	7.49	122.76	61.0	37.3	653.4
	LDDV	2230001110	0.07	1.25	0.60	0.4	6.9	4.1
	LDDT	2230060110	3.14	27.11	17.13	17.7	150.4	116.7
	2BHDDV	2230071110	1.37	12.00	7.53	7.8	66.7	51.4
	LHDDV	2230072110	7.47	63.90	40.44	42.2	354.2	275.0
	MHDDV	2230073110	17.23	281.49	73.31	90.8	1,384.5	385.2
HHDDV	2230074110	45.10	1,129.87	228.30	238.2	5,557.7	1,199.4	
BUSES	2230075110	1.71	34.23	8.79	9.0	168.4	46.2	
Rural Principal Arterial	LDGV	2201001130	33.65	113.61	629.45	193.9	654.0	4,244.8
	LDGT1	2201020130	36.88	149.19	708.92	214.4	847.2	4,701.6
	LDGT2	2201040130	19.00	76.86	365.20	110.4	436.4	2,422.1
	HDGV	2201070130	6.69	31.89	135.07	38.5	169.7	824.3
	MC	2201080130	21.15	10.98	186.63	114.5	54.8	993.4
	LDDV	2230001130	0.06	1.02	0.43	0.3	5.9	2.8
	LDDT	2230060130	1.30	10.05	7.05	7.3	58.6	47.1
	2BHDDV	2230071130	0.57	4.46	3.10	3.2	26.1	20.7
	LHDDV	2230072130	3.08	23.59	16.65	17.3	137.3	111.1
	MHDDV	2230073130	4.17	51.42	16.61	22.0	253.2	87.3
HHDDV	2230074130	7.84	159.49	38.37	41.4	785.5	201.6	
BUSES	2230075130	0.72	12.48	3.53	3.8	61.5	18.5	
Rural Minor Arterial	LDGV	2201001150	32.70	110.40	611.65	188.5	635.5	4,124.9
	LDGT1	2201020150	35.84	144.97	688.88	208.3	823.2	4,568.7
	LDGT2	2201040150	18.46	74.68	354.88	107.3	424.1	2,353.6
	HDGV	2201070150	6.50	30.98	131.25	37.4	164.9	801.0
	MC	2201080150	20.55	10.67	181.35	111.3	53.2	965.3
	LDDV	2230001150	0.06	0.99	0.42	0.3	5.8	2.8
	LDDT	2230060150	1.26	9.76	6.85	7.1	56.9	45.8
	2BHDDV	2230071150	0.55	4.34	3.01	3.1	25.3	20.2
	LHDDV	2230072150	2.99	22.92	16.18	16.8	133.4	107.9
	MHDDV	2230073150	4.05	49.96	16.14	21.3	246.1	84.8
HHDDV	2230074150	7.62	154.98	37.28	40.2	763.3	195.9	
BUSES	2230075150	0.70	12.13	3.43	3.7	59.8	18.0	
Rural Major Collector	LDGV	2201001170	6.09	20.58	114.00	35.1	118.4	768.8
	LDGT1	2201020170	6.68	27.02	128.40	38.8	153.4	851.6
	LDGT2	2201040170	3.44	13.92	66.14	20.0	79.0	438.7
	HDGV	2201070170	1.21	5.78	24.46	7.0	30.7	149.3
	MC	2201080170	3.83	1.99	33.80	20.7	9.9	179.9
	LDDV	2230001170	0.01	0.18	0.08	0.1	1.1	0.5
	LDDT	2230060170	0.23	1.82	1.28	1.3	10.6	8.5
	2BHDDV	2230071170	0.10	0.81	0.56	0.6	4.7	3.8
	LHDDV	2230072170	0.56	4.27	3.01	3.1	24.9	20.1
	MHDDV	2230073170	0.76	9.31	3.01	4.0	45.9	15.8
HHDDV	2230074170	1.42	28.89	6.95	7.5	142.3	36.5	
BUSES	2230075170	0.13	2.26	0.64	0.7	11.1	3.4	

Table 5.2–3. Annual and ozone season-day onroad mobile source emissions by facility type and vehicle class in Maricopa County (continued).

Facility Type	Vehicle Class	SCC	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
			VOC	NO _x	CO	VOC	NO _x	CO
Rural Minor Collector	LDGV	2201001190	1.41	4.76	26.39	8.1	27.4	178.0
	LDGT1	2201020190	1.55	6.26	29.73	9.0	35.5	197.1
	LDGT2	2201040190	0.80	3.22	15.31	4.6	18.3	101.6
	HDGV	2201070190	0.28	1.34	5.66	1.6	7.1	34.6
	MC	2201080190	0.89	0.46	7.83	4.8	2.3	41.7
	LDDV	2230001190	0.00	0.04	0.02	0.0	0.2	0.1
	LDDT	2230060190	0.05	0.42	0.30	0.3	2.5	2.0
	2BHDDV	2230071190	0.02	0.19	0.13	0.1	1.1	0.9
	LHDDV	2230072190	0.13	0.99	0.70	0.7	5.8	4.7
	MHDDV	2230073190	0.17	2.16	0.70	0.9	10.6	3.7
HHDDV	2230074190	0.33	6.69	1.61	1.7	32.9	8.5	
BUSES	2230075190	0.03	0.52	0.15	0.2	2.6	0.8	
Rural Local	LDGV	2201001210	14.74	49.77	275.73	85.0	286.5	1,859.5
	LDGT1	2201020210	16.15	65.35	310.54	93.9	371.1	2,059.6
	LDGT2	2201040210	8.32	33.67	159.98	48.4	191.2	1,061.0
	HDGV	2201070210	2.93	13.97	59.17	16.8	74.3	361.1
	MC	2201080210	9.27	4.81	81.75	50.2	24.0	435.1
	LDDV	2230001210	0.03	0.45	0.19	0.1	2.6	1.2
	LDDT	2230060210	0.57	4.40	3.09	3.2	25.7	20.6
	2BHDDV	2230071210	0.25	1.96	1.36	1.4	11.4	9.1
	LHDDV	2230072210	1.35	10.33	7.29	7.6	60.1	48.7
	MHDDV	2230073210	1.83	22.52	7.28	9.6	110.9	38.2
HHDDV	2230074210	3.43	69.87	16.81	18.1	344.1	88.3	
BUSES	2230075210	0.31	5.47	1.55	1.7	26.9	8.1	
Urban Interstate	LDGV	2201001230	321.75	1,147.02	8,736.08	1,863.8	6,328.9	59,952.7
	LDGT1	2201020230	398.95	1,645.13	10,050.63	2,327.9	8,971.4	67,690.5
	LDGT2	2201040230	205.52	847.49	5,177.59	1,199.2	4,621.6	34,870.8
	HDGV	2201070230	129.18	613.34	2,887.04	734.1	3,105.0	16,939.0
	MC	2201080230	131.85	75.30	1,270.33	715.0	375.0	6,761.5
	LDDV	2230001230	0.55	8.99	4.69	3.1	50.4	31.5
	LDDT	2230060230	13.33	105.63	73.26	75.1	590.3	495.6
	2BHDDV	2230071230	5.82	46.83	32.15	32.9	262.1	218.0
	LHDDV	2230072230	31.79	248.83	173.43	179.1	1,388.4	1,170.7
	MHDDV	2230073230	96.93	1,361.53	391.49	510.7	6,696.0	2,056.8
HHDDV	2230074230	179.94	3,879.33	884.45	949.8	19,079.9	4,646.8	
BUSES	2230075230	14.81	281.59	75.68	78.0	1,385.0	397.6	
Urban Freeway and Express- way	LDGV	2201001250	337.58	1,203.43	9,165.73	1,955.5	6,640.2	62,901.2
	LDGT1	2201020250	418.57	1,726.04	10,544.93	2,442.3	9,412.6	71,019.7
	LDGT2	2201040250	215.63	889.17	5,432.23	1,258.2	4,848.9	36,585.8
	HDGV	2201070250	135.53	643.51	3,029.03	770.2	3,257.7	17,772.0
	MC	2201080250	138.33	79.00	1,332.81	750.1	393.4	7,094.0
	LDDV	2230001250	0.58	9.43	4.92	3.2	52.9	33.1
	LDDT	2230060250	13.98	110.83	76.86	78.8	619.4	519.9
	2BHDDV	2230071250	6.11	49.13	33.73	34.5	275.0	228.7
	LHDDV	2230072250	33.36	261.06	181.96	187.9	1,456.7	1,228.3
	MHDDV	2230073250	101.70	1,428.49	410.75	535.8	7,025.3	2,158.0
HHDDV	2230074250	188.78	4,070.12	927.95	996.5	20,018.3	4,875.3	
BUSES	2230075250	15.54	295.43	79.40	81.9	1,453.1	417.2	

Table 5.2–3. Annual and ozone season-day onroad mobile source emissions by facility type and vehicle class in Maricopa County (continued).

Facility Type	Vehicle Class	SCC	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
			VOC	NOx	CO	VOC	NOx	CO
Urban Principal Arterial	LDGV	2201001270	887.40	2,518.28	15,177.93	5,093.7	14,946.0	101,100.4
	LDGT1	2201020270	740.73	2,323.35	12,173.14	4,288.1	13,611.0	79,607.5
	LDGT2	2201040270	381.59	1,196.87	6,271.01	2,209.0	7,011.7	41,009.9
	HDGV	2201070270	163.87	541.20	2,685.49	932.4	2,910.9	15,968.7
	MC	2201080270	372.91	123.95	2,445.17	2,014.6	618.5	13,014.7
	LDDV	2230001270	1.53	25.46	10.92	8.5	153.6	71.0
	LDDT	2230060270	25.87	207.85	146.31	144.6	1,256.8	962.1
	2BHDDV	2230071270	11.30	92.40	64.13	63.2	559.6	422.5
	LHDDV	2230072270	61.76	489.28	346.88	345.0	2,953.3	2,276.6
	MHDDV	2230073270	102.21	1,151.68	373.34	538.2	5,671.2	1,961.2
HHDDV	2230074270	172.44	3,077.56	801.69	909.6	15,155.6	4,211.4	
BUSES	2230075270	14.77	236.81	68.89	77.8	1,166.2	361.9	
Urban Minor Arterial	LDGV	2201001290	451.06	1,280.03	7,714.88	2,589.1	7,597.0	51,389.0
	LDGT1	2201020290	376.51	1,180.95	6,187.56	2,179.6	6,918.4	40,464.2
	LDGT2	2201040290	193.96	608.37	3,187.53	1,122.8	3,564.0	20,845.2
	HDGV	2201070290	83.30	275.09	1,365.02	473.9	1,479.6	8,116.9
	MC	2201080290	189.55	63.00	1,242.87	1,024.0	314.4	6,615.3
	LDDV	2230001290	0.78	12.94	5.55	4.3	78.1	36.1
	LDDT	2230060290	13.15	105.65	74.37	73.5	638.8	489.0
	2BHDDV	2230071290	5.74	46.97	32.60	32.1	284.5	214.8
	LHDDV	2230072290	31.39	248.70	176.32	175.4	1,501.2	1,157.2
	MHDDV	2230073290	51.95	585.39	189.77	273.6	2,882.6	996.9
HHDDV	2230074290	87.65	1,564.31	407.50	462.3	7,703.5	2,140.7	
BUSES	2230075290	7.51	120.37	35.02	39.5	592.8	184.0	
Urban Collector	LDGV	2201001310	88.09	249.98	1,506.66	505.6	1,483.6	10,035.9
	LDGT1	2201020310	73.53	230.63	1,208.39	425.7	1,351.1	7,902.4
	LDGT2	2201040310	37.88	118.81	622.50	219.3	696.0	4,070.9
	HDGV	2201070310	16.27	53.72	266.58	92.6	289.0	1,585.2
	MC	2201080310	37.02	12.30	242.72	200.0	61.4	1,291.9
	LDDV	2230001310	0.15	2.53	1.08	0.8	15.2	7.1
	LDDT	2230060310	2.57	20.63	14.52	14.4	124.8	95.5
	2BHDDV	2230071310	1.12	9.17	6.37	6.3	55.6	41.9
	LHDDV	2230072310	6.13	48.57	34.43	34.3	293.2	226.0
	MHDDV	2230073310	10.15	114.32	37.06	53.4	563.0	194.7
HHDDV	2230074310	17.12	305.50	79.58	90.3	1,504.4	418.1	
BUSES	2230075310	1.47	23.51	6.84	7.7	115.8	35.9	
Urban Local	LDGV	2201001330	425.21	1,206.67	7,272.74	2,440.7	7,161.6	48,443.8
	LDGT1	2201020330	354.93	1,113.27	5,832.94	2,054.7	6,521.9	38,145.1
	LDGT2	2201040330	182.84	573.50	3,004.85	1,058.5	3,359.8	19,650.5
	HDGV	2201070330	78.52	259.32	1,286.79	446.8	1,394.8	7,651.6
	MC	2201080330	178.68	59.39	1,171.64	965.3	296.4	6,236.2
	LDDV	2230001330	0.73	12.20	5.23	4.1	73.6	34.0
	LDDT	2230060330	12.40	99.59	70.11	69.3	602.2	461.0
	2BHDDV	2230071330	5.41	44.27	30.73	30.3	268.2	202.5
	LHDDV	2230072330	29.59	234.45	166.21	165.3	1,415.1	1,090.9
	MHDDV	2230073330	48.97	551.84	178.89	257.9	2,717.4	939.8
HHDDV	2230074330	82.63	1,474.66	384.14	435.8	7,262.0	2,018.0	
BUSES	2230075330	7.08	113.47	33.01	37.3	558.8	173.4	

Table 5.2–3. Annual and ozone season-day onroad mobile source emissions by facility type and vehicle class in Maricopa County (continued).

Facility Type	Vehicle Class	SCC	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
			VOC	NO _x	CO	VOC	NO _x	CO
	LDGV	2201001000	9,343.57	4,398.52	42,913.45	60,666.2	23,621.4	182,460.8
	LDGT1	2201020000	2,565.00	1,457.16	19,206.53	16,298.8	7,918.2	95,359.0
	LDGT2	2201040000	1,321.36	750.66	9,894.27	8,396.3	4,079.0	49,124.2
	HDGV	2201070000	369.74	215.64	4,033.93	2,320.0	1,174.6	20,862.9
	MC	2201080000	539.75	2.40	82.65	4,215.5	9.7	205.7
Off-	LDDV	2230001000	6.44	27.47	24.90	22.3	120.1	130.6
Network	LDDT	2230060000	3.29	26.39	16.79	7.6	119.8	87.2
	2BHDDV	2230071000	1.41	11.57	7.30	3.2	52.5	37.9
	LHDDV	2230072000	7.74	61.88	38.74	17.6	281.0	201.1
	MHDDV	2230073000	26.03	153.86	192.53	120.6	666.0	1,033.9
	HHDDV	2230074000	448.68	2,863.21	1,186.93	2,336.0	13,033.7	6,262.1
	BUSES	2230075000	1.62	4.42	95.35	0.1	0.0	518.1

5.3 Summary of ozone precursor emissions from onroad mobile sources

Tables 5.3–1 and 5.3–2 show the annual and ozone season-day onroad mobile source emissions by facility type in the eight-hour ozone nonattainment area and Maricopa County, respectively.

Table 5.3–1. Annual and ozone season-day onroad mobile source emissions by facility type in the eight-hour ozone NAA.

Facility Type	Annual emissions (tons/year)			Season-day emissions (lbs/day)			
	VOC	NOx	CO	VOC	NOx	CO	
Rural	Interstate	167.77	1,367.91	3,404.10	954.6	7,016.5	22,555.8
	Principal Arterial	73.98	344.03	1,159.12	419.8	1,865.0	7,512.3
	Minor Arterial	71.88	334.28	1,126.36	408.1	1,812.1	7,300.1
	Major Collector	13.39	62.30	209.96	76.1	337.7	1,360.6
	Minor Collector	3.12	14.42	48.60	17.8	78.3	314.9
	Local	32.41	150.69	507.76	183.8	816.9	3,290.7
Urban	Interstate	1,492.06	9,956.16	28,989.94	8,452.2	51,306.2	190,213.1
	Freeway/Expressway	1,565.43	10,445.81	30,415.67	8,867.9	53,829.6	199,567.7
	Principal Arterial	2,866.48	11,677.55	39,579.44	16,229.6	64,386.0	254,620.3
	Minor Arterial	1,457.02	5,935.65	20,118.06	8,249.4	32,727.3	129,422.4
	Collector	284.55	1,159.19	3,928.92	1,610.9	6,391.4	25,275.2
	Local	1,373.52	5,595.47	18,965.08	7,776.6	30,851.4	122,005.2
Off-network	14,708.43	9,818.36	78,128.19	94,939.4	50,405.3	358,241.9	
Total	24,110.04	56,861.82	226,581.20	148,186.2	301,823.7	1,321,680.2	

Table 5.3–2. Annual and ozone season-day onroad mobile source emissions by facility type in Maricopa County.

Facility Type	Annual emissions (tons/year)			Season-day emissions (lbs/day)			
	VOC	NOx	CO	VOC	NOx	CO	
Rural	Interstate	303.00	2,563.08	6,211.93	1,725.5	13,143.7	41,242.5
	Principal Arterial	135.11	645.04	2,111.01	767.0	3,490.2	13,675.3
	Minor Arterial	131.28	626.78	2,051.32	745.3	3,391.5	13,288.9
	Major Collector	24.46	116.83	382.33	138.9	632.0	2,476.9
	Minor Collector	5.66	27.05	88.53	32.0	146.3	573.7
	Local	59.18	282.57	924.74	336.0	1,528.8	5,990.5
Urban	Interstate	1,530.42	10,261.01	29,756.82	8,668.7	52,854.0	195,231.5
	Freeway/Expressway	1,605.69	10,765.64	31,220.30	9,094.9	55,453.5	204,833.2
	Principal Arterial	2,936.38	11,984.69	40,564.90	16,624.7	66,014.4	260,967.9
	Minor Arterial	1,492.55	6,091.77	20,618.99	8,450.1	33,554.9	132,649.3
	Collector	291.50	1,189.67	4,026.73	1,650.4	6,553.1	25,905.5
	Local	1,406.99	5,742.63	19,437.28	7,966.0	31,631.8	125,046.8
Off-network	14,634.63	9,973.18	77,693.37	94,404.2	51,076.0	356,283.5	
Total	24,556.85	60,269.94	235,088.25	150,603.7	319,470.2	1,378,165.5	

Tables 5.3–3 and 5.3–4 present the same emissions by vehicle class in the eight-hour ozone nonattainment area and Maricopa County, respectively.

Table 5.3–3. Annual and ozone season-day onroad mobile source emissions by vehicle class in the eight-hour ozone NAA.

Vehicle Class	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
LDGV	11,942.21	12,157.14	93,378.25	75,668.9	68,649.4	521,757.3
LDGT1	4,997.65	9,932.44	66,509.59	30,440.7	56,125.6	408,747.3
LDGT2	2,574.55	5,116.70	34,262.49	15,681.6	28,913.2	210,566.7
HDGV	984.43	2,651.31	15,746.11	5,819.4	13,873.3	90,103.4
MC	1,609.22	425.76	7,951.01	10,016.4	2,120.7	42,083.4
LDDV	10.85	100.12	57.82	46.7	550.2	346.9
LDDT	86.04	688.92	479.65	471.5	4,022.6	3,161.3
2BHDDV	37.56	305.81	210.30	205.9	1,788.7	1,388.6
LHDDV	205.15	1,621.70	1,135.36	1,123.8	9,453.6	7,469.4
MHDDV	440.46	5,409.17	1,789.81	2,303.5	26,530.0	9,424.9
HHDDV	1,158.77	17,368.71	4,663.83	6,083.6	84,483.4	24,528.1
BUSES	63.15	1,084.04	396.98	324.2	5,313.0	2,102.9
Total	24,110.04	56,861.82	226,581.20	148,186.2	301,823.7	1,321,680.2

Table 5.3–4. Annual and ozone season-day onroad mobile source emissions by vehicle class in Maricopa County.

Vehicle Class	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
LDGV	11,985.06	12,469.79	95,292.09	75,868.1	70,411.7	535,379.4
LDGT1	5,125.88	10,544.57	69,728.72	31,170.0	59,506.6	430,578.7
LDGT2	2,640.60	5,432.05	35,920.83	16,057.2	30,654.8	221,813.1
HDGV	1,015.54	2,804.70	16,447.69	5,995.1	14,668.3	94,367.6
MC	1,655.00	451.74	8,402.31	10,247.0	2,250.3	44,488.1
LDDV	10.99	102.95	59.03	47.5	566.4	354.9
LDDT	91.14	730.13	507.92	500.2	4,256.8	3,351.0
2BHDDV	39.77	324.10	222.70	218.7	1,892.8	1,472.4
LHDDV	217.34	1,718.77	1,202.24	1,192.3	10,004.6	7,918.3
MHDDV	466.15	5,763.97	1,890.88	2,438.8	28,272.7	9,956.3
HHDDV	1,242.98	18,784.48	5,001.56	6,527.4	91,383.2	26,302.6
BUSES	66.40	1,142.69	412.28	341.4	5,602.0	2,183.1
Total	24,556.85	60,269.94	235,088.25	150,603.7	319,470.2	1,378,165.5

Table 5.3–5 summarizes annual and ozone season-day emissions for VOC, NO_x, and CO from all onroad mobile sources in the eight-hour ozone nonattainment area and Maricopa County in 2011.

Table 5.3–5. Annual and ozone season-day emissions from all onroad mobile sources in the eight-hour ozone NAA and Maricopa County.

	Annual emissions (tons/year)			Season-day emissions (lbs/day)		
	VOC	NO _x	CO	VOC	NO _x	CO
8-hr ozone NAA	24,110.04	56,861.82	226,581.20	148,186.2	301,823.7	1,321,680.2
Maricopa County	24,556.85	60,269.94	235,088.25	150,603.7	319,470.2	1,378,165.5

5.4 Quality assurance process

5.4.1 VMT estimates

Normal quality assurance procedures, including automated and manual consistency checks, were conducted by MAG in developing the 2011 TransCAD traffic assignment network used to generate the VMT data. The VMT estimates using the MAG travel demand model have been validated by the MAG transportation modeling group.

5.4.2 Emission estimates

The quality assurance process performed on the MOVES2010b analyses included accuracy, completeness, and reasonableness checks. For accuracy and completeness, all calculations were checked by an independent reviewer. Any errors found were corrected and the corrections were then rechecked by the reviewer.

5.4.3 Draft emissions inventory for ozone precursors

The draft onroad mobile source portion of the 2011 periodic emissions inventory for ozone precursors was reviewed using published EPA quality review guidelines for base year emissions inventories (EPA, 1992b). The procedure review (Levels I, II, and III) included checks for completeness, consistency, and the correct use of appropriate procedures.

5.5 References

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6. Biogenic Sources

6.1 Introduction

Biogenic emissions have been estimated for the 2011 Periodic Emissions Inventory for ozone precursors in Maricopa County (9,223 square miles) and the eight-hour ozone nonattainment area (NAA) (5,025 square miles). The Model of Emissions of Gases and Aerosols from Nature (MEGAN) has been used to estimate the biogenic emissions. MEGAN is a state-of-the-art biogenic emissions model developed by the National Center for Atmospheric Research (NCAR). Some important corrections and improvements were made in the latest version of MEGAN2.1 (Guenther et al, 2012; Jiang et al, 2011) compared to previous versions (Guenther, 2006a, 2006b, and 2007; Guenther et al, 2006). The most important change is that higher temporal and spatial resolution of land use and land cover data for MEGAN input has become available. MEGAN, with the vegetation data released in 2011, was applied to compute biogenic emissions in Maricopa County and the eight-hour ozone nonattainment area. Estimated emissions for volatile organic compounds (VOC), carbon monoxide (CO), and nitrogen oxides (NO_x) are included in this biogenic emissions inventory. The MEGAN runs were executed by the Maricopa Association of Governments. The contact person for the MEGAN emission estimates is Feng Liu (602-254-6300).

6.2 Modeling domain

As a numerical model, the MEGAN inputs and outputs are given in user-defined two-dimensional grid cells. To develop biogenic emissions for the 2011 Periodic Emissions Inventory for ozone precursors, the 4-km modeling domain that covers the entire area of Maricopa County were employed. The target area is the eight-hour ozone nonattainment area within the County. The definition of the domain in the Lambert Conformal Conic Projection (LCP) coordinate system is presented in Table 6.2–1. Since MEGAN estimates biogenic emissions for the entire modeling domain rather than specific areas, additional input files, masking areas covered by the eight-hour ozone nonattainment area and Maricopa County, were developed by applying Geographic Information Systems (GIS) to calculate emissions for those two target areas. In order to represent the target area, the masking file assigns 1.0 for the grid cells fully covered by the target area, a fractional value for grid cells partially covered by the target area, and 0.0 for grid cells outside the target area. As shown in Figure 6.3–1, biogenic emissions for the eight-hour ozone nonattainment area and Maricopa County were extracted from MEGAN runs for the masked grid cells in the 4-km modeling domain.

Table 6.2–1. Two modeling domains defined in the LCP coordinate system.

Grid Horizontal Resolution	Grid Size	LCP Range (km)	Target Area
4-km	65 by 65	(–131.4713, –129.4593) to (127.9845, 131.1945)	Eight-hour ozone NAA and Maricopa County

6.3 Input data

To calculate biogenic emissions using MEGAN, the following gridded input files for land cover and meteorological data were prepared:

1. EFMAP_LAI file: This file provides emission factors (EF) for 20 MEGAN species including NO_x, CO and VOC, and 8-day average leaf index (LAI) for year 2011 in each grid cell.
2. PFTF file: This input file gives percentage of four plant function types (PFT) including broadleaf trees (BT), needle leaf trees (NT), grass and crops (HB) and shrubs (SB) for each model domain grid location.
3. METCRO2D file: This file contains meteorological parameters including temperature, short wave radiation, wind speed, humidity and soil moisture for each grid.

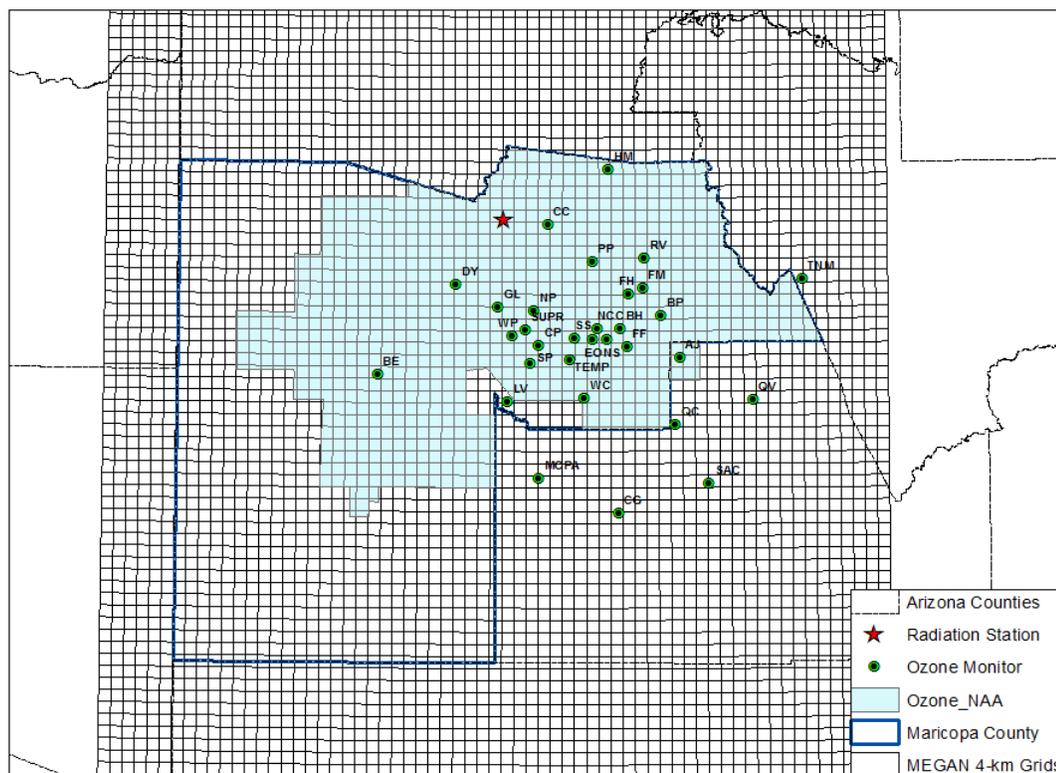


Figure 6.3–1. The masked grid cells in the 4-km modeling domain.

6.3.1 Land cover data

The land cover data, including the 8-day averaged LAI input files for North America for years 2003 to 2011 based on NASA MODIS data, monthly mean PFT, and EF, are provided by the EFMAP_LAI and PFTF files. These input data were derived from the MEGAN land cover database available at the resolution of 30 seconds latitude by 30 seconds longitude (1x1 km²) in netCDF format (<http://acd.ucar.edu/~guenther/MEGAN/MEGAN.htm>).

6.3.2 Weather data

The weather data used by MEGAN are temperature, downward short wave radiation, wind speed, humidity and soil moisture. The Measurement and Instrumentation Data Center (MIDC) collects irradiance and meteorological data from nation-wide stations. One of those stations is located in northern Phoenix (33.83°N, 112.17°W, see red star in Figure 6.3–1) and is operated by the National Renewable Energy Laboratory (NREL). The archived hourly temperature, wind speed, humidity and radiation data from this site are available to the public. Monthly mean

diurnal cycles of the weather parameters were calculated based on hourly data for the year 2011, and a netCDF file representing 24-hour data for each month was prepared for MEGAN inputs. Biogenic emissions of VOC, NO_x, and CO are first governed by temperature and then highly dependent on downward short wave radiation. Figure 6.3–2 shows monthly mean (left panel) and annual mean diurnal cycle (right panel) of temperature. Figure 6.3–3 illustrates monthly averaged and annual mean diurnal cycle of short wave radiation. The maximum monthly temperature was recorded in August, while the highest radiation was observed in June. The maximum monthly temperature appeared two months later than the highest radiation. The peak hourly temperature was observed around 4:00 – 6:00 pm and lagged three hours behind the peak radiation. The delay is due to the fact that heating of the air occurs not from the sun’s rays, but from heating of the earth and infrared radiation leaving the ground in the form of heat. As a result, maximum seasonal emission rates appear in the summer. The highest hourly emission rates take place in the afternoon because the emission rates are positively related to both temperature and short wave radiation (Guenther et al., 2006, 2012). The maximum monthly VOC, NO_x, and CO biogenic emission rates would be expected to occur in the same month as the maximum temperature.

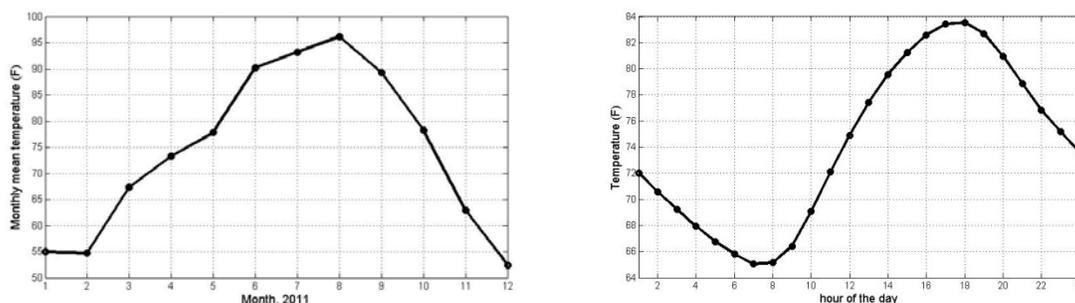


Figure 6.3–2. Monthly averaged temperature (left panel) and annual mean diurnal cycle of temperature (right panel) in 2011.

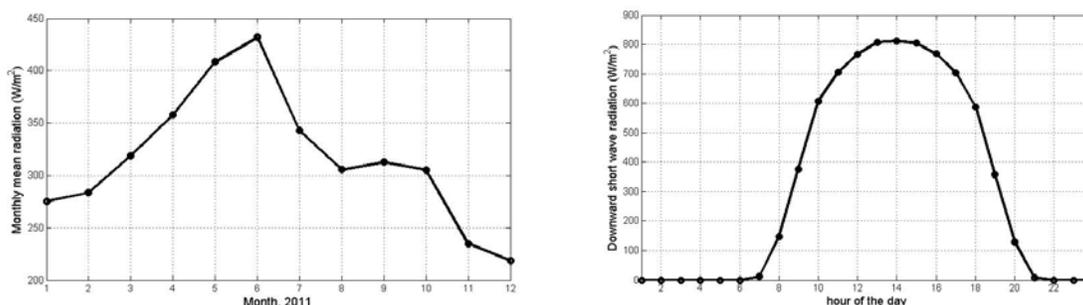


Figure 6.3–3. Monthly averaged radiation (left panel) and annual mean diurnal cycle of radiation (right panel) in 2011.

6.4 Emission estimation

MEGAN runs for the modeling domain provide hourly emission outputs for the year 2011. Figure 6.4–1 illustrates isoprene (ISOP), a major contributor to VOCs, and NO_x emission rates simulated by MEGAN at 17:00 MST in August, 2011. The high ISOP emissions occur in northeastern portion. The high NO_x emissions appear at the central part of Maricopa County and southeastern portion. Daily mean emissions for each month in 2011 are derived by using the hourly outputs for each month. In addition, monthly total emissions were obtained by multiplying the daily mean emissions for each month by the number of days in the month. The

daily mean emissions for the 12 months in 2011 are shown in Tables 6.4–1 and 6.4–2 for the eight-hour ozone nonattainment area and Maricopa County, respectively.

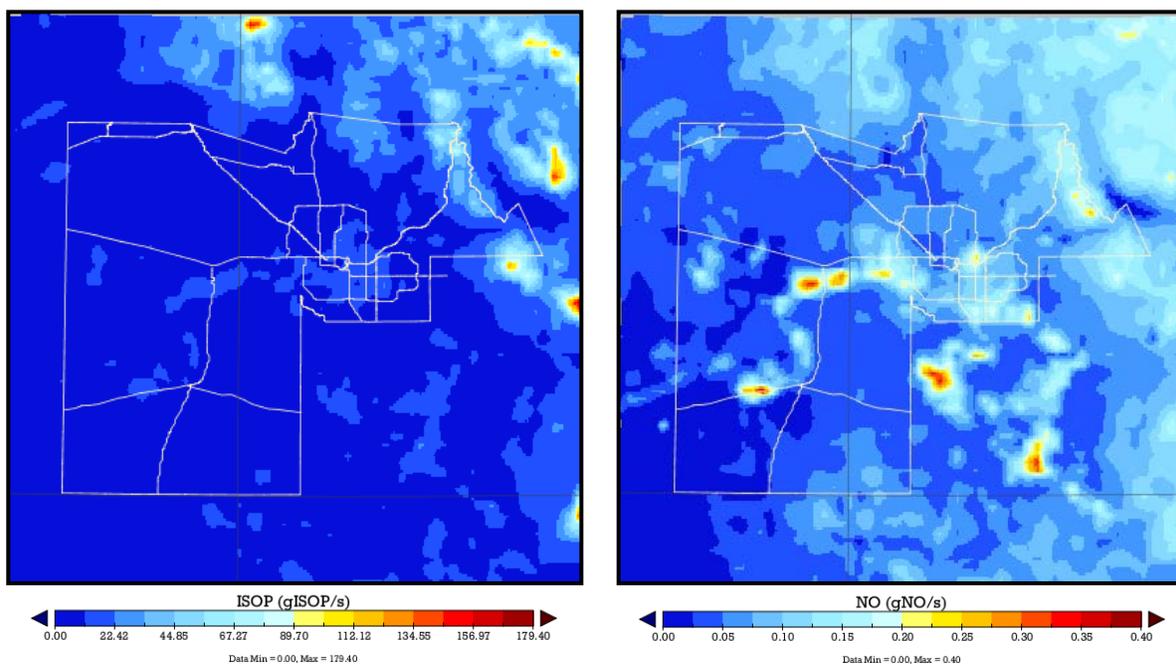


Figure 6.4–1. Estimated emission rates of ISOP (left panel) and NO_x (right panel) at 17:00 MST, August 2011 by MEGAN model.

Table 6.4–1. Daily mean biogenic emissions for each month in the eight-hour ozone NAA.

Month	VOC		NO _x		CO	
	kg/day	lbs/day	kg/day	lbs/day	kg/day	lbs/day
January	15,264.7	33,652.9	210.5	464.1	2,950.2	6,504.1
February	35,341.7	77,915.0	351.6	775.1	5,262.4	11,601.6
March	73,407.4	161,835.4	796.7	1,756.4	10,665.2	23,512.7
April	97,461.1	214,864.7	910.5	2,007.3	11,966.6	26,381.8
May	139,906.1	308,439.8	1,113.0	2,453.7	14,937.6	32,931.7
June	313,026.5	690,104.5	2,308.4	5,089.1	27,998.8	61,726.7
July	314,669.0	693,725.6	2,855.0	6,294.2	29,982.6	66,100.2
August	326,736.8	720,330.5	3,415.3	7,529.4	32,557.0	71,775.8
September	208,257.6	459,128.9	2,209.6	4,871.3	22,623.7	49,876.7
October	86,989.6	191,779.0	994.4	2,192.3	11,389.6	25,109.7
November	20,395.5	44,964.3	309.9	683.2	3,687.5	8,129.5
December	11,230.4	24,758.8	171.8	378.8	2,295.1	5,059.8

Table 6.4–2. Daily mean biogenic emissions for each month in Maricopa County.

Month	VOC		NO _x		CO	
	kg/day	lbs/day	kg/day	lbs/day	kg/day	lbs/day
January	23,123.3	50,978.1	316.3	697.3	5,654.4	12,465.8
February	53,015.2	116,878.4	524.0	1,155.2	9,971.5	21,983.4
March	104,165.5	229,645.3	1,152.6	2,541.0	19,383.1	42,732.4
April	139,181.0	306,841.2	1,330.8	2,933.9	22,591.4	49,805.5
May	200,913.3	442,937.5	1,641.2	3,618.2	28,869.2	63,645.6
June	451,990.3	996,466.9	3,432.5	7,567.4	55,292.2	121,898.3
July	451,204.3	994,734.0	4,207.9	9,276.8	58,566.5	129,116.9
August	467,398.8	1,030,436.7	5,031.7	11,093.0	63,445.8	139,873.9
September	300,464.1	662,409.2	3,278.2	7,227.2	44,256.1	97,567.9
October	129,711.0	285,963.5	1,506.4	3,321.0	23,713.3	52,278.8
November	30,063.3	66,278.2	462.5	1,019.6	7,101.2	15,655.4
December	16,413.2	36,184.9	252.8	557.3	4,255.2	9,381.1

Monthly mean emissions for Maricopa County and the eight-hour ozone nonattainment area are illustrated in Figure 6.4–2. Monthly emission values for the eight-hour ozone nonattainment area and Maricopa County are presented in Tables 6.4–3 and 6.4–4, respectively. It can be seen that the maximum monthly VOC, NO_x, and CO emissions took place in August, because monthly mean temperatures reached the maximum levels in this month.

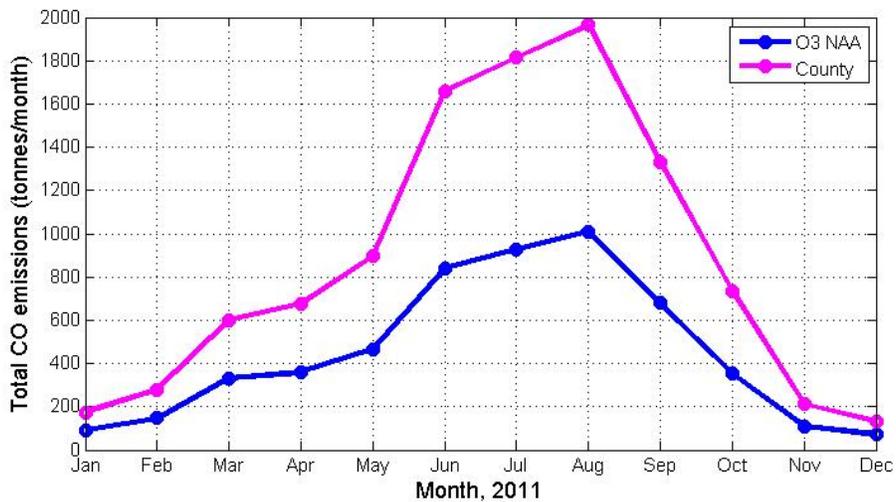
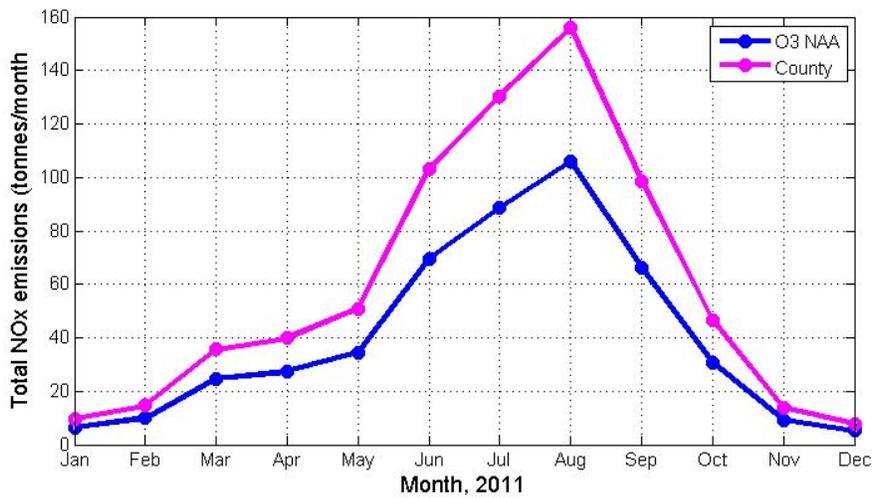
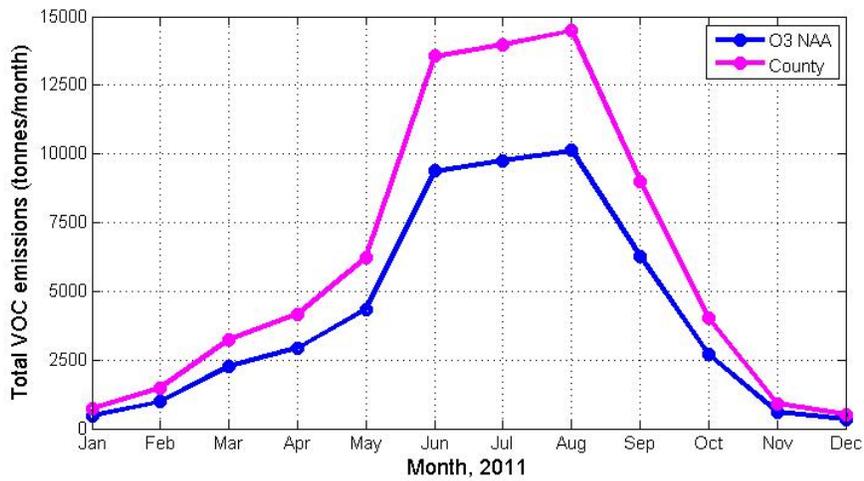


Figure 6.4–2. Monthly emissions of VOC (top), NO_x (middle) and CO (bottom) in Maricopa County (pink solid line, abbreviated as “County”) and the eight-hour ozone NAA (blue solid line, abbreviated as “O3 NAA”).

Table 6.4-3. Monthly biogenic emissions in the eight-hour ozone NAA.

Month	VOC		NO _x		CO	
	Metric tons	Short tons	Metric tons	Short tons	Metric tons	Short tons
January	473.21	521.62	6.53	7.19	91.46	100.81
February	989.57	1,090.81	9.84	10.85	147.35	162.42
March	2,275.63	2,508.45	24.70	27.22	330.62	364.45
April	2,923.83	3,222.97	27.32	30.11	359.00	395.73
May	4,337.09	4,780.82	34.50	38.03	463.07	510.44
June	9,390.80	10,351.57	69.25	76.34	839.96	925.90
July	9,754.74	10,752.75	88.51	97.56	929.46	1,024.55
August	10,128.84	11,165.12	105.87	116.71	1,009.27	1,112.53
September	6,247.73	6,886.93	66.29	73.07	678.71	748.15
October	2,696.68	2,972.57	30.83	33.98	353.08	389.20
November	611.87	674.46	9.30	10.25	110.63	121.94
December	348.14	383.76	5.33	5.87	71.15	78.43

Table 6.4-4. Monthly biogenic emissions in Maricopa County.

Month	VOC		NO _x		CO	
	Metric tons	Short tons	Metric tons	Short tons	Metric tons	Short tons
January	716.82	790.16	9.81	10.81	175.29	193.22
February	1,484.43	1,636.30	14.67	16.17	279.20	307.77
March	3,229.13	3,559.50	35.73	39.39	600.88	662.35
April	4,175.43	4,602.62	39.92	44.01	677.74	747.08
May	6,228.31	6,865.53	50.88	56.08	894.95	986.51
June	13,559.71	14,947.00	102.98	113.51	1,658.77	1,828.47
July	13,987.33	15,418.38	130.44	143.79	1,815.56	2,001.31
August	14,489.36	15,971.77	155.98	171.94	1,966.82	2,168.05
September	9,013.92	9,936.14	98.35	108.41	1,327.68	1,463.52
October	4,021.04	4,432.43	46.70	51.48	735.11	810.32
November	901.90	994.17	13.88	15.29	213.04	234.83
December	508.81	560.87	7.84	8.64	131.91	145.41

6.5 Summary of biogenic source emissions

Ozone season daily emissions for Maricopa County and the eight-hour ozone nonattainment area in 2011 are shown in Table 6.5-1. Annual emissions for Maricopa County and the eight-hour ozone nonattainment area in 2011 are summarized in Table 6.5-2. Emissions of VOC, NO_x, and CO all decreased in 2011 compared to MEGAN results for PEI 2008. Due to the incorporation of land cover data that are more characteristic of plants located in the desert southwest, as well as improvements to the MEGAN model, the 2011 data shown in Tables 6.5-1 and 6.5-2 represent a substantial improvement over previous biogenic emission estimates for Maricopa County and the eight-hour ozone NAA.

Table 6.5–1. Season-day biogenic emissions.

Area	VOC		NO _x		CO	
	kg/day	lbs/day	kg/day	lbs/day	kg/day	lbs/day
Maricopa County	406,355.7	895,860.0	4,172.6	9,199.0	55,422.8	122,186.2
8-hr ozone NAA	283,221.1	624,395.0	2,826.6	6,231.7	28,387.8	62,584.2

Table 6.5–2. Annual biogenic emissions.

Area	VOC		NO _x		CO	
	tonnes [*] /yr	tons [*] /yr	tonnes/yr	tons/yr	tonnes/yr	tons/yr
Maricopa County	72,316.20	79,714.87	707.17	779.52	10,476.94	11,548.84
8-hr ozone NAA	50,178.11	55,311.84	478.25	527.18	5,383.74	5,934.55

* "Tonne" denotes metric ton, and "ton" denotes short (or English) ton

6.6 References

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Maricopa County
Air Quality Department

INSTRUCTIONS

FOR REPORTING 2011

ANNUAL AIR POLLUTION EMISSIONS

February 2012

**Emissions Inventory Unit
1001 North Central Avenue, Suite 125
Phoenix, Arizona 85004
Phone: (602) 506-6790
Fax: (602) 506-6179
Email: *EmisInv@mail.maricopa.gov***

**Copies of this document, related forms,
and other reference materials are available online at our web site:
http://www.maricopa.gov/aq/divisions/planning_analysis/emissions_inventory/Default.aspx**

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WHAT'S NEW FOR 2011?

Reporting forms:

- Emission factors for PM-10 for several processes typically found at sand and gravel facilities and/or concrete batch plants, have been revised. The new values are lower than the previous EPA default emission factors, and reflect the more stringent moisture-content requirements required by Maricopa County Rule 316 (Nonmetallic Mineral Processing).
- Some **preprinted information** on your report may be different from last year's version. Please review the enclosed forms carefully, and verify all preprinted information.
- Many of our reporting forms **have changed** in past years. If you develop your own forms, or a computerized reproduction of our forms, the forms used **MUST** conform to the current information requirements and **FORMAT** as supplied on our preprinted forms. "Homemade" reporting forms that vary significantly from the preprinted forms sent to you will **not** be accepted.
- Please **VERIFY THOROUGHLY** that the information you provide on all reporting forms match the information presented on the preprinted forms from MCAQD.

Miscellaneous:

- **Non-operational facilities:** Any facility that has been issued an air quality permit, but that did NOT operate at any time during 2011, must still respond in writing to this request for annual emissions information, as a condition of its air quality permit. Please provide ALL information requested on both the "Business Form" and the "Data Certification Form", and submit these forms, along with a letter certifying that there were no operations at the facility during calendar year 2011, by the due date shown on the Business Form.
- **Emissions fees for Title V facilities:** In accordance with Maricopa County Air Pollution Control Rule 280 (Fees), the 2011 annual emission fee for Title V sources is \$39.83/ton. **NOTE:** Only emissions from Title V sources (those whose air quality permit numbers have a "V" prefix) are subject to this annual emissions fee.

I. INTRODUCTION

An annual emissions inventory is a document submitted by a business that: (1) lists all processes emitting reportable air pollutants and (2) provides details about each of those processes. Submitting the emissions inventory report is **required** as a condition of your Maricopa County Air Quality Permit. A separate emissions report is required for each business location with its own air quality permit.

Follow these steps to complete your 2011 Maricopa County emissions inventory:

STEP 1: Determine which forms are needed for your business. There are eight different forms available, but not all are required for every type of business. For most permitted sources, the packet you received from us contains the necessary preprinted forms based on your site's most recent emissions inventory.

1. **Business Form:** Contains general contact information about the permitted site. This form is required for all businesses.
2. **Stack Form:** Only required if your business location annually emits over 10 tons of a single pollutant (CO, VOC, NO_x, PM₁₀, or SO_x). A "stack" is defined as a stack, pipe, vent or opening through which a significant percentage of emissions (from one or more processes) are released into the atmosphere. See the "Stack Form Instructions" on page 9 for specific requirements.
3. **Control Device Form:** Required only if there is one or more emission control devices used at the business location.
4. **General Process Form** and
5. **Evaporative Process Form:** } Either or both will be required for all businesses.
6. **Off-Site Recycling/Disposal Form:** Required if you want to claim off-site recycling or disposal.
7. **Emission Factor Calculations:** Required as attachment for each process for which you calculated your own emission factors.
8. **Data Certification Form or Data Certification/Fee Calculation Form:** Only sources with a **Title V** (permit number would start with "V") permit are required to pay a fee for their emissions and need to use the Data Certification/Fee Calculation Form. All other sources use the Data Certification Form.

STEP 2: Complete the applicable forms. Verify all preprinted information, and make corrections where necessary. When making corrections, strike out the preprinted data and write in corrections beside it. Please make all changes readily noticeable. Detailed information on how to complete the most common forms is included in this document. The packet you received also contains information about other resources (workshops, one-on-one assistance, etc.) available to help you in completing the necessary forms.

STEP 3: Make a copy of your completed emissions inventory report. Make sure to **KEEP COPIES** of all forms submitted and copies of all records and calculations used in completing the forms. Air pollution control regulations require that you keep all documentation for at least **FIVE YEARS** at the location where pollution is being emitted.

STEP 4: Make sure the Data Certification Form (or Data Certification/Fee Calculation Form for Title V sources) is **signed** by a company representative. **Include your air quality permit number on all correspondence and applicable checks submitted with your report.** Return the **original**, signed copy of your annual emission report, with payment for any applicable emission fees to:

Maricopa County Air Quality Department
Emissions Inventory Unit
1001 North Central Avenue, Suite 125
Phoenix, AZ 85004

II. REPORTING REQUIREMENTS

POLLUTANTS TO BE REPORTED:

Your emissions inventory must include your business's emissions of the following air pollutants:

- CO = Carbon monoxide
- NO_x = Nitrogen oxides
- PM₁₀ = Particulate matter less than 10 microns
- SO_x = Sulfur oxides
- VOC = Volatile organic compounds *
- HAP&NON = Hazardous Air Pollutant (HAP) that is also NOT a volatile organic compound (VOC)**
- NH_x = Ammonia and ammonium compounds
- Pb = Lead

* A *volatile organic compound (VOC)* is defined as any compound of carbon that participates in atmospheric photochemical reactions. This definition *excludes*: carbon monoxide, carbon dioxide, acetone, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, as well as certain other organic compounds. (See Maricopa County Air Pollution Control Rule 100, Sections 200.69 and 200.110 for a full definition.)

EPA has re-designated the chemical **t-butyl acetate (CAS Number 540-88-5)** as a VOC for record-keeping requirements and emissions reporting, but not for emission limitations or content requirements. County Rule 100, Section 200.69b states:

“The following compound(s) are VOC for purposes of all recordkeeping, emissions reporting, photochemical dispersion modeling and inventory requirements which apply to VOC and shall be uniquely identified in emission reports, but are not VOC for purposes of VOC emissions limitations or VOC content requirements: t-butyl acetate (540-88-5).”

Therefore, if your facility uses t-butyl acetate, it is necessary to report t-butyl acetate as a separate material on the evaporative process form, not as part of a grouped material (e.g., solvents, thinners, activators, etc.). T-butyl acetate will continue to be identified as a VOC on your emission report and count towards any applicable emission fees.

** **HAP&NON**: Usage of certain materials that are: (1) a Hazardous Air Pollutant (HAP) **and** (2) **not** also a VOC (that is, not also an ozone precursor) should also be reported if:

- (a) your site is subject to a Federal MACT (Maximum Achievable Control Technology) standard **or**
- (b) your air quality permit contains specific quantitative limits for HAP emissions.

The most common materials categorized as “HAP&NON” include:

- methylene chloride (dichloromethane)
- perchloroethylene
- 111-trichloroethane (111-TCA or methyl chloroform)
- hydrochloric acid
- hydrofluoric acid

NOTE: HAPs that are also considered volatile organic compounds are reported as VOC.

EMISSION CALCULATION METHOD HIERARCHY:

When preparing emission information for your report, the most accurate method for calculating **actual** emissions must be used. The hierarchy listed below outlines the preferred methods for calculating emission estimates (taken from County Rule 280, Section 305.1).

- (1) Whenever available, emissions estimates should be calculated from continuous emissions monitors certified under 40 CFR Part 75, Subpart C, or data quality assured pursuant to Appendix F of 40 CFR, Part 60.
- (2) When sufficient data obtained using the methods described in paragraph 1 is not available, emissions estimates should be calculated from source performance tests conducted pursuant to Rule 270 in Maricopa County's Air Pollution Control Rules and Regulations.
- (3) When sufficient data obtained using the methods described in paragraphs 1 or 2 is not available, emissions estimates should be calculated from material balance using engineering knowledge of the process.
- (4) When sufficient data obtained using the methods described in paragraphs 1 through 3 is not available, emissions estimates shall be calculated using emissions factors from EPA Publication No. AP-42 "Compilation of Air Pollutant Emission Factors," Volume I: Stationary Point and Area Sources.
- (5) When sufficient data obtained using the methods described in paragraphs 1 through 4 is not available, emissions estimates should be calculated by equivalent methods supported by back-up documentation that will substantiate the chosen method.

III. CONFIDENTIALITY OF DATA SUBMITTED

Information submitted in your annual emissions reports must be made available to the public unless it meets certain criteria of Arizona State Statutes and Maricopa County Rules. Applicable excerpts concerning confidentiality of data are reproduced below.

ARS § 49-487 D. ...the following information shall be available to the public:...

2. The chemical constituents, concentrations and amounts of any emission of any air contaminant. ...

MARICOPA COUNTY AIR POLLUTION CONTROL RULES AND REGULATIONS, Rule 100:

§ 200.107 TRADE SECRETS - Information to which all of the following apply:

- a. A person has taken reasonable measures to protect from disclosure and the person intends to continue to take such measures.
- b. The information is not, and has not been, reasonably obtainable without the person's consent by other persons, other than governmental bodies, by use of legitimate means, other than discovery based on a showing of special need in a judicial or quasi-judicial proceeding.
- c. No statute, including ARS §49-487, specifically requires disclosure of the information to the public.
- d. The person has satisfactorily shown that disclosure of the information is likely to cause substantial harm to the business's competitive position.

§ 402 CONFIDENTIALITY OF INFORMATION:

402.2 Any records, reports or information obtained from any person under these rules shall be available to the public ... unless a person:

- a. Precisely identifies the information in the permit(s), records, or reports which is considered confidential.
- b. Provides sufficient supporting information to allow the Control Officer to evaluate whether such information satisfies the requirements related to trade secrets as defined in Section 200.107 of this rule.

For emissions inventory information to be deemed confidential, the following steps must be followed:

- Specific data which you request be held confidential must be identified by marking an "X" in the corresponding gray confidentiality box(es) on the relevant report forms.
- Provide a written explanation which gives factual information satisfactorily describing why releasing this information could cause substantial harm to the business's competitive position.
- Use the gray-shaded boxes on the reporting forms to indicate which data are to be held confidential. Do NOT stamp "Confidential", highlight data, or otherwise mark the page.

No data can be held confidential without proper justification.

IV. HELPFUL HINTS AND INFORMATION

Be sure to verify all preprinted information on forms. If any information is incorrect or blank, please provide correct information. Making a change on the Business Form will **NOT** transfer the permit ownership or location. You must contact the Department's Small Business Assistance Program at (602) 506-5102 or the Engineering & Permitting Division at (602) 506-6094 to accomplish this.

WHAT IS A PROCESS? A *process* is a business activity at your location that emits one or more of the pollutants listed on page 3, and has only *one* material type as input and *one* operating schedule. For each applicable process at your business, you must assign a unique Process ID number to differentiate each process.

PROCESSES AND MATERIALS THAT DO NOT HAVE TO BE REPORTED:

- Welding.
- Acetone usage.
- Fuel use for forklifts or other vehicles. (NOTE: Fuel use in *non-vehicle* engines *is* reportable.)
- Soil remediation activities. (Note: Other periodic reporting requirements may exist; consult your permit.)
- Storage emissions from fuels or organic chemicals in any tank with a capacity of 250 gallons or less.
- Storage emissions of diesel and Jet A fuel in underground tanks of any size.
- Storage emissions of diesel and Jet A fuel in aboveground tanks, with throughput < 4,000,000 gal/yr.
- Routine pesticide usage, housekeeping cleaners, and routine maintenance painting at your facility.

Please group all similar equipment and materials together before applying the following limitations:

- Internal combustion engines (e.g., emergency generators) or external combustion equipment (e.g., boilers and heaters) that operated less than 100 hrs. and burned less than 200 gals. diesel or gas, or less than 100,000 cubic feet of natural gas.
- Materials with usage of less than 15 gallons or 100 pounds per year.

GROUPING MATERIALS AND/OR EQUIPMENT UNDER ONE PROCESS ID:

You can group together under one process ID:

- All internal combustion engines *less than 600 hp* if they burn the same fuel and have similar operating schedules.
- All external combustion equipment (boilers, heaters) with a capacity of *less than 10,000,000 Btu* per hour if they burn the same fuel and have similar operating schedules.
- All similar evaporative materials with similar emission factors that have similar operating schedules and process descriptions. For example, group low-VOC red paint, green paint and white paint together as one material: "Paint: Low-VOC." Do *not* group dissimilar materials together, such as thinners and paints. Attach documentation (see example, p. 20) showing how the grouped emission factor was determined.
- All underground tanks with the same fuel and same type of vapor recovery system.

ASSIGNING IDENTIFICATION NUMBERS (IDs):

Unique IDs are required for the following report elements: Stacks, Control Devices and Processes. For processes, that means a process ID number may be used only once on each General Process form and for each material reported on the Evaporative Process Forms.

These numbers are usually assigned by the person who prepares the original report. If you are adding a new item to a preprinted report, assign a number not already in use. Once an ID number is assigned, continue using the same number for that item each year. If that item is no longer reportable, mark it with 'DELETE' and return the preprinted form with a brief explanation. Do not use that ID number again.

INDUSTRY-SPECIFIC INSTRUCTIONS: Additional help sheets, detailed examples, and special instructions are available for a number of specific processes or industries listed below. To get copies of any of these documents, please call (602) 506-6790, or visit our web site at: http://www.maricopa.gov/aq/divisions/planning_analysis/emissions_inventory/Default.aspx

- Bakeries
- Concrete Batch Plants
- Fuel Storage and Handling
- Incinerators and Crematories
- Lg. Aboveground Storage Tanks
- Natural Gas Boilers/Heaters
- Polyester Resin
- Printing Plants
- Roofing Asphalt
- Sand and Gravel Plants
- Using EPA's TANKS 4.09d Program
- Vehicle Refinishing
- Vehicle Travel on Unpaved Roads
- Woodworking

COMMONLY USED CONVERSION FACTORS:

1 gram/liter	= 0.00834 lbs/gal	1 foot	= 0.0001894 mile
1 liter	= 0.2642 gallon (US)	1 square foot	= 0.000022957 acre
1 therm	= 0.0000952 MMCF	1 pound	= 0.0005 ton

NOTE: MM = 1,000,000 Example: MMCF = 1,000,000 cubic feet
M = 1,000 Example: MGAL = 1,000 gallons

ADDITIONAL RESOURCES AND ASSISTANCE:

The Maricopa County Emissions Inventory web site

at: http://www.maricopa.gov/aq/divisions/planning_analysis/emissions_inventory/Default.aspx

contains additional reference materials, such as:

- blank copies of most emissions reporting forms.
- an updated list of emission factors for a large number of industrial processes, including SCC codes.
- a list of Tier Codes for industrial processes.
- detailed help sheets for a number of specific industries or processes.

To receive any of the above materials by fax or mail, or for additional information or assistance in how to calculate and report your emissions, please call us at (602) 506-6790.

V. INSTRUCTIONS AND EXAMPLES FOR COMPLETING EMISSIONS REPORTING FORMS

Business Form Instructions

Verify all preprinted information, and make corrections where necessary. When making corrections, strike out the preprinted data and write in corrections beside it. Please make all changes readily noticeable.

NOTE: Making a change on the Business Form will **NOT** transfer the permit ownership or location. You must contact the Department's Small Business Assistance Program at (602) 506-5102 or the Engineering & Permitting Division at (602) 506-6094 to accomplish this.

Data fields:

- 6 Number of employees: This should be the annual average number of full-time equivalent (FTE) employee positions *at this business location*.
- 9 NAICS Code: This 5- or 6-digit North American Industrial Classification System (NAICS) code has been introduced to replace the 4-digit Standard Industrial Classification (SIC) codes. Please list the primary and secondary NAICS codes for your business, if known. (Consult our website, at: http://www.maricopa.gov/aq/divisions/planning_analysis/emissions_inventory/Default.aspx, for a link to a full list of NAICS codes.)
- 10 Preparer of the Inventory (primary contact for technical questions concerning this report): This should be the person who knows the most about the data in the report. If this person has an e-mail address used for business purposes, please provide it.
- 11 Who should receive the Annual Emissions Inventory Form next year?: This should be a person who is directly employed with the business. This person should not be a consultant for the business.

Control Device Form Instructions

EXAMPLE Control Device Form Information

1	2	3	4	5	6
Control ID	Installation/ Reconstruction* Date	Size or Rated Capacity**	Control Type Code	Control Device Name/Description	Stack ID
1	05/09/98	25,000.0 cfm	021	Thermal oxidizer	2
4	03/10/97	cfm	153	Watering with water trucks	

Data fields:

- 1 **Control ID:** (See “Assigning Identification Numbers” on page 6.) A unique number (up to three digits) that you assign to identify a specific control device.
- 2 **Installation/Reconstruction Date:** The completion date (given in *mm/dd/yy* format) of installation or the most recent reconstruction of the identified control device. This is not a date on which routine repair or maintenance was done. “Reconstruction” means any component of the control device was replaced and the cost (fixed capital) of the new component(s) was more than half of what it would have cost to purchase or construct a new control device.
- 3 **Size or Rated Capacity:** Report the air or water flow rate in *cubic feet per minute*. Some devices (e.g., water trucks for dust control) will not include a value in this field.
- 4 **Control Type Code:** A 3-digit code designating the type of control device. A complete list of all EPA control device codes can be found on the Web at: http://www.maricopa.gov/aq/divisions/planning_analysis/emissions_inventory/Default.aspx or call (602) 506-6790 for assistance.
- 6 **Stack ID:** Not all businesses require a Stack ID. This is required if the Stack Form is used for your site (see page 9) **and** the control device is vented through that identified stack. This is the ID number shown in column 1 of the Stack Form. The Stack ID can be entered on this form after the Stack Form has been filled out.

General Process Form Instructions

The General Process Form is used to record data on all emissions-producing processes except evaporative processes. A “**general process**” is normally characterized by the burning or handling of a material. One form reports all the pollutants for one process. For example, several pollutants are produced by burning fuel, and PM₁₀ is emitted by processing rock products, processing materials such as wood or cotton, and driving on unpaved areas.

Data fields: (See sample forms on pages 13 and 14.)

- 1 Process ID: A number (up to three digits) that is preprinted or you assign. (See “Assigning Identification Numbers” on page 6.) This Process ID number can not be used for any other process at this location.
- 2 Process Type/Description: Brief details on the type of activity that is occurring.
- 3 Stack ID(s): The stack ID number(s) shown in column 1 of the Stack Form that identify the stack(s) which vent pollution created by this process. Not all businesses are required to report stacks. This is only required if the Stack Form is required for your site (see page 9) **and** the process has a stack.
- 4 Process Tier Code and If these codes are not preprinted on your form, please consult the
5 SCC Code: section “Other Resources” on our web site, or call (602) 506-6790.
- 6 Seasonal Throughput Percent: Enter the percent of total annual operating time that occurred per season, rounded to the nearest percent. For example, “Dec-Feb 30%” means 30% of total annual activity occurred in January, February and December 2011. The total for all four seasons must equal 100%.
- 7 Normal Operating Schedule and These reflect the normal daily, weekly, and annual operating
8 Typical Hours of Operation: parameters of **this process** during 2011.
- 9 Emissions Based on: Provide the **name** of the material used, fuel used, product produced, or whatever was measured for the purpose of calculating emissions, such as “natural gas”, “hours of operation,” “vehicle miles traveled,” or “acres.”
- 10 Used, Produced or Existing: Indicate whether calculated emissions are based on a material type or fuel *used* (an input, such as “paint” or “natural gas”), or an *output* (such as “sawdust produced” or “finished product”). Use “Existing” if the parameter reported on line 9 is not directly used or produced in the process (such as “vehicle miles traveled” or “acres”).
- 11 Annual Amount: The annual amount (a number) of material that was used, fuel combusted, product produced, hours of operation, vehicle miles traveled, or acres.
- 12 Fuel Sulfur Content (in percent): For processes that involve the combustion of oil or diesel fuels, report the sulfur content of the fuel as a decimal value. Example: 0.05 % (= 500 ppm)
- 13 Unit of Measure: Units of the material used, fuel used or product produced shown on line 9. For example: gallons, pounds, tons, therms, acres, vehicle miles traveled, units produced.
- 14 Unit Conversion Factor: You must provide this if you use an emission factor with an emission factor unit (see item 17 below) that is **not** the same as the unit of measure (from line 13). This is the standard number you would multiply your amount (line 11) by to convert it to the units of the emission factor. See page 7 for a list of commonly used conversion factors.

General Process Form Instructions (continued)

- 15 Pollutant: See page 3 for a list of pollutants that need to be reported.
- 16 Emission Factor (EF): The number to be multiplied by the annual amount (line 11) to determine how much of the pollutant was emitted. If you calculate your own emission factor or change the preprinted emission factor, you must provide details of your calculations in an attachment.
- 17 Emission Factor (EF) Units: Enter the appropriate Emission Factor Units in pounds (lb) per unit; e.g., lb/ton, lb/MMCF, lb/gal.
- 18 Controlled Emission Factor (EF)? YES or NO: Indicate “YES” if: 1) you have your own emission factor from testing **and** included the control device efficiency within the factor, or 2) the emission factor used is clearly identified as a controlled emission factor. A “YES” response requires the use of Formula A (see #25 below). Indicate “NO” if: 1) there is no emission control device, or 2) the emission factor represents emission rates **before** controls. A “NO” response requires the use of Formula B (see #25 below).
- 19 Calculation Method: Enter the number code (listed at the bottom of the General Process Form) which best describes the method you used to obtain this emission factor. Code 5, “AP-42/FIRE Method or Emission Factor” means that the factor comes from EPA documents or software. **NOTE**: If you have continuous emissions monitors (CEM) data or conducted a source test that was required and approved by the County for a specific process or piece of equipment, you **must** use the emission data from the CEM or the test results. Report “1” in this column for CEM data or “4” for performance test data.
- 20 through 24: Leave blank if there is no control device.
- 20 Capture % Efficiency: The percent of the pollutant that is captured and sent to the primary control device in this process. Be sure to list capture efficiency separately for **each** pollutant affected.
- 21 Primary Control Device ID: If this pollutant is being controlled in this process, enter the Control Device ID number which represents the first control device affecting the pollutant.
- 22 Secondary Control Device ID: If this pollutant is being controlled sequentially by 2 devices, enter the Control Device ID number which represents the second control device; otherwise leave this field blank.
- 23 Control Device(s) % Efficiency: Enter the total control efficiency of the control device(s). Be sure to list control device efficiency separately for **each** pollutant affected. If you report control device efficiency, you must **also** show capture efficiency in column 20.
- 24 Efficiency Reference Code: Enter the code (1 through 6) that best describes how you determined the **control device efficiency**. A list of possible codes is included at the bottom of the form.
- 25 Estimated Actual Emissions (in pounds/year): You may round the calculated emissions values to the nearest pound. Calculate as follows:
- A. Emissions with no controls or controls are reflected in the emission factor:
Column 25 = line 11 × line 14 × column 16
- B. Emissions after control:
Column 25 = line 11 × line 14 × column 16 × (1 – [column 20 × column 23])
Use the decimal equivalent for columns 20 and 23. Example: 96.123% = 0.96123

Place an X in any gray cell to mark data requested to be held confidential. See page 5 for requirements for information to be deemed confidential.

1- Process ID 80

2- Process Type/Description: 3 ENGINES FOR CRUSHING (EACH LESS THAN 600 HP)

3- Stack ID(s) (only if required on Stack Form) _____

4- Process TIER Code: 020599 FUEL COMB. INDUSTRIAL: INTERNAL COMBUSTION

5- SCC Code 20200102 (8 digit number) IND:DIESEL-RECIPROCATING

6- Seasonal Throughput Percent: Dec-Feb 25 % Mar-May 25 % Jun-Aug 25 % Sep-Nov 25 %

7- Normal Operating Schedule: Hours/Day 8 Days/Week 5 Hours/Year 2080 Weeks/Year 52

8- Typical Hours of Operation: (military time) Start 0700 End 1530

9- Emissions based on (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") DIESEL

10- Used (input) or Produced (output) or Existing (e.g. VMT, acres)

11- Annual Amount: (a number) 16,250 12- Fuel Sulfur Content (in percent) 0.05 %

13- Unit of Measure: (for example: tons, gallons, million cu ft, acres, units produced, etc.) GALLONS

14- Unit Conversion Factor (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Emission Factor (EF) Information				Control Device Information						
15	16	17	18	19	20	21	22	23	24	25
Pollutant	Emission Factor (EF) (number)	Emission Factor Unit (lb per)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**	Estimated Actual Emissions
CO	130	M GALS	N	5						2,113 lbs
NOx	604	M GALS	N	5						9,815 lbs
PM-10	42.5	M GALS	N	5						691 lbs
SOx	39.7	M GALS	N	5						645 lbs
VOC	49.3	M GALS	N	5						801 lbs

* Calculation Method Codes:

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess / Engineering Judgment
- 3 = Material Balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42 / FIRE Method or Emission Factor

- 6 = State or Local Agency Emission Factor
- 7 = Manufacturer Specifications
- 8 = Site-Specific Emission Factor
- 9 = Vendor Emission Factor
- 10 = Trade Group Emission Factor

** Control Efficiency Reference Codes:

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best guess / engineering estimate
- 5 = Calculated based on material balance
- 6 = Estimated, based on a published value

Place an X in any gray cell to mark data requested to be held confidential. See page 5 for requirements for information to be deemed confidential.

1- Process ID 28

2- Process Type/Description: UNPAVED ROAD TRAVEL: HEAVY-DUTY TRUCKS @ 15 MPH

3- Stack ID(s) (only if required on Stack Form) _____

4- Process TIER Code: 140799 MISCELLANEOUS: FUGITIVE DUST

5- SCC Code 30502504 (8 digit number) SAND/GRAVEL: HAULING

6- Seasonal Throughput Percent: Dec-Feb 25 % Mar-May 25 % Jun-Aug 25 % Sep-Nov 25 %

7- Normal Operating Schedule: Hours/Day 8 Days/Week 5 Hours/Year 2080 Weeks/Year 52

8- Typical Hours of Operation: (military time) Start 0700 End 1530

9- Emissions based on (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") VEHICLE MILES TRAVELED (VMT)

10- Used (input) or Produced (output) or Existing (e.g. VMT, acres)

11- Annual Amount: (a number) 7,500 12- Fuel Sulfur Content (in percent) _____%

13- Unit of Measure: (for example: tons, gallons, million cu ft, acres, units produced, etc.) VMT

14- Unit Conversion Factor (if needed to convert Unit of Measure to correlate with emission factor units) _____

Emission Factor (EF) Information					Control Device Information					
15	16	17	18	19	20	21	22	23	24	25
Pollutant	Emission Factor (EF) (number)	Emission Factor Unit (lb per)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**	Estimated Actual Emissions
<i>PM-10</i>	<i>3.2</i>	<i>VMT</i>	<i>N</i>	<i>6</i>	<i>100</i>	<i>4</i>		<i>90</i>	<i>6</i>	<i>2400</i> lbs
										lbs
										lbs
										lbs
										lbs
										lbs

NOTE: Emissions in col. 25 are calculated as follows: (line 11 × col. 16) × (1 - [col. 20 × col. 23])

- | | | |
|--|---|--|
| <p>* Calculation Method Codes:</p> <ul style="list-style-type: none"> 1 = Continuous Emissions Monitoring Measurements 2 = Best Guess / Engineering Judgment 3 = Material Balance 4 = Source Test Measurements (Stack Test) 5 = AP-42 / FIRE Method or Emission Factor | <ul style="list-style-type: none"> 6 = State or Local Agency Emission Factor 7 = Manufacturer Specifications 8 = Site-Specific Emission Factor 9 = Vendor Emission Factor 10 = Trade Group Emission Factor | <p>** Control Efficiency Reference Codes</p> <ul style="list-style-type: none"> 1 = Tested efficiency / EPA reference method 2 = Tested efficiency / other source test method 3 = Design value from manufacturer 4 = Best guess / engineering estimate 5 = Calculated based on material balance 6 = Estimated, based on a published value |
|--|---|--|

Evaporative Process Form Instructions

The Evaporative Process Form is used to report all emissions produced by evaporation. Examples include: cleaning with solvents, painting and other coatings, printing, using resin, evaporation of fuels from storage tanks, ammonia use, etc. All other processes should be shown on the General Process Form.

One Evaporative Process Form may be used to report numerous materials, with each material given a separate process ID number, as long as the information on lines 1–5 apply to all items on that form. Use a separate form for each group of materials that has a different Process Type/Description (shown on line 1), different Tier Code (line 2) or different operating schedule (lines 3, 4, or 5).

Data fields: (See sample forms on pages 17 and 18.)

- 1 Process Type/Description: Brief details of the activity in which the listed materials were used.
- 2 Process Tier Code: If this 6-digit code is not preprinted on your form, please refer to the Tier Code list at: http://www.maricopa.gov/aq/divisions/planning_analysis/emissions_inventory/Default.aspx or call (602) 506-6790.
- 3 Seasonal Throughput Percent: Enter the percent of total annual operating time that occurred per season (rounded to the nearest percent). For example, “Dec-Feb 30% ” means 30% of the total annual activity occurred during January, February and December 2011. The total for all four seasons must equal 100%.
- 4 Normal Operating Schedule and
5 Typical Hours of Operation: These represent the usual number of hours, time of day and weeks per year when *this process* occurred during the calendar year.
- 6 Process ID: A number (up to three digits) that represents this specific material (process). Each process on one form must have the same tier code and operating schedule as that shown in the top portion of the form. This Process ID number can *not* be used for any other process at this business location. See page 6 of these instructions for more explanation of ID numbers and for exclusions and guidance on grouping materials.
- 7 Stack ID(s): The stack ID number(s) shown in column 1 of the Stack Form that identify the stack(s) which vent pollution created by this process. Not all businesses are required to report stacks. This is only required if the Stack Form is required for your site (see page 9) *and* the process has a stack.
- 8 Material Type: Provide the name of the material used in this process. Give the chemical name for pure chemicals or a name that reflects its use (paint, ink, etc.), rather than just a brand name or code number. Examples of materials include: paint, thinner, degreasing solvent (plus its common name), ink, fountain solution, ammonia, alcohol, ETO (ethylene oxide), gasoline (in a storage tank).
- 9 Annual Material Usage/Input: Amount of this material used during the year. In most cases, the amount purchased is suitable. Write in “lbs” or “gal” (pounds or gallons).
- 10 Pollutant: The only pollutants reported on this form are VOC, HAP&NON and NH_x (see definitions on page 3). When one process (or material) has more than one of these pollutants, list each pollutant on a separate line, using the same process ID number.

Evaporative Process Form (continued)

- 11 **Emission Factor (EF):** An emission factor is a number used to calculate the pounds of pollutant emitted based on the quantity of material used in a process. Emission factors can be obtained from your supplier (usually provided on a Material Safety Data Sheet or environmental data sheet), and must correspond with the material units reported in column 9. If the material unit is “gal,” then the emission factor must be in pounds of pollutant per gallon. If the material unit is “lb,” then the emission factor must be in pounds of pollutant per pound of material.

Verify (and correct, where necessary) all preprinted emission factors, as the composition of materials used may have changed since your last report. A “lb/gal” emission factor is almost always less than 8 and never greater than 14. A “lb/lb” emission factor is never larger than 1.0.

- 12 **Pounds of pollutant sent off-site:** Required only if you wish to take credit for reduced emissions because waste of this material is sent off-site for recycling or disposal. Only waste generated during the report year may be claimed. The Off-Site Recycling/Disposal Form *must* be completed if you wish to claim a credit. The number of pounds reported in column 12 *must* equal the number of pounds reported on the Off-Site Recycling/Disposal Form(s) for the same Process ID number.

13 and 14: Leave these fields blank if there is no control device present.

- 13 **Capture % Efficiency:** The percent of the pollutant from this process that is captured and sent to the control device.

- 14 **Control ID:** If this pollutant is being controlled in this process, enter the Control Device ID number from column 1 of the Control Device Form.

Control % Efficiency: Enter the percent of this pollutant that is controlled by this control device.

Code: Select the Control Efficiency Reference Code from the list at the bottom of the form.

- 15 **Estimated Emissions (lbs/yr):** Estimated pounds of the pollutant emitted during the year, after off-site recycling/disposal and controls if applicable. **Credit will not be given for off-site recycling/disposal unless it is shown on the Off-Site Recycling/Disposal Form.** Round to the nearest pound. If the answer is 0, give a decimal answer to the first significant digit. Column 15 is calculated as follows:

Emissions without off-site recycling/disposal or controls:

$$\text{Column 15} = \text{column 9} \times \text{column 11}$$

Emissions with off-site recycling/disposal:

$$\text{Column 15} = (\text{column 9} \times \text{column 11}) - \text{column 12}$$

*Emissions with off-site recycling/disposal **and** controls:*

$$\text{Column 15} = ((\text{column 9} \times \text{column 11}) - \text{column 12}) \times (1 - [\text{column 13} \times \text{column 14}])$$

Use the decimal equivalent for columns 13 and 14. Example: 96.123% = 0.96123

EXAMPLE: Coating and Painting

Evaporative Process Form 2011

Permit number(s) v99999

Place an X in any gray cell to mark data requested to be held confidential. See page 5 for requirements for information to be deemed confidential.

1- Process Type/Description: Coating metal parts

2- Process TIER Code: 080415 SOLVENT USE: SURFACE COATING - MISC METAL PARTS

3- Seasonal Throughput Percent: Dec-Feb 25 % Mar-May 25 % Jun-Aug 25 % Sep-Nov 25 %

4- Normal Operating Schedule: Hours/Day 8 Days/Week 5 Hours/Year 2080 Weeks/Year 52

5- Typical Hours of Operation (military time) Start 0800 End 1700

6	7	8	9	10	11	12	13	14			15		
Process ID	Stack ID(s)	Material Type	Annual Usage Input	lb or gal	VOC, HAP&NON or NHx	Emission Factor	EF Units (lbs per)	Pounds of pollutant* sent off site	Capture Efficiency %	Control ID	Control Efficiency %	Control Efficiency Code**	Estimated Emissions (lbs/yr)
800	1	Lacquer 6455-06	95	gal	VOC	4.7	gal		%		%		447
801	1	lacq thinner	120	gal	VOC	7.1	gal		%		%		852
802	1	Paint red 4039-03	940	gal	VOC	4.2	gal		%		%		3,948
803	1	Toro-Red Paint	707	gal	VOC	7.0	gal		%		%		4,949
803	1	Toro-Red Paint	707	gal	HAP&NON	0.5	gal		%		%		354
804	1	powder paint 8730-11	20,200	lb	VOC	0.001	lb		%		%		20

Note: Do NOT change preprinted Process ID numbers. See page 6 of these instructions for information on how to delete materials that are no longer used, or to assign Process ID numbers for new materials.

* If you have off-site recycling/disposal of any of the materials listed above, you must complete an Off-site Recycling/Disposal Form to receive credit for reduced emissions.

NOTE: Emissions in col. 15 are calculated as follows: $([\text{col. 9} \times \text{col. 11}] - \text{col. 12}) \times (1 - [\text{col. 13} \times \text{col. 14}])$

**** Control Efficiency Reference Codes**

1 = Tested efficiency / EPA reference method
4 = Best guess / engineering estimate

2 = Tested efficiency / other source test method
5 = Calculated based on material balance

3 = Design value from manufacturer
6 = Estimated, based on a published value.

EXAMPLE: Cleaning solvent (with recycling)

Evaporative Process Form 2011

Permit number(s) V99999

Place an X in any gray cell to mark data requested to be held confidential. See page 5 for requirements for information to be deemed confidential.

1- Process Type/Description: CLEANING METAL PARTS

2- Process TIER Code: 080103 **SOLVENT USE: DEGREASING - COLD CLEANING**

3- Seasonal Throughput Percent: Dec-Feb 25 % Mar-May 25 % Jun-Aug 25 % Sep-Nov 25 %

4- Normal Operating Schedule: Hours/Day 8 Days/Week 5 Hours/Year 2080 Weeks/Year 52

5- Typical Hours of Operation (military time) Start 1300 End 1700

6	7	8	9	10	11	12	13	14	15				
Process ID	Stack ID(s)	Material Type	Annual Usage Input	lb or gal	VOC, HAP&NON or NHx	Emission Factor	EF Units (lbs per)	Pounds of pollutant* sent off site	Capture Efficiency %	Control ID	Control Efficiency %	Control Efficiency Code**	Estimated Emissions (lbs/yr)
3	2	SANITIZER	716	lb	VOC	1.0	lb		95 %	1	80 %	3	172
6		GUN CLEANER	180	gal	VOC	7.2	gal	569	%		%		727
7		XYZ STRIPPER	1300	gal	VOC	3.3	gal	1,884	%		%		2,406
8		CLEANING SOLVENTS	358	gal	VOC	6.4	gal	1,006	%		%		1,285
9		MEGASOLVE	2258	gal	VOC	6.8	gal	6,741	%		%		8,613
									%		%		

Note: Do NOT change preprinted Process ID numbers. See page 6 of these instructions for information on how to delete materials that are no longer used, or to assign Process ID numbers for new materials.

* If you have off-site recycling/disposal of any of the materials listed above, you must complete an Off-site Recycling/Disposal Form to receive credit for reduced emissions.

NOTE: This example shows the case where 2,400 of the original 4,096 gallons of materials #6 through 9 were captured for off-site recycling, and the pollutant content of the waste material was estimated to be 75% of the original. The pounds of pollutant sent off-site shown in column 12 is calculated on the example Off-Site Recycling/Disposal Form on the next page.

EXAMPLE

Off-Site Recycling/Disposal Form 2011

Permit number(s) V99999

NOTE: If you need blank copies of this form, call the Emissions Inventory Unit at (602) 506-6790 or consult our web page at http://www.maricopa.gov/aq/divisions/planning_analysis/emissions_inventory/Default.aspx

Provide one off-site recycling/disposal form for each waste stream at your business location. A waste stream is the waste from one or more processes mixed together to make one waste product before it is taken off site for recycling, disposal or combustion.

- 1) Assign a unique two-digit ID number to identify the waste stream that will be described below. 01
 (Start with ID# 01 for first waste stream. Make copies of a blank Off-Site Recycling/Disposal form and use 02 for second, etc.)

Check one:

pounds
 gallons

- 2) What was the quantity of this waste stream in 2011? 2,400
 Indicate whether this quantity is reported in pounds or gallons. Keep waste disposal company manifests as proof that this amount of waste was taken off-site.

- 3) What was the **average** pollutant content of the waste stream? NOTE: Report in the same units (pounds or gallons) as used in line 2.

VOC 4.25 lbs/unit HAP&NON _____ lbs/unit NHx _____ lbs/unit

NOTE: Waste normally has less pollutant content than the new product. Some of the pollutant evaporates during the use of the product, and there is usually dirt, water or other contaminants in the waste stream. The estimated pollutant content of the waste is usually between 50% and 95% of the new product. This example estimates an average VOC content (on line 3) to be 75% of the original VOC content of 5.67 lbs/gal., to account for evaporation and contaminants. See page 20 to calculate a weighted average.

- 4) Calculate the **total** annual pollutant content of the waste in this waste stream.
 (volume of waste, from Line 2) × (pollutant content, from Line 3) = Total pollutants in waste stream, in lbs/yr.

VOC 10,200 lbs/yr HAP&NON _____ lbs/yr NHx _____ lbs/yr

- 5) List the process ID numbers of the processes contributing to this waste stream. Also estimate the pounds of pollutant that each process contributed to this waste stream.

NOTE: In this example, the amount each process material contributed to total pollutants in the waste stream (Line 4) is based on the percentage, by weight, of each material that contributed to the waste stream (e.g., Process ID #6 contributed 5.6%, therefore 5.6% × 10,200 lbs/yr = 569 lbs. See example on page 20).

NOTE: Column totals in the table below must equal the total for each pollutant type reported on line 4. The quantities you report below for each pollutant and process must also be reported in column 12 on the Evaporative Process Form.

Process ID	Annual VOC (lbs)	Annual HAP&NON (lbs)	Annual NHx (lbs)
6 Contributed about	569 lbs	lbs	lbs
7 Contributed about	1,884 lbs	lbs	lbs
8 Contributed about	1,006 lbs	lbs	lbs
9 Contributed about	6,741 lbs	lbs	lbs

EXAMPLE: Documentation of Emission Factor Calculations

Identify the process ID number(s) and pollutant(s). Show calculations made to obtain the emission factors used for the process(es). Include references to data sources used, including the document name, date published, page numbers, etc.

Emission Factor Calculation

Process ID 201

Permit number V99999

Emission factors derived from source test performed 12/2/00 by XYZ Engineering Company (copy of summary tables also attached).

Outlet (after controls):

$$\begin{aligned} \text{CO} &= 0.43 \text{ lb/hr} \times 1 \text{ hr}/60 \text{ min} \times 1 \text{ min}/77.9 \text{ cu. ft} \times 1,000,000 \text{ cu. ft/MMCF} \\ &= 92.0 \text{ lb/MMCF} \end{aligned}$$

$$\begin{aligned} \text{NOx} &= 0.09 \text{ lb/hr} \times 1 \text{ hr}/60 \text{ min} \times 1 \text{ min}/77.9 \text{ cu. ft} \times 1,000,000 \text{ cu. ft/MMCF} \\ &= 19.3 \text{ lb/MMCF} \end{aligned}$$

Weighted average sample calculation

NOTE: The example below shows how the weighted average of the materials going into the waste stream is calculated. A weighted-average emission factor has been calculated by listing usage amounts and emission factors for each material, summing each column, and then dividing the total emissions by the total gallons used.

In this example: 23,231 lbs ÷ 4,096 gal = 5.67 lb/gal average VOC content. This emission factor is then used to calculate the average pollutant content in the Off-site Recycling/Disposal Form example.

This process can also be used to find the weighted average emission factor for similar materials if you are reporting them together as a single line item on the Evaporative Process form. Refer to the explanation of "grouping" on page 6.

Process ID #	Material Type	2011 Usage	Units	VOC (lbs/unit)	VOC Emissions (= Usage × VOC content)	Percent contributed to waste stream
6	gun cleaner	180	gal	7.2	1,296 lbs.	5.6 %
7	xyz stripper	1,300	gal	3.3	4,290 lbs.	18.5 %
8	cleaning solvent	358	gal	6.4	2,291 lbs.	9.9 %
9	MEGASOLVE	2,258	gal	6.8	15,354 lbs.	66.1 %
	Totals:	4,096	gal		23,231 lbs.	100.0 %

Average VOC content:	$\frac{23,231 \text{ lbs.}}{4,096 \text{ gals}}$	=	$\frac{5.67}{\text{lb/gal}}$
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EXAMPLE (for all sources except Title V sources)

Data Certification Form 2011

Permit number 999999

For EACH pollutant listed, total up all emissions recorded on your General Process and Evaporative Process Forms. Enter these numbers in column 1, "Totals from Process Forms." Report any emissions from accidental releases in column 2. Add the figures in each row across, and enter the result in column 3, "Total Emissions".

NOTE: "Accidental Releases" reported in column 2 should include all excess emissions reported to the Department under Rule 140, Section 500.

Summary of 2011 Annual Emissions:	(1) Totals from Process Forms	(2) + Accidental Releases	(3) = TOTAL 2011 Emissions
CO	2,113	0	2,113
NH _x	0	0	0
Lead	0	0	0
HAP&NON	354	0	354
VOC	24,220	0	24,220
NO _x	9,815	0	9,815
SO _x	645	0	645
PM ₁₀	3,091	0	3,091

NOTE: Review specific requirements for data confidentiality on page 5. We cannot hold any data confidential without the required documentation.

TO COMPLETE YOUR EMISSIONS INVENTORY REPORT:

- Complete the Confidentiality Statement below.
- Sign and date this form below where indicated.
- Send the **original** copy of your completed forms to: Maricopa County Air Quality Dept., Emissions Inventory Unit, 1001 North Central Avenue, Suite 125, Phoenix, AZ 85004.
- Keep a copy of all forms for your records.

CONFIDENTIALITY STATEMENT:

This annual emissions report contains requests to keep some data confidential. YES NO

If you check "YES", you must submit documentation and meet certain requirements before your data can be deemed confidential. See enclosed instructions for further details.

NOTE: The Data Certification form must be signed by a responsible company official.

CERTIFICATION STATEMENT:

I declare under penalty of perjury that the data (e.g. inputs, emission factors, controls, and annual emissions) presented herein represents the best available information and is true, accurate and complete to the best of my knowledge.

Signature of owner/business officer

Date of signature

Telephone number

Type or print full name of owner/business officer

Type or print full title

How to calculate an emission fee (for Title V sources only):

1. For each pollutant listed on the “Data Certification/Fee Calculation” form, total up all emissions recorded on your General Process and Evaporative Process Forms. Enter these numbers in column 1, “Totals from Process Forms.”

NOTE: While most processes that generate PM₁₀ should be reported on line 5 of the Data Certification/Fee Calculation form, “[f]ugitive emissions of PM₁₀ from activities other than crushing, belt transfers, screening, or stacking” (County Rule 280, § 305.2d) are NOT subject to annual emission fees. The most common occurrences of these PM₁₀-producing activities that are NON-billable are listed below:

SCC codes and description of PM₁₀-producing processes that are NOT subject to emission fees

SCC	Major Category	Subcategory	Facility / Process Type	Process Description
30200814	Industrial Processes	Food and Agriculture	Feed Manufacture	Storage
30400737	Industrial Processes	Secondary Metal Production	Steel Foundries	Raw Material Silo
30500120	Industrial Processes	Mineral Products	Asphalt Roofing Manufacture	Storage Bins: Ferric Chloride
30500121	Industrial Processes	Mineral Products	Asphalt Roofing Manufacture	Storage Bins: Mineral Stabilizer
30500134	Industrial Processes	Mineral Products	Asphalt Roofing Manufacture	Blown Saturant Storage
30500135	Industrial Processes	Mineral Products	Asphalt Roofing Manufacture	Blown Coating Storage
30500141	Industrial Processes	Mineral Products	Asphalt Roofing Manufacture	Granules Storage
30500143	Industrial Processes	Mineral Products	Asphalt Roofing Manufacture	Mineral Dust Storage
30500203	Industrial Processes	Mineral Products	Asphalt Concrete	Storage Piles
30500212	Industrial Processes	Mineral Products	Asphalt Concrete	Heated Asphalt Storage Tanks
30500213	Industrial Processes	Mineral Products	Asphalt Concrete	Storage Silo
30500290	Industrial Processes	Mineral Products	Asphalt Concrete	Haul Roads: General
30500303	Industrial Processes	Mineral Products	Brick Manufacture	Storage of Raw Materials
30500608	Industrial Processes	Mineral Products	Cement Manufacturing (Dry Process)	Raw Material Piles
30500708	Industrial Processes	Mineral Products	Cement Manufacturing (Wet Process)	Raw Material Piles
30501710	Industrial Processes	Mineral Products	Mineral Wool	Storage of Oils and Binders
30502007	Industrial Processes	Mineral Products	Stone Quarrying - Processing	Open Storage
30502011	Industrial Processes	Mineral Products	Stone Quarrying - Processing	Hauling
30502504	Industrial Processes	Mineral Products	Construction Sand and Gravel	Hauling
30502507	Industrial Processes	Mineral Products	Construction Sand and Gravel	Storage Piles
30502760	Industrial Processes	Mineral Products	Industrial Sand and Gravel	Sand Handling, Transfer, & Storage
30531090	Industrial Processes	Mineral Products	Coal Mining, Cleaning, Material Handling	Haul Roads: General
30532007	Industrial Processes	Mineral Products	Stone Quarrying - Processing	Open Storage
30704002	Industrial Processes	Pulp and Paper & Wood Pdts.	Bulk Handling and Storage - Wood/Bark	Stockpiles
31100199	Industrial Processes	Building Construction	Construction: Building Contractors	Other Not Classified
31100299	Industrial Processes	Building Construction	Demolitions/Special Trade Contracts	Other Construction/Demolition
50100401	Waste Disposal	Solid Waste Disposal	Landfill Dump	Unpaved Road Traffic
50100402	Waste Disposal	Solid Waste Disposal	Landfill Dump	Fugitive Emissions
50100403	Waste Disposal	Solid Waste Disposal	Landfill Dump	Area Method
50100404	Waste Disposal	Solid Waste Disposal	Landfill Dump	Trench Method
50100405	Waste Disposal	Solid Waste Disposal	Landfill Dump	Ramp Method

2. Report any accidental releases in column 2. Add columns 1 and 2 together for each pollutant, and enter the sum in column 3. Sum lines 1 through 5 together, and enter the total on line 6.
3. Divide your facility's total billable emissions (on line 6) by 2000 to convert pounds into tons. **Round to the nearest ton.** Enter this value on line 7. Multiply this number by **\$39.83**, and enter the result on line 8. This is your 2011 emission fee.

EXAMPLE (for Title V sources only)

Data Certification/Fee Calculation Form 2011

Permit number v99999

For EACH pollutant listed, total up all emissions recorded on your General Process and Evaporative Process Forms. Enter these numbers in column 1, "Totals from Process Forms." Report any emissions from accidental releases in column 2.

Add the figures in each row across, and enter the result in column 3, "Total Emissions".

Carefully follow the instructions on lines 6 through 8 to calculate any emission fee owed.

NOTE: "Accidental Releases" reported in column 2 should include all excess emissions reported to the Department under Rule 140, Section 500.

Summary of 2011 Annual Emissions:	(1) Totals from Process Forms	(2) + Accidental Releases	(3) = TOTAL 2011 Emissions
CO	2,113	0	2,113
NH _x	0	0	0
Lead	0	0	0
PM ₁₀ (non-billable; see page 22)	2,400	0	2,400

Emissions fees are based on your emissions of the following pollutants ONLY:

1	HAP&NON	354	0	354
2	VOC	24,220	0	24,220
3	NO _x	9,815	0	9,815
4	SO _x	645	0	645
5	PM ₁₀ (billable; see page 22)	691	0	691
6	Add "TOTAL" column from lines 1 through 5 ONLY:			35,725 lbs.
7	Divide the total on line 6 by 2000 (pounds per ton) to get tons, and round the number to the nearest ton. (Drop any decimal of .499 or less. Increase to the next whole number any decimal of .500 or more.) Enter the resulting WHOLE NUMBER here.			18 TONS
8	Multiply line 7 (a WHOLE number) by \$ 39.83. This is your 2011 ANNUAL EMISSION FEE.			\$ 716.94

NOTE: Review specific requirements for data confidentiality on page 5. We cannot hold any data confidential without the required documentation.

TO COMPLETE YOUR EMISSIONS INVENTORY REPORT:

- Include a check (made payable to Maricopa County Air Quality Department) for the amount calculated on line 8 above.
- Complete the Confidentiality Statement below.
- Sign and date this form below where indicated.
- Send the **Original** copy of your completed forms along with any emission fee due to: Maricopa County Air Quality Department, Emissions Inventory Unit, 1001 North Central Avenue, Suite 125, Phoenix, AZ 85004.
- Keep a copy of all forms for your records.

CONFIDENTIALITY STATEMENT:

This annual emissions report contains requests to keep some data confidential. YES NO

If you check "YES", you must submit documentation and meet certain requirements before your data can be deemed confidential. See enclosed instructions for further details.

NOTE: The Data Certification form must be signed by a responsible company official.

CERTIFICATION STATEMENT:

I declare under penalty of perjury that the data (e.g. inputs, emission factors, controls, and annual emissions) presented herein represents the best available information and is true, accurate and complete to the best of my knowledge.

Signature of owner/business officer	Date of signature	Telephone number
Type or print full name of owner/business officer	Type or print full title	

Appendix B. Rule Effectiveness (RE) Studies

1. Introduction

Rule effectiveness (RE) studies are designed to assess the success of regulatory rules at controlling their targeted emissions. It is acknowledged that facilities and source categories subject to control techniques and devices mandated by rules do not always achieve 100% compliance with those requirements. Given this reality, the US EPA recommends the use of rule effectiveness studies to improve the quality of emission estimates presented in emission inventories.

Once an RE rate has been calculated, its value is applied to relevant sources at an individual process level, thus adjusting (i.e., increasing) emission estimates to reflect a lower degree of control efficiency. The formulas below illustrate how inclusion of rule effectiveness can significantly affect the resulting emission estimates:

Emissions before the application of rule effectiveness:

$$\begin{array}{rcl} \text{Uncontrolled Emissions} & \times & [1 - (\text{Control Efficiency})] = \text{Emissions with Control} \\ \mathbf{100 \text{ tons}} & \times & [1 - (\mathbf{0.90})] = \mathbf{10.0 \text{ tons}} \end{array}$$

Emissions including the application of rule effectiveness:

$$\begin{array}{rcl} \text{Uncontrolled Emissions} & \times & [1 - (\text{Control Efficiency} \times \text{RE})] = \text{Emissions with Control} \\ \mathbf{100 \text{ tons}} & \times & [1 - (\mathbf{0.90} \times \mathbf{0.83})] = \mathbf{25.3 \text{ tons}} \end{array}$$

In general, the RE rate is applied to all processes where a control device or control technique is in use. There are however some limitations to this blanket rule, as expressed in US EPA's most recent guidance:

...not all emission estimates involving use of a control device or technique need to be adjusted to account for RE... For example, a state or local agency may conclude that a control device that operates in conjunction with a continuous emissions monitor, or is equipped with an automatic shutdown device, may provide a sufficient level of assurance that intended emission reductions will be achieved, and therefore an adjustment for rule effectiveness is not necessary. Another example would be in instances where a direct determination of emissions, such as via a mass balance calculation, can be made. (US EPA, 2005)

Another complication in any attempt to apply a blanket RE percentage rate occurs where control device efficiencies are extremely high. Some categories of control devices routinely operate at efficiencies of 99% or greater (e.g., baghouses, thermal oxidizers). For these activities, even small adjustments through the application of RE can cause a dramatic increase in reported emissions. As an example, a process with a control device of 99.9% efficiency may report controlled emissions of 10 tons. If an RE rate of 85% were applied to this process, the adjusted emissions would total 1,508.5 tons (an increase of nearly 15,000%). In these types of instances, the department evaluated the affected processes on a case-by-case basis to determine the appropriateness of applying an RE adjustment.

2. Calculating Rule Effectiveness Rates for Title V Facilities and Non-Title V Facilities

The observed compliance rate in some cases, such as multi-source Title V and non-Title V facilities, can be better described as a rate at which inspection staff issue violations. Inspection staff has a range of experience and training which influences their proficiency in issuing appropriate violations. There may be instances when a rule violation goes unnoticed by staff, or conversely a violation may be issued in error. Even when a compliance rate has a high statistical measure of accuracy, it can fail to reflect a number of programmatic measures that affect overall rule effectiveness; measures like the strength of rule language, departmental enforcement and penalty actions, inspector training programs, educational and public outreach efforts, etc. This reality is reflected in earlier US EPA guidance:

A percentage effectiveness rating is not enough to describe the compliance effectiveness of a rule for a source category. An SSCD [Stationary Source Compliance Division] study should attempt to link the rating to a regulatory agency's overall effort. The study should address the factors that affect the percentage effectiveness rating such as the compliance rate of the sources in a category, inspection frequency and thoroughness, the language of the rule (i.e., whether or not it has loopholes), and the reporting and recordkeeping by the regulatory agency. Evaluating these factors will provide a more complete evaluation of the effectiveness of a rule. (US EPA, 1994)

In order to incorporate all the salient factors described above, a matrix was created to produce a final RE rate. US EPA's latest guidance (2005) provides a listing of factors that can impact rule effectiveness rates (e.g., inspector training, frequency of inspections, media outreach, enforcement policies, recordkeeping requirements, etc.), grouped into major categories such as most important factors, important factors and other factors. The department used these suggested factors as the basis for developing the RE matrices contained in Tables B-2 and B-3.

In brief, the compliance rate developed from inspection data accounts for 70% of the overall RE rate, while all other factors account for the remaining 30%. Each factor is scored individually, based upon the department's success in implementing that factor. As an example, the score for the factor "Compliance History" is the compliance rate developed from the study period inspection data, while the score for "Enforcement Penalties" is based upon the department's timely response to, and settlement of, observed violations associated with the subject rule or source category. The complete matrices for each applicable rule or source category for which rule effectiveness was addressed, are contained in Tables B-2 and B-3.

The following sections describe in further detail the data and methods used in the development of the remaining RE factors for Title V and non-Title V permitted facilities; results are summarized in Table B-1 below.

Table B-1. Rule effectiveness rate, by source category analyzed.

Source Category	Compliance Rate	Rule Effectiveness (RE) Rate
Title V Facilities	90.45% *	91.81%
Non-Title V Facilities	85.92% *	87.81%

* Compliance rates for both Title V and Non-Title V facilities are based upon 2010-2011 inspection data, and reflect compliance self-monitoring recordkeeping practice, in addition to violation data.

For the remaining emission processes that include a control device or technique that limits ozone formation, separate multi-rule RE rates have been calculated for permitted Title V and non-Title V facilities. Factor-based matrices have been utilized to develop RE rates for Title V and non-Title V facilities. Compliance rates for these sources are based upon two full years of data (2010 through 2011), as compliance information for these sources tends to be more detailed (as reflected in the matrix). The compliance rate for these facilities also includes data on self-monitoring recordkeeping practices in addition to inspection data. The combined scores of the monitoring data and inspection data divided by the 70% of the overall RE rate comprise the ‘compliance rate’ section of the RE calculation matrix. The combined compliance rate for Title V facilities is 90.45% and 85.92% for non-Title V facilities, resulting in RE rates of 91.81% and 87.81% for Title V and non-Title V facilities, respectively, as shown in Tables B–2 and B–3 below.

3 References

US EPA, 1994. Rule Effectiveness Guidance: Integration of Inventory, Compliance and Assessment Applications. EPA Rep. 452/R-94-001, January 1994.

US EPA, 2005. Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations. EPA Rep. 454/R-05-001, November 2005.

Table B–2. Rule Effectiveness Matrix for Title V Facilities

A. Most important factors (2 criteria, each assigned weighting of 35% of total):

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score (= weight × value)
Monitoring	94%	100%	97%	Source specific monitoring used for compliance purposes, and monitoring records filed with regulatory agency at least every 4 months.			
	87%	93%	90%	Source specific monitoring used as an indicator of compliance, and monitoring records filed with regulatory agency every 6 to 9 months.	35%	90%	31.5%
	81%	86%	84%	Source specific monitoring used as an indicator of compliance, and monitoring records filed with regulatory agency each year.			
	70%	80%	75%	General guidance exists for source specific enhanced monitoring, and monitoring records required but aren't submitted to regulatory agency.			
		< 70%	35%	No requirements for any type of monitoring.			

Compliance History	94%	100%	97%	The facility has been in compliance for the past eight quarters.	35%	12 of 21 facilities	19.4%
	87%	93%	90%	The facility is believed to have been in compliance for the past eight quarters, although inspection frequency is such that this can't be positively confirmed.			
	81%	86%	84%	On schedule; the facility is meeting its compliance schedule.			
	70%	80%	75%	In Violation; facility is in violation of emissions and/or procedural requirements.		7 of 21 facilities	11.3%
		< 70%	35%	High Priority Violator (HPV): the facility is in significant violation of one or more applicable requirement of the CAA.		2 of 21 facilities	1.2%
Sum:							31.8%

Overall Compliance Rate for Title V facilities: **90.45%**

B. Other important factors (4 criteria, each assigned weighting of 3% of total):

Type of Inspection	94%	100%	97%	Inspections involve compliance test methods with a high degree of accuracy, such as stack testing or other types of precise emissions measurement.	3%	97%	2.9%
	87%	93%	90%	Inspections involve detailed review of process parameters & inspection of control equipment.			
	81%	86%	84%	Inspections involve review of process and inspection of control equipment.			
	70%	80%	75%	Inspections generally consist of only a records review.			
		< 70%	35%	Inspections most likely consist of visual inspection (e.g., opacity), or drive by.			

Operation & Maintenance	94%	100%	97%	Control equipment operators follow and sign daily O&M instructions.			
	87%	93%	90%	Control equipment operators follow daily O&M instructions.	3%	90%	2.7%
	81%	86%	84%	Control equipment operators follow daily or weekly O&M instructions.			
	70%	80%	75%	O&M requirements exist, but on no specific schedule.			
		< 70%	35%	No specific O&M requirements.			

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score (= weight × value)
Unannounced Inspections	94%	100%	97%	Routinely conducted.	3%	97%	2.9%
	87%	93%	90%	Sometimes done.			
	81%	86%	84%	Done, but infrequently.			
	70%	80%	75%	Rarely done.			
		< 70%	35%	Never done.			

Enforcement Penalties	94%	100%	97%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.	3%	97%	2.91%
	87%	93%	90%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.			
	81%	86%	84%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.			
	70%	80%	75%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.			
		< 70%	35%	Agency does not have sufficient authority to impose punitive measures towards violators.			

C. Other factors (9 criteria, each assigned weighting of 2% of total):

Compliance Certifications	94%	100%	97%	Source subject to Title V or other type of compliance certification.	2%	97%	1.94%
	87%	93%	90%	Source subject to Title V or other type of compliance certification.			
	81%	86%	84%	Source not subject to any type of compliance certification.			
	70%	80%	75%	Source not subject to any type of compliance certification.			
		< 70%	35%	Source not subject to any type of compliance certification.			

Inspection Frequency	94%	100%	97%	Source(s) are inspected once every 2 years or more frequently.	2%	97%	1.94%
	87%	93%	90%	Source(s) are inspected once every 3 years or more frequently.			
	81%	86%	84%	Source(s) are inspected once every 5 years or more frequently.			
	70%	80%	75%	Inspection of source(s) infrequent; > every 5 years.			
		< 70%	35%	Inspections rarely, if ever, performed.			

EPA HPV Enforcement	94%	100%	97%	Agency has sufficient resources to implement EPA's 12/22/98 HPV policy.	2%	97%	1.94%
	87%	93%	90%	Agency's resources allow it to implement EPA's 12/22/98 HPV policy in most instances.			
	81%	86%	84%	Agency's resources allow it to implement EPA's 12/22/98 HPV policy in most instances.			
	70%	80%	75%	Agency's resources allow it to implement EPA's 12/22/98 HPV policy more often than not.			
		< 70%	35%	Resource constraints prohibit agency from implementing EPA's 12/22/98 HPV policy in most instances.			

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score (= weight × value)
Operator Training	94%	100%	97%	Control equipment operators complete a formal training program on use of the equipment, and such program is kept up to date and has been reviewed by the regulatory agency.			
	87%	93%	90%	Control equipment operators complete formal training program, and such program is kept up to date and available for review by the regulatory agency upon request.			
	81%	86%	84%	Control equipment operators complete some amount of formal training.	2%	84%	1.68%
	70%	0.8	75%	Control equipment operators receive only on the job training.			
		< 70%	35%	Control equipment operators receive no specific training.			
Media Publicity	94%	100%	97%	Media publicity of enforcement actions.	2%	97%	1.94%
	87%	93%	90%	Media publicity of enforcement actions.			
	81%	86%	84%	Media publicity of enforcement actions.			
	70%	80%	75%	Media publicity of enforcement actions.			
		< 70%	35%	No media publicity of enforcement actions.			
Regulatory Workshops	94%	100%	97%	Regulatory workshops are available annually, and/or the implementing agency mails regulatory information packages each year.	2%	97%	1.94%
	87%	93%	90%	Regulatory workshops are available every 1-2 years, and/or the implementing agency mails regulatory information packages every 1-2 years.			
	81%	86%	84%	Regulatory workshops are available every 2-3 years, and/or the implementing agency mails regulatory information packages once every 2-3 years.			
	70%	80%	75%	Regulatory workshop not routinely available, but implementing agency mails regulatory information packages out about once every 2-3 years.			
		< 70%	35%	Regulatory workshops not routinely available. Implementing agency mails regulatory information packages infrequently, if ever.			
Inspector Training	94%	100%	97%	Inspectors must undergo 2 weeks of comprehensive basic training, and 1 to 2 weeks of source specific training, and such training is updated each year.			
	87%	93%	90%	Inspectors must undergo 1 to 2 weeks of basic training and 1 week of source specific training and such training is updated every 1-2 years.	2%	90%	1.80%
	81%	86%	84%	Inspectors must undergo 1 to 2 weeks of basic training and 3 to 5 days of source specific training, and such training is updated every 1-2 years.			
	70%	80%	75%	Inspectors must undergo 1 to 2 weeks of basic training and 1 to 3 days of source specific training, and such training is updated every 1-2 years.			
		< 70%	35%	Inspectors must undergo less than 5 days of basic training less than 3 days of source specific training, and such training is updated only every 2 years or less frequently.			

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score (= weight × value)
Testing Guidelines	94%	100%	97%	Specific guidelines and schedule for testing and test methods exist.	2%	97%	1.94%
	87%	93%	90%	Specific guidelines on testing and test methods exist, but no schedule for testing.			
	81%	86%	84%	Specific guidelines on testing and test methods exist, but no schedule for testing.			
	70%	80%	75%	Specific guidelines on testing and test methods, but no schedule for testing.			
		< 70%	35%	Only general guidance on testing, or no mention of testing requirements.			

Follow-up Inspections	94%	100%	97%	Follow-up inspections always or almost always conducted (90 % of the time or more).	2%	97%	1.94%
	87%	93%	90%	Follow-up inspections usually conducted (approximately 75% of the time).			
	81%	86%	84%	Follow-up inspections sometimes conducted (approximately 50% of the time).			
	70%	80%	75%	Follow-up inspections infrequently conducted (approximately 25% of the time).			
		< 70%	35%	Follow-up inspections rarely or never conducted (10% of the time or less)			

Overall rule effectiveness score for Title V facilities:

91.81%

Table B-3. Rule Effectiveness Matrix for Non-Title V Facilities

A. Most important factors (2 criteria, each assigned weighting of 35% of total):

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score (= weight × value)
Monitoring	94%	100%	97%	Source specific monitoring used for compliance purposes, and monitoring records filed with regulatory agency at least every 4 months.			
	87%	93%	90%	Source specific monitoring used as an indicator of compliance, and monitoring records filed with regulatory agency every 6 to 9 months.			
	81%	86%	84%	Source specific monitoring used as an indicator of compliance, and monitoring records filed with regulatory agency each year.			
	70%	80%	75%	General guidance exists for source specific enhanced monitoring, and monitoring records required but aren't submitted to regulatory agency.	35%	75%	26.3%
		< 70%	35%	No requirements for any type of monitoring.			

Compliance History	94%	100%	97%	The facility has been in compliance for the past eight quarters.	35%	191 of 268 facilities	24.2%
	87%	93%	90%	The facility is believed to have been in compliance for the past eight quarters, although inspection frequency is such that this can't be positively confirmed.		19 of 268 facilities	2.2%
	81%	86%	84%	On schedule; the facility is meeting its compliance schedule.			
	70%	80%	75%	In Violation; facility is in violation of emissions and/or procedural requirements.		77 of 268 facilities	7.5%
		< 70%	35%	High Priority Violator (HPV): the facility is in significant violation of one or more applicable requirement of the CAA.		0 of 268 facilities	0.0%
Sum:							33.9%

Overall Compliance Rate for Non-Title V facilities: 85.92%

B. Other important factors (4 criteria, each assigned weighting of 3% of total):

Type of Inspection	94%	100%	97%	Inspections involve compliance test methods with a high degree of accuracy, such as stack testing or other types of precise emissions measurement.			
	87%	93%	90%	Inspections involve detailed review of process parameters & inspection of control equipment.	3%	90%	2.7%
	81%	86%	84%	Inspections involve review of process and inspection of control equipment.			
	70%	80%	75%	Inspections generally consist of only a records review.			
		< 70%	35%	Inspections most likely consist of visual inspection (e.g., opacity), or drive by.			

Operation & Maintenance	94%	100%	97%	Control equipment operators follow and sign daily O&M instructions.			
	87%	93%	90%	Control equipment operators follow daily O&M instructions.	3%	90%	2.7%
	81%	86%	84%	Control equipment operators follow daily or weekly O&M instructions.			
	70%	80%	75%	O&M requirements exist, but on no specific schedule.			
		< 70%	35%	No specific O&M requirements.			

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score (= weight × value)
Unannounced Inspections	94%	100%	97%	Routinely conducted.	3%	97%	2.91%
	87%	93%	90%	Sometimes done.			
	81%	86%	84%	Done, but infrequently.			
	70%	80%	75%	Rarely done.			
		< 70%	35%	Never done.			

Enforcement Penalties	94%	100%	97%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.	3%	97%	2.91%
	87%	93%	90%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.			
	81%	86%	84%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.			
	70%	80%	75%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.			
		< 70%	35%	Agency does not have sufficient authority to impose punitive measures towards violators.			

C. Other factors (9 criteria, each assigned weighting of 2% of total):

Compliance Certifications	94%	100%	97%	Source subject to Title V or other type of compliance certification.	2%	75%	1.5%
	87%	93%	90%	Source subject to Title V or other type of compliance certification.			
	81%	86%	84%	Source not subject to any type of compliance certification.			
	70%	80%	75%	Source not subject to any type of compliance certification.			
		< 70%	35%	Source not subject to any type of compliance certification.			

Inspection Frequency	94%	100%	97%	Source(s) are inspected once every 2 years or more frequently.	2%	97%	1.94%
	87%	93%	90%	Source(s) inspected every 3 years or more frequently.			
	81%	86%	84%	Source(s) inspected every 5 years or more frequently.			
	70%	80%	75%	Inspection of source(s) infrequent; > every 5 years.			
		< 70%	35%	Inspections rarely, if ever, performed.			

EPA HPV Enforcement	94%	100%	97%	Agency has sufficient resources to implement EPA's 12/22/98 HPV policy.	2%	97%	1.94%
	87%	93%	90%	Agency's resources allow it to implement EPA's 12/22/98 HPV policy in most instances.			
	81%	86%	84%	Agency's resources allow it to implement EPA's 12/22/98 HPV policy in most instances.			
	70%	80%	75%	Agency's resources allow it to implement EPA's 12/22/98 HPV policy more often than not.			
		< 70%	35%	Resource constraints prohibit agency from implementing EPA's 12/22/98 HPV policy in most instances.			

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score(= weight × value)
Operator Training	94%	100%	97%	Control equipment operators complete a formal training program on use of the equipment; the program is kept up to date and has been reviewed by the regulatory agency.			
	87%	93%	90%	Control equipment operators complete formal training program, and such program is kept up to date and available for review by the regulatory agency upon request.			
	81%	86%	84%	Control equipment operators complete some amount of formal training.			
	70%	0.8	75%	Control equipment operators receive only on the job training.	2%	75%	1.50%
		< 70%	35%	Control equipment operators receive no specific training.			
Media Publicity	94%	100%	97%	Media publicity of enforcement actions.	2%	97%	1.94%
	87%	93%	90%	Media publicity of enforcement actions.			
	81%	86%	84%	Media publicity of enforcement actions.			
	70%	80%	75%	Media publicity of enforcement actions.			
		< 70%	35%	No media publicity of enforcement actions.			
Regulatory Workshops	94%	100%	97%	Regulatory workshops are available annually, and/or the implementing agency mails regulatory information packages each year.	2%	97%	1.94%
	87%	93%	90%	Regulatory workshops are available every 1-2 years, and/or the implementing agency mails regulatory information packages every 1-2 years.			
	81%	86%	84%	Regulatory workshops are available every 2-3 years, and/or the implementing agency mails regulatory information packages once every 2-3 years.			
	70%	80%	75%	Regulatory workshop not routinely available, but implementing agency mails regulatory information packages out about once every 2-3 years.			
		< 70%	35%	Regulatory workshops not routinely available. The implementing agency mails regulatory information packages infrequently, if ever.			
Inspector Training	94%	100%	97%	Inspectors must undergo 2 weeks of comprehensive basic training, and 1 to 2 weeks of source specific training, and such training is updated each year.			
	87%	93%	90%	Inspectors must undergo 1 to 2 weeks of basic training and 1 week of source specific training and such training is updated every 1-2 years.	2%	90%	1.80%
	81%	86%	84%	Inspectors must undergo 1 to 2 weeks of basic training and 3 to 5 days of source specific training, and such training is updated every 1-2 years.			
	70%	80%	75%	Inspectors must undergo 1 to 2 weeks of basic training and 1 to 3 days of source specific training, and such training is updated every 1-2 years.			
		< 70%	35%	Inspectors must undergo less than 5 days of basic training less than 3 days of source specific training, and such training is updated only every 2 years or less frequently.			

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score(= weight × value)
Testing Guidelines	94%	100%	97%	Specific guidelines and schedule for testing and test methods exist.	2%	97%	1.94%
	87%	93%	90%	Specific guidelines on testing and test methods exist, but no schedule for testing.			
	81%	86%	84%	Specific guidelines on testing and test methods exist, but no schedule for testing.			
	70%	80%	75%	Specific guidelines on testing and test methods, but no schedule for testing.			
		< 70%	35%	Only general guidance on testing, or no mention of testing requirements.			

Follow-up Inspections	94%	100%	97%	Follow-up inspections always or almost always conducted (90 % of the time or more).	2%	97%	1.94%
	87%	93%	90%	Follow-up inspections usually conducted (approximately 75% of the time).			
	81%	86%	84%	Follow-up inspections sometimes conducted (approximately 50% of the time).			
	70%	80%	75%	Follow-up inspections infrequently conducted (approximately 25% of the time).			
		< 70%	35%	Follow-up inspections rarely or never conducted (10% of the time or less)			

Overall rule effectiveness score for non-Title V facilities:

87.81%

Appendix C. MOVES2010b Local Input Data and RunSpecs

In order to calculate the 2011 annual and ozone season-day onroad source emissions, MOVES2010b was executed using local input data for each month of the year and each geographical area (the eight-hour ozone NAA and Maricopa County).

A portion of the MOVES2010b RunSpec Summary, RunSpec, and local input data for Maricopa County are provided in this appendix as an example.

MOVES2010b RunSpec Summary (Maricopa County, December 2011)

* Output Database Server Name: [using default]

* Scale:

Domain/Scale: County
Calculation Type: Inventory

* Time Spans:

Time Aggregation Level: Hour
Years: 2011
Months: December
Days: Weekend & Weekdays
Hours: Start Hour 00:00 - 00:59 | End Hour 23:00 - 23:59

* Geographic Bounds:

Region: County
Selections: ARIZONA - Maricopa County
Domain Input Database: pei_mc_2011_may2011_m2010b_in_v1

* Vehicles/Equipment

On Road Vehicle Equipment:
Diesel Fuel - Combination Long-haul Truck
Diesel Fuel - Combination Short-haul Truck
Diesel Fuel - Intercity Bus
Diesel Fuel - Light Commercial Truck
Diesel Fuel - Motor Home
Diesel Fuel - Motorcycle
Diesel Fuel - Passenger Car
Diesel Fuel - Passenger Truck
Diesel Fuel - Refuse Truck
Diesel Fuel - School Bus
Diesel Fuel - Single Unit Long-haul Truck
Diesel Fuel - Single Unit Short-haul Truck
Diesel Fuel - Transit Bus
Gasoline - Combination Long-haul Truck
Gasoline - Combination Short-haul Truck
Gasoline - Intercity Bus
Gasoline - Light Commercial Truck
Gasoline - Motor Home
Gasoline - Motorcycle
Gasoline - Passenger Car
Gasoline - Passenger Truck
Gasoline - Refuse Truck
Gasoline - School Bus
Gasoline - Single Unit Long-haul Truck
Gasoline - Single Unit Short-haul Truck
Gasoline - Transit Bus
Compressed natural Gas (CNG) - Combination Long-haul Truck
Compressed natural Gas (CNG) - Combination Short-haul Truck
Compressed natural Gas (CNG) - Intercity Bus
Compressed natural Gas (CNG) - Light Commercial Truck
Compressed natural Gas (CNG) - Motor Home
Compressed natural Gas (CNG) - Motorcycle
Compressed natural Gas (CNG) - Passenger Car
Compressed natural Gas (CNG) - Passenger Truck
Compressed natural Gas (CNG) - Refuse Truck
Compressed natural Gas (CNG) - School Bus
Compressed natural Gas (CNG) - Single Unit Long-haul Truck
Compressed natural Gas (CNG) - Single Unit Short-haul Truck
Compressed natural Gas (CNG) - Transit Bus

* Road Type

Off-Network
Rural Restricted Access
Rural Unrestricted Access
Urban Restricted Access
Urban Unrestricted Access

* Pollutants and Processes

Total Gaseous Hydrocarbons - Running Exhaust
Total Gaseous Hydrocarbons - Start Exhaust
Total Gaseous Hydrocarbons - Evap Permeation
Total Gaseous Hydrocarbons - Evap Fuel Vapor Venting
Total Gaseous Hydrocarbons - Evap Fuel Leaks
Total Gaseous Hydrocarbons - Crankcase Running Exhaust
Total Gaseous Hydrocarbons - Crankcase Start Exhaust
Total Gaseous Hydrocarbons - Crankcase Extended Idle Exhaust
Total Gaseous Hydrocarbons - Refueling Displacement Vapor Loss
Total Gaseous Hydrocarbons - Refueling Spillage Loss
Total Gaseous Hydrocarbons - Extended Idle Exhaust
Carbon Monoxide (CO) - Running Exhaust
Carbon Monoxide (CO) - Start Exhaust
Carbon Monoxide (CO) - Crankcase Running Exhaust
Carbon Monoxide (CO) - Crankcase Start Exhaust
Carbon Monoxide (CO) - Crankcase Extended Idle Exhaust
Carbon Monoxide (CO) - Extended Idle Exhaust
Oxides of Nitrogen (NOx) - Running Exhaust
Oxides of Nitrogen (NOx) - Start Exhaust
Oxides of Nitrogen (NOx) - Crankcase Running Exhaust
Oxides of Nitrogen (NOx) - Crankcase Start Exhaust
Oxides of Nitrogen (NOx) - Crankcase Extended Idle Exhaust
Oxides of Nitrogen (NOx) - Extended Idle Exhaust
Methane (CH4) - Running Exhaust
Methane (CH4) - Start Exhaust
Methane (CH4) - Crankcase Running Exhaust
Methane (CH4) - Crankcase Start Exhaust
Methane (CH4) - Crankcase Extended Idle Exhaust
Methane (CH4) - Refueling Displacement Vapor Loss
Methane (CH4) - Refueling Spillage Loss
Methane (CH4) - Extended Idle Exhaust
Non-Methane Hydrocarbons - Running Exhaust
Non-Methane Hydrocarbons - Start Exhaust
Non-Methane Hydrocarbons - Evap Permeation
Non-Methane Hydrocarbons - Evap Fuel Vapor Venting
Non-Methane Hydrocarbons - Evap Fuel Leaks
Non-Methane Hydrocarbons - Crankcase Running Exhaust
Non-Methane Hydrocarbons - Crankcase Start Exhaust
Non-Methane Hydrocarbons - Crankcase Extended Idle Exhaust
Non-Methane Hydrocarbons - Refueling Displacement Vapor Loss
Non-Methane Hydrocarbons - Refueling Spillage Loss
Non-Methane Hydrocarbons - Extended Idle Exhaust
Non-Methane Organic Gases - Running Exhaust
Non-Methane Organic Gases - Start Exhaust
Non-Methane Organic Gases - Evap Permeation
Non-Methane Organic Gases - Evap Fuel Vapor Venting
Non-Methane Organic Gases - Evap Fuel Leaks
Non-Methane Organic Gases - Crankcase Running Exhaust
Non-Methane Organic Gases - Crankcase Start Exhaust
Non-Methane Organic Gases - Crankcase Extended Idle Exhaust
Non-Methane Organic Gases - Refueling Displacement Vapor Loss
Non-Methane Organic Gases - Refueling Spillage Loss
Non-Methane Organic Gases - Extended Idle Exhaust
Total Organic Gases - Running Exhaust
Total Organic Gases - Start Exhaust
Total Organic Gases - Evap Permeation
Total Organic Gases - Evap Fuel Vapor Venting
Total Organic Gases - Evap Fuel Leaks
Total Organic Gases - Crankcase Running Exhaust
Total Organic Gases - Crankcase Start Exhaust
Total Organic Gases - Crankcase Extended Idle Exhaust
Total Organic Gases - Refueling Displacement Vapor Loss
Total Organic Gases - Refueling Spillage Loss
Total Organic Gases - Extended Idle Exhaust
Volatile Organic Compounds - Running Exhaust
Volatile Organic Compounds - Start Exhaust
Volatile Organic Compounds - Evap Permeation
Volatile Organic Compounds - Evap Fuel Vapor Venting
Volatile Organic Compounds - Evap Fuel Leaks
Volatile Organic Compounds - Crankcase Running Exhaust

Volatile Organic Compounds - Crankcase Start Exhaust
Volatile Organic Compounds - Crankcase Extended Idle Exhaust
Volatile Organic Compounds - Refueling Displacement Vapor
Loss
Volatile Organic Compounds - Refueling Spillage Loss
Volatile Organic Compounds - Extended Idle Exhaust

* Manage Input Data Sets
Selections: / StageII_Input / Stage II Refueling Input

* Output
General Output:

Output Database: pei_mc_2011_may2011_m2010b_out_v1
Units: Mass Units (Grams) | Energy Units (Joules) | Distance
Units (Miles)

Activity: Distance Traveled | Source Hours | Source Hours
Idling | Source Hours Operating | Source Hours
Parked | Population | Starts

Output Emissions Detail:

Always: Time (Month) | Location (NATION) | Pollutant
For All Vehicle/Equipment Categories: Fuel Type | Emission
Process

On Road: SCC

MOVES2010b RunSpec (Maricopa County, December 2011)

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  <onroadvehicleselection fueltypeid="3" fueltyperedesc="Compressed Natural Gas (CNG)" sourcetypeid="21" sourcetypername="Passenger Car"/>
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  <onroadvehicleselection fueltypeid="3" fueltyperedesc="Compressed Natural Gas (CNG)" sourcetypeid="61" sourcetypername="Combination Short-haul Truck"/>
  <onroadvehicleselection fueltypeid="3" fueltyperedesc="Compressed Natural Gas (CNG)" sourcetypeid="62" sourcetypername="Combination Long-haul Truck"/>
</onroadvehicleselections>
<offroadvehicleselections>
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<roadtypes>
  <roadtype roadtypeid="1" roadtypername="Off-Network"/>
  <roadtype roadtypeid="2" roadtypername="Rural Restricted Access"/>
  <roadtype roadtypeid="3" roadtypername="Rural Unrestricted Access"/>
  <roadtype roadtypeid="4" roadtypername="Urban Restricted Access"/>
  <roadtype roadtypeid="5" roadtypername="Urban Unrestricted Access"/>
</roadtypes>
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  <pollutantprocessassociation pollutantkey="1" pollutantname="Total Gaseous Hydrocarbons" processkey="1" processname="Running Exhaust"/>
  <pollutantprocessassociation pollutantkey="1" pollutantname="Total Gaseous Hydrocarbons" processkey="2" processname="Start Exhaust"/>
  <pollutantprocessassociation pollutantkey="1" pollutantname="Total Gaseous Hydrocarbons" processkey="11" processname="Evap Permeation"/>
  <pollutantprocessassociation pollutantkey="1" pollutantname="Total Gaseous Hydrocarbons" processkey="12" processname="Evap Fuel">

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Vapor Venting"/>

<pollutantprocessassociation pollutantkey="1" pollutantname="Total Gaseous Hydrocarbons" processkey="13" processname="Evap Fuel Leaks"/>

<pollutantprocessassociation pollutantkey="1" pollutantname="Total Gaseous Hydrocarbons" processkey="15" processname="Crankcase Running Exhaust"/>

<pollutantprocessassociation pollutantkey="1" pollutantname="Total Gaseous Hydrocarbons" processkey="16" processname="Crankcase Start Exhaust"/>

<pollutantprocessassociation pollutantkey="1" pollutantname="Total Gaseous Hydrocarbons" processkey="17" processname="Crankcase Extended Idle Exhaust"/>

<pollutantprocessassociation pollutantkey="1" pollutantname="Total Gaseous Hydrocarbons" processkey="18" processname="Refueling Displacement Vapor Loss"/>

<pollutantprocessassociation pollutantkey="1" pollutantname="Total Gaseous Hydrocarbons" processkey="19" processname="Refueling Spillage Loss"/>

<pollutantprocessassociation pollutantkey="1" pollutantname="Total Gaseous Hydrocarbons" processkey="90" processname="Extended Idle Exhaust"/>

<pollutantprocessassociation pollutantkey="2" pollutantname="Carbon Monoxide (CO)" processkey="1" processname="Running Exhaust"/>

<pollutantprocessassociation pollutantkey="2" pollutantname="Carbon Monoxide (CO)" processkey="2" processname="Start Exhaust"/>

<pollutantprocessassociation pollutantkey="2" pollutantname="Carbon Monoxide (CO)" processkey="15" processname="Crankcase Running Exhaust"/>

<pollutantprocessassociation pollutantkey="2" pollutantname="Carbon Monoxide (CO)" processkey="16" processname="Crankcase Start Exhaust"/>

<pollutantprocessassociation pollutantkey="2" pollutantname="Carbon Monoxide (CO)" processkey="17" processname="Crankcase Extended Idle Exhaust"/>

<pollutantprocessassociation pollutantkey="2" pollutantname="Carbon Monoxide (CO)" processkey="90" processname="Extended Idle Exhaust"/>

<pollutantprocessassociation pollutantkey="3" pollutantname="Oxides of Nitrogen (NOx)" processkey="1" processname="Running Exhaust"/>

<pollutantprocessassociation pollutantkey="3" pollutantname="Oxides of Nitrogen (NOx)" processkey="2" processname="Start Exhaust"/>

<pollutantprocessassociation pollutantkey="3" pollutantname="Oxides of Nitrogen (NOx)" processkey="15" processname="Crankcase Running Exhaust"/>

<pollutantprocessassociation pollutantkey="3" pollutantname="Oxides of Nitrogen (NOx)" processkey="16" processname="Crankcase Start Exhaust"/>

<pollutantprocessassociation pollutantkey="3" pollutantname="Oxides of Nitrogen (NOx)" processkey="17" processname="Crankcase Extended Idle Exhaust"/>

<pollutantprocessassociation pollutantkey="3" pollutantname="Oxides of Nitrogen (NOx)" processkey="90" processname="Extended Idle Exhaust"/>

<pollutantprocessassociation pollutantkey="5" pollutantname="Methane (CH4)" processkey="1" processname="Running Exhaust"/>

<pollutantprocessassociation pollutantkey="5" pollutantname="Methane (CH4)" processkey="2" processname="Start Exhaust"/>

<pollutantprocessassociation pollutantkey="5" pollutantname="Methane (CH4)" processkey="15" processname="Crankcase Running Exhaust"/>

<pollutantprocessassociation pollutantkey="5" pollutantname="Methane (CH4)" processkey="16" processname="Crankcase Start Exhaust"/>

<pollutantprocessassociation pollutantkey="5" pollutantname="Methane (CH4)" processkey="17" processname="Crankcase Extended Idle Exhaust"/>

<pollutantprocessassociation pollutantkey="5" pollutantname="Methane (CH4)" processkey="18" processname="Refueling Displacement Vapor Loss"/>

<pollutantprocessassociation pollutantkey="5" pollutantname="Methane (CH4)" processkey="19" processname="Refueling Spillage Loss"/>

<pollutantprocessassociation pollutantkey="5" pollutantname="Methane (CH4)" processkey="90" processname="Extended Idle Exhaust"/>

<pollutantprocessassociation pollutantkey="79" pollutantname="Non-Methane Hydrocarbons" processkey="1" processname="Running Exhaust"/>

<pollutantprocessassociation pollutantkey="79" pollutantname="Non-Methane Hydrocarbons" processkey="2" processname="Start Exhaust"/>

<pollutantprocessassociation pollutantkey="79" pollutantname="Non-Methane Hydrocarbons" processkey="11" processname="Evap Permeation"/>

<pollutantprocessassociation pollutantkey="79" pollutantname="Non-Methane Hydrocarbons" processkey="12" processname="Evap Fuel Vapor Venting"/>

<pollutantprocessassociation pollutantkey="79" pollutantname="Non-Methane Hydrocarbons" processkey="13" processname="Evap Fuel Leaks"/>

<pollutantprocessassociation pollutantkey="79" pollutantname="Non-Methane Hydrocarbons" processkey="15" processname="Crankcase Running Exhaust"/>

<pollutantprocessassociation pollutantkey="79" pollutantname="Non-Methane Hydrocarbons" processkey="16" processname="Crankcase Start Exhaust"/>

<pollutantprocessassociation pollutantkey="79" pollutantname="Non-Methane Hydrocarbons" processkey="17" processname="Crankcase Extended Idle Exhaust"/>


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    <pollutantprocessassociation pollutantkey="87" pollutantname="Volatile Organic Compounds" processkey="19" processname="Refueling
Spillage Loss"/>
    <pollutantprocessassociation pollutantkey="87" pollutantname="Volatile Organic Compounds" processkey="90" processname="Extended
Idle Exhaust"/>
  </pollutantprocessassociations>
  <databaseselections>
  <databaseselection servername="" databasename="StageII_Input" description="Stage II Refueling Input"/>
  </databaseselections>
  <internalcontrolstrategies>
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classname="gov.epa.otaq.moves.master.implementation.ghg.internalcontrolstrategies.rateofprogress.RateOfProgressStrategy"><![CDATA
[
useParameters          No
]]></internalcontrolstrategy>
</internalcontrolstrategies>
  <inputdatabase servername="" databasename="" description=""/>
  <uncertaintyparameters uncertaintymodeenabled="false" numberofrunspersimulation="0" numberofsimulations="0"/>
  <geographicoutputdetail description="LINK"/>
  <outputemissionsbreakdownselection>
    <modelyear selected="false"/>
    <fueltype selected="true"/>
    <emissionprocess selected="true"/>
    <onroadoffroad selected="true"/>
    <roadtype selected="true"/>
    <sourceusetype selected="false"/>
    <movesvehicletype selected="false"/>
    <onroadsc selected="true"/>
    <offroadsc selected="false"/>
    <estimateuncertainty selected="false" numberOfIterations="2" keepSampledData="false" keepIterations="false"/>
    <sector selected="false"/>
    <engtechid selected="false"/>
    <hpclass selected="false"/>
  </outputemissionsbreakdownselection>
  <outputdatabase servername="" databasename="pei_mc_2011_may2011_m2010b_out_v1" description=""/>
  <outputtimestep value="Month"/>
  <outputvmtdata value="true"/>
  <outputsho value="true"/>
  <outputsh value="true"/>
  <outputshp value="true"/>
  <outputshidling value="true"/>
  <outputstarts value="true"/>
  <outputpopulation value="true"/>
  <scaleinputdatabase servername="localhost" databasename="pei_mc_2011_may2011_m2010b_in_v1" description=""/>
  <pmsize value="0"/>
  <outputfactors>
    <timefactors selected="true" units="Months"/>
    <distancefactors selected="true" units="Miles"/>
    <massfactors selected="true" units="Grams" energyunits="Joules"/>
  </outputfactors>
  <savedata>
  </savedata>
  <donotexecute>
  </donotexecute>
  <generatordatabase shouldsave="false" servername="" databasename="" description=""/>
  <donotperformfinalaggregation selected="false"/>
  <lookupableflags scenarioid="pei_mc_2011_may2011_m2010b_in_v1" truncateoutput="true" truncateactivity="true"/>
</runspec>

```

MOVES2010b Local Input Data (Maricopa County, December 2011)

[FuelFormulation]

Fuel Formulation	Fuel Subtype	RVP	Sulfur Level	ETOH Volume	MTBE Volume	ETBE Volume	TAME Volume	Aromatic Content	Olefin Content	Benzen e Content	e20 0	e30 0	volToWt PercentOxy	BioDiesel Ester	Cetane Index	PAH Content	T50	T90
11100	12	8.02	20.2	10.	0	0.00194	0.05179	19.6	9.2	1.2	47.9	88.0	2.1717	0	0	0	197.721	309.431
11101	12	8.81	15.4	10.	0	0	0	17.5	6.5	0.9	53.3	90.7	3.7575	0	0	0	185.333	295.25
11102	13	8.79	14.7	10.	0	0	0	20.1	9.1	0.9	54.6	89.4	3.1457	0	0	0	177.636	302.727
11103	12	10.7	15.0	10.	0	0	0	31.9	14.	1.9	54.0	86.0	3.5900	0	0	0	170	317
11104	14	6.94	24.6	10.	0	0.00428	0.11395	19.6	9.9	0.9	42.7	86.7	0.7805	0	0	0	212.908	315.856
11105	12	8.02	26.0	10.	0	0	0	19.9	6.8	0.8	46.0	90.0	3.7400	0	0	0	210	297
11106	11	6.54	22.0	10.	0	0	0	17.6	10.	0.7	45.0	85.5	0.0000	0	0	0	209	320
11107	14	6.80	23.3	10.	0	0	0.36666	21.4	10.	1.2	44.3	86.0	0.1000	0	0	0	212	322
11108	11	6.64	27.2	10.	0	0.02142	0.08571	19.9	11.	0.8	39.0	86.3	0.0171	0	0	0	217	319
11109	14	6.69	24.5	10.	0	0	0.11739	19.2	10.	0.7	39.3	85.8	0.0454	0	0	0	216.543	321.282
11110	13	8.16	19.3	10.	0	0	0	17.0	8.5	0.9	47.8	88.3	2.6418	0	0	0	195.941	310.647
11111	13	8.49	18.7	10.	0	0	0	15.2	6.4	0.8	51.5	90.1	3.2706	0	0	0	191.117	300.294
11112	12	8.53	16.3	10.	0	0	0	16.0	6.4	3.7	51.6	90.3	3.5806	0	0	0	190.363	298.545
21100	12	8.02	20.2	0.0	0	0.00194	0.05179	19.6	9.2	1.2	47.9	88.0	2.1717	0	0	0	197.721	309.431
21101	12	8.81	15.4	0.0	0	0	0	17.5	6.5	0.9	53.3	90.7	3.7575	0	0	0	185.333	295.25
21102	13	8.79	14.7	0.0	0	0	0	20.1	9.1	0.9	54.6	89.4	3.1457	0	0	0	177.636	302.727
21103	12	10.7	15.0	0.0	0	0	0	31.9	14.	1.9	54.0	86.0	3.5900	0	0	0	170	317
21104	14	6.94	24.6	0.0	0	0.00428	0.11395	19.6	9.9	0.9	42.7	86.7	0.7805	0	0	0	212.908	315.856
21105	12	8.02	26.0	0.0	0	0	0	19.9	6.8	0.8	46.0	90.0	3.7400	0	0	0	210	297
21106	11	6.54	22.0	0.0	0	0	0	17.6	10.	0.7	45.0	85.5	0.0000	0	0	0	209	320
21107	14	6.80	23.3	0.0	0	0	0.36666	21.4	10.	1.2	44.3	86.0	0.1000	0	0	0	212	322
21108	11	6.64	27.2	0.0	0	0.02142	0.08571	19.9	11.	0.8	39.0	86.3	0.0171	0	0	0	217	319
21109	14	6.69	24.5	0.0	0	0	0.11739	19.2	10.	0.7	39.3	85.8	0.0454	0	0	0	216.543	321.282
21110	13	8.16	19.3	0.0	0	0	0	17.0	8.5	0.9	47.8	88.3	2.6418	0	0	0	195.941	310.647
21111	13	8.49	18.7	0.0	0	0	0	15.2	6.4	0.8	51.5	90.1	3.2706	0	0	0	191.117	300.294
21112	12	8.53	16.3	0.0	0	0	0	16.0	6.4	3.7	51.6	90.3	3.5806	0	0	0	190.363	298.545
31000	20	0	5.71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31001	20	0	5.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31002	20	0	5.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31003	20	0	5.88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31004	20	0	5.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31005	20	0	5.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31006	20	0	5.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31007	20	0	5.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31008	20	0	5.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31009	20	0	5.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31010	20	0	5.88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31011	20	0	7.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31012	20	0	5.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[HPMSvTypeYear]

HPMSvTypeID	yearID	VMTGrowthFactor	HPMSBaseYearVMT	baseYearOffNetVMT
10	2011	0	623037600.1	0
20	2011	0	15806675171	0
30	2011	0	12967244959	0
40	2011	0	118381498.4	0
50	2011	0	1281267928	0
60	2011	0	1646318085	0

[Source TypeYear]

yearID	sourceTypeID	sourceTypePopulation
2011	11	75309
2011	21	2044983
2011	31	440595.7
2011	32	172099
2011	41	1172.42
2011	42	718.58
2011	43	7592.578
2011	51	585.7895
2011	52	21663.06
2011	53	1344.71
2011	54	3344.705
2011	61	9859.552
2011	62	8092.895

[FuelSupply]

countyID	fuelYearID	monthGroupID	fuelFormulationID	marketShare	marketShareCV
4013	2011	1	21101	0.05	0.5
4013	2011	1	11101	0.95	0.5
4013	2011	1	31001	1	0.5
4013	2011	1	30	1	0.5
4013	2011	2	21102	0.05	0.5
4013	2011	2	11102	0.95	0.5
4013	2011	2	31002	1	0.5
4013	2011	2	30	1	0.5
4013	2011	3	21103	0.05	0.5
4013	2011	3	11103	0.95	0.5
4013	2011	3	31003	1	0.5
4013	2011	3	30	1	0.5
4013	2011	4	21104	0.05	0.5
4013	2011	4	11104	0.95	0.5
4013	2011	4	31004	1	0.5
4013	2011	4	30	1	0.5
4013	2011	5	21105	0.05	0.5
4013	2011	5	11105	0.95	0.5
4013	2011	5	31005	1	0.5
4013	2011	5	30	1	0.5
4013	2011	6	21106	0.05	0.5
4013	2011	6	11106	0.95	0.5
4013	2011	6	31006	1	0.5
4013	2011	6	30	1	0.5
4013	2011	7	21107	0.05	0.5
4013	2011	7	11107	0.95	0.5
4013	2011	7	31007	1	0.5
4013	2011	7	30	1	0.5
4013	2011	8	21108	0.05	0.5
4013	2011	8	11108	0.95	0.5
4013	2011	8	31008	1	0.5
4013	2011	8	30	1	0.5
4013	2011	9	21109	0.05	0.5
4013	2011	9	11109	0.95	0.5
4013	2011	9	31009	1	0.5
4013	2011	9	30	1	0.5
4013	2011	10	21110	0.05	0.5
4013	2011	10	11110	0.95	0.5
4013	2011	10	31010	1	0.5
4013	2011	10	30	1	0.5
4013	2011	11	21111	0.05	0.5
4013	2011	11	11111	0.95	0.5
4013	2011	11	31011	1	0.5
4013	2011	11	30	1	0.5
4013	2011	12	21112	0.05	0.5
4013	2011	12	11112	0.95	0.5
4013	2011	12	31012	1	0.5
4013	2011	12	30	1	0.5

[ZoneMonthHour]

monthID	zoneID	HourID	temperature	relHumidity
12	40130	1	48	62
12	40130	2	47	65
12	40130	3	47	64
12	40130	4	47	64
12	40130	5	46	66
12	40130	6	46	66
12	40130	7	45	68
12	40130	8	46	67
12	40130	9	48	62
12	40130	10	52	54
12	40130	11	55	48
12	40130	12	57	43
12	40130	13	59	40
12	40130	14	60	38
12	40130	15	61	36
12	40130	16	62	35
12	40130	17	61	37
12	40130	18	58	42
12	40130	19	56	47
12	40130	20	54	51
12	40130	21	53	52
12	40130	22	52	56
12	40130	23	50	59
12	40130	24	49	60
12	40130	1	48	62

[Source Type Age Distribution]

Source TypeID	YearID	AgeID	AgeFraction
11	2011	0	0.029892
11	2011	1	0.036417
11	2011	2	0.083781
11	2011	3	0.101569
11	2011	4	0.116094
11	2011	5	0.105884
11	2011	6	0.081115
11	2011	7	0.058941
11	2011	8	0.067783
11	2011	9	0.054942
11	2011	10	0.046522
11	2011	11	0.038838
11	2011	12	0.031681
11	2011	13	0.023471
11	2011	14	0.018524
11	2011	15	0.017472
11	2011	16	0.014525
11	2011	17	0.011157
11	2011	18	0.010525
11	2011	19	0.007262
11	2011	20	0.005157
11	2011	21	0.005263
11	2011	22	0.005052
11	2011	23	0.004631
11	2011	24	0.004245
11	2011	25	0.003891
11	2011	26	0.003567
11	2011	27	0.00327
11	2011	28	0.002997
11	2011	29	0.002748
11	2011	30	0.002748
21	2011	0	0.043696
21	2011	1	0.053295
21	2011	2	0.042596
21	2011	3	0.068793
21	2011	4	0.083192
21	2011	5	0.080592
21	2011	6	0.077392
21	2011	7	0.070493
21	2011	8	0.065393
21	2011	9	0.061294
21	2011	10	0.056294
21	2011	11	0.051995
21	2011	12	0.043696
21	2011	13	0.034097
21	2011	14	0.029997
21	2011	15	0.022198
21	2011	16	0.021098
21	2011	17	0.015798
21	2011	18	0.012199
21	2011	19	0.009499
21	2011	20	0.008099
21	2011	21	0.006399
21	2011	22	0.005299
21	2011	23	0.004
21	2011	24	0.003019
21	2011	25	0.002278
21	2011	26	0.001719
21	2011	27	0.001298
21	2011	28	0.000979
21	2011	29	0.000739
21	2011	30	0.022565
31	2011	0	0.040367
31	2011	1	0.036952
31	2011	2	0.023272
31	2011	3	0.060977
31	2011	4	0.080902
31	2011	5	0.086168
31	2011	6	0.070426
31	2011	7	0.071799
31	2011	8	0.060662
31	2011	9	0.054761
31	2011	10	0.061661
31	2011	11	0.055069
31	2011	12	0.041776
31	2011	13	0.034756
31	2011	14	0.036143
31	2011	15	0.02573
31	2011	16	0.02484
31	2011	17	0.022254
31	2011	18	0.014775
31	2011	19	0.010328
31	2011	20	0.008996
31	2011	21	0.007982
31	2011	22	0.008785

Source TypeID	YearID	AgeID	AgeFraction
31	2011	23	0.006661
31	2011	24	0.005076
31	2011	25	0.003888
31	2011	26	0.003002
31	2011	27	0.002329
31	2011	28	0.001818
31	2011	29	0.001418
31	2011	30	0.036429
32	2011	0	0.043709
32	2011	1	0.037275
32	2011	2	0.024506
32	2011	3	0.063116
32	2011	4	0.086828
32	2011	5	0.091952
32	2011	6	0.071425
32	2011	7	0.069687
32	2011	8	0.057689
32	2011	9	0.051358
32	2011	10	0.058053
32	2011	11	0.055657
32	2011	12	0.041337
32	2011	13	0.03425
32	2011	14	0.036441
32	2011	15	0.02487
32	2011	16	0.023712
32	2011	17	0.02089
32	2011	18	0.013959
32	2011	19	0.009727
32	2011	20	0.008543
32	2011	21	0.007639
32	2011	22	0.00826
32	2011	23	0.006259
32	2011	24	0.004777
32	2011	25	0.00368
32	2011	26	0.002847
32	2011	27	0.002226
32	2011	28	0.001755
32	2011	29	0.001411
32	2011	30	0.036162
41	2011	0	0.038296
41	2011	1	0.015698
41	2011	2	0.027397
41	2011	3	0.064494
41	2011	4	0.149585
41	2011	5	0.139386
41	2011	6	0.09579
41	2011	7	0.060294
41	2011	8	0.043396
41	2011	9	0.034397
41	2011	10	0.044396
41	2011	11	0.055294
41	2011	12	0.052495
41	2011	13	0.028097
41	2011	14	0.027297
41	2011	15	0.025797
41	2011	16	0.024298
41	2011	17	0.014999
41	2011	18	0.009599
41	2011	19	0.007199
41	2011	20	0.006299
41	2011	21	0.009299
41	2011	22	0.006299
41	2011	23	0.0048
41	2011	24	0.003657
41	2011	25	0.002786
41	2011	26	0.002123
41	2011	27	0.001617
41	2011	28	0.001232
41	2011	29	0.000939
41	2011	30	0.002744
42	2011	0	0.038296
42	2011	1	0.015698
42	2011	2	0.027397
42	2011	3	0.064494
42	2011	4	0.149585
42	2011	5	0.139386
42	2011	6	0.09579
42	2011	7	0.060294
42	2011	8	0.043396
42	2011	9	0.034397
42	2011	10	0.044396
42	2011	11	0.055294
42	2011	12	0.052495
42	2011	13	0.028097
42	2011	14	0.027297

Source TypeID	YearID	AgeID	AgeFraction
42	2011	15	0.025797
42	2011	16	0.024298
42	2011	17	0.014999
42	2011	18	0.009599
42	2011	19	0.007199
42	2011	20	0.006299
42	2011	21	0.009299
42	2011	22	0.006299
42	2011	23	0.0048
42	2011	24	0.003657
42	2011	25	0.002786
42	2011	26	0.002123
42	2011	27	0.001617
42	2011	28	0.001232
42	2011	29	0.000939
42	2011	30	0.002744
43	2011	0	0.075389
43	2011	1	0.040094
43	2011	2	0.037195
43	2011	3	0.085088
43	2011	4	0.147379
43	2011	5	0.151778
43	2011	6	0.083488
43	2011	7	0.051493
43	2011	8	0.030696
43	2011	9	0.020197
43	2011	10	0.024996
43	2011	11	0.063691
43	2011	12	0.038794
43	2011	13	0.030796
43	2011	14	0.041094
43	2011	15	0.017397
43	2011	16	0.013008
43	2011	17	0.00801
43	2011	18	0.005722
43	2011	19	0.003933
43	2011	20	0.004121
43	2011	21	0.004475
43	2011	22	0.003412
43	2011	23	0.002644
43	2011	24	0.002026
43	2011	25	0.001526
43	2011	26	0.001172
43	2011	27	0.000893
43	2011	28	0.000686
43	2011	29	0.000527
43	2011	30	0.008281
51	2011	0	0.075401
51	2011	1	0.0401
51	2011	2	0.0372
51	2011	3	0.085101
51	2011	4	0.147402
51	2011	5	0.151802
51	2011	6	0.083501
51	2011	7	0.051501
51	2011	8	0.0307
51	2011	9	0.0202
51	2011	10	0.025
51	2011	11	0.063701
51	2011	12	0.0388
51	2011	13	0.0308
51	2011	14	0.0411
51	2011	15	0.0174
51	2011	16	0.013199
51	2011	17	0.008099
51	2011	18	0.0059
51	2011	19	0.003999
51	2011	20	0.004199
51	2011	21	0.004499
51	2011	22	0.003399
51	2011	23	0.002599
51	2011	24	0.001988
51	2011	25	0.00152
51	2011	26	0.001162
51	2011	27	0.000889
51	2011	28	0.00068
51	2011	29	0.00052
51	2011	30	0.007638
52	2011	0	0.066214
52	2011	1	0.039334
52	2011	2	0.03318
52	2011	3	0.078132
52	2011	4	0.128378
52	2011	5	0.132775
52	2011	6	0.079084

Source TypeID	YearID	AgeID	AgeFraction
52	2011	7	0.056074
52	2011	8	0.038042
52	2011	9	0.02878
52	2011	10	0.034102
52	2011	11	0.060507
52	2011	12	0.038954
52	2011	13	0.031317
52	2011	14	0.039113
52	2011	15	0.019306
52	2011	16	0.016191
52	2011	17	0.011791
52	2011	18	0.008363
52	2011	19	0.005691
52	2011	20	0.005513
52	2011	21	0.005414
52	2011	22	0.004802
52	2011	23	0.003655
52	2011	24	0.00283
52	2011	25	0.002259
52	2011	26	0.00176
52	2011	27	0.001429
52	2011	28	0.001176
52	2011	29	0.001073
52	2011	30	0.002476
53	2011	0	0.074869
53	2011	1	0.040084
53	2011	2	0.036613
53	2011	3	0.08406
53	2011	4	0.144792
53	2011	5	0.148968
53	2011	6	0.082261
53	2011	7	0.050975
53	2011	8	0.030557
53	2011	9	0.02016
53	2011	10	0.024955
53	2011	11	0.062595
53	2011	12	0.038177
53	2011	13	0.030303
53	2011	14	0.040308
53	2011	15	0.017217
53	2011	16	0.013996
53	2011	17	0.008668
53	2011	18	0.006817
53	2011	19	0.004401
53	2011	20	0.004658
53	2011	21	0.004706
53	2011	22	0.003492
53	2011	23	0.002575
53	2011	24	0.002017
53	2011	25	0.001726
53	2011	26	0.001332

Source TypeID	YearID	AgeID	AgeFraction
53	2011	27	0.001106
53	2011	28	0.000916
53	2011	29	0.000861
53	2011	30	0.015836
54	2011	0	0.075419
54	2011	1	0.04011
54	2011	2	0.037209
54	2011	3	0.085122
54	2011	4	0.147438
54	2011	5	0.151839
54	2011	6	0.083521
54	2011	7	0.051513
54	2011	8	0.030708
54	2011	9	0.020205
54	2011	10	0.025006
54	2011	11	0.063716
54	2011	12	0.03881
54	2011	13	0.030808
54	2011	14	0.04111
54	2011	15	0.017404
54	2011	16	0.012531
54	2011	17	0.007698
54	2011	18	0.005268
54	2011	19	0.003727
54	2011	20	0.003917
54	2011	21	0.004384
54	2011	22	0.003365
54	2011	23	0.002681
54	2011	24	0.002082
54	2011	25	0.001515
54	2011	26	0.00117
54	2011	27	0.000884
54	2011	28	0.000678
54	2011	29	0.000526
54	2011	30	0.009633
61	2011	0	0.075521
61	2011	1	0.040164
61	2011	2	0.03726
61	2011	3	0.085237
61	2011	4	0.147637
61	2011	5	0.152044
61	2011	6	0.083634
61	2011	7	0.051583
61	2011	8	0.030749
61	2011	9	0.020232
61	2011	10	0.02504
61	2011	11	0.063802
61	2011	12	0.038862
61	2011	13	0.030849
61	2011	14	0.041166
61	2011	15	0.017428

Source TypeID	YearID	AgeID	AgeFraction
61	2011	16	0.013144
61	2011	17	0.00788
61	2011	18	0.005826
61	2011	19	0.003897
61	2011	20	0.004157
61	2011	21	0.004432
61	2011	22	0.003239
61	2011	23	0.002455
61	2011	24	0.001916
61	2011	25	0.001465
61	2011	26	0.001114
61	2011	27	0.000846
61	2011	28	0.00063
61	2011	29	0.000485
61	2011	30	0.007306
62	2011	0	0.075452
62	2011	1	0.040127
62	2011	2	0.037225
62	2011	3	0.085158
62	2011	4	0.147501
62	2011	5	0.151904
62	2011	6	0.083557
62	2011	7	0.051535
62	2011	8	0.030721
62	2011	9	0.020214
62	2011	10	0.025017
62	2011	11	0.063744
62	2011	12	0.038827
62	2011	13	0.030821
62	2011	14	0.041128
62	2011	15	0.017412
62	2011	16	0.013178
62	2011	17	0.008015
62	2011	18	0.005871
62	2011	19	0.003959
62	2011	20	0.00418
62	2011	21	0.00447
62	2011	22	0.003336
62	2011	23	0.00254
62	2011	24	0.001955
62	2011	25	0.001495
62	2011	26	0.001141
62	2011	27	0.00087
62	2011	28	0.000659
62	2011	29	0.000505
62	2011	30	0.007485

[IMCoverage]

polProcess ID	State ID	County ID	yearID	sourceTypeID	fuelTypeID	IMProgramID	Beg ModelYearID	End ModelYearID	inspectFreq	Test StandardsID	useMyn	Compliance Factor
101	4	4013	2011	21	1	3	1967	1980	1	13	N	95.8845
101	4	4013	2011	21	1	6	1981	1995	2	33	N	95.8845
101	4	4013	2011	21	1	10	1996	2005	2	51	N	95.8845
101	4	4013	2011	31	1	3	1967	1980	1	13	N	95.8845
101	4	4013	2011	31	1	6	1981	1995	2	33	N	95.8845
101	4	4013	2011	31	1	10	1996	2005	2	51	N	95.8845
101	4	4013	2011	32	1	3	1967	1980	1	13	N	95.8845
101	4	4013	2011	32	1	6	1981	1995	2	33	N	95.8845
101	4	4013	2011	32	1	10	1996	2005	2	51	N	95.8845
101	4	4013	2011	52	1	3	1967	2005	1	13	N	95.8845
102	4	4013	2011	21	1	3	1967	1980	1	13	N	95.8845
102	4	4013	2011	21	1	6	1981	1995	2	33	N	95.8845
102	4	4013	2011	21	1	10	1996	2005	2	51	N	95.8845
102	4	4013	2011	31	1	3	1967	1980	1	13	N	95.8845
102	4	4013	2011	31	1	6	1981	1995	2	33	N	95.8845
102	4	4013	2011	31	1	10	1996	2005	2	51	N	95.8845
102	4	4013	2011	32	1	3	1967	1980	1	13	N	95.8845
102	4	4013	2011	32	1	6	1981	1995	2	33	N	95.8845
102	4	4013	2011	32	1	10	1996	2005	2	51	N	95.8845
102	4	4013	2011	52	1	3	1967	2005	1	13	N	95.8845
112	4	4013	2011	21	1	8	1996	2005	2	43	N	95.8845
112	4	4013	2011	21	1	9	1981	1995	1	44	N	95.8845
112	4	4013	2011	31	1	8	1996	2005	2	43	N	95.8845
112	4	4013	2011	31	1	9	1981	1995	1	44	N	95.8845
112	4	4013	2011	32	1	8	1996	2005	2	43	N	95.8845
112	4	4013	2011	32	1	9	1981	1995	1	44	N	95.8845
112	4	4013	2011	52	1	7	1967	2005	1	41	N	95.8845
113	4	4013	2011	21	1	8	1996	2005	2	43	N	95.8845
113	4	4013	2011	21	1	9	1981	1995	1	44	N	95.8845
113	4	4013	2011	31	1	8	1996	2005	2	43	N	95.8845
113	4	4013	2011	31	1	9	1981	1995	1	44	N	95.8845
113	4	4013	2011	32	1	8	1996	2005	2	43	N	95.8845
113	4	4013	2011	32	1	9	1981	1995	1	44	N	95.8845
113	4	4013	2011	52	1	7	1967	2005	1	41	N	95.8845
201	4	4013	2011	21	1	3	1967	1980	1	13	N	95.8845
201	4	4013	2011	21	1	6	1981	1995	2	33	N	95.8845
201	4	4013	2011	21	1	10	1996	2005	2	51	N	95.8845
201	4	4013	2011	31	1	3	1967	1980	1	13	N	95.8845
201	4	4013	2011	31	1	6	1981	1995	2	33	N	95.8845
201	4	4013	2011	31	1	10	1996	2005	2	51	N	95.8845
201	4	4013	2011	32	1	3	1967	1980	1	13	N	95.8845
201	4	4013	2011	32	1	6	1981	1995	2	33	N	95.8845
201	4	4013	2011	32	1	10	1996	2005	2	51	N	95.8845
201	4	4013	2011	52	1	3	1967	2005	1	13	N	95.8845
202	4	4013	2011	21	1	3	1967	1980	1	13	N	95.8845
202	4	4013	2011	21	1	6	1981	1995	2	33	N	95.8845
202	4	4013	2011	21	1	10	1996	2005	2	51	N	95.8845
202	4	4013	2011	31	1	3	1967	1980	1	13	N	95.8845
202	4	4013	2011	31	1	6	1981	1995	2	33	N	95.8845
202	4	4013	2011	31	1	10	1996	2005	2	51	N	95.8845
202	4	4013	2011	32	1	3	1967	1980	1	13	N	95.8845
202	4	4013	2011	32	1	6	1981	1995	2	33	N	95.8845
202	4	4013	2011	32	1	10	1996	2005	2	51	N	95.8845
202	4	4013	2011	52	1	3	1967	2005	1	13	N	95.8845
301	4	4013	2011	21	1	3	1967	1980	1	13	N	95.8845
301	4	4013	2011	21	1	6	1981	1995	2	33	N	95.8845
301	4	4013	2011	21	1	10	1996	2005	2	51	N	95.8845
301	4	4013	2011	31	1	3	1967	1980	1	13	N	95.8845
301	4	4013	2011	31	1	6	1981	1995	2	33	N	95.8845
301	4	4013	2011	31	1	10	1996	2005	2	51	N	95.8845
301	4	4013	2011	32	1	3	1967	1980	1	13	N	95.8845
301	4	4013	2011	32	1	6	1981	1995	2	33	N	95.8845
301	4	4013	2011	32	1	10	1996	2005	2	51	N	95.8845
301	4	4013	2011	52	1	3	1967	2005	1	13	N	95.8845
302	4	4013	2011	21	1	3	1967	1980	1	13	N	95.8845
302	4	4013	2011	21	1	6	1981	1995	2	33	N	95.8845
302	4	4013	2011	21	1	10	1996	2005	2	51	N	95.8845
302	4	4013	2011	31	1	3	1967	1980	1	13	N	95.8845
302	4	4013	2011	31	1	6	1981	1995	2	33	N	95.8845
302	4	4013	2011	31	1	10	1996	2005	2	51	N	95.8845
302	4	4013	2011	32	1	3	1967	1980	1	13	N	95.8845
302	4	4013	2011	32	1	6	1981	1995	2	33	N	95.8845
302	4	4013	2011	32	1	10	1996	2005	2	51	N	95.8845
302	4	4013	2011	52	1	3	1967	2005	1	13	N	95.8845
101	4	4013	2011	21	1	103	1967	1980	1	13	Y	57.6164
101	4	4013	2011	21	1	106	1981	1995	2	31	Y	64.12
101	4	4013	2011	21	1	110	1996	2007	2	51	Y	90.0428
101	4	4013	2011	31	1	103	1967	1980	1	13	Y	57.6164
101	4	4013	2011	31	1	106	1981	1995	2	31	Y	64.12
101	4	4013	2011	31	1	110	1996	2007	2	51	Y	90.0428
101	4	4013	2011	32	1	103	1967	1980	1	13	Y	57.6164
101	4	4013	2011	32	1	106	1981	1995	2	31	Y	64.12
101	4	4013	2011	32	1	110	1996	2007	2	51	Y	90.0428
102	4	4013	2011	21	1	103	1967	1980	1	13	Y	57.6164
102	4	4013	2011	21	1	106	1981	1995	2	31	Y	64.12
102	4	4013	2011	21	1	110	1996	2007	2	51	Y	90.0428
102	4	4013	2011	31	1	103	1967	1980	1	13	Y	57.6164
102	4	4013	2011	31	1	106	1981	1995	2	31	Y	64.12
102	4	4013	2011	31	1	110	1996	2007	2	51	Y	90.0428
102	4	4013	2011	32	1	103	1967	1980	1	13	Y	57.6164

polProcess ID	State ID	County ID	yearID	sourceTypeID	fuelTypeID	IMProgramID	Beg ModelYearID	End ModelYearID	inspectFreq	Test StandardsID	uselMyn	Compliance Factor
102	4	4013	2011	32	1	106	1981	1995	2	31	Y	64.12
102	4	4013	2011	32	1	110	1996	2007	2	51	Y	90.0428
102	4	4013	2011	52	1	103	1967	2007	1	13	Y	87.2032
112	4	4013	2011	21	1	108	1996	2007	2	43	Y	83.814
112	4	4013	2011	21	1	109	1981	1995	2	44	Y	64.12
112	4	4013	2011	31	1	108	1996	2007	2	43	Y	83.814
112	4	4013	2011	31	1	109	1981	1995	2	44	Y	64.12
112	4	4013	2011	32	1	108	1996	2007	2	43	Y	83.814
112	4	4013	2011	32	1	109	1981	1995	2	44	Y	64.12
112	4	4013	2011	52	1	107	1981	2007	1	41	Y	86.2872
113	4	4013	2011	21	1	108	1996	2007	2	43	Y	83.814
113	4	4013	2011	21	1	109	1981	1995	2	44	Y	64.12
113	4	4013	2011	31	1	108	1996	2007	2	43	Y	83.814
113	4	4013	2011	31	1	109	1981	1995	2	44	Y	64.12
113	4	4013	2011	32	1	108	1996	2007	2	43	Y	83.814
113	4	4013	2011	32	1	109	1981	1995	2	44	Y	64.12
113	4	4013	2011	52	1	107	1981	2007	1	41	Y	86.2872
201	4	4013	2011	21	1	103	1967	1980	1	13	Y	57.6164
201	4	4013	2011	21	1	106	1981	1995	2	31	Y	64.12
201	4	4013	2011	21	1	110	1996	2007	2	51	Y	90.0428
201	4	4013	2011	31	1	103	1967	1980	1	13	Y	57.6164
201	4	4013	2011	31	1	106	1981	1995	2	31	Y	64.12
201	4	4013	2011	31	1	110	1996	2007	2	51	Y	90.0428
201	4	4013	2011	32	1	103	1967	1980	1	13	Y	57.6164
201	4	4013	2011	32	1	106	1981	1995	2	31	Y	64.12
201	4	4013	2011	32	1	110	1996	2007	2	51	Y	90.0428
201	4	4013	2011	52	1	103	1967	2007	1	13	Y	87.2032
202	4	4013	2011	21	1	103	1967	1980	1	13	Y	57.6164
202	4	4013	2011	21	1	106	1981	1995	2	31	Y	64.12
202	4	4013	2011	21	1	110	1996	2007	2	51	Y	90.0428
202	4	4013	2011	31	1	103	1967	1980	1	13	Y	57.6164
202	4	4013	2011	31	1	106	1981	1995	2	31	Y	64.12
202	4	4013	2011	31	1	110	1996	2007	2	51	Y	90.0428
202	4	4013	2011	32	1	103	1967	1980	1	13	Y	57.6164
202	4	4013	2011	32	1	106	1981	1995	2	31	Y	64.12
202	4	4013	2011	32	1	110	1996	2007	2	51	Y	90.0428
202	4	4013	2011	52	1	103	1967	2007	1	13	Y	87.2032
301	4	4013	2011	21	1	103	1967	1980	1	13	Y	57.6164
301	4	4013	2011	21	1	106	1981	1995	2	31	Y	64.12
301	4	4013	2011	21	1	110	1996	2007	2	51	Y	90.0428
301	4	4013	2011	31	1	103	1967	1980	1	13	Y	57.6164
301	4	4013	2011	31	1	106	1981	1995	2	31	Y	64.12
301	4	4013	2011	31	1	110	1996	2007	2	51	Y	90.0428
301	4	4013	2011	32	1	103	1967	1980	1	13	Y	57.6164
301	4	4013	2011	32	1	106	1981	1995	2	31	Y	64.12
301	4	4013	2011	32	1	110	1996	2007	2	51	Y	90.0428
301	4	4013	2011	52	1	103	1967	2007	1	13	Y	87.2032
302	4	4013	2011	21	1	103	1967	1980	1	13	Y	57.6164
302	4	4013	2011	21	1	106	1981	1995	2	31	Y	64.12
302	4	4013	2011	21	1	110	1996	2007	2	51	Y	90.0428
302	4	4013	2011	31	1	103	1967	1980	1	13	Y	57.6164
302	4	4013	2011	31	1	106	1981	1995	2	31	Y	64.12
302	4	4013	2011	31	1	110	1996	2007	2	51	Y	90.0428
302	4	4013	2011	32	1	103	1967	1980	1	13	Y	57.6164
302	4	4013	2011	32	1	106	1981	1995	2	31	Y	64.12
302	4	4013	2011	32	1	110	1996	2007	2	51	Y	90.0428
302	4	4013	2011	52	1	103	1967	2007	1	13	Y	87.2032

[RoadType]

roadTypeID	rampFraction
2	0.054636
4	0.111569

[RoadTypeDistribution]

sourceTypeID	roadTypeID	roadTypeVMTFraction
11	1	0
11	2	0.013318
11	3	0.05643
11	4	0.290786
11	5	0.639467
21	1	0
21	2	0.021036
21	3	0.039609
21	4	0.296909
21	5	0.642446
31	1	0
31	2	0.050257
31	3	0.044142
31	4	0.371289
31	5	0.534312
32	1	0
32	2	0.050257
32	3	0.044142
32	4	0.371289
32	5	0.534312
41	1	0
41	2	0.030808
41	3	0.032603
41	4	0.500175
41	5	0.436415
42	1	0
42	2	0.030808
42	3	0.032603
42	4	0.500175
42	5	0.436415
43	1	0
43	2	0.030808
43	3	0.032603
43	4	0.500175
43	5	0.436415
51	1	0
51	2	0.043408
51	3	0.027296
51	4	0.52444
51	5	0.404856
52	1	0
52	2	0.043408
52	3	0.027296
52	4	0.52444
52	5	0.404856
53	1	0
53	2	0.043408
53	3	0.027296
53	4	0.52444
53	5	0.404856
54	1	0
54	2	0.043408
54	3	0.027296
54	4	0.52444
54	5	0.404856
61	1	0
61	2	0.081128
61	3	0.02854
61	4	0.528464
61	5	0.361868
62	1	0
62	2	0.081128
62	3	0.02854
62	4	0.528464
62	5	0.361868

[MonthVMTFraction]

sourceTypeID	isLeapYear	monthID	monthVMTFraction
11	N	12	0.083229
21	N	12	0.083229
31	N	12	0.083229
32	N	12	0.083229
41	N	12	0.083229
42	N	12	0.083229
43	N	12	0.083229
51	N	12	0.083229
52	N	12	0.083229
53	N	12	0.083229
54	N	12	0.083229
61	N	12	0.083229
62	N	12	0.083229

[DayVMTFraction]

Source TypeID	Month ID	Road TypeID	dayID	Day VMTFraction
11	12	1	5	0.767488
21	12	1	5	0.767488
31	12	1	5	0.767488
32	12	1	5	0.767488
41	12	1	5	0.767488
42	12	1	5	0.767488
43	12	1	5	0.767488
51	12	1	5	0.767488
52	12	1	5	0.767488
53	12	1	5	0.767488
54	12	1	5	0.767488
61	12	1	5	0.767488
62	12	1	5	0.767488
11	12	2	5	0.768458
21	12	2	5	0.768458
31	12	2	5	0.768458
32	12	2	5	0.768458
41	12	2	5	0.768458
42	12	2	5	0.768458
43	12	2	5	0.768458
51	12	2	5	0.768458
52	12	2	5	0.768458
53	12	2	5	0.768458
54	12	2	5	0.768458
61	12	2	5	0.768458
62	12	2	5	0.768458
11	12	3	5	0.766507
21	12	3	5	0.766507
31	12	3	5	0.766507
32	12	3	5	0.766507
41	12	3	5	0.766507
42	12	3	5	0.766507
43	12	3	5	0.766507
51	12	3	5	0.766507
52	12	3	5	0.766507
53	12	3	5	0.766507
54	12	3	5	0.766507
61	12	3	5	0.766507
62	12	3	5	0.766507
11	12	4	5	0.768458
21	12	4	5	0.768458
31	12	4	5	0.768458
32	12	4	5	0.768458
41	12	4	5	0.768458
42	12	4	5	0.768458

Source TypeID	Month ID	Road TypeID	dayID	Day VMTFraction
43	12	4	5	0.768458
51	12	4	5	0.768458
52	12	4	5	0.768458
53	12	4	5	0.768458
54	12	4	5	0.768458
61	12	4	5	0.768458
62	12	4	5	0.768458
11	12	5	5	0.766507
21	12	5	5	0.766507
31	12	5	5	0.766507
32	12	5	5	0.766507
41	12	5	5	0.766507
42	12	5	5	0.766507
43	12	5	5	0.766507
51	12	5	5	0.766507
52	12	5	5	0.766507
53	12	5	5	0.766507
54	12	5	5	0.766507
61	12	5	5	0.766507
62	12	5	5	0.766507
11	12	1	2	0.232512
21	12	1	2	0.232512
31	12	1	2	0.232512
32	12	1	2	0.232512
41	12	1	2	0.232512
42	12	1	2	0.232512
43	12	1	2	0.232512
51	12	1	2	0.232512
52	12	1	2	0.232512
53	12	1	2	0.232512
54	12	1	2	0.232512
61	12	1	2	0.232512
62	12	1	2	0.232512
11	12	2	2	0.231542
21	12	2	2	0.231542
31	12	2	2	0.231542
32	12	2	2	0.231542
41	12	2	2	0.231542
42	12	2	2	0.231542
43	12	2	2	0.231542
51	12	2	2	0.231542
52	12	2	2	0.231542
53	12	2	2	0.231542
54	12	2	2	0.231542
61	12	2	2	0.231542

Source TypeID	Month ID	Road TypeID	dayID	Day VMTFraction
62	12	2	2	0.231542
11	12	3	2	0.233493
21	12	3	2	0.233493
31	12	3	2	0.233493
32	12	3	2	0.233493
41	12	3	2	0.233493
42	12	3	2	0.233493
43	12	3	2	0.233493
51	12	3	2	0.233493
52	12	3	2	0.233493
53	12	3	2	0.233493
54	12	3	2	0.233493
61	12	3	2	0.233493
62	12	3	2	0.233493
11	12	4	2	0.231542
21	12	4	2	0.231542
31	12	4	2	0.231542
32	12	4	2	0.231542
41	12	4	2	0.231542
42	12	4	2	0.231542
43	12	4	2	0.231542
51	12	4	2	0.231542
52	12	4	2	0.231542
53	12	4	2	0.231542
54	12	4	2	0.231542
61	12	4	2	0.231542
62	12	4	2	0.231542
11	12	5	2	0.233493
21	12	5	2	0.233493
31	12	5	2	0.233493
32	12	5	2	0.233493
41	12	5	2	0.233493
42	12	5	2	0.233493
43	12	5	2	0.233493
51	12	5	2	0.233493
52	12	5	2	0.233493
53	12	5	2	0.233493
54	12	5	2	0.233493
61	12	5	2	0.233493
62	12	5	2	0.233493

[HourVMTFraction] (SourceTypeID 21: Passenger Car)

Source TypeID	Road TypeID	dayID	hourID	hourVMT Fraction
21	1	5	1	0.007957
21	1	5	2	0.005448
21	1	5	3	0.004973
21	1	5	4	0.006014
21	1	5	5	0.013468
21	1	5	6	0.034281
21	1	5	7	0.054676
21	1	5	8	0.064666
21	1	5	9	0.060292
21	1	5	10	0.052697
21	1	5	11	0.050973
21	1	5	12	0.054873
21	1	5	13	0.057626
21	1	5	14	0.059009
21	1	5	15	0.064762
21	1	5	16	0.06924
21	1	5	17	0.070039
21	1	5	18	0.07009
21	1	5	19	0.05904
21	1	5	20	0.04192
21	1	5	21	0.033428
21	1	5	22	0.029157
21	1	5	23	0.02144
21	1	5	24	0.013936
21	2	5	1	0.009807
21	2	5	2	0.006923
21	2	5	3	0.00651
21	2	5	4	0.007961
21	2	5	5	0.017302
21	2	5	6	0.042783
21	2	5	7	0.060321
21	2	5	8	0.059377
21	2	5	9	0.057361
21	2	5	10	0.055026
21	2	5	11	0.052104
21	2	5	12	0.05478
21	2	5	13	0.05683
21	2	5	14	0.059985
21	2	5	15	0.065538
21	2	5	16	0.065523
21	2	5	17	0.061668
21	2	5	18	0.059173
21	2	5	19	0.054281
21	2	5	20	0.040837
21	2	5	21	0.033031
21	2	5	22	0.030836
21	2	5	23	0.024921
21	2	5	24	0.021721
21	3	5	1	0.006081
21	3	5	2	0.003952
21	3	5	3	0.003413
21	3	5	4	0.004039
21	3	5	5	0.009578
21	3	5	6	0.025656
21	3	5	7	0.04895
21	3	5	8	0.07002
21	3	5	9	0.063264
21	3	5	10	0.050335
21	3	5	11	0.049826
21	3	5	12	0.054967
21	3	5	13	0.058433
21	3	5	14	0.058019
21	3	5	15	0.063976
21	3	5	16	0.073011
21	3	5	17	0.07853
21	3	5	18	0.081166
21	3	5	19	0.063868
21	3	5	20	0.043018
21	3	5	21	0.033831
21	3	5	22	0.027454
21	3	5	23	0.017909
21	3	5	24	0.010705
21	4	5	1	0.009807
21	4	5	2	0.006923
21	4	5	3	0.00651
21	4	5	4	0.007961
21	4	5	5	0.017302
21	4	5	6	0.042783
21	4	5	7	0.060321
21	4	5	8	0.059377
21	4	5	9	0.057361
21	4	5	10	0.055026
21	4	5	11	0.052104
21	4	5	12	0.05478
21	4	5	13	0.05683

Source TypeID	Road TypeID	dayID	hourID	hourVMT Fraction
21	4	5	14	0.059985
21	4	5	15	0.065538
21	4	5	16	0.065523
21	4	5	17	0.061668
21	4	5	18	0.059173
21	4	5	19	0.054281
21	4	5	20	0.040837
21	4	5	21	0.033031
21	4	5	22	0.030836
21	4	5	23	0.024921
21	4	5	24	0.017121
21	5	5	1	0.006081
21	5	5	2	0.003952
21	5	5	3	0.003413
21	5	5	4	0.004039
21	5	5	5	0.009578
21	5	5	6	0.025656
21	5	5	7	0.04895
21	5	5	8	0.07002
21	5	5	9	0.063264
21	5	5	10	0.050335
21	5	5	11	0.049826
21	5	5	12	0.054967
21	5	5	13	0.058433
21	5	5	14	0.058019
21	5	5	15	0.063976
21	5	5	16	0.073011
21	5	5	17	0.07853
21	5	5	18	0.081166
21	5	5	19	0.063868
21	5	5	20	0.043018
21	5	5	21	0.033831
21	5	5	22	0.027454
21	5	5	23	0.017909
21	5	5	24	0.010705
21	1	2	1	0.020872
21	1	2	2	0.014804
21	1	2	3	0.013016
21	1	2	4	0.010079
21	1	2	5	0.011715
21	1	2	6	0.018691
21	1	2	7	0.027033
21	1	2	8	0.033174
21	1	2	9	0.040089
21	1	2	10	0.048519
21	1	2	11	0.05524
21	1	2	12	0.060009
21	1	2	13	0.064796
21	1	2	14	0.06555
21	1	2	15	0.064719
21	1	2	16	0.064355
21	1	2	17	0.064852
21	1	2	18	0.064713
21	1	2	19	0.061678
21	1	2	20	0.050477
21	1	2	21	0.043519
21	1	2	22	0.040777
21	1	2	23	0.035718
21	1	2	24	0.025605
21	2	2	1	0.020431
21	2	2	2	0.014508
21	2	2	3	0.012577
21	2	2	4	0.009828
21	2	2	5	0.011013
21	2	2	6	0.01751
21	2	2	7	0.025995
21	2	2	8	0.031456
21	2	2	9	0.038799
21	2	2	10	0.047714
21	2	2	11	0.054712
21	2	2	12	0.060251
21	2	2	13	0.065575
21	2	2	14	0.066506
21	2	2	15	0.065746
21	2	2	16	0.065312
21	2	2	17	0.065948
21	2	2	18	0.066767
21	2	2	19	0.064137
21	2	2	20	0.050196
21	2	2	21	0.042573
21	2	2	22	0.040589
21	2	2	23	0.036012
21	2	2	24	0.025845
21	3	2	1	0.021315
21	3	2	2	0.015101

Source TypeID	Road TypeID	dayID	hourID	hourVMT Fraction
21	3	2	3	0.013457
21	3	2	4	0.010331
21	3	2	5	0.01242
21	3	2	6	0.019876
21	3	2	7	0.028075
21	3	2	8	0.034899
21	3	2	9	0.041383
21	3	2	10	0.049326
21	3	2	11	0.05577
21	3	2	12	0.059766
21	3	2	13	0.064014
21	3	2	14	0.064591
21	3	2	15	0.063689
21	3	2	16	0.063394
21	3	2	17	0.063753
21	3	2	18	0.062652
21	3	2	19	0.05921
21	3	2	20	0.050759
21	3	2	21	0.044469
21	3	2	22	0.040966
21	3	2	23	0.035423
21	3	2	24	0.025364
21	4	2	1	0.020431
21	4	2	2	0.014508
21	4	2	3	0.012577
21	4	2	4	0.009828
21	4	2	5	0.011013
21	4	2	6	0.01751
21	4	2	7	0.025995
21	4	2	8	0.031456
21	4	2	9	0.038799
21	4	2	10	0.047714
21	4	2	11	0.054712
21	4	2	12	0.060251
21	4	2	13	0.065575
21	4	2	14	0.066506
21	4	2	15	0.065746
21	4	2	16	0.065312
21	4	2	17	0.065948
21	4	2	18	0.066767
21	4	2	19	0.064137
21	4	2	20	0.050196
21	4	2	21	0.042573
21	4	2	22	0.040589
21	4	2	23	0.036012
21	4	2	24	0.025845
21	5	2	1	0.021315
21	5	2	2	0.015101
21	5	2	3	0.013457
21	5	2	4	0.010331
21	5	2	5	0.01242
21	5	2	6	0.019876
21	5	2	7	0.028075
21	5	2	8	0.034899
21	5	2	9	0.041383
21	5	2	10	0.049326
21	5	2	11	0.05577
21	5	2	12	0.059766
21	5	2	13	0.064014
21	5	2	14	0.064591
21	5	2	15	0.063689
21	5	2	16	0.063394
21	5	2	17	0.063753
21	5	2	18	0.062652
21	5	2	19	0.05921
21	5	2	20	0.050759
21	5	2	21	0.044469
21	5	2	22	0.040966
21	5	2	23	0.035423
21	5	2	24	0.025364

[AvgSpeedDistribution] (SourceTypeID 21: Passenger Car and RoadTypeID 2: Rural Restricted Access)

Source TypeID	Road TypeID	Hour DayID	avgSpeed BinID	avgSpeed Fraction
21	2	15	1	2.51E-05
21	2	15	2	0

Source TypeID	Road TypeID	Hour DayID	avgSpeed BinID	avgSpeed Fraction
21	2	15	3	0
21	2	15	4	0

Source TypeID	Road TypeID	Hour DayID	avgSpeed BinID	avgSpeed Fraction
21	2	15	5	0
21	2	15	6	0

Source TypeID	Road TypeID	Hour DayID	avgSpeed BinID	avgSpeed Fraction
21	2	15	7	0.019619
21	2	15	8	0.097646
21	2	15	9	0.131977
21	2	15	10	0.203234
21	2	15	11	0.087838
21	2	15	12	0.07357
21	2	15	13	0.039194
21	2	15	14	0.083438
21	2	15	15	0.102646
21	2	15	16	0.160812
21	2	25	1	2.51E-05
21	2	25	2	0
21	2	25	3	0
21	2	25	4	0
21	2	25	5	0
21	2	25	6	0
21	2	25	7	0.019619
21	2	25	8	0.097646
21	2	25	9	0.131977
21	2	25	10	0.203234
21	2	25	11	0.087838
21	2	25	12	0.07357
21	2	25	13	0.039194
21	2	25	14	0.083438
21	2	25	15	0.102646
21	2	25	16	0.160812
21	2	35	1	2.51E-05
21	2	35	2	0
21	2	35	3	0
21	2	35	4	0
21	2	35	5	0
21	2	35	6	0
21	2	35	7	0.019619
21	2	35	8	0.097646
21	2	35	9	0.131977
21	2	35	10	0.203234
21	2	35	11	0.087838
21	2	35	12	0.07357
21	2	35	13	0.039194
21	2	35	14	0.083438
21	2	35	15	0.102646
21	2	35	16	0.160812
21	2	45	1	2.51E-05
21	2	45	2	0
21	2	45	3	0
21	2	45	4	0
21	2	45	5	0
21	2	45	6	0
21	2	45	7	0.019619
21	2	45	8	0.097646
21	2	45	9	0.131977
21	2	45	10	0.203234
21	2	45	11	0.087838
21	2	45	12	0.07357
21	2	45	13	0.039194
21	2	45	14	0.083438
21	2	45	15	0.102646
21	2	45	16	0.160812
21	2	55	1	2.51E-05
21	2	55	2	0
21	2	55	3	0
21	2	55	4	0
21	2	55	5	0
21	2	55	6	0
21	2	55	7	0.019619
21	2	55	8	0.097646
21	2	55	9	0.131977
21	2	55	10	0.203234
21	2	55	11	0.087838
21	2	55	12	0.07357
21	2	55	13	0.039194
21	2	55	14	0.083438
21	2	55	15	0.102646
21	2	55	16	0.160812
21	2	65	1	2.51E-05
21	2	65	2	0
21	2	65	3	0
21	2	65	4	0
21	2	65	5	0
21	2	65	6	0
21	2	65	7	0.019619
21	2	65	8	0.097646
21	2	65	9	0.131977
21	2	65	10	0.203234
21	2	65	11	0.087838
21	2	65	12	0.07357
21	2	65	13	0.039194

Source TypeID	Road TypeID	Hour DayID	avgSpeed BinID	avgSpeed Fraction
21	2	65	14	0.083438
21	2	65	15	0.102646
21	2	65	16	0.160812
21	2	75	1	1.98E-05
21	2	75	2	0
21	2	75	3	0
21	2	75	4	0
21	2	75	5	0
21	2	75	6	0
21	2	75	7	0
21	2	75	8	0
21	2	75	9	0
21	2	75	10	0.057069
21	2	75	11	0.140623
21	2	75	12	0.248507
21	2	75	13	0.169045
21	2	75	14	0.075169
21	2	75	15	0.111641
21	2	75	16	0.197927
21	2	85	1	1.98E-05
21	2	85	2	0
21	2	85	3	0
21	2	85	4	0
21	2	85	5	0
21	2	85	6	0
21	2	85	7	0
21	2	85	8	0
21	2	85	9	0
21	2	85	10	0.057069
21	2	85	11	0.140623
21	2	85	12	0.248507
21	2	85	13	0.169045
21	2	85	14	0.075169
21	2	85	15	0.111641
21	2	85	16	0.197927
21	2	95	1	1.98E-05
21	2	95	2	0
21	2	95	3	0
21	2	95	4	0
21	2	95	5	0
21	2	95	6	0
21	2	95	7	0
21	2	95	8	0
21	2	95	9	0
21	2	95	10	0.057069
21	2	95	11	0.140623
21	2	95	12	0.248507
21	2	95	13	0.169045
21	2	95	14	0.075169
21	2	95	15	0.111641
21	2	95	16	0.197927
21	2	105	1	1.78E-05
21	2	105	2	0
21	2	105	3	0
21	2	105	4	0
21	2	105	5	0
21	2	105	6	0
21	2	105	7	0
21	2	105	8	0
21	2	105	9	0
21	2	105	10	0.059729
21	2	105	11	0.129919
21	2	105	12	0.24385
21	2	105	13	0.049713
21	2	105	14	0.140357
21	2	105	15	0.191024
21	2	105	16	0.18539
21	2	115	1	1.78E-05
21	2	115	2	0
21	2	115	3	0
21	2	115	4	0
21	2	115	5	0
21	2	115	6	0
21	2	115	7	0
21	2	115	8	0
21	2	115	9	0
21	2	115	10	0.059729
21	2	115	11	0.129919
21	2	115	12	0.24385
21	2	115	13	0.049713
21	2	115	14	0.140357
21	2	115	15	0.191024
21	2	125	1	1.78E-05
21	2	125	2	0
21	2	125	3	0
21	2	125	4	0

Source TypeID	Road TypeID	Hour DayID	avgSpeed BinID	avgSpeed Fraction
21	2	125	5	0
21	2	125	6	0
21	2	125	7	0
21	2	125	8	0
21	2	125	9	0
21	2	125	10	0.059729
21	2	125	11	0.129919
21	2	125	12	0.24385
21	2	125	13	0.049713
21	2	125	14	0.140357
21	2	125	15	0.191024
21	2	125	16	0.18539
21	2	135	1	1.78E-05
21	2	135	2	0
21	2	135	3	0
21	2	135	4	0
21	2	135	5	0
21	2	135	6	0
21	2	135	7	0
21	2	135	8	0
21	2	135	9	0
21	2	135	10	0.059729
21	2	135	11	0.129919
21	2	135	12	0.24385
21	2	135	13	0.049713
21	2	135	14	0.140357
21	2	135	15	0.191024
21	2	135	16	0.18539
21	2	145	1	1.78E-05
21	2	145	2	0
21	2	145	3	0
21	2	145	4	0
21	2	145	5	0
21	2	145	6	0
21	2	145	7	0
21	2	145	8	0
21	2	145	9	0
21	2	145	10	0.059729
21	2	145	11	0.129919
21	2	145	12	0.24385
21	2	145	13	0.049713
21	2	145	14	0.140357
21	2	145	15	0.191024
21	2	145	16	0.18539
21	2	155	1	1.78E-05
21	2	155	2	0
21	2	155	3	0
21	2	155	4	0
21	2	155	5	0
21	2	155	6	0
21	2	155	7	0
21	2	155	8	0
21	2	155	9	0
21	2	155	10	0.059729
21	2	155	11	0.129919
21	2	155	12	0.24385
21	2	155	13	0.049713
21	2	155	14	0.140357
21	2	155	15	0.191024
21	2	155	16	0.18539
21	2	165	1	1.69E-05
21	2	165	2	0
21	2	165	3	0
21	2	165	4	0
21	2	165	5	0
21	2	165	6	0
21	2	165	7	0
21	2	165	8	0
21	2	165	9	0
21	2	165	10	0
21	2	165	11	0
21	2	165	12	0.000288
21	2	165	13	0.094046
21	2	165	14	0.274366
21	2	165	15	0.241766
21	2	165	16	0.389518
21	2	175	1	1.69E-05
21	2	175	2	0
21	2	175	3	0
21	2	175	4	0
21	2	175	5	0
21	2	175	6	0
21	2	175	7	0
21	2	175	8	0
21	2	175	9	0
21	2	175	10	0
21	2	175	11	0

Source TypeID	Road TypeID	Hour DayID	avgSpeed BinID	avgSpeed Fraction
21	2	175	12	0.000288
21	2	175	13	0.094046
21	2	175	14	0.274366
21	2	175	15	0.241766
21	2	175	16	0.389518
21	2	185	1	1.69E-05
21	2	185	2	0
21	2	185	3	0
21	2	185	4	0
21	2	185	5	0
21	2	185	6	0
21	2	185	7	0
21	2	185	8	0
21	2	185	9	0
21	2	185	10	0
21	2	185	11	0
21	2	185	12	0.000288
21	2	185	13	0.094046
21	2	185	14	0.274366
21	2	185	15	0.241766
21	2	185	16	0.389518
21	2	195	1	2.51E-05
21	2	195	2	0
21	2	195	3	0
21	2	195	4	0
21	2	195	5	0
21	2	195	6	0
21	2	195	7	0.019619
21	2	195	8	0.097646
21	2	195	9	0.131977
21	2	195	10	0.203234
21	2	195	11	0.087838
21	2	195	12	0.07357
21	2	195	13	0.039194
21	2	195	14	0.083438
21	2	195	15	0.102646
21	2	195	16	0.160812
21	2	205	1	2.51E-05
21	2	205	2	0
21	2	205	3	0
21	2	205	4	0
21	2	205	5	0
21	2	205	6	0
21	2	205	7	0.019619
21	2	205	8	0.097646
21	2	205	9	0.131977
21	2	205	10	0.203234
21	2	205	11	0.087838
21	2	205	12	0.07357
21	2	205	13	0.039194
21	2	205	14	0.083438
21	2	205	15	0.102646
21	2	205	16	0.160812
21	2	215	1	2.51E-05
21	2	215	2	0
21	2	215	3	0
21	2	215	4	0
21	2	215	5	0
21	2	215	6	0
21	2	215	7	0.019619
21	2	215	8	0.097646
21	2	215	9	0.131977
21	2	215	10	0.203234
21	2	215	11	0.087838
21	2	215	12	0.07357
21	2	215	13	0.039194
21	2	215	14	0.083438
21	2	215	15	0.102646
21	2	215	16	0.160812
21	2	225	1	2.51E-05
21	2	225	2	0
21	2	225	3	0
21	2	225	4	0
21	2	225	5	0
21	2	225	6	0
21	2	225	7	0.019619
21	2	225	8	0.097646
21	2	225	9	0.131977
21	2	225	10	0.203234
21	2	225	11	0.087838
21	2	225	12	0.07357
21	2	225	13	0.039194
21	2	225	14	0.083438
21	2	225	15	0.102646
21	2	225	16	0.160812
21	2	235	1	2.51E-05
21	2	235	2	0

Source TypeID	Road TypeID	Hour DayID	avgSpeed BinID	avgSpeed Fraction
21	2	235	3	0
21	2	235	4	0
21	2	235	5	0
21	2	235	6	0
21	2	235	7	0.019619
21	2	235	8	0.097646
21	2	235	9	0.131977
21	2	235	10	0.203234
21	2	235	11	0.087838
21	2	235	12	0.07357
21	2	235	13	0.039194
21	2	235	14	0.083438
21	2	235	15	0.102646
21	2	235	16	0.160812
21	2	245	1	2.51E-05
21	2	245	2	0
21	2	245	3	0
21	2	245	4	0
21	2	245	5	0
21	2	245	6	0
21	2	245	7	0.019619
21	2	245	8	0.097646
21	2	245	9	0.131977
21	2	245	10	0.203234
21	2	245	11	0.087838
21	2	245	12	0.07357
21	2	245	13	0.039194
21	2	245	14	0.083438
21	2	245	15	0.102646
21	2	245	16	0.160812
21	2	12	1	2.51E-05
21	2	12	2	0
21	2	12	3	0
21	2	12	4	0
21	2	12	5	0
21	2	12	6	0
21	2	12	7	0.019619
21	2	12	8	0.097646
21	2	12	9	0.131977
21	2	12	10	0.203234
21	2	12	11	0.087838
21	2	12	12	0.07357
21	2	12	13	0.039194
21	2	12	14	0.083438
21	2	12	15	0.102646
21	2	12	16	0.160812
21	2	22	1	2.51E-05
21	2	22	2	0
21	2	22	3	0
21	2	22	4	0
21	2	22	5	0
21	2	22	6	0
21	2	22	7	0.019619
21	2	22	8	0.097646
21	2	22	9	0.131977
21	2	22	10	0.203234
21	2	22	11	0.087838
21	2	22	12	0.07357
21	2	22	13	0.039194
21	2	22	14	0.083438
21	2	22	15	0.102646
21	2	22	16	0.160812
21	2	32	1	2.51E-05
21	2	32	2	0
21	2	32	3	0
21	2	32	4	0
21	2	32	5	0
21	2	32	6	0
21	2	32	7	0.019619
21	2	32	8	0.097646
21	2	32	9	0.131977
21	2	32	10	0.203234
21	2	32	11	0.087838
21	2	32	12	0.07357
21	2	32	13	0.039194
21	2	32	14	0.083438
21	2	32	15	0.102646
21	2	32	16	0.160812
21	2	42	1	2.51E-05
21	2	42	2	0
21	2	42	3	0
21	2	42	4	0
21	2	42	5	0
21	2	42	6	0
21	2	42	7	0.019619
21	2	42	8	0.097646
21	2	42	9	0.131977

Source TypeID	Road TypeID	Hour DayID	avgSpeed BinID	avgSpeed Fraction
21	2	42	10	0.203234
21	2	42	11	0.087838
21	2	42	12	0.07357
21	2	42	13	0.039194
21	2	42	14	0.083438
21	2	42	15	0.102646
21	2	42	16	0.160812
21	2	52	1	2.51E-05
21	2	52	2	0
21	2	52	3	0
21	2	52	4	0
21	2	52	5	0
21	2	52	6	0
21	2	52	7	0.019619
21	2	52	8	0.097646
21	2	52	9	0.131977
21	2	52	10	0.203234
21	2	52	11	0.087838
21	2	52	12	0.07357
21	2	52	13	0.039194
21	2	52	14	0.083438
21	2	52	15	0.102646
21	2	52	16	0.160812
21	2	62	1	2.51E-05
21	2	62	2	0
21	2	62	3	0
21	2	62	4	0
21	2	62	5	0
21	2	62	6	0
21	2	62	7	0.019619
21	2	62	8	0.097646
21	2	62	9	0.131977
21	2	62	10	0.203234
21	2	62	11	0.087838
21	2	62	12	0.07357
21	2	62	13	0.039194
21	2	62	14	0.083438
21	2	62	15	0.102646
21	2	62	16	0.160812
21	2	72	1	2.51E-05
21	2	72	2	0
21	2	72	3	0
21	2	72	4	0
21	2	72	5	0
21	2	72	6	0
21	2	72	7	0.019619
21	2	72	8	0.097646
21	2	72	9	0.131977
21	2	72	10	0.203234
21	2	72	11	0.087838
21	2	72	12	0.07357
21	2	72	13	0.039194
21	2	72	14	0.083438
21	2	72	15	0.102646
21	2	72	16	0.160812
21	2	82	1	2.51E-05
21	2	82	2	0
21	2	82	3	0
21	2	82	4	0
21	2	82	5	0
21	2	82	6	0
21	2	82	7	0.019619
21	2	82	8	0.097646
21	2	82	9	0.131977
21	2	82	10	0.203234
21	2	82	11	0.087838
21	2	82	12	0.07357
21	2	82	13	0.039194
21	2	82	14	0.083438
21	2	82	15	0.102646
21	2	82	16	0.160812
21	2	92	1	2.51E-05
21	2	92	2	0
21	2	92	3	0
21	2	92	4	0
21	2	92	5	0
21	2	92	6	0
21	2	92	7	0.019619
21	2	92	8	0.097646
21	2	92	9	0.131977
21	2	92	10	0.203234
21	2	92	11	0.087838
21	2	92	12	0.07357
21	2	92	13	0.039194
21	2	92	14	0.083438
21	2	92	15	0.102646
21	2	92	16	0.160812

Source TypeID	Road TypeID	Hour DayID	avgSpeed BinID	avgSpeed Fraction
21	2	102	1	2.51E-05
21	2	102	2	0
21	2	102	3	0
21	2	102	4	0
21	2	102	5	0
21	2	102	6	0
21	2	102	7	0.019619
21	2	102	8	0.097646
21	2	102	9	0.131977
21	2	102	10	0.203234
21	2	102	11	0.087838
21	2	102	12	0.07357
21	2	102	13	0.039194
21	2	102	14	0.083438
21	2	102	15	0.102646
21	2	102	16	0.160812
21	2	112	1	2.51E-05
21	2	112	2	0
21	2	112	3	0
21	2	112	4	0
21	2	112	5	0
21	2	112	6	0
21	2	112	7	0.019619
21	2	112	8	0.097646
21	2	112	9	0.131977
21	2	112	10	0.203234
21	2	112	11	0.087838
21	2	112	12	0.07357
21	2	112	13	0.039194
21	2	112	14	0.083438
21	2	112	15	0.102646
21	2	112	16	0.160812
21	2	122	1	2.51E-05
21	2	122	2	0
21	2	122	3	0
21	2	122	4	0
21	2	122	5	0
21	2	122	6	0
21	2	122	7	0.019619
21	2	122	8	0.097646
21	2	122	9	0.131977
21	2	122	10	0.203234
21	2	122	11	0.087838
21	2	122	12	0.07357
21	2	122	13	0.039194
21	2	122	14	0.083438
21	2	122	15	0.102646
21	2	122	16	0.160812
21	2	132	1	2.51E-05
21	2	132	2	0
21	2	132	3	0
21	2	132	4	0
21	2	132	5	0
21	2	132	6	0
21	2	132	7	0.019619
21	2	132	8	0.097646
21	2	132	9	0.131977
21	2	132	10	0.203234
21	2	132	11	0.087838
21	2	132	12	0.07357
21	2	132	13	0.039194
21	2	132	14	0.083438
21	2	132	15	0.102646
21	2	132	16	0.160812
21	2	142	1	2.51E-05
21	2	142	2	0
21	2	142	3	0
21	2	142	4	0
21	2	142	5	0
21	2	142	6	0
21	2	142	7	0.019619
21	2	142	8	0.097646
21	2	142	9	0.131977
21	2	142	10	0.203234
21	2	142	11	0.087838
21	2	142	12	0.07357
21	2	142	13	0.039194
21	2	142	14	0.083438
21	2	142	15	0.102646
21	2	142	16	0.160812
21	2	152	1	2.51E-05
21	2	152	2	0
21	2	152	3	0
21	2	152	4	0
21	2	152	5	0

Source TypeID	Road TypeID	Hour DayID	avgSpeed BinID	avgSpeed Fraction
21	2	152	6	0
21	2	152	7	0.019619
21	2	152	8	0.097646
21	2	152	9	0.131977
21	2	152	10	0.203234
21	2	152	11	0.087838
21	2	152	12	0.07357
21	2	152	13	0.039194
21	2	152	14	0.083438
21	2	152	15	0.102646
21	2	152	16	0.160812
21	2	162	1	2.51E-05
21	2	162	2	0
21	2	162	3	0
21	2	162	4	0
21	2	162	5	0
21	2	162	6	0
21	2	162	7	0.019619
21	2	162	8	0.097646
21	2	162	9	0.131977
21	2	162	10	0.203234
21	2	162	11	0.087838
21	2	162	12	0.07357
21	2	162	13	0.039194
21	2	162	14	0.083438
21	2	162	15	0.102646
21	2	162	16	0.160812
21	2	172	1	2.51E-05
21	2	172	2	0
21	2	172	3	0
21	2	172	4	0
21	2	172	5	0
21	2	172	6	0
21	2	172	7	0.019619
21	2	172	8	0.097646
21	2	172	9	0.131977
21	2	172	10	0.203234
21	2	172	11	0.087838
21	2	172	12	0.07357
21	2	172	13	0.039194
21	2	172	14	0.083438
21	2	172	15	0.102646
21	2	172	16	0.160812
21	2	182	1	2.51E-05
21	2	182	2	0
21	2	182	3	0
21	2	182	4	0
21	2	182	5	0
21	2	182	6	0
21	2	182	7	0.019619
21	2	182	8	0.097646
21	2	182	9	0.131977
21	2	182	10	0.203234
21	2	182	11	0.087838
21	2	182	12	0.07357
21	2	182	13	0.039194
21	2	182	14	0.083438
21	2	182	15	0.102646
21	2	182	16	0.160812
21	2	192	1	2.51E-05
21	2	192	2	0
21	2	192	3	0
21	2	192	4	0
21	2	192	5	0
21	2	192	6	0
21	2	192	7	0.019619
21	2	192	8	0.097646
21	2	192	9	0.131977
21	2	192	10	0.203234
21	2	192	11	0.087838
21	2	192	12	0.07357
21	2	192	13	0.039194
21	2	192	14	0.083438
21	2	192	15	0.102646
21	2	192	16	0.160812
21	2	202	1	2.51E-05
21	2	202	2	0
21	2	202	3	0
21	2	202	4	0
21	2	202	5	0
21	2	202	6	0
21	2	202	7	0.019619
21	2	202	8	0.097646
21	2	202	9	0.131977
21	2	202	10	0.203234

Source TypeID	Road TypeID	Hour DayID	avgSpeed BinID	avgSpeed Fraction
21	2	202	11	0.087838
21	2	202	12	0.07357
21	2	202	13	0.039194
21	2	202	14	0.083438
21	2	202	15	0.102646
21	2	202	16	0.160812
21	2	212	1	2.51E-05
21	2	212	2	0
21	2	212	3	0
21	2	212	4	0
21	2	212	5	0
21	2	212	6	0
21	2	212	7	0.019619
21	2	212	8	0.097646
21	2	212	9	0.131977
21	2	212	10	0.203234
21	2	212	11	0.087838
21	2	212	12	0.07357
21	2	212	13	0.039194
21	2	212	14	0.083438
21	2	212	15	0.102646
21	2	212	16	0.160812
21	2	222	1	2.51E-05
21	2	222	2	0
21	2	222	3	0
21	2	222	4	0
21	2	222	5	0
21	2	222	6	0
21	2	222	7	0.019619
21	2	222	8	0.097646
21	2	222	9	0.131977
21	2	222	10	0.203234
21	2	222	11	0.087838
21	2	222	12	0.07357
21	2	222	13	0.039194
21	2	222	14	0.083438
21	2	222	15	0.102646
21	2	222	16	0.160812
21	2	232	1	2.51E-05
21	2	232	2	0
21	2	232	3	0
21	2	232	4	0
21	2	232	5	0
21	2	232	6	0
21	2	232	7	0.019619
21	2	232	8	0.097646
21	2	232	9	0.131977
21	2	232	10	0.203234
21	2	232	11	0.087838
21	2	232	12	0.07357
21	2	232	13	0.039194
21	2	232	14	0.083438
21	2	232	15	0.102646
21	2	232	16	0.160812
21	2	242	1	2.51E-05
21	2	242	2	0
21	2	242	3	0
21	2	242	4	0
21	2	242	5	0
21	2	242	6	0
21	2	242	7	0.019619
21	2	242	8	0.097646
21	2	242	9	0.131977
21	2	242	10	0.203234
21	2	242	11	0.087838
21	2	242	12	0.07357
21	2	242	13	0.039194
21	2	242	14	0.083438
21	2	242	15	0.102646
21	2	242	16	0.160812

[AVFT] (SourceTypeID 42: Transit Bus)

Source TypeID	Model YearID	Fuel TypeID	Eng TechID	fuelEng Fraction
42	1960	2	1	1
42	1961	2	1	1
42	1962	2	1	1
42	1963	2	1	1
42	1964	2	1	1
42	1965	2	1	1
42	1966	2	1	1
42	1967	2	1	1
42	1968	2	1	1
42	1969	2	1	1
42	1970	2	1	1
42	1971	2	1	1
42	1972	2	1	1
42	1973	2	1	1
42	1974	2	1	1
42	1975	2	1	1
42	1976	2	1	1
42	1977	2	1	1
42	1978	2	1	1
42	1979	2	1	1
42	1980	2	1	1
42	1981	2	1	1
42	1982	2	1	1
42	1983	2	1	1
42	1984	2	1	1
42	1985	2	1	1
42	1986	2	1	1
42	1987	2	1	1
42	1988	2	1	1
42	1989	2	1	1
42	1990	2	1	0.993
42	1990	3	1	0.007
42	1991	2	1	0.982
42	1991	3	1	0.018
42	1992	1	1	0.01
42	1992	2	1	0.944
42	1992	3	1	0.046
42	1993	1	1	0.01
42	1993	2	1	0.914
42	1993	3	1	0.076
42	1994	1	1	0.01
42	1994	2	1	0.905
42	1994	3	1	0.085
42	1995	1	1	0.01
42	1995	2	1	0.837
42	1995	3	1	0.153
42	1996	1	1	0.01
42	1996	2	1	0.892
42	1996	3	1	0.098
42	1997	1	1	0
42	1997	2	1	1
42	1997	3	1	0
42	1998	1	1	0
42	1998	2	1	0
42	1998	3	1	1
42	1999	1	1	0
42	1999	2	1	0
42	1999	3	1	1
42	2000	1	1	0
42	2000	2	1	0
42	2000	3	1	1
42	2001	1	1	0
42	2001	2	1	0
42	2001	3	1	1
42	2002	1	1	0
42	2002	2	1	0
42	2002	3	1	1
42	2003	1	1	0
42	2003	2	1	0.08
42	2003	3	1	0.92
42	2004	1	1	0
42	2004	2	1	0.397059
42	2004	3	1	0.602941
42	2005	1	1	0
42	2005	2	1	1

Source TypeID	Model YearID	Fuel TypeID	Eng TechID	fuelEng Fraction
42	2005	3	1	0
42	2006	1	1	0.089744
42	2006	2	1	0.128205
42	2006	3	1	0.782051
42	2007	1	1	0.149533
42	2007	2	1	0.850467
42	2007	3	1	0
42	2008	1	1	0
42	2008	2	1	0.479592
42	2008	3	1	0.520408
42	2009	1	1	0.121212
42	2009	2	1	0.030303
42	2009	3	1	0.848485
42	2010	1	1	0
42	2010	2	1	1
42	2010	3	1	0
42	2011	1	1	0
42	2011	2	1	1
42	2011	3	1	0
42	2012	1	1	0
42	2012	2	1	1
42	2012	3	1	0
42	2013	1	1	0
42	2013	2	1	1
42	2013	3	1	0
42	2014	1	1	0
42	2014	2	1	1
42	2014	3	1	0
42	2015	1	1	0
42	2015	2	1	1
42	2015	3	1	0
42	2016	1	1	0
42	2016	2	1	1
42	2016	3	1	0
42	2017	1	1	0
42	2017	2	1	1
42	2017	3	1	0
42	2018	1	1	0
42	2018	2	1	1
42	2018	3	1	0
42	2019	1	1	0
42	2019	2	1	1
42	2019	3	1	0
42	2020	1	1	0
42	2020	2	1	1
42	2020	3	1	0
42	2021	1	1	0
42	2021	2	1	1
42	2021	3	1	0
42	2022	1	1	0
42	2022	2	1	1
42	2022	3	1	0
42	2023	1	1	0
42	2023	2	1	1
42	2023	3	1	0
42	2024	1	1	0
42	2024	2	1	1
42	2024	3	1	0
42	2025	1	1	0
42	2025	2	1	1
42	2025	3	1	0
42	2026	1	1	0
42	2026	2	1	1
42	2026	3	1	0
42	2027	1	1	0
42	2027	2	1	1
42	2027	3	1	0
42	2028	1	1	0
42	2028	2	1	1
42	2028	3	1	0
42	2029	1	1	0
42	2029	2	1	1
42	2029	3	1	0
42	2030	1	1	0
42	2030	2	1	1

Source TypeID	Model YearID	Fuel TypeID	Eng TechID	fuelEng Fraction
42	2030	3	1	0
42	2031	1	1	0
42	2031	2	1	1
42	2031	3	1	0
42	2032	1	1	0
42	2032	2	1	1
42	2032	3	1	0
42	2033	1	1	0
42	2033	2	1	1
42	2033	3	1	0
42	2034	1	1	0
42	2034	2	1	1
42	2034	3	1	0
42	2035	1	1	0
42	2035	2	1	1
42	2035	3	1	0
42	2036	1	1	0
42	2036	2	1	1
42	2036	3	1	0
42	2037	1	1	0
42	2037	2	1	1
42	2037	3	1	0
42	2038	1	1	0
42	2038	2	1	1
42	2038	3	1	0
42	2039	1	1	0
42	2039	2	1	1
42	2039	3	1	0
42	2040	1	1	0
42	2040	2	1	1
42	2040	3	1	0
42	2041	1	1	0
42	2041	2	1	1
42	2041	3	1	0
42	2042	1	1	0
42	2042	2	1	1
42	2042	3	1	0
42	2043	1	1	0
42	2043	2	1	1
42	2043	3	1	0
42	2044	1	1	0
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42	2044	3	1	0
42	2045	1	1	0
42	2045	2	1	1
42	2045	3	1	0
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42	2046	2	1	1
42	2046	3	1	0
42	2047	1	1	0
42	2047	2	1	1
42	2047	3	1	0
42	2048	1	1	0
42	2048	2	1	1
42	2048	3	1	0
42	2049	1	1	0
42	2049	2	1	1
42	2049	3	1	0
42	2050	1	1	0
42	2050	2	1	1
42	2050	3	1	0

[CountyYear]

countyID	yearID	refuelingVaporProgramAdjust	refuelingSpillProgramAdjust
4013	1999	0.46	0.46
4013	2000	0.46	0.46
4013	2001	0.46	0.46
4013	2002	0.46	0.46
4013	2003	0.46	0.46
4013	2004	0.46	0.46
4013	2005	0.46	0.46
4013	2006	0.46	0.46
4013	2007	0.46	0.46
4013	2008	0.46	0.46
4013	2009	0.46	0.46
4013	2010	0.46	0.46
4013	2011	0.46	0.46
4013	2012	0.46	0.46
4013	2013	0.46	0.46
4013	2014	0.46	0.46
4013	2015	0.46	0.46
4013	2016	0.46	0.46
4013	2017	0.46	0.46
4013	2018	0.46	0.46
4013	2019	0.46	0.46
4013	2020	0.46	0.46
4013	2021	0.46	0.46
4013	2022	0.46	0.46
4013	2023	0.46	0.46
4013	2024	0.46	0.46
4013	2025	0.46	0.46
4013	2026	0.46	0.46
4013	2027	0.46	0.46
4013	2028	0.46	0.46
4013	2029	0.46	0.46
4013	2030	0.46	0.46
4013	2031	0.46	0.46
4013	2032	0.46	0.46
4013	2033	0.46	0.46
4013	2034	0.46	0.46
4013	2035	0.46	0.46
4013	2036	0.46	0.46
4013	2037	0.46	0.46
4013	2038	0.46	0.46
4013	2039	0.46	0.46
4013	2040	0.46	0.46
4013	2041	0.46	0.46
4013	2042	0.46	0.46
4013	2043	0.46	0.46
4013	2044	0.46	0.46
4013	2045	0.46	0.46
4013	2046	0.46	0.46
4013	2047	0.46	0.46
4013	2048	0.46	0.46
4013	2049	0.46	0.46
4013	2050	0.46	0.46

NEWS

for immediate release



MARICOPA COUNTY

[Air Quality Department, Bob Huhn, PIO](#)

1001 North Central Avenue

Phoenix, AZ 85004

Ph 602-506-6713

www.maricopa.gov

Emissions Inventory Public Review Draft Released

PHOENIX, January 22, 2014 – The Maricopa County Air Quality Department (MCAQD) today released its draft **2011 Periodic Emissions Inventory for Ozone Precursors**. The inventory includes emission estimates for volatile organic compounds (VOC), nitrogen oxides (NO_x) and carbon monoxide (CO). Emissions are calculated for both Maricopa County and the eight-hour ozone nonattainment area. Annual totals as well as season-day emissions are provided for all source categories.

The emissions inventory report will now undergo a 30-day public review period. The document is available in electronic format (PDF files) on the department’s website at:

http://www.maricopa.gov/aq/divisions/planning_analysis/emissions_inventory/Default.aspx

The main body of the report consists of six chapters:

- Chapter 1:** Introduction (overview and summary of all source categories)
- Chapter 2:** Point sources (large manufacturing facilities, power plants, etc.)
- Chapter 3:** Area sources (widespread similar sources, such as fuel combustion, fires, etc.)
- Chapter 4:** Nonroad mobile sources (aircraft, locomotives, lawn mowers, tractors, etc.)
- Chapter 5:** Onroad mobile sources (cars, trucks, other vehicles, etc.)
- Chapter 6:** Biogenic sources (crops, indigenous vegetation, landscaping, etc.)

MCAQD will hold a public workshop to discuss the draft emissions inventory report on Friday, February 14, 2014. The workshop will begin at 2:00 PM in the fifth-floor classroom (Suite 560) at the department’s offices at 1001 N. Central Ave. in Phoenix.

**All visitors to the MCAQD office located at 1001 N. Central Ave. will need to check-in at the reception area in suite 125 and then proceed to the 5th floor classroom.*

The department is also accepting written comments on the draft report through the close of business on Friday, February 21, 2014. Written comments may be submitted (via US mail or email) to:

Maricopa County Air Quality Department
Emissions Inventory Unit
1001 N. Central Ave. Suite 595
Phoenix, AZ 85004
E-mail: EmisInv@mail.maricopa.gov

###

About Maricopa County Air Quality Department

The Maricopa County Air Quality Department is a regulatory agency whose goal is to ensure federal clean air standards are achieved and maintained for the residents and visitors of Maricopa County. The department is governed by the Maricopa County Board of Supervisors and follows air quality standards set forth by the federal Clean Air Act.



News

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Rapid Response Notification

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23	24	25	26	27	28	1
2	3	4	5	6	7	8

Calendar

Public Workshop

Air Quality Department, Bob Huhn, PIO

The Maricopa County Air Quality Department is holding a public workshop to discuss the draft 2011 Periodic Emissions Inventory for Ozone Precursors, published in January 2014.

The inventory includes emissions estimates for volatile organic compounds (VOC), nitrogen oxides (NOx) and carbon monoxide (CO). Emissions are calculated for both Maricopa County and the eight-hour ozone nonattainment area. Annual totals as well as season-day emissions are provided for all source categories.

The emissions inventory report will undergo a 30-day public review period. The document is available in electronic format (PDF files) on the department's website (see link below).

The department is accepting written comments on the draft emissions inventory report through the close of business on Friday, February 21, 2014.

The public workshop is an informal meeting for all interested parties, is free of charge, and requires no advance registration or RSVP.

*All visitors to the MCAQD offices at 1001 N. Central Ave, Phoenix, AZ are kindly requested to check in at the reception area in Suite 125.

Date: 2/14/2014

Time: 2:00 PM

Registration Required: No

Fee: None

More

Info: http://www.maricopa.gov/aa/divisions/planning_analysis/emissions_inventory/reports/Default.aspx

Contact: Bob Downing
Emissions Inventory Unit Manager
602-506-6790
bdowning@mail.maricopa.gov

Location: Maricopa County Air Quality Department

Address:

1001 N. Central Ave. Suite 125
Phoenix, AZ 85004

Maricopa County Air Quality Department 1001 North Central Avenue, Suite 125, Phoenix AZ 85004 (602) 506-6010



APPENDIX A

EXHIBIT 2:

**Letter from the Arizona Department of Environmental
Quality to EPA Submitting the 2012 New Source
Review State Implementation Plan Revision.
October 29, 2012.**



Janice K. Brewer
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.azdeq.gov



Henry R. Darwin
Director

October 29, 2012

Mr. Jared Blumenfeld, Regional Administrator
U.S. Environmental Protection Agency, Region IX
Mail Code ORA-1
75 Hawthorne Street
San Francisco, CA 94105

RE: 2012 New Source Review State Implementation Plan Submission

Dear Mr. Blumenfeld:

Consistent with the provisions of Arizona Revised Statutes §§ 49-104, 49-106, 49-404, 49-406 and 49-425 and the Code of Federal Regulations (CFR) Title 40, §§ 51.102 through 51.104, the Arizona Department of Environmental Quality (ADEQ) hereby submits to the U.S. Environmental Protection Agency (EPA) the "State Implementation Plan – New Source Review" as a proposed revision to the Arizona State Implementation Plan (SIP).

ADEQ previously submitted this SIP revision for parallel processing on April 10, 2012, in accordance with 40 C.F.R. Part 51, Appendix V, § 2.3.1. (The cover letter for that submission was incorrectly dated April 10, 2011.) That version included the most recent revisions to the New Source Review (NSR) program in the form of the Notice of Final Rulemaking (NFRM) that had been submitted to the Arizona Governor's Regulatory Review Council (GRRC) for approval. The final rule revisions, which did not differ substantially from the version submitted to GRRC, were published in the Arizona Administrative Register on July 6, 2012 and became effective on August 7, 2012. This SIP revision also includes rules that were not amended by the NFRM and existing Arizona statutes.

The SIP consists of a document demonstrating that the requirements of 40 C.F.R. Part 51 Appendix V are satisfied, a copy of the NFRM (Appendix A), existing statutes and rules being proposed for inclusion in the SIP (Appendix B), copies of the authorizing statutes cited above (Appendix C) and all other documentation required under Appendix V. A hard copy of the SIP and an electronic exact duplicate of the hard copy on CD are included with this letter.

As noted in the attached SIP document, ADEQ has recently amended most of the rules proposed for inclusion in the SIP to assure that they meet current federal requirements. ADEQ has engaged in extensive discussions with EPA regarding this SIP submission and has made many revisions in response to EPA comments.

Southern Regional Office
400 West Congress Street • Suite 433 • Tucson, AZ 85701
(520) 628-6733

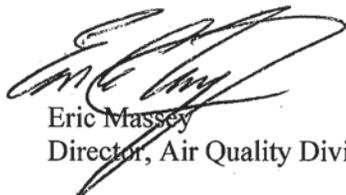
Printed on recycled paper

Mr. Jarrod Blumenfeld
Page 2 of 2

I am submitting this SIP revision in my capacity as Director of the ADEQ Air Quality Division pursuant to the attached delegation of authority from Henry R. Darwin, ADEQ Director.

If you have any questions about this submission, please contact me, at (602) 771-2288.

Sincerely,



Eric Massey
Director, Air Quality Division

EM:sb5

Enclosures (2)

Cc (via email): Lisa Hanf, EPA Region IX
Colleen McKaughan, EPA Region IX
Lisa Beckham, EPA Region IX
Andrew Chew, EPA Region IX
Laura Yannayon, EPA Region IX

APPENDIX A

EXHIBIT 3:

**Arizona Revised Statute Section 49-402 and
Delegation Agreement # EV12-0061 Between
Arizona Department of Environmental Quality
and Pinal County.**



Fifty-first Legislature - Second Regular Session

[Email a Member](#) | [Email Webmaster](#)[change session](#) | [printer friendly version](#)[Senate](#)[House](#)[Legislative Council](#)[JLBC](#)[More Agencies](#)[Bills](#)[Committees](#)[Calendars/News](#)[ARS TITLE PAGE](#) [NEXT DOCUMENT](#) [PREVIOUS DOCUMENT](#)**49-402. State and county control**

A. The department shall have original jurisdiction over such sources, permits and violations that pertain to:

1. Major sources in any county that has not received approval from the administrator for new source review under the clean air act and prevention of significant deterioration under the clean air act.
2. Smelting of metal ore.
3. Petroleum refineries.
4. Coal fired electrical generating stations.
5. Portland cement plants.
6. Air pollution by portable sources.

7. Air pollution by mobile sources for the purpose of regulating those sources as prescribed by article 5 of this chapter and consistent with the clean air act.

8. Sources that are subject to title V of the clean air act and that are located in a county for which the administrator has disapproved that county's title V permit program if the department has a title V program that has been approved by the administrator. On approval of that county's title V permit program by the administrator, the county shall resume jurisdiction over those sources.

B. Except as specified in subsection A of this section, the review, issuance, administration and enforcement of permits issued pursuant to this chapter shall be by the county or multi-county air quality control region pursuant to the provisions of article 3 of this chapter. After the director has provided prior written notice to the control officer describing the reason for asserting jurisdiction and has provided an opportunity to confer, the county or multi-county air quality control region shall relinquish jurisdiction, control and enforcement over such permits as the director designates and at such times as the director asserts jurisdiction at the state level. The order of the director which asserts state jurisdiction shall specify the matters, geographical area, or sources over which the department shall exercise jurisdiction and control. Such state authority shall then be the sole and exclusive jurisdiction and control to the extent asserted, and the provisions of this chapter shall govern, except as provided in this chapter, until jurisdiction is surrendered by the department to such county or region.

C. Portable sources under jurisdiction of the department under subsection A, paragraph 6 of this section may be required to file notice with the director and the control officer who has jurisdiction over the geographic area that includes the new location before beginning operations at that new location.

D. Notwithstanding any other law, a permit issued to a state regulated source shall include the emission standard or standard of performance adopted pursuant to section 49-479, if such standards are more stringent than those adopted by the director and if such standards are specifically identified as applicable to the permitted source or a component of the permitted source. Such standards shall be applied to sources identified in subsection A, paragraph 2, 3, 4 or 5 of this section only if the standard is formally proposed for adoption as part of the state implementation plan.

E. The regional planning agency for each county which contains a vehicle emissions control area shall develop plan revisions containing transportation related air quality control measures designed to attain and maintain primary and secondary ambient air quality standards as prescribed by and within the time frames specified in the clean air act. In developing the plan revisions, the regional planning agency shall consider all of the following:

1. Mandatory employee parking fees.
2. Park and ride programs.
3. Removal of on-street parking.
4. Ride share programs.
5. Mass transit alternatives.

6. Expansion of public transportation systems.
 7. Optimizing freeway ramp metering.
 8. Coordinating traffic signal systems.
 9. Reduction of traffic congestion at major intersections.
 10. Site specific transportation control measures.
 11. Reversible lanes.
 12. Fixed lanes for buses and carpools.
 13. Encouragement of pedestrian travel.
 14. Encouragement of bicycle travel.
 15. Development of bicycle travel facilities.
 16. Employer incentives regarding ride share programs.
 17. Modification of work schedules.
 18. Strategies for controlling the generation of air pollution by nonresidents of nonattainment or maintenance areas.
 19. Use of alternative fuels.
 20. Use of emission control devices on public diesel powered vehicles.
 21. Paving of roads.
 22. Restricting off-road vehicle travel.
 23. Construction site air pollution control.
 24. Other air quality control measures.
- F. Each regional planning agency shall consult with the department of transportation to coordinate the plans developed pursuant to subsection E of this section with transportation plans developed by the department of transportation pursuant to any other law.

DELEGATION AGREEMENT

Between

Arizona Department of Environmental Quality

And

Pinal County, hereinafter, County, a political subdivision of the State of Arizona

Delegation Agreement # EV12-0061

Whereas, Arizona Revised Statutes (A.R.S.) § 49-107, authorizes the Director of the Arizona Department of Environmental Quality (ADEQ) to delegate to a local environmental agency, or county health department, any functions, powers, and duties, hereinafter, Functions and Duties, which the Director believes can be competently, efficiently, and properly performed by the local environmental agency, or county health department and

Whereas, Pinal County includes: an Environmental Health Division, which is an operating division of the Health Department; and Air Quality Control District, which is an operating division of the Development Services Department; and an Emergency Management Department, which is an operating division of the Development Services Department, and therefore, Pinal County is the local environmental agency or county health department, hereinafter, LA, as set forth in A.R.S. § 49-107, and

Whereas, A.R.S. §§ 11-201(A)(3) and 11-952 authorize the County Board of Supervisors (and by delegation the LA, where the LA is a local environmental agency or health department) to enter into contracts as necessary to assist LA in exercising its powers, and

Whereas, the LA deems that it is in its best interests to accept such delegation,

Therefore, the Director of ADEQ delegates to Pinal County as LA, and the LA accepts the delegation of those Functions and Duties described in the Appendices of this Delegation Agreement, hereinafter Agreement, (Appendix A of this Agreement for Wastewater and Drinking Water Delegations, Appendix B of this Agreement for Solid Waste Delegations, and Appendix C of this Agreement for Air Quality Delegations) on behalf of ADEQ and in accordance with the terms and conditions specified in this Agreement.

A. DELEGATED FUNCTIONS AND DUTIES

The Functions and Duties that are delegated to the LA by this Agreement are identified in Sections A through N, and in Appendices A, B, and C of this Agreement. ADEQ statutes, rules, policies and guidance shall be used in implementing the delegated Functions and Duties. The Functions and Duties not specifically delegated by this Agreement are retained by ADEQ.

B. STANDARDS OF PERFORMANCE

1. The standards of performance required of the LA to perform the delegated Functions and Duties and to fulfill the terms of this Agreement are those provided by statute and duly adopted rule, and are generally the same as those required of ADEQ personnel. The performance of the delegated Functions and Duties by the LA shall conform to ADEQ statutes, rules, policies and guidance. Program-specific standards of performance are identified in the Appendices of this Agreement.
2. ADEQ shall provide the LA with periodic training upon the request of the LA.
3. ADEQ shall provide operating guidance for use in implementing the terms of this Agreement concurrent with the execution of this Agreement. ADEQ will use its best efforts to provide the LA with new and/or updated guidance prior to or shortly after the effective date of the guidance. The guidance shall, at a minimum, include Engineering Bulletins, program guidance memoranda, substantive policy statements, copies of all applicable forms, policies and procedures, and other material that may assist the LA to carry out the delegated Functions and Duties specified in this Agreement. The LA may contact ADEQ for clarification or guidance on procedural or technical issues.
4. In the event of any dispute between the LA and a third party regarding the LA's interpretation or application of ADEQ statutes, rules, policies and guidance, ADEQ shall, if requested by the LA, provide timely assistance and direction to the LA.

C. FEE AUTHORITY AND TYPES OF FEES

1. To the extent permitted by law, ADEQ delegates the authority to collect fees under its established fee rules to assure the LA may accomplish delegated Functions and Duties according to the applicable standards.

The LA shall annually report delegated program authority fees to ADEQ on or before September 1. The report shall list all permits issued that year and the total revenue for each general permit category. ADEQ shall provide the LA with a template for the report. The report shall be delivered to ADEQ Central Office, 1110 West Washington Avenue, Phoenix, Arizona 85007, to the Office of the Chief Financial Officer.

Unless otherwise provided by statute, fees imposed by the LA shall be limited to the cost of service, including all direct and indirect costs.

2. Fees are authorized by, and shall conform to, the requirements of state laws and rules and county ordinances.
3. All fees collected by the LA pursuant to this Agreement shall be retained by the LA as consideration for performing the Functions and Duties described in this Agreement.

D. PERSONNEL QUALIFICATIONS

The required personnel qualifications for exercising each Program's delegated Functions and Duties are identified in the corresponding Appendix to this Agreement.

E. RECORD KEEPING AND REPORTING REQUIREMENTS

1. The LA agrees to maintain records relating to its performance of the delegated Functions and Duties as specified in this Agreement for a period of ten years from the date of complete resolution of any technical dispute, contested case, action against a party, or any appealable agency action, unless a longer period is required by statute or rule.
2. The LA agrees to create and submit reports related to its performance of the delegated Functions and Duties as specified in this Agreement. The reports shall be created and submitted to ADEQ in accordance with the specifications in the Appendices to this Agreement.

F. OVERSIGHT ACTIVITIES

1. ADEQ may accompany LA personnel on inspections and may review all records relating to the LA's performance of the delegated Functions and Duties as set forth in this Agreement. ADEQ shall provide prior notice to the LA of its intent to accompany LA personnel on inspections. LA personnel may accompany ADEQ inspectors on inspections for purposes of training, information sharing or coordinating LA and ADEQ activities. The LA shall provide prior notice to ADEQ of its request to accompany ADEQ inspectors on inspections.
2. Periodically, ADEQ shall conduct an evaluation of the LA's performance of the delegated Functions and Duties. Either party to this Agreement may request that the frequency of evaluations be increased. The initial results of all program evaluations shall be in writing and shall be communicated to the LA in a draft report. The LA is entitled to comment on the draft report. After ADEQ'S response to comments, ADEQ shall finalize the report and transmit a copy to the LA. The final reports of all program evaluations are public documents pursuant to A.R.S. § 39-121 *et seq.*

G. DELEGATION OF ENFORCEMENT AUTHORITIES; LOCAL AGENCY OBLIGATIONS

1. This Agreement is subject to the provisions of A.R.S. § 49-106.
2. As a supplement to any independent statutory authority LA may have, LA is hereby delegated the enforcement authorities pursuant to A.R.S. §§ 44-1307, 49-141, 49-142, 49-261, 49-262, 49-354 (A) and (B), 49-460 through 463, 49-781 through 783, 49-791, 49-922(B), 49-923 and 49-924, as applicable to the delegated Functions and Duties specified in this Agreement.
3. The LA shall be responsible for initiating timely and appropriate enforcement actions for alleged violations by individuals and facilities affected under this Agreement. The LA shall make compliance determinations and conduct enforcement actions in accordance with ADEQ's Compliance and Enforcement Handbook. The LA shall use inspection checklists and boilerplate documents provided by ADEQ or such documents that contain the same content as those documents provided by ADEQ.
4. ADEQ retains its authority to take an enforcement action against any individual or facility, the regulation of which is specified in this Agreement. At its discretion, ADEQ may refrain from exercising such authority if ADEQ determines that the enforcement action taken by the LA is timely, appropriate and effective. Except in a case involving an immediate threat to the public health, safety or environment, ADEQ shall give the LA 30 days prior written notice of its intent to initiate an enforcement action if the LA fails to initiate such enforcement action. In a case involving an immediate threat to the public health, safety or environment, ADEQ shall make its best efforts to notify the LA prior to its undertaking such an enforcement action.
5. Where appropriate, and if there is no conflict with applicable environmental statutes and rules, LA may conduct enforcement action using the authority provided by A.R.S. Title 36 or A.R.S. Title 49, Chapter 3, Article 3. Nothing herein shall preclude LA from independently initiating enforcement action pursuant to its own authority under A.R.S. §§ 36-602, 36-603, 49-143, and 49-144, or any other civil or criminal statute or local ordinance, or from pursuing any other available legal or equitable remedy.
6. In those cases where the Attorney General has exclusive authority to bring an action to collect civil penalties, ADEQ shall timely notify the Attorney General of the LA's intent to initiate an enforcement action and such enforcement action shall be coordinated among the LA, ADEQ, the Attorney General and the LA's County Attorney.
7. In cases of civil enforcement, the LA and ADEQ shall coordinate litigation and settlements, unless the LA has independent statutory enforcement authority. The LA and ADEQ may act as co-plaintiffs in order to maximize resources.

8. Civil penalties assessed and collected under the authority of ADEQ's statutory enforcement authority shall be in the name of the State of Arizona, and shall be forwarded to ADEQ with copies of court documentation for deposit into the state general fund in accordance with A.R.S. Title 35, Article 3.
9. ADEQ may execute compliance initiatives directed at certain classes of violations or facilities that are alleged to be in violation of applicable statutes or rules. To the best of its ability, the LA agrees to cooperate in the successful execution of such compliance initiatives that involve facilities, the regulation of which has been delegated in by this Agreement.

H. APPEALS OF LOCAL AGENCY ACTIONS

1. Unless otherwise provided by statute, LA shall conduct administrative hearings for appeals of licensing decisions and enforcement actions taken by the LA under the delegated Functions and Duties of this Agreement in accordance with the A.R.S. Title 41, Chapter 6 Administrative Procedures, A.R.S. § 41-1092 *et seq.*, and the Office of Administrative Hearings, Rules of Procedure, Arizona Administrative Code (A.A.C.) R2-19-101 *et seq.* The LA shall use administrative law judges provided by the Office of Administrative Hearings (OAH). If an OAH administrative law judge conducts an administrative hearing under this Agreement, ADEQ shall pay for the LA's OAH hearing related costs. The LA, the LA's County Attorney, or counsel retained by LA, shall represent the LA at all administrative hearings. Nothing in this agreement mandates that the LA contract for the services of administrative law judges with respect to administrative hearings involving matters arising from the LA's independent authority, functions and duties.
2. Pursuant to A.R.S. § 12-904, if the OAH administrative law judge grants or denies the relief requested, either the appellant or the LA may file a complaint in superior court within 35 days after the decision.
3. The LA shall provide ADEQ an annual report by July 31st of appeals filed and their final resolution.

I. LICENSING AUTHORITY

1. The LA agrees to comply with the overall time frames set forth in A.A.C. R18-1-525 when issuing licenses pursuant to delegated Functions and Duties under this Agreement. The LA shall provide a quarterly report to ADEQ indicating the number of licenses issued that quarter, by general type of license, and the number of licenses that exceeded the licensing time frame for the licensing decision. If the LA fails to meet a licensing time frame, the quarterly report shall indicate the reason(s) why the licensing time frame was missed and the corrective action the LA has taken. If the LA demonstrates a pattern of failing to meet the required licensing time frames, ADEQ shall assist the LA in correcting the deficiencies in LA's licensing procedures.

2. The LA shall submit the quarterly reports described in subsection 1 of this Section to the ADEQ primary contact person designated in Appendices A through C of this Agreement.

J. LOCAL AGENCY INDEPENDENT AUTHORITY; SUBDELEGATION

1. ADEQ's delegation of Functions and Duties to a municipality within the LA's boundaries shall in no way infringe upon, reduce or usurp the LA's right, authority and responsibility to implement non-delegated authorized activities and programs.
2. The LA may not sub-delegate Functions and Duties delegated pursuant to this Agreement to another local government agency or political subdivision without obtaining the prior written approval of the Director of ADEQ.
3. ADEQ shall provide the LA a copy of any delegation agreement it has entered into with a municipality, located in whole or in part within the LA's boundaries.

K. CONFLICT RESOLUTION PROCEDURES

The parties may resolve a conflict arising under this Agreement through arbitration. If the parties invoke this provision, the parties shall select a mutually acceptable third party as arbitrator. Each party shall bear its own arbitration fees, attorney fees and costs.

L. AMENDMENT AND TERMINATION PROCEDURES

1. Either party may seek to amend this Agreement. An amendment to this Agreement shall be in writing, shall be executed by the Director of ADEQ, the Director of the LA, the Chairman of the LA's Board of Supervisors, the Clerk of the LA's Board of Supervisors, and shall be approved as to form by the Attorney General and the LA's County Attorney. Amendments shall comply with the provisions in A.R.S. § 41-1081. Amendments to this Agreement shall be effective 30 days after written notice of ADEQ's final decision to amend this agreement.
2. This Agreement may be terminated, in whole or in part, by either party upon providing 30 days prior written notice by certified mail to the other party and in compliance with subsection 3 of this section.
3. The LA shall, prior to the termination of all or part of this Agreement, forward to the ADEQ Director all files, public documents and pending applications received by the LA for those delegated Functions and Duties being terminated, a summary status report of those delegated Functions and Duties, and shall provide written notification to all persons with pending applications and to all regulated facilities affected by the termination of this Agreement.

4. The cancellation provisions of A.R.S. § 38-511, the terms of which are incorporated by reference, shall apply to this Agreement.

M. TERM OF AGREEMENT

Unless otherwise stated, this Agreement is effective 30 days after written notice of ADEQ's decision to enter into this Agreement. This Agreement shall expire on June 30, 2050. If a new Agreement is not executed by that date, ADEQ and the LA may agree to extend this Agreement by filing an amendment in accordance with Section L of this Agreement.

N. NAME AND ADDRESS OF PRIMARY CONTACT PERSONS

ADEQ David Lelsz
Delegations Coordinator
Arizona Department of Environmental Quality
1110 W. Washington Street
Phoenix, AZ 85007
(602) 771-2212
dl2@azdeq.gov

LA Fritz Behring, County Manager and LA Director
Pinal County
31 N. Pinal St., Bldg.A
P.O. Box 827
Florence, AZ-85132
Tel: (520) 866-6212
fritz.behring@pinalcountyz.gov

The name of a successor to any of the above-named individuals shall not require the execution of an amendment to this Agreement.

O. MAINTENANCE OF CONTACT INFORMATION

Annually, beginning in January of 2014, and in January of each year thereafter, ADEQ and the LA shall provide the other party with an updated schedule of contact persons as identified in paragraph N above, and in each of the Appendices A, B, C.

Appendix C
Pinal County
Air Quality Management

A. DELEGATED JURISDICTION AND RESPONSIBILITIES:

1. As a supplement to the LA existing statutory jurisdiction, ADEQ delegates to the LA permitting and enforcement jurisdiction over all major sources, as defined in A.R.S. § 49-401.01, A.A.C. R18-2-101, and R9-3-101 of the Arizona State Implementation Plan, located within Pinal County, other than those sources within the source categories specified in Subpart B, Paragraph 1, Items a through f of this Appendix. The delegation of jurisdiction under this paragraph shall be suspended and the LA shall have original jurisdiction over the major sources covered by this paragraph under A.R.S. § 49-402.A.1 and B during any period when the LA has approval from the Administrator for new source review and prevention of significant deterioration under the Federal Clean Air Act.
2. The LA shall exercise its statutory authority, as supplemented by this delegation, to meet the requirements and standards established under the Federal Clean Air Act and A.R.S. Title 49, Chapter 3. In administering this delegation, the LA shall meet the personnel qualifications, standards of performance and reporting requirements listed in Subparts C, D and E of this Appendix.

B. RESERVED JURISDICTION AND RESPONSIBILITIES:

1. Pursuant to A.R.S. § 49-402.A, ADEQ reserves jurisdiction within Pinal County over such sources, permits and violations that pertain to:
 - a. Smelting of metal ore.
 - b. Petroleum refineries.
 - c. Coal fired electrical generating stations
 - d. Portland cement plants.
 - e. Air pollution by portable sources.
 - f. Air pollution by mobile sources for the purpose of regulating those sources as prescribed by A.R.S. Title 49, Chapter 3, Article 5, and consistent with the Federal Clean Air Act.
2. ADEQ further reserves source-wide, source-specific jurisdiction with respect to permits and other regulation of incidental emissions, if the source is one over which ADEQ has reserved jurisdiction, pursuant to Paragraph B.1 of this Subpart, and both the activity that gives rise to the original reservation in favor of ADEQ and the activity that gives rise to the incidental emissions are under the control of the same entity or parent-and-subsidary entities.
3. This Agreement does not preclude ADEQ from asserting jurisdiction over any source pursuant to A.R.S. § 49-402.B.

C. PERSONNEL QUALIFICATIONS:

The following minimum personnel qualifications shall apply to personnel performing the delegated Functions and Duties listed in Subpart A of this Appendix.

1. Permit evaluations shall be performed by, or under the direct supervision of, an engineer qualified through air quality permitting experience or registration as a professional engineer in the State of Arizona.
2. Duties may be performed by personnel with the minimum qualifications of two years of college training in engineering, industrial hygiene, or a closely related field and two years of training, education or experience which demonstrates ability to perform the duties of the position; including 30 semester hours of college-level chemistry, physics, engineering or closely related subjects and two years of technical experience with industrial processes producing pollutants, pollution investigation work or two years experience in general enforcement of air quality related activities.
3. Inspectors must maintain current certification as a Visible Emission Observer, as specified in Arizona Testing Manual Revision F, and attend training equivalent to that specified in EPA Order 3500.1. Training for current inspectors must be completed within 18 months. Training for newly hired inspectors must be completed within 18 months of hiring.

D. STANDARDS OF PERFORMANCE:

The following standards of performance apply, where indicated, to the delegated Functions and Duties listed in Subpart A of this Appendix:

1. Permit Issuance Timeframes
 - a. Permitting activities shall be completed within the licensing time-frames established by the applicable provisions of the Federal Clean Air Act, Code of Federal Regulations, Arizona Revised Statutes, the overall timeframes in Arizona Administrative Code R18-1-525, and locally applicable air quality rules, whichever is more stringent.
 - b. If at any time the LA determines that the overall timeframes in Arizona Administrative Code R18-1-525 may be exceeded for an application, the LA shall, in addition to complying with any other applicable statutory requirements, notify the ADEQ Air Quality Director (AQD) Director as soon as practicable prior to exceeding the timeframes.
2. All permits shall include the elements set forth in A.A.C. R18-2-306, 309 and 325, and shall be processed according to A.A.C. R18-2-304 and 307, or locally applicable air quality rules, whichever is more stringent.
3. All new major sources and major modifications to existing sources shall be processed according to A.A.C. Title 18, Chapter 2, Article 4, as applicable, or locally applicable air quality rules, whichever is more stringent.
4. All permit revisions, reopenings, renewals, transfers, or other permit changes shall be processed according to A.A.C. R18-2-317, 318, 319, 320, 321, 322, and 323 or locally applicable air quality rules, whichever are more stringent.

5. All permitted facilities shall be required to submit annual emission inventories in accordance with A.A.C. R18-2-327 or locally applicable air quality rules, whichever is more stringent.
6. All permitted facilities shall pay annual fees in accordance with A.A.C. R18-2-326 or locally applicable air quality rules.
7. Prior to denying a permit application for a source covered by this Agreement, the LA shall obtain ADEQ's approval of the action.
8. Provisions shall be in place for accelerated permit processing.
9. Unannounced inspections shall be conducted in accordance with an EPA-approved Compliance Monitoring Strategy (CMS Plan). Any source under this delegation not covered by a CMS Plan shall be inspected annually.
10. Initial response to complaints shall be done, to the extent practicable, within 5 days of receipt of the complaint.
11. All compliance and enforcement activities shall be conducted in accordance with ADEQ's Compliance and Enforcement Handbook or locally applicable air quality rules and policies, whichever is more stringent.

E. REPORTING REQUIREMENTS:

1. The LA shall report the following
 - a. Within 60 days after the execution of this Agreement, and annually thereafter in conjunction with Paragraph 2 of this Subpart, the LA shall file with the ADEQ AQD Director a list of the sources that are permitted by the LA that are covered by this Agreement. The list shall include the following:
 - i. Name of the company operating the facility;
 - ii. Name of the facility;
 - iii. Description of the facilities operation;
 - iv. Physical location, including both address and a general latitude and longitude; and
 - v. For the initial report, an explanation as to why each source is under ADEQ's delegated authority. For subsequent annual reports, this explanation is only required for sources which were not on the previously submitted report.
 - b. The LA shall file an annual report with the ADEQ AQD Director specifying the following for each source covered by this Agreement:
 - i. Number of permits issued, including the date of receipt of the application and the date of permit issuance;
 - ii. Number of notices of violation and the percent of notices handled in a manner consistent with ADEQ compliance and enforcement policy;
 - iii. Number of inspections;
 - iv. Number of complaints received and the percent of complaints receiving initial follow-up within 5 working days;
 - v. Number of escalated enforcement cases; and

- vi. Description and disposition of each escalated enforcement case and amount of penalty assessed and collected, if any.
2. The report required in Paragraph 1.b of this Subpart shall be submitted within 30 days of the anniversary date of this Agreement.
3. The LA shall provide copies of records associated with the activities specified in this Agreement upon request by ADEQ.

D. AGENCY CONTACT PERSONS:

The following LA employee is responsible for administering the delegated Functions and Duties as specified in this Appendix. The LA shall provide written notice to ADEQ of any successor.

Name: Donald P. Gabrielson
Title: Director
Agency: Pinal County Air Quality Department
Address: P.O. Box 987
31 North Pinal Street, Building F
Florence, AZ 85232
Phone: (520) 866-6929 Fax: (520) 866-6967
E-Mail: Don.Gabrielson@pinalcountyz.gov

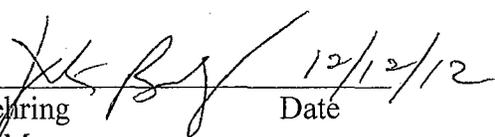
The following ADEQ employee is responsible for administering the delegated Functions and Duties as specified in this Appendix. ADEQ shall provide written notice to the LA of any successor.

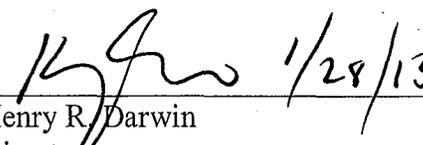
Name: Eric C. Massey
Title: Director, Air Quality Division
Agency: Arizona Department of Environmental Quality
Address: 1110 W. Washington Street
Phoenix, Arizona 85007
Phone: (602) 771-2308, Fax: (602) 771-2366
E-mail: ecm@azdeq.gov

The naming of successor to either of the above-named individuals shall not require the execution of an amendment to this Agreement.

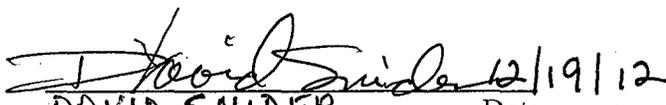
**Signature Page for
Pinal County
Delegation Agreement #EV12-0061**

for Pinal County Arizona Department of Environmental Quality

 12/12/12
Fritz Behring Date
County Manager

 1/28/13
Henry R. Darwin Date
Director

County Board of Supervisors

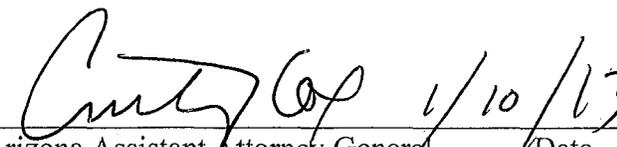
 12/19/12
DAVID SNIDER Date
Chairman

Attest:

 12/19/12
Clerk of the Board Date

Pursuant to A.R.S. § 11-952(D), the foregoing Agreement has been reviewed by the undersigned attorneys for the County Division of Environmental Health and the Arizona Department of Environmental Quality, who have determined that this Agreement is in proper form and is within the powers and authority granted under Arizona law to their respective agencies.

 December 20, 2012
County Attorney Date

 1/10/13
Arizona Assistant Attorney General Date

APPENDIX A

EXHIBIT 4:

**Documentation from the Arizona Department of
Environmental Quality Submitted to EPA that
Includes the Arizona State Legislature Authorization
of the Vehicle Emissions Inspection Program
through January 1, 2017.
June 22, 2009.**



Janice K. Brewer
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.azdeq.gov



Patrick J. Cunningham
Acting Director

JUN 22 2009

Ms. Laura Yoshii, Acting Regional Administrator
U.S. Environmental Protection Agency, Region IX
Mail Code: ORA-1
75 Hawthorne Street
San Francisco, CA 94105

Re: Submittal of a Supplement to the 2008 Revision to the Carbon Monoxide (CO) Limited Maintenance Plan (LMP) for the Tucson Air Planning Area (TAPA)

Dear Ms. Yoshii:

Consistent with provisions of Arizona Revised Statutes §§ 49-104, 49-404, 49-406 (Enclosure 1) and the Code of Federal Regulation, Title 40, §§ 51.102 through 51.104 and Appendix V to Part 51, the Arizona Department of Environmental Quality (ADEQ) hereby adopts and submits to the U.S. Environmental Protection Agency (EPA), a supplement to Appendix D of the **2008 Revision to the Carbon Monoxide Limited Maintenance Plan for the Tucson Air Planning Area** as a revision to the Arizona State Implementation Plan (SIP). Pursuant to A.R.S. § 49-406, the plan and the supplement were developed by the Pima Association of Governments (PAG).

As required by EPA's LMP policy, on June 26, 2008, PAG submitted a revision of the CO LMP for the plan's second ten-year period (2010-2020). This supplement to Appendix D of the 2008 LMP revision includes the authorization of the Arizona State Legislature to extend the Vehicle Emissions Inspection Program (VEIP) through the year 2017. The VEIP is a crucial component of PAG's LMP and essential to maintain CO attainment status in the TAPA.

Enclosure 2 is the SIP Completeness Checklist. Enclosure 3 contains two paper copies and one electronic copy of the of the supplement to Appendix D of the **2008 Revision to the Carbon Monoxide Limited Maintenance Plan for the Tucson Air Planning Area**, for your review and action.

Northern Regional Office
1801 W. Route 66 • Suite 117 • Flagstaff, AZ 86001
(928) 779-0313

Southern Regional Office
400 West Congress Street • Suite 433 • Tucson, AZ 85701
(520) 628-6733

Ms. Yoshii
Page 2 of 2

If you have any questions, please do not hesitate to contact Nancy Wrona, Director, Air Quality Division, at (602) 771-2308.

Sincerely,



Patrick J. Cunningham
Acting Director

Enclosures (3)

cc: Colleen McKaughn, EPA
Lee Comrie, w/o enclosures, PAG
Ursula Kramer, w/o enclosures, Pima County Department of Environmental Quality

**Appendix D
(Revised)**

Letter from Arizona Department of Environmental Quality re: Vehicle
Emissions Inspection Program (VEIP)

*Revised to include supporting documents authorizing the VEIP from 2009 to
2017 (Chapter 171, Senate Bill 1531 from the 48th Regular Session of the
Arizona Legislature and Arizona Revised Statute text A.R.S. 41-3017.01)*



Janet Napolitano
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.azdeq.gov



Stephen A. Owens
Director

March 10, 2008

Ms. Deborah Jordan, Director
Air Division
U.S. Environmental Protection Agency, Region IX, Air-4
75 Hawthorne Street
San Francisco, California 94105

SUBJECT: Vehicle Emissions Inspection Program

Dear Ms. Jordan:

The purpose of this letter is to give a brief overview of the recent legislative changes to Arizona's Vehicle Emissions Inspection Program (VEIP) and explain why the State is prohibited from taking further action to extend the Program at this time.

The VEIP is an integral component of Arizona's State Implementation Plans for the Phoenix carbon monoxide (CO) maintenance area and PM10 nonattainment area and the Tucson CO maintenance area. Continuation of the Program is essential to achieve attainment status for Phoenix and continuation of attainment of the CO national ambient air quality standard for Phoenix and Tucson.

The VEIP precedes the formation of ADEQ, and has been in place since 1976. The VEIP has consistently received support for necessary program updates from the Legislature. In 2007, the Arizona Legislature approved SB 1531, which authorized the VEIP through January 1, 2017, and subjecting the Program to the state agency sunset provisions (see Enclosure 1, Arizona Revised States § 41-2951, et seq.), rather than a simple repeal.

Though a sunset date for VEIP does exist, the Arizona Department of Environmental Quality maintains that the Arizona Legislature's practice of approving VEIP legislation, when necessary to support the SIP, has established a sufficient precedent to enable EPA to move forward in approving the appropriate SIP revisions for the Phoenix and Tucson areas. If you have any questions, please call me at (602) 771-2308.

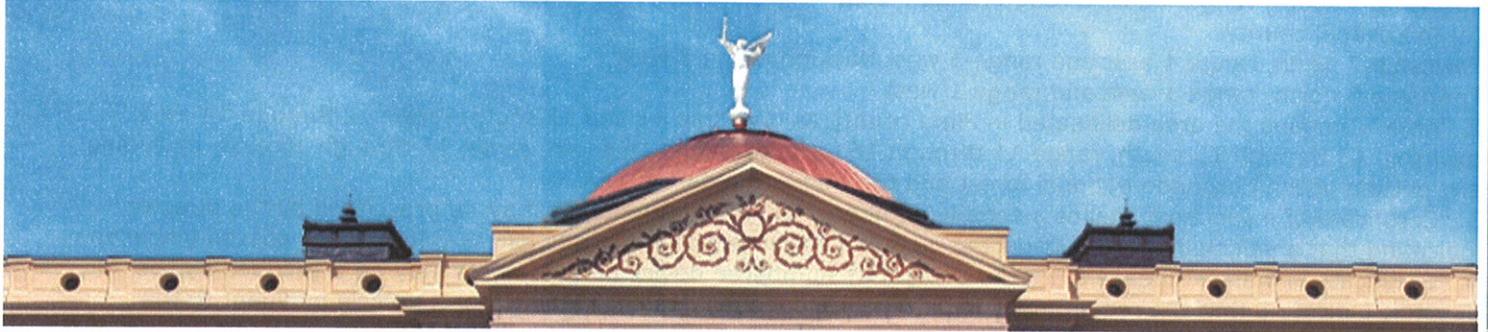
Sincerely,

Nancy C. Wrona, Director
Air Quality Division

cc: Lindy Bauer, MAG
Lee Comrie, PAG
Colleen McKaughan, EPA

Northern Regional Office
1801 W. Route 66 • Suite 117 • Flagstaff, AZ 86001
(928) 779-0313

Southern Regional Office
400 West Congress Street • Suite 433 • Tucson, AZ 85701
(520) 628-6733



Forty-ninth Legislature - First Regular Session

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House Engrossed Senate Bill
-----State of Arizona
Senate
Forty-eighth Legislature
First Regular Session
2007
-----CHAPTER 171
-----SENATE BILL 1531
-----**AN ACT**

REPEALING SECTION 41-3009.03, ARIZONA REVISED STATUTES; AMENDING TITLE 41, CHAPTER 27, ARTICLE 2, ARIZONA REVISED STATUTES, BY ADDING SECTION 41-3019.03; AMENDING SECTION 49-541, ARIZONA REVISED STATUTES; AMENDING SECTION 49-542, ARIZONA REVISED STATUTES, AS AMENDED BY LAWS 2004, CHAPTER 73, SECTION 1; AMENDING SECTION 49-542, ARIZONA REVISED STATUTES, AS AMENDED BY LAWS 2005, CHAPTER 76, SECTION 1; AMENDING SECTION 49-543, ARIZONA REVISED STATUTES; RELATING TO VEHICLE EMISSIONS INSPECTIONS; PROVIDING FOR CONDITIONAL ENACTMENT.

(TEXT OF BILL BEGINS ON NEXT PAGE)

Be it enacted by the Legislature of the State of Arizona:

Section 1. Repeal

Section 41-3009.03, Arizona Revised Statutes, is repealed.

Sec. 2. Title 41, chapter 27, article 2, Arizona Revised Statutes, is amended by adding section 41-3019.03, to read: 41-3019.03. **Vehicle emissions inspection program; termination January 1, 2017**

A. THE VEHICLE EMISSIONS INSPECTION PROGRAM TERMINATES ON JANUARY 1, 2017.

B. TITLE 49, CHAPTER 3, ARTICLE 5 IS REPEALED ON JULY 1, 2017.

Sec. 3. Section 49-541, Arizona Revised Statutes, is amended to read:

49-541. Definitions

In this article, unless the context otherwise requires:

1. "Area A" means the area delineated as follows:

(a) In Maricopa county:

Township 8 north, range 2 east and range 3 east
 Township 7 north, range 2 west through range 5 east
 Township 6 north, range 5 west through range 6 east
 Township 5 north, range 5 west through range 7 east
 Township 4 north, range 5 west through range 8 east
 Township 3 north, range 5 west through range 8 east
 Township 2 north, range 5 west through range 8 east
 Township 1 north, range 5 west through range 7 east
 Township 1 south, range 5 west through range 7 east
 Township 2 south, range 5 west through range 7 east
 Township 3 south, range 5 west through range 1 east
 Township 4 south, range 5 west through range 1 east

(b) In Pinal county:

Township 1 north, range 8 east and range 9 east
Township 1 south, range 8 east and range 9 east
Township 2 south, range 8 east and range 9 east
Township 3 south, range 7 east through range 9 east

(c) In Yavapai county:

Township 7 north, range 1 east and range 1 west through range 2 west

Township 6 north, range 1 east and range 1 west

2. "Area B" means the area delineated in Pima county as township 11 and 12 south, range 12 through 14 east; township 13 through 15 south, range 11 through 16 east; township 16 south, range 12 through 16 east, excluding any portion of the Coronado national forest and the Saguaro national park.

3. "Certificate of inspection" means a serially numbered device or symbol, as may be prescribed by the director, indicating that a vehicle has been inspected pursuant to the provisions of section 49-546 and has passed inspection.

4. "Certificate of waiver" means a **serially** UNIQUELY numbered device or symbol, as may be prescribed by the director, indicating that the requirement of passing reinspection has been waived for a vehicle pursuant to the provisions of this article.

5. "Conditioning mode" means either a fast idle test condition or a loaded test condition.

6. "Curb idle test condition" means an exhaust emissions test conducted with the engine of a vehicle running at the manufacturer's specified idle speed plus or minus one hundred revolutions per minute but without pressure exerted on the accelerator.

7. "Emissions inspection station permit" means a certificate issued by the director authorizing the holder to perform vehicular inspections pursuant to this article.

8. "Fast idle test condition" means an exhaust emissions test conducted with the engine of the vehicle running under an accelerated condition to an extent prescribed by the director.

9. "Fleet emissions inspection station" means any inspection facility operated under a permit issued to a qualified fleet owner or lessee as determined by the director.

10. "Golf cart" means a motor vehicle which has not less than three wheels in contact with the ground, has an unladen weight of less than thirteen hundred pounds, is designed to be and is operated at not more than fifteen miles an hour and is designed to carry golf equipment and persons.

11. "Gross weight" has the same meaning prescribed in section 28-5431.

12. "Independent contractor" means any person, business, firm, partnership or corporation with which the director may enter into an agreement providing for the construction, equipment, maintenance, personnel, management and operation of official emissions inspection stations pursuant to section 49-545.

13. "Loaded test condition" means an exhaust emissions test conducted at cruise or transient conditions as prescribed by the director.

14. "Official emissions inspection station" means an inspection facility, other than a fleet emissions inspection station, whether placed in a permanent structure or in a mobile unit for conveyance among various locations within this state, for the purpose of conducting emissions inspections of all vehicles required to be inspected pursuant to this article.

15. "Tampering" means removing, defeating or altering an emissions control device which was installed at the time a vehicle was manufactured.

16. "Vehicle" means any automobile, truck, truck tractor, motor bus or self-propelled or motor-driven vehicle registered or to be registered in this state and used upon the public highways of this state for the purpose of transporting persons or property, except implements of husbandry, road rollers or road machinery temporarily operated upon the highway.

17. "Vehicle emissions control area" means area A or area B.

Sec. 4. Section 49-542, Arizona Revised Statutes, as amended by Laws 2004, chapter 73, section 1, is amended to read:

49-542. Emissions inspection program; powers and duties of director; administration; periodic inspection; minimum standards and rules; exceptions

A. The director shall administer a comprehensive annual or biennial emissions inspection program which shall require the inspection of vehicles in this state pursuant to this article and applicable administrative rules. Such inspection is required in area A and area B, for those vehicles owned by a person who is subject to section 15-1444 or 15-1627 and for those vehicles registered outside of area A or area B but used to commute to the driver's principal place of employment located within area A or area B. Inspection in other counties of the state shall commence upon application by a county board of supervisors for participation in such inspection program, subject to approval by the director. In all counties with a population of three hundred fifty thousand or fewer persons according to the most recent United States decennial census, except for the portion of counties that contain any portion of area A, the director shall as conditions dictate provide for testing to determine the effect of vehicle related pollution on ambient air quality in all communities with a metropolitan area population of twenty thousand persons or more according to the most recent United States decennial census. If such testing detects the violation of state ambient air quality standards by vehicle related pollution, the director shall forward a full report of such violation to the president of the senate, the speaker of the house of representatives and the governor.

B. The state's annual or biennial emissions inspection program shall provide for vehicle inspections at official emissions inspection stations or at fleet emissions inspection stations. Each inspection station in area A shall employ at least one mechanic who is available during the station's hours of operation to provide technical advice and

assistance for persons who fail the emissions test. The director may enter into agreements with the department of transportation or with county assessors for the use of official emissions inspection stations for the purpose of conducting vehicle registrations. An official or fleet emissions inspection station permit shall not be sold, assigned, transferred, conveyed or removed to another location except on such terms and conditions as the director may prescribe.

C. Vehicles required to be inspected and registered in this state, except those provided for in section 49-546, shall be inspected, for the purpose of complying with the registration or reregistration requirement pursuant to subsection D of this section, in accordance with the provisions of this article no more than ninety days prior to each reregistration expiration date. A vehicle may be submitted voluntarily for inspection more than ninety days before the reregistration expiration date on payment of the prescribed inspection fee. Such voluntary inspection shall not be considered as compliance with the registration or reregistration requirement pursuant to subsection D of this section.

D. A vehicle shall not be registered or reregistered until such vehicle has passed the emissions inspection and the tampering inspection prescribed in subsection G of this section or has been issued a certificate of waiver. A certificate of waiver shall only be issued one time to a vehicle after January 1, 1997. If any vehicle to be registered or reregistered is being sold by a dealer licensed to sell motor vehicles pursuant to title 28, the cost of any inspection and any repairs necessary to pass the inspection shall be borne by the dealer. A dealer who is licensed to sell motor vehicles pursuant to title 28 and whose place of business is located in area A or area B shall not deliver any vehicle to the retail purchaser until the vehicle passes any inspection required by this article or the vehicle is exempt under subsection J of this section.

E. On the registration or reregistration of a vehicle which has complied with the minimum emissions standards pursuant to this section or is otherwise exempt under this section, the registering officer shall issue an air quality compliance sticker to the registered owner which shall be placed on the vehicle as prescribed by rule adopted by the department of transportation or issue a modified year validating tab as prescribed by rule adopted by the department of transportation. Those persons who reside outside of area A or area B but who elect to test their vehicle or are required to test their vehicle pursuant to this section and who comply with the minimum emissions standards pursuant to this section or are otherwise exempt under this section shall remit a compliance form, as prescribed by the department of transportation, and proof of compliance issued at an official emissions inspection station to the department of transportation along with the appropriate fees. The department of transportation shall then issue the person an air quality compliance sticker which shall be placed on the vehicle as prescribed by rule adopted by the department of transportation. The registering officer or the department of transportation shall collect an air quality compliance fee of twenty-five cents. The registering officer or the department of transportation shall deposit, pursuant to sections 35-146 and 35-147, the air quality compliance fee in the state highway fund established by section 28-6991. The department of transportation shall deposit, pursuant to sections 35-146 and 35-147, any emissions inspection fee in the emissions inspection fund. The provisions of this subsection do not apply to those vehicles registered pursuant to title 28, chapter 7, article 7 or 8, the sale of vehicles between motor vehicle dealers or vehicles leased to a person residing outside of area A or area B by a leasing company whose place of business is in area A or area B.

F. The director shall adopt minimum emissions standards pursuant to section 49-447 with which the various classes of vehicles shall be required to comply as follows:

1. For the purpose of determining compliance with minimum emissions standards in area B:

(a) A motor vehicle manufactured in or before the 1980 model year, other than a diesel powered vehicle, shall be required to take and pass the curb idle test condition. A diesel powered vehicle is subject to only a loaded test condition. The conditioning mode shall, at the option of the vehicle owner or owner's agent, be administered only after the vehicle has failed the curb idle test condition. Upon completion of such conditioning mode, a vehicle that has failed the curb idle test condition may be retested in the curb idle test condition. If the vehicle passes such retest, it shall be deemed in compliance with minimum emissions standards unless the vehicle fails the tampering inspection pursuant to subsection G of this section.

(b) A motor vehicle manufactured in or after the 1981 model year, other than a diesel powered vehicle, shall be required to take and pass the curb idle test condition and the loaded test condition or an ~~on-board~~ ONBOARD diagnostic check as may be required pursuant to title II of the clean air act.

2. For purposes of determining compliance with minimum emissions standards and functional tests in area A:

(a) Motor vehicles manufactured in or after model year 1981 with a gross vehicle weight rating of eighty-five hundred pounds or less, other than diesel powered vehicles, shall be required to take and pass a transient loaded emissions test or an ~~on-board~~ ONBOARD diagnostic check as may be required pursuant to title II of the clean air act.

(b) Motor vehicles other than those prescribed by subdivision (a) of this paragraph and other than diesel powered vehicles shall be required to take and pass a steady state loaded test and a curb idle emissions test.

(c) ~~Notwithstanding the requirement of subsection C of this section that the first emissions inspection after the purchase of a new vehicle be for the second registration year for that vehicle;~~ A diesel powered motor vehicle applying for registration or reregistration in area A ~~more than thirty-three months after the date of initial registration~~ shall be required to take and pass an annual emissions test conducted at an official emissions inspection station or a fleet emissions inspection station as follows:

(i) A loaded, transient or any other form of test as provided for in rules adopted by the director for vehicles with a gross vehicle weight rating of eight thousand five hundred pounds or less.

(ii) A test that conforms with the society for automotive engineers standard J1667 for vehicles with a gross vehicle

weight rating of more than eight thousand five hundred pounds.

(d) Motor vehicles by specific class or model year shall be required to take and pass any of the following tests:

(i) An evaporative system purge test.

(ii) An evaporative system integrity test.

(e) An ~~on-board~~ ONBOARD diagnostic check as may be required pursuant to title II of the clean air act ~~may be conducted for advisory purposes.~~

3. A motorcycle or constant four wheel drive vehicle shall be required to take and pass a curb idle emissions test OR AN ONBOARD DIAGNOSTIC CHECK AS REQUIRED PURSUANT TO TITLE II OF THE CLEAN AIR ACT.

4. Fleet operators in area B ~~which have~~ MUST COMPLY WITH THIS SECTION, EXCEPT THAT USED VEHICLES SOLD BY A MOTOR VEHICLE DEALER WHO IS A FLEET OPERATOR AND WHO HAS been issued a permit under section 49-546 ~~are required to test their vehicles~~ SHALL BE TESTED as follows:

(a) A motor vehicle manufactured in or before the 1980 model year shall take and pass only the curb idle test condition, except that a diesel powered vehicle is subject to only a loaded test condition.

(b) A motor vehicle manufactured in or after the 1981 model year shall take and pass the curb idle test condition and a twenty-five hundred revolutions per minute unloaded test condition.

5. Vehicles owned or operated by the United States, this state or a political subdivision of this state shall comply with this subsection without regard to whether those vehicles are required to be registered in this state, except that alternative fuel vehicles of a school district that is located in area A shall be required to take and pass the curb idle test condition and the loaded test condition.

6. Fleet operators in area A shall comply with this section, except that used vehicles sold by a motor vehicle dealer who is a fleet operator and who has been issued a permit pursuant to section 49-546 for purposes of determining compliance with minimum emission standards in area A shall ~~test their vehicles~~ BE TESTED as follows:

(a) A motor vehicle manufactured in or before the 1980 model year shall take and pass the curb idle test condition, except that a diesel powered vehicle is subject to only a loaded test condition.

(b) A motor vehicle manufactured in or after the 1981 model year shall take and pass the curb idle test condition and a two thousand five hundred revolutions per minute unloaded test condition.

7. Beginning on January 1, 2004 and except for any registered owner or lessee of a fleet of less than twenty-five vehicles, a diesel powered motor vehicle with a gross vehicle weight of more than twenty-six thousand pounds and for which gross weight fees are paid pursuant to title 28, chapter 15, article 2 in area A shall not be allowed to operate in area A unless it was manufactured in or after the 1988 model year or is powered by an engine that is certified to meet or surpass emissions standards contained in 40 Code of Federal Regulations section 86.088-11. This paragraph does not apply to vehicles that are registered pursuant to title 28, chapter 7, article 7 or 8.

8. Beginning on January 1, 2006 for any registered owner or lessee of a fleet of less than twenty-five vehicles, a diesel powered motor vehicle with a gross vehicle weight of more than twenty-six thousand pounds and for which gross weight fees are paid pursuant to title 28, chapter 15, article 2 in area A shall not be allowed to operate in area A unless it was manufactured in or after the 1988 model year or is powered by an engine that is certified to meet or surpass emissions standards contained in 40 Code of Federal Regulations section 86.088-11. This paragraph does not apply to vehicles that are registered pursuant to title 28, chapter 7, article 7 or 8.

G. In addition to an emissions inspection, a vehicle is subject to a tampering inspection on at least a biennial basis if the vehicle was manufactured after the 1974 model year and the vehicle is not subject to a transient loaded emissions test OR AN ONBOARD DIAGNOSTIC CHECK AS REQUIRED PURSUANT TO TITLE II OF THE CLEAN AIR ACT. The director shall adopt vehicle configuration guidelines for the tampering inspection which shall be based on the original configuration of the vehicle when manufactured. The tampering inspection shall consist of the following:

1. A visual check to determine the presence of properly installed catalytic converters.

2. An examination to determine the presence of an operational air pump.

3. In area A, if the vehicle was manufactured after the 1974 model year and is not subject to a transient loaded emissions test OR AN ONBOARD DIAGNOSTIC CHECK AS REQUIRED PURSUANT TO TITLE II OF THE CLEAN AIR ACT, a visual inspection for the presence or malfunction of the positive crankcase ventilation system and the evaporative control system.

H. Vehicles required to be inspected shall undergo a functional test of the gas cap to determine if the cap holds pressure within limits prescribed by the director, except for any vehicle that is subject to an evaporative system integrity test.

I. Motor vehicles failing the initial or subsequent test are not subject to a penalty fee for late registration renewal if the original testing was accomplished before the expiration date and if the registration renewal is received by the motor vehicle division or the county assessor within thirty days of the original test.

J. The director may adopt rules for purposes of implementation, administration, regulation and enforcement of the provisions of this article including:

1. The submission of records relating to the emissions inspection of vehicles inspected by another jurisdiction in accordance with another inspection law and the acceptance of such inspection for compliance with the provisions of this article.

2. The exemption from inspection of:

(a) A motor vehicle manufactured in or before the 1966 model year.

(b) New vehicles originally registered at the time of initial retail sale and titling in this state pursuant to section 28-2153 or 28-2154.

(c) Vehicles registered pursuant to title 28, chapter 7, article 7 or 8.

~~(d) During each calendar year vehicles of that model year and vehicles from the prior four model years.~~

(d) NEW VEHICLES BEFORE THE SIXTH REGISTRATION YEAR AFTER INITIAL PURCHASE OR LEASE.

(e) Vehicles which will not be available within the state during the ninety days prior to registration.

(f) Golf carts.

(g) Electrically-powered vehicles.

(h) Vehicles with an engine displacement of less than ninety cubic centimeters.

(i) The sale of vehicles between motor vehicle dealers.

(j) Vehicles leased to a person residing outside of area A or area B by a leasing company whose place of business is in area A or area B.

3. Compiling and maintaining records of emissions test results after servicing.

4. A procedure which shall allow the vehicle service and repair industry to compare the calibration accuracy of its emissions testing equipment with the department's calibration standards.

5. Training requirements for automotive repair personnel using emissions measuring equipment whose calibration accuracy has been compared with the department's calibration standards.

6. Any other rule which may be required to accomplish the provisions of this article.

K. The director shall, after consultation with automobile manufacturers and the vehicle service and repair industry, establish by rule a definition of "low emissions tune-up" for motor vehicles subject to inspection under this article. The definition shall specify repair procedures which, when implemented, will reduce vehicle emissions.

L. The director shall adopt rules which specify that the estimated retail cost of all recommended maintenance and repairs shall not exceed the amounts prescribed in this subsection, except that if a vehicle fails a tampering inspection there is no limit on the cost of recommended maintenance and repairs. The director shall issue a certificate of waiver for a vehicle which has failed reinspection, if the director has determined that all recommended maintenance and repairs have been performed. If, after reinspection, the director has determined that the vehicle is in compliance with minimum emissions standards or that all recommended maintenance and repairs for compliance with minimum emissions standards have been performed, but that tampering discovered at a tampering inspection has not been repaired, the director may issue a certificate of waiver if the owner of the vehicle provides to the director a written statement from an automobile parts or repair business that an emissions control device which is necessary to repair the tampering is not available and cannot be obtained from any usual source of supply before the vehicle's current registration expires. Rules adopted by the director for the purpose of establishing the estimated retail cost of all recommended maintenance and repairs pursuant to this subsection shall specify that:

1. In area A the cost shall not exceed:

(a) Five hundred dollars for a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds.

(b) Five hundred dollars for a diesel powered vehicle with tandem axles.

(c) For a vehicle other than a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds and other than a diesel powered vehicle with tandem axles:

(i) Two hundred dollars for such a vehicle manufactured in or before the 1974 model year.

(ii) Three hundred dollars for such a vehicle manufactured in the 1975 through 1979 model years.

(iii) Four hundred fifty dollars for such a vehicle manufactured in or after the 1980 model year.

2. In area B the cost shall not exceed:

(a) Three hundred dollars for a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds.

(b) Three hundred dollars for a diesel powered vehicle with tandem axles.

3. For a vehicle other than a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds and other than a diesel powered vehicle with tandem axles:

(a) Fifty dollars for such a vehicle manufactured in or before the 1974 model year.

(b) Two hundred dollars for such a vehicle manufactured in the 1975 through 1979 model years.

(c) Three hundred dollars for such a vehicle manufactured in or after the 1980 model year.

M. Each person whose vehicle has failed an emissions inspection shall be provided a list of those general recommended tune-up procedures for vehicles which are designed to reduce vehicle emissions levels. The list shall include the following notice: "This test is the result of federal law. You may wish to contact your representative in the United States Congress."

N. Notwithstanding any other provisions of this article, the director may adopt rules allowing exemptions from the requirement that all vehicles must meet the minimum standards for registration or reregistration.

O. The director of environmental quality shall establish, in cooperation with the assistant director for the motor vehicle division of the department of transportation:

1. An adequate method for identifying bona fide residents residing outside of area A or area B to ensure that such residents are exempt from compliance with the inspection program established by this article and rules adopted under this article.

2. A written notice that shall accompany the vehicle registration application forms that are sent to vehicle owners pursuant to section 28-2151 and that shall accompany or be included as part of the vehicle emissions test results that are provided to vehicle owners at the time of the vehicle emissions test. This written notice shall describe at least the following:

(a) The restriction of the waiver program to one time per vehicle and a brief description of the implications of this limit.

(b) The availability and a brief description of the vehicle repair and retrofit program established pursuant to section 49-474.03.

(c) Notice that many vehicles carry extended warranties for vehicle emissions systems, and those warranties are described in the vehicle's owner's manual or other literature.

(d) A description of the catalytic converter replacement program established pursuant to section 49-474.03.

P. Notwithstanding any other law, if area A or area B is reclassified as an attainment area, emissions testing conducted pursuant to this article shall continue for vehicles registered inside that reclassified area, vehicles owned by a person who is subject to section 15-1444 or 15-1627 and vehicles registered outside of that reclassified area but used to commute to the driver's principal place of employment located within that reclassified area.

Q. A fleet operator who is issued a permit pursuant to section 49-546 may electronically transmit emissions inspection data to the department of transportation pursuant to rules adopted by the director of the department of transportation in consultation with the director of environmental quality.

R. The director shall prohibit a certificate of waiver pursuant to subsection L of this section for any vehicle which has failed inspection in area A due to the catalytic converter system.

S. The director shall establish provisions for rapid testing of certain vehicles and to allow fleet operators, singly or in combination, to contract directly for vehicle emissions testing.

T. Each vehicle emissions control station in area A shall have a sign posted to be visible to persons who are having their vehicles tested. This sign shall state that enhanced testing procedures are a direct result of federal law.

U. The initial adoption of rules pursuant to this section shall be deemed emergency rules pursuant to section 41-1026.

V. The director of environmental quality and the director of the department of transportation shall implement a system to exchange information relating to the waiver program, including information relating to vehicle emissions test results and vehicle registration information.

W. Any person who sells a vehicle that has been issued a certificate of waiver pursuant to this section after January 1, 1997 and who knows that a certificate of waiver has been issued after January 1, 1997 for that vehicle shall disclose to the buyer before completion of the sale that a certificate of waiver has been issued for that vehicle.

X. Vehicles that fail the emissions test at emission levels higher than twice the standard established for that vehicle class by the department pursuant to section 49-447 are not eligible for a certificate of waiver pursuant to this section unless the vehicle is repaired sufficiently to achieve an emissions level below twice the standard for that class of vehicle.

Sec. 5. Section 49-542, Arizona Revised Statutes, as amended by Laws 2005, chapter 76, section 1, is amended to read:

49-542. Emissions inspection program; powers and duties of director; administration; periodic inspection; minimum standards and rules; exceptions; definition

A. The director shall administer a comprehensive annual or biennial emissions inspection program which shall require the inspection of vehicles in this state pursuant to this article and applicable administrative rules. Such inspection is required in area A and area B, for those vehicles owned by a person who is subject to section 15-1444 or 15-1627 and for those vehicles registered outside of area A or area B but used to commute to the driver's principal place of employment located within area A or area B. Inspection in other counties of the state shall commence upon application by a county board of supervisors for participation in such inspection program, subject to approval by the director. In all counties with a population of three hundred fifty thousand or fewer persons according to the most recent United States decennial census, except for the portion of counties that contain any portion of area A, the director shall as conditions dictate provide for testing to determine the effect of vehicle related pollution on ambient air quality in all communities with a metropolitan area population of twenty thousand persons or more according to the most recent United States decennial census. If such testing detects the violation of state ambient air quality standards by vehicle related pollution, the director shall forward a full report of such violation to the president of the senate, the speaker of the house of representatives and the governor.

B. The state's annual or biennial emissions inspection program shall provide for vehicle inspections at official emissions inspection stations or at fleet emissions inspection stations. Each inspection station in area A shall employ at least one mechanic who is available during the station's hours of operation to provide technical advice and assistance for persons who fail the emissions test. The director may enter into agreements with the department of transportation or with county assessors for the use of official emissions inspection stations for the purpose of conducting vehicle registrations. An official or fleet emissions inspection station permit shall not be sold, assigned, transferred, conveyed or removed to another location except on such terms and conditions as the director may prescribe.

C. Vehicles required to be inspected and registered in this state, except those provided for in section 49-546, shall be inspected, for the purpose of complying with the registration or reregistration requirement pursuant to subsection D of this section, in accordance with the provisions of this article no more than ninety days prior to each reregistration expiration date. A vehicle may be submitted voluntarily for inspection more than ninety days before the reregistration expiration date on payment of the prescribed inspection fee. Such voluntary inspection shall not be considered as compliance with the registration or reregistration requirement pursuant to subsection D of this section.

D. A vehicle shall not be registered or reregistered until such vehicle has passed the emissions inspection and the tampering inspection prescribed in subsection G of this section or has been issued a certificate of waiver. A certificate of waiver shall only be issued one time to a vehicle after January 1, 1997. If any vehicle to be registered or

reregistered is being sold by a dealer licensed to sell motor vehicles pursuant to title 28, the cost of any inspection and any repairs necessary to pass the inspection shall be borne by the dealer. A dealer who is licensed to sell motor vehicles pursuant to title 28 and whose place of business is located in area A or area B shall not deliver any vehicle to the retail purchaser until the vehicle passes any inspection required by this article or the vehicle is exempt under subsection J of this section.

E. On the registration or reregistration of a vehicle which has complied with the minimum emissions standards pursuant to this section or is otherwise exempt under this section, the registering officer shall issue an air quality compliance sticker to the registered owner which shall be placed on the vehicle as prescribed by rule adopted by the department of transportation or issue a modified year validating tab as prescribed by rule adopted by the department of transportation. Those persons who reside outside of area A or area B but who elect to test their vehicle or are required to test their vehicle pursuant to this section and who comply with the minimum emissions standards pursuant to this section or are otherwise exempt under this section shall remit a compliance form, as prescribed by the department of transportation, and proof of compliance issued at an official emissions inspection station to the department of transportation along with the appropriate fees. The department of transportation shall then issue the person an air quality compliance sticker which shall be placed on the vehicle as prescribed by rule adopted by the department of transportation. The registering officer or the department of transportation shall collect an air quality compliance fee of twenty-five cents. The registering officer or the department of transportation shall deposit, pursuant to sections 35-146 and 35-147, the air quality compliance fee in the state highway fund established by section 28-6991. The department of transportation shall deposit, pursuant to sections 35-146 and 35-147, any emissions inspection fee in the emissions inspection fund. The provisions of this subsection do not apply to those vehicles registered pursuant to title 28, chapter 7, article 7 or 8, the sale of vehicles between motor vehicle dealers or vehicles leased to a person residing outside of area A or area B by a leasing company whose place of business is in area A or area B.

F. The director shall adopt minimum emissions standards pursuant to section 49-447 with which the various classes of vehicles shall be required to comply as follows:

1. For the purpose of determining compliance with minimum emissions standards in area B:

(a) A motor vehicle manufactured in or before the 1980 model year, other than a diesel powered vehicle, shall be required to take and pass the curb idle test condition. A diesel powered vehicle is subject to only a loaded test condition. The conditioning mode shall, at the option of the vehicle owner or owner's agent, be administered only after the vehicle has failed the curb idle test condition. Upon completion of such conditioning mode, a vehicle that has failed the curb idle test condition may be retested in the curb idle test condition. If the vehicle passes such retest, it shall be deemed in compliance with minimum emissions standards unless the vehicle fails the tampering inspection pursuant to subsection G of this section.

(b) A motor vehicle manufactured in or after the 1981 model year, other than a diesel powered vehicle, shall be required to take and pass the curb idle test condition and the loaded test condition or an onboard diagnostic check as may be required pursuant to title II of the clean air act.

2. For purposes of determining compliance with minimum emissions standards and functional tests in area A:

(a) Motor vehicles manufactured in or after model year 1981 with a gross vehicle weight rating of eighty-five hundred pounds or less, other than diesel powered vehicles, shall be required to take and pass a transient loaded emissions test or an onboard diagnostic check as may be required pursuant to title II of the clean air act.

(b) Motor vehicles other than those prescribed by subdivision (a) of this paragraph and other than diesel powered vehicles shall be required to take and pass a steady state loaded test and a curb idle emissions test.

(c) ~~Notwithstanding the requirement of subsection C of this section that the first emissions inspection after the purchase of a new vehicle be for the second registration year for that vehicle,~~ A diesel powered motor vehicle applying for registration or reregistration in area A ~~more than thirty-three months after the date of initial registration~~ shall be required to take and pass an annual emissions test conducted at an official emissions inspection station or a fleet emissions inspection station as follows:

(i) A loaded, transient or any other form of test as provided for in rules adopted by the director for vehicles with a gross vehicle weight rating of eight thousand five hundred pounds or less.

(ii) A test that conforms with the society for automotive engineers standard J1667 for vehicles with a gross vehicle weight rating of more than eight thousand five hundred pounds.

(d) Motor vehicles by specific class or model year shall be required to take and pass any of the following tests:

(i) An evaporative system purge test.

(ii) An evaporative system integrity test.

(e) An onboard diagnostic check as may be required pursuant to title II of the clean air act ~~may be conducted for advisory purposes.~~

3. A motorcycle in area A or any constant four wheel drive vehicle shall be required to take and pass a curb idle emissions test ~~OR AN ONBOARD DIAGNOSTIC CHECK AS REQUIRED PURSUANT TO TITLE II OF THE CLEAN AIR ACT.~~

4. Fleet operators in area B ~~which have~~ **MUST COMPLY WITH THIS SECTION, EXCEPT THAT USED VEHICLES SOLD BY A MOTOR VEHICLE DEALER WHO IS A FLEET OPERATOR AND WHO HAS** been issued a permit under section 49-546 ~~are required to test their vehicles~~ **SHALL BE TESTED** as follows:

(a) A motor vehicle manufactured in or before the 1980 model year shall take and pass only the curb idle test condition, except that a diesel powered vehicle is subject to only a loaded test condition.

(b) A motor vehicle manufactured in or after the 1981 model year shall take and pass the curb idle test condition and

a twenty-five hundred revolutions per minute unloaded test condition.

5. Vehicles owned or operated by the United States, this state or a political subdivision of this state shall comply with this subsection without regard to whether those vehicles are required to be registered in this state, except that alternative fuel vehicles of a school district that is located in area A shall be required to take and pass the curb idle test condition and the loaded test condition.

6. Fleet operators in area A shall comply with this section, except that used vehicles sold by a motor vehicle dealer who is a fleet operator and who has been issued a permit pursuant to section 49-546 for purposes of determining compliance with minimum emission standards in area A shall ~~test their vehicles~~ BE TESTED as follows:

(a) A motor vehicle manufactured in or before the 1980 model year shall take and pass the curb idle test condition, except that a diesel powered vehicle is subject to only a loaded test condition.

(b) A motor vehicle manufactured in or after the 1981 model year shall take and pass the curb idle test condition and a two thousand five hundred revolutions per minute unloaded test condition.

7. Beginning on January 1, 2004 and except for any registered owner or lessee of a fleet of less than twenty-five vehicles, a diesel powered motor vehicle with a gross vehicle weight of more than twenty-six thousand pounds and for which gross weight fees are paid pursuant to title 28, chapter 15, article 2 in area A shall not be allowed to operate in area A unless it was manufactured in or after the 1988 model year or is powered by an engine that is certified to meet or surpass emissions standards contained in 40 Code of Federal Regulations section 86.088-11. This paragraph does not apply to vehicles that are registered pursuant to title 28, chapter 7, article 7 or 8.

8. Beginning on January 1, 2006 for any registered owner or lessee of a fleet of less than twenty-five vehicles, a diesel powered motor vehicle with a gross vehicle weight of more than twenty-six thousand pounds and for which gross weight fees are paid pursuant to title 28, chapter 15, article 2 in area A shall not be allowed to operate in area A unless it was manufactured in or after the 1988 model year or is powered by an engine that is certified to meet or surpass emissions standards contained in 40 Code of Federal Regulations section 86.088-11. This paragraph does not apply to vehicles that are registered pursuant to title 28, chapter 7, article 7 or 8.

G. In addition to an emissions inspection, a vehicle is subject to a tampering inspection on at least a biennial basis if the vehicle was manufactured after the 1974 model year and the vehicle is not subject to a transient loaded emissions test OR AN ONBOARD DIAGNOSTIC CHECK AS REQUIRED PURSUANT TO TITLE II OF THE CLEAN AIR ACT. The director shall adopt vehicle configuration guidelines for the tampering inspection which shall be based on the original configuration of the vehicle when manufactured. The tampering inspection shall consist of the following:

1. A visual check to determine the presence of properly installed catalytic converters.

2. An examination to determine the presence of an operational air pump.

3. In area A, if the vehicle was manufactured after the 1974 model year and is not subject to a transient loaded emissions test OR AN ONBOARD DIAGNOSTIC CHECK AS REQUIRED PURSUANT TO TITLE II OF THE CLEAN AIR ACT, a visual inspection for the presence or malfunction of the positive crankcase ventilation system and the evaporative control system.

H. Vehicles required to be inspected shall undergo a functional test of the gas cap to determine if the cap holds pressure within limits prescribed by the director, except for any vehicle that is subject to an evaporative system integrity test.

I. Motor vehicles failing the initial or subsequent test are not subject to a penalty fee for late registration renewal if the original testing was accomplished before the expiration date and if the registration renewal is received by the motor vehicle division or the county assessor within thirty days of the original test.

J. The director may adopt rules for purposes of implementation, administration, regulation and enforcement of the provisions of this article including:

1. The submission of records relating to the emissions inspection of vehicles inspected by another jurisdiction in accordance with another inspection law and the acceptance of such inspection for compliance with the provisions of this article.

2. The exemption from inspection of:

(a) A motor vehicle manufactured in or before the 1966 model year.

(b) New vehicles originally registered at the time of initial retail sale and titling in this state pursuant to section 28-2153 or 28-2154.

(c) Vehicles registered pursuant to title 28, chapter 7, article 7 or 8.

~~(d) During each calendar year vehicles of that model year and vehicles from the prior four model years:~~

(d) NEW VEHICLES BEFORE THE SIXTH REGISTRATION YEAR AFTER INITIAL PURCHASE OR LEASE.

(e) Vehicles which will not be available within the state during the ninety days prior to registration.

(f) Golf carts.

(g) Electrically-powered vehicles.

(h) Vehicles with an engine displacement of less than ninety cubic centimeters.

(i) The sale of vehicles between motor vehicle dealers.

(j) Vehicles leased to a person residing outside of area A or area B by a leasing company whose place of business is in area A or area B.

(k) Collectible vehicles.

(l) Motorcycles in area B.

3. Compiling and maintaining records of emissions test results after servicing.

4. A procedure which shall allow the vehicle service and repair industry to compare the calibration accuracy of its

emissions testing equipment with the department's calibration standards.

5. Training requirements for automotive repair personnel using emissions measuring equipment whose calibration accuracy has been compared with the department's calibration standards.

6. Any other rule which may be required to accomplish the provisions of this article.

K. The director shall, after consultation with automobile manufacturers and the vehicle service and repair industry, establish by rule a definition of "low emissions tune-up" for motor vehicles subject to inspection under this article. The definition shall specify repair procedures which, when implemented, will reduce vehicle emissions.

L. The director shall adopt rules which specify that the estimated retail cost of all recommended maintenance and repairs shall not exceed the amounts prescribed in this subsection, except that if a vehicle fails a tampering inspection there is no limit on the cost of recommended maintenance and repairs. The director shall issue a certificate of waiver for a vehicle which has failed reinspection, if the director has determined that all recommended maintenance and repairs have been performed. If, after reinspection, the director has determined that the vehicle is in compliance with minimum emissions standards or that all recommended maintenance and repairs for compliance with minimum emissions standards have been performed, but that tampering discovered at a tampering inspection has not been repaired, the director may issue a certificate of waiver if the owner of the vehicle provides to the director a written statement from an automobile parts or repair business that an emissions control device which is necessary to repair the tampering is not available and cannot be obtained from any usual source of supply before the vehicle's current registration expires. Rules adopted by the director for the purpose of establishing the estimated retail cost of all recommended maintenance and repairs pursuant to this subsection shall specify that:

1. In area A the cost shall not exceed:

(a) Five hundred dollars for a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds.

(b) Five hundred dollars for a diesel powered vehicle with tandem axles.

(c) For a vehicle other than a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds and other than a diesel powered vehicle with tandem axles:

(i) Two hundred dollars for such a vehicle manufactured in or before the 1974 model year.

(ii) Three hundred dollars for such a vehicle manufactured in the 1975 through 1979 model years.

(iii) Four hundred fifty dollars for such a vehicle manufactured in or after the 1980 model year.

2. In area B the cost shall not exceed:

(a) Three hundred dollars for a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds.

(b) Three hundred dollars for a diesel powered vehicle with tandem axles.

3. For a vehicle other than a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds and other than a diesel powered vehicle with tandem axles:

(a) Fifty dollars for such a vehicle manufactured in or before the 1974 model year.

(b) Two hundred dollars for such a vehicle manufactured in the 1975 through 1979 model years.

(c) Three hundred dollars for such a vehicle manufactured in or after the 1980 model year.

M. Each person whose vehicle has failed an emissions inspection shall be provided a list of those general recommended tune-up procedures for vehicles which are designed to reduce vehicle emissions levels. The list shall include the following notice: "This test is the result of federal law. You may wish to contact your representative in the United States Congress."

N. Notwithstanding any other provisions of this article, the director may adopt rules allowing exemptions from the requirement that all vehicles must meet the minimum standards for registration or reregistration.

O. The director of environmental quality shall establish, in cooperation with the assistant director for the motor vehicle division of the department of transportation:

1. An adequate method for identifying bona fide residents residing outside of area A or area B to ensure that such residents are exempt from compliance with the inspection program established by this article and rules adopted under this article.

2. A written notice that shall accompany the vehicle registration application forms that are sent to vehicle owners pursuant to section 28-2151 and that shall accompany or be included as part of the vehicle emissions test results that are provided to vehicle owners at the time of the vehicle emissions test. This written notice shall describe at least the following:

(a) The restriction of the waiver program to one time per vehicle and a brief description of the implications of this limit.

(b) The availability and a brief description of the vehicle repair and retrofit program established pursuant to section 49-474.03.

(c) Notice that many vehicles carry extended warranties for vehicle emissions systems, and those warranties are described in the vehicle's owner's manual or other literature.

(d) A description of the catalytic converter replacement program established pursuant to section 49-474.03.

P. Notwithstanding any other law, if area A or area B is reclassified as an attainment area, emissions testing conducted pursuant to this article shall continue for vehicles registered inside that reclassified area, vehicles owned by a person who is subject to section 15-1444 or 15-1627 and vehicles registered outside of that reclassified area but used to commute to the driver's principal place of employment located within that reclassified area.

Q. A fleet operator who is issued a permit pursuant to section 49-546 may electronically transmit emissions inspection data to the department of transportation pursuant to rules adopted by the director of the department of transportation in consultation with the director of environmental quality.

R. The director shall prohibit a certificate of waiver pursuant to subsection L of this section for any vehicle which has failed inspection in area A due to the catalytic converter system.

S. The director shall establish provisions for rapid testing of certain vehicles and to allow fleet operators, singly or in combination, to contract directly for vehicle emissions testing.

T. Each vehicle emissions control station in area A shall have a sign posted to be visible to persons who are having their vehicles tested. This sign shall state that enhanced testing procedures are a direct result of federal law.

U. The initial adoption of rules pursuant to this section shall be deemed emergency rules pursuant to section 41-1026.

V. The director of environmental quality and the director of the department of transportation shall implement a system to exchange information relating to the waiver program, including information relating to vehicle emissions test results and vehicle registration information.

W. Any person who sells a vehicle that has been issued a certificate of waiver pursuant to this section after January 1, 1997 and who knows that a certificate of waiver has been issued after January 1, 1997 for that vehicle shall disclose to the buyer before completion of the sale that a certificate of waiver has been issued for that vehicle.

X. Vehicles that fail the emissions test at emission levels higher than twice the standard established for that vehicle class by the department pursuant to section 49-447 are not eligible for a certificate of waiver pursuant to this section unless the vehicle is repaired sufficiently to achieve an emissions level below twice the standard for that class of vehicle.

Y. If an insurer notifies the department of transportation of the cancellation or nonrenewal of collectible vehicle or classic automobile insurance coverage for a collectible vehicle, the department of transportation shall cancel the registration of the vehicle and the vehicle's exemption from emissions testing pursuant to this section unless evidence of coverage is presented to the department of transportation within sixty days.

Z. For the purposes of this section, "collectible vehicle" means a vehicle that complies with both of the following:

1. Either:

(a) Bears a model year date of original manufacture that is at least fifteen years old.

(b) Is of unique or rare design, of limited production and an object of curiosity.

2. Meets both of the following criteria:

(a) Is maintained primarily for use in car club activities, exhibitions, parades or other functions of public interest or for a private collection and is used only infrequently for other purposes.

(b) Has a collectible vehicle or classic automobile insurance coverage that restricts the collectible vehicle mileage or use, or both, and requires the owner to have another vehicle for personal use.

Sec. 6. Section 49-543, Arizona Revised Statutes, is amended to read:

49-543. Emissions inspection costs; disposition; fleet inspection; certificates

A. The director shall fix, regulate and alter in accordance with this section the fees required to be paid for the full costs of the vehicle emissions inspection program pursuant to this article including administration, implementation and enforcement.

B. Except as provided in section 49-542.05, the registration renewal notice required for the second through fifth registration year of a new vehicle shall include a notice to the vehicle owner that even though an emissions inspection test is not required pursuant to section 49-542, subsection J, paragraph 2, subdivision (d) the owner may choose to have an emissions inspection because of vehicle emissions performance warranty limitations on emissions components of the vehicle.

C. The fees charged for official emissions inspection shall be uniform as applied to each class of vehicle, which shall be defined by the director. Except for fees collected by the director pursuant to section 49-546, the inspection fees required to be paid pursuant to this article may be collected with the registration fee by the registering officer at the time and place of motor vehicle registration pursuant to title 28, chapter 7, article 5 and deposited, pursuant to sections 35-146 and 35-147, in the emissions inspection fund in accordance with the rules adopted by the director or may be collected by the independent contractor at the time of inspection ~~by means of an approved check or cash.~~

D. Any person, except a person who has been issued a certificate of waiver pursuant to section 49-542, subsection L, whose vehicle has been inspected at an official emissions inspection station, if the vehicle was not found to comply with the minimum standards, shall have the vehicle repaired, including recommended repair or replacement of emissions control devices as a result of tampering, and have the right within sixty consecutive calendar days but not thereafter to return the vehicle for one reinspection without charge. The department may provide for additional reinspections without charge. A vehicle shall not be deemed to pass a reinspection unless the tampering discovered during the tampering inspection is repaired with new or reconditioned emissions control devices.

E. The department shall issue certificates of inspection to owners of fleet emissions inspection stations. Each certificate shall be validated by the fleet emissions inspection stations in a manner required by the director at the time that each owner's fleet vehicle has been inspected or has passed inspection. The validated certificate of inspection shall indicate at the time of registration that the owner's fleet vehicle has been inspected and that the vehicle has passed inspection.

F. The director shall fix an emissions inspection fee before inspection certificates may be issued to the owner of any fleet emissions inspection station. Such fee shall be uniform for each inspection certificate issued and shall be based on the director's estimated costs to the state of administering and enforcing this article as ~~they apply~~ **IT APPLIES** to fleet emissions inspection stations and the vehicles inspected in fleet emissions inspection stations. The director shall deposit, pursuant to sections 35-146 and 35-147, all such monies collected by the director pursuant to this article in

the emissions inspection fund.

Sec. 7. Purpose

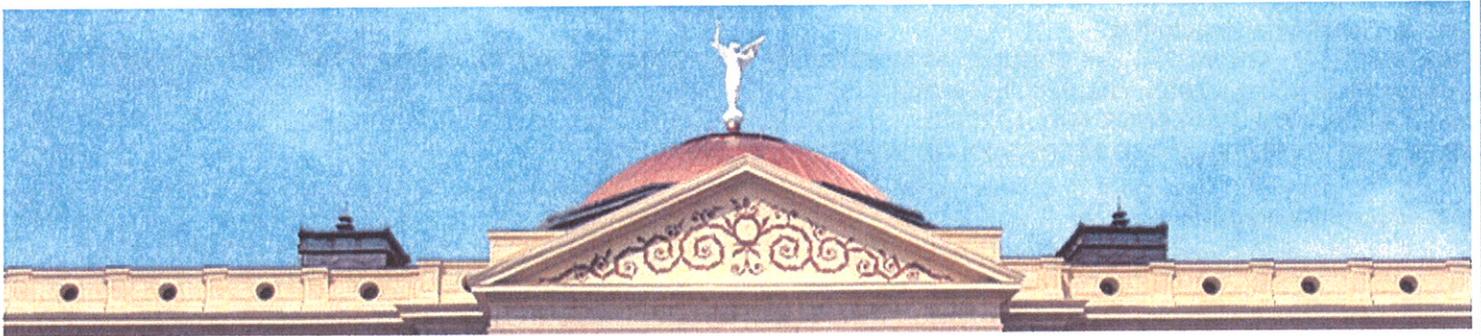
Pursuant to section 41-2955, subsection B, Arizona Revised Statutes, the legislature continues the vehicle emissions inspection program to identify violations and compel compliance with vehicle emissions requirements.

Sec. 8. Conditional enactment

Section 49-542, Arizona Revised Statutes, as amended by Laws 2005, chapter 76, section 1 and this act, is effective as prescribed in Laws 2005, chapter 76, section 2.

APPROVED BY THE GOVERNOR MAY 1, 2007.

FILED IN THE OFFICE OF THE SECRETARY OF STATE MAY 1, 2007.



Forty-ninth Legislature - First Special Session

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41-3017.01. Vehicle emissions inspection program; termination January 1, 2017

- A. The vehicle emissions inspection program terminates on January 1, 2017.
- B. Title 49, chapter 3, article 5 is repealed on July 1, 2017.

APPENDIX B

APPENDIX B

EXHIBIT 1:

Public Hearing Process Documentation

**CERTIFICATION OF HOLDING OF PUBLIC HEARING ON THE
MAG 2014 EIGHT-HOUR OZONE PLAN-SUBMITTAL OF MARGINAL AREA
REQUIREMENTS FOR THE MARICOPA NONATTAINMENT AREA**

I affirm that a public hearing was held jointly by the Arizona Department of Environmental Quality and the Maricopa Association of Governments (MAG) starting at 5:30 p.m. Thursday, May 15, 2014 at the MAG Offices, Saguaro Room, 302 North 1st Avenue, Phoenix, Arizona and that the hearing was held in accordance with the Arizona open meeting laws and 40 CFR 51.102 (d) to receive public comment on the MAG 2014 Eight-Hour Ozone Plan-Submittal of Marginal Area Requirements for the Maricopa Nonattainment Area.

Date May 16, 2014

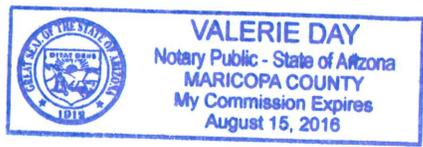
Lindy Bauer

Lindy Bauer, MAG
Environmental Director

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

Personally appeared before me the above-named Lindy Bauer known to me to be the same person who executed the foregoing instrument and to be the Environmental Director for the Maricopa Association of Governments and acknowledged to me that she executed the same as her free act.

SUBSCRIBED AND SWORN TO before me on this 16th day of May 2014.



Valerie Day

Notary Public

My Commission Expires:
August 15, 2016

THE ARIZONA REPUBLIC

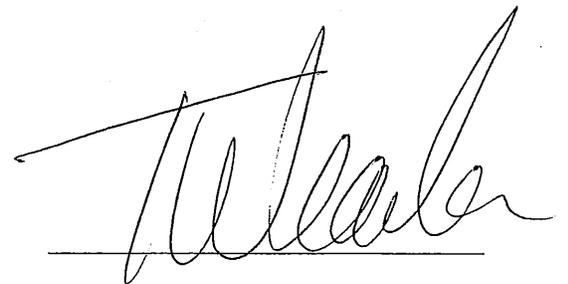
STATE OF ARIZONA }
COUNTY OF MARICOPA } SS.

**PUBLIC HEARING ON THE
MAG 2014 EIGHT-HOUR
OZONE PLAN - SUBMITTAL
OF MARGINAL AREA
REQUIREMENTS FOR THE
MARICOPA
NONATTAINMENT AREA**
May 15, 2014 at 5:30 p.m.
MAG Offices, Saguaro Room
302 North 1st Avenue, Sec-
ond Floor Phoenix, Arizona
85003
The Arizona Department of
Environmental Quality
(ADEQ) and Maricopa Assoc-
iation of Governments
(MAG) will jointly conduct a
public hearing on the Draft
MAG 2014 Eight-Hour Ozone
Plan - Submittal of Marginal
Area Requirements for the
Maricopa Nonattainment
Area on May 15, 2014 at 5:30
p.m. The purpose of this
hearing is to receive public
comments.
in accordance with the
Clean Air Act, the U.S. Envi-
ronmental Protection Agen-
cy (EPA) designated the
Maricopa nonattainment
area as a Marginal Area on
May 21, 2012, for the 2008
eight-hour ozone standard
of 0.075 parts per million.
The MAG 2014 Eight-Hour
Ozone Plan addresses re-
quirements for a Marginal
nonattainment area, such
as an Emissions Statement,
Baseline Emissions Inven-
tory, Periodic Emissions In-
ventory, Corrections to Pre-
1990 Reasonably Available
Control Technology, New
Source Review, Corrections
to Pre-1990 Previously Re-
quired Vehicle Inspection
and Maintenance Programs,
and Transportation Con-
formity.
The draft document is avail-
able for public review at the
MAG Offices, 3rd floor, from
8:00 a.m. to 5:00 p.m. Mon-
day through Friday and on
the MAG website at www.azmag.gov. Public comments
are welcome at the hearing,
or may be submitted in
writing by 5:30 p.m. on May
15, 2014 to Lindy Bauer at
the address below. After
considering the public com-
ments, the MAG Regional
Council may take action on
the plan on June 25, 2014.
The ADEQ may then adopt
the plan for submittal to the
EPA.
Contact Person:
Lindy Bauer, MAG (602) 254-
6300, 302 N. 1st Avenue,
Suite 300 Phoenix, AZ 85003
Fax: (602) 254-6490
E-mail: lbauer@azmag.gov
Pub: April 14, 15, 2014

Tabitha Weaver, being first duly sworn, upon oath deposes and says: That she is a legal advertising representative of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

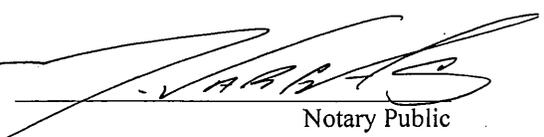
The Arizona Republic

April 14, 15, 2014



Sworn to before me this
15th day of
April A.D. 2014

 **MANUEL VARGAS**
Notary Public - State of Arizona
MARICOPA COUNTY
My Commission Expires
November 30, 2015


Notary Public

April 14, 2014

TO: Interested Parties for Air Quality

FROM: Lindy Bauer, Environmental Director

SUBJECT: PUBLIC HEARING ON THE MAG 2014 EIGHT-HOUR OZONE PLAN-
SUBMITTAL OF MARGINAL AREA REQUIREMENTS FOR THE MARICOPA
NONATTAINMENT AREA

Public Hearing
May 15, 2014 at 5:30 p.m.
MAG Offices, Saguaro Room
302 North 1st Avenue, Second Floor
Phoenix, Arizona 85003

The Arizona Department of Environmental Quality and Maricopa Association of Governments (MAG) will jointly conduct a public hearing on the Draft MAG 2014 Eight-Hour Ozone Plan-Submittal of Marginal Area Requirements for the Maricopa Nonattainment Area on May 15, 2014 at 5:30 p.m. The purpose of this hearing is to receive public comments.

In accordance with the Clean Air Act, the U.S. Environmental Protection Agency (EPA) designated the Maricopa nonattainment area as a Marginal Area on May 21, 2012, for the 2008 eight-hour ozone standard of 0.075 parts per million. The MAG 2014 Eight-Hour Ozone Plan addresses requirements for a Marginal nonattainment area, such as an Emissions Statement, Baseline Emissions Inventory, Periodic Emissions Inventory, Corrections to Pre-1990 Reasonably Available Control Technology, New Source Review, Corrections to Pre-1990 Previously Required Vehicle Inspection and Maintenance Programs, and Transportation Conformity.

For your information and convenience, a copy of the public hearing notice is enclosed. The draft document is available for public review at the MAG Offices, third floor, from 8:00 a.m. to 5:00 p.m. Monday through Friday. In addition, the draft document is available for agency and public review on the MAG website at www.azmag.gov.

Attachment

**PUBLIC HEARING ON THE MAG 2014 EIGHT-HOUR OZONE PLAN - SUBMITTAL
OF MARGINAL AREA REQUIREMENTS FOR THE MARICOPA
NONATTAINMENT AREA**

May 15, 2014 at 5:30 p.m.
MAG Offices, Saguaro Room
302 North 1st Avenue, Second Floor
Phoenix, Arizona 85003

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The draft document is available for public review at the MAG Offices, 3rd floor, from 8:00 a.m. to 5:00 p.m. Monday through Friday and on the MAG website at www.azmag.gov. Public comments are welcome at the hearing, or may be submitted in writing by 5:30 p.m. on May 15, 2014 to Lindy Bauer at the address below. After considering the public comments, the MAG Regional Council may take action on the plan on June 25, 2014. The ADEQ may then adopt the plan for submittal to the EPA.

Contact Person: Lindy Bauer, MAG (602) 254-6300
302 N. 1st Avenue, Suite 300
Phoenix, AZ 85003
Fax: (602) 254-6490
E-mail: lbauer@azmag.gov



302 North 1st Avenue, Suite 300 ▲ Phoenix, Arizona 85003
Phone (602) 254-6300 ▲ FAX (602) 254-6490
E-mail: mag@azmag.gov ▲ Web site: www.azmag.gov

April 14, 2014

Ms. Cynthia Zwick
Director
Arizona Community Action Association
2700 North 3rd Street, Suite 3040
Phoenix, AZ 85004-1122

Dear Ms. Zwick:

You are cordially invited to a public hearing on the Draft MAG 2014 Eight-Hour Ozone Plan-Submittal of Marginal Area Requirements for the Maricopa Nonattainment Area. The hearing will be held jointly by the Arizona Department of Environmental Quality and Maricopa Association of Governments (MAG) on Thursday, May 15, 2014 at 5:30 p.m. in the Saguaro Room at the MAG Offices, 302 North 1st Avenue, Second Floor, Phoenix, Arizona, 85003. The purpose of this hearing is to receive public comments. Written and verbal comments are welcomed at the public hearing. After considering public comments, the MAG Regional Council may take action on the plan on June 25, 2014.

In accordance with the Clean Air Act, the U.S. Environmental Protection Agency (EPA) designated the Maricopa nonattainment area as a Marginal Area on May 21, 2012, for the 2008 eight-hour ozone standard of 0.075 parts per million. The MAG 2014 Eight-Hour Ozone Plan addresses requirements for a Marginal nonattainment area, such as an Emissions Statement, Baseline Emissions Inventory, Periodic Emissions Inventory, Corrections to Pre-1990 Reasonably Available Control Technology, New Source Review, Corrections to Pre-1990 Previously Required Vehicle Inspection and Maintenance Programs, and Transportation Conformity.

The draft document is available for review at the MAG Offices, third floor, from 8:00 a.m. to 5:00 p.m. Monday through Friday. In addition, the draft document is available for agency and public review on the MAG website at www.azmag.gov. We hope to see you or your representative at the hearing and to include your input in future planning efforts. For your convenience, a copy of the public hearing notice is attached. If you have any questions, please do not hesitate to contact me at (602) 254-6300.

Sincerely,

A handwritten signature in cursive script that reads "Lindy Bauer".

Lindy Bauer
Environmental Director

Attachment

**PUBLIC HEARING ON THE MAG 2014 EIGHT-HOUR OZONE PLAN - SUBMITTAL
OF MARGINAL AREA REQUIREMENTS FOR THE MARICOPA
NONATTAINMENT AREA**

May 15, 2014 at 5:30 p.m.
MAG Offices, Saguaro Room
302 North 1st Avenue, Second Floor
Phoenix, Arizona 85003

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Contact Person: Lindy Bauer, MAG (602) 254-6300
302 N. 1st Avenue, Suite 300
Phoenix, AZ 85003
Fax: (602) 254-6490
E-mail: lbauer@azmag.gov

April 14, 2014

TO: Leslie Rogers, Federal Transit Administration
Karla Petty, Federal Highway Administration
John Halikowski, Arizona Department of Transportation
Henry Darwin, Arizona Department of Environmental Quality
Maria Hyatt, City of Phoenix Public Transit Department
Stephen Banta, Valley Metro/RPTA
William Wiley, Maricopa County Air Quality Department
Kenneth Hall, Central Arizona Governments
Michael Sundblom, Pinal County Air Quality Control District
Sharon Mitchell, Sun Corridor Metropolitan Planning Organization
Gregory Nudd, U.S. Environmental Protection Agency, Region IX

FROM: Lindy Bauer, Environmental Director

SUBJECT: TRANSMITTAL OF THE DRAFT MAG 2014 EIGHT-HOUR OZONE PLAN-
SUBMITTAL OF MARGINAL AREA REQUIREMENTS FOR THE MARICOPA
NONATTAINMENT AREA

The Maricopa Association of Governments (MAG) has prepared the Draft MAG 2014 Eight-Hour Ozone Plan-Submittal of Marginal Area Requirements for the Maricopa Nonattainment Area. The draft document is available for review at the MAG Offices, third floor, from 8:00 a.m. to 5:00 p.m. Monday through Friday. In addition, the draft document is available for agency and public review on the MAG website at www.azmag.gov. Any comments are requested by 5:30 p.m. on May 15, 2014.

In accordance with the Clean Air Act, the U.S. Environmental Protection Agency (EPA) designated the Maricopa nonattainment area as a Marginal Area on May 21, 2012, for the 2008 eight-hour ozone standard of 0.075 parts per million. The MAG 2014 Eight-Hour Ozone Plan addresses requirements for a Marginal nonattainment area, such as an Emissions Statement, Baseline Emissions Inventory, Periodic Emissions Inventory, Corrections to Pre-1990 Reasonably Available Control Technology, New Source Review, Corrections to Pre-1990 Previously Required Vehicle Inspection and Maintenance Programs, and Transportation Conformity.

On May 15, 2014, a public hearing will be held jointly by the Arizona Department of Environmental Quality (ADEQ) and MAG at the MAG Offices, Saguaro Room, Second Floor, Phoenix, Arizona, at 5:30 p.m. After considering public comments, the MAG Regional Council may take action on the plan on June 25, 2014. The ADEQ may then adopt the plan for submittal to the EPA. If you have any questions, please do not hesitate to contact me at (602) 254-6300.

cc: Eric Massey, Arizona Department of Environmental Quality
Scott Omer, Arizona Department of Transportation

**PUBLIC HEARING ON THE MAG 2014 EIGHT-HOUR OZONE PLAN - SUBMITTAL
OF MARGINAL AREA REQUIREMENTS FOR THE MARICOPA
NONATTAINMENT AREA**

May 15, 2014 at 5:30 p.m.
MAG Offices, Saguaro Room
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Phoenix, Arizona 85003

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Contact Person: Lindy Bauer, MAG (602) 254-6300
302 N. 1st Avenue, Suite 300
Phoenix, AZ 85003
Fax: (602) 254-6490
E-mail: lbauer@azmag.gov

PUBLIC HEARING
MAG 2014 EIGHT-HOUR OZONE PLAN-SUBMITTAL OF
MARGINAL AREA REQUIREMENTS

Phoenix, Arizona

May 15, 2014

5:32 p.m.

PREPARED FOR:

Maricopa Association of Governments
(ORIGINAL)

REPORTED BY:

Debora Mitchell
Arizona CCR No. 50768



Ottmar & Associates, Inc.
2800 North Central Avenue, Suite 150
Phoenix, AZ 85004
T 602.485.1488
F 602.485.1605
Toll free 1.866.485.1444

MARICOPA ASSOCIATION OF GOVERNMENTS 2014
EIGHT-HOUR OZONE PLAN-SUBMITTAL OF MARGINAL AREA
REQUIREMENTS, taken on May 15, 2014, commencing at
5:32 p.m. at Maricopa Association of Governments, 302
North 1st Avenue, Saguaro Room, Phoenix, Arizona,
before Debora Mitchell, an Arizona Certified Reporter,
in and for the County of Maricopa, State of Arizona.

APPEARANCES:

Ms. Lindy Bauer, Maricopa Association of
Governments

Mr. Matt Poppen, Maricopa Association of
Governments

Mr. Steve Calderon, Arizona Department of
Environmental Quality

1 MS. BAUER: I would like to welcome those in
2 attendance tonight for our public hearing. My name is
3 Lindy Bauer, and I am with MAG. And I have
4 Steve Calderon from the Arizona Department of
5 Environmental Quality. This public hearing is being
6 held jointly by the Arizona Department of Environmental
7 Quality and Maricopa Association of Governments to
8 receive public comments on the draft MAG 2014
9 Eight-Hour Ozone Plan-Submittal of Marginal Area
10 Requirements for the Maricopa Nonattainment Area.

11 Those driving to the meeting who parked in the
12 garage can have their tickets validated by the MAG
13 staff.

14 And now I'm going to talk a little bit about
15 the public hearing process. The public hearing will
16 begin with some introductory remarks by the Arizona
17 Department of Environmental Quality and an overview
18 presentation by the MAG staff.

19 Following the presentation, hearing
20 participants are invited to make comments for the
21 public record. A court reporter is present to provide
22 an official record of the hearing. Written comments
23 are also welcomed at the hearing. For those
24 participants wishing to speak, please fill out a form
25 on the table and place it in the box. If you need to

1 speak early to meet a bus schedule, please tell the MAG
2 staff, and we will accommodate your request. As you
3 come up to the podium, please state some information
4 for the formal record, your name and who you represent.

5 I would like to note that we have a timer to
6 assist the public with their presentations. We have a
7 three-minute time limit. When two minutes have
8 elapsed, the yellow light will come on notifying the
9 speaker that they have a minute to sum up. At the end
10 of the three minute time period, the red light will
11 come on.

12 And so now I would like to turn this over to
13 Steve Calderon with the Arizona Department of
14 Environmental Quality to make some introductory
15 remarks.

16 MR. CALDERON: We appreciate the efforts in
17 regards to the eight-hour marginal plan, the 2008 ozone
18 standard of 75 parts per billion, and we appreciate the
19 Maricopa Association of Governments' development of the
20 plan with the assistance of the emission inventory
21 development by the Maricopa County Air Quality
22 Department. Thank you for having us here.

23 MS. BAUER: Thank you, Steve.

24 And now we will have a presentation on the MAG
25 2014 Eight-Hour Ozone Plan-Submittal of Marginal Area

1 Requirements by Matt Poppen of the MAG staff.

2 MR. MATT POPPEN: Thank you, Lindy.

3 On May 21, 2012, EPA designated the Maricopa
4 area as a marginal nonattainment area for the 2008
5 national ambient air quality standard for ozone.

6 On June 6, 2013, the EPA published a proposed
7 rule on the implementation of the 2008 national ambient
8 air quality standards for ozone, which addresses the
9 state implementation plan requirements for the 2008
10 ozone standard.

11 As a marginal area, the Maricopa nonattainment
12 area has a December 31, 2015, attainment date. EPA
13 assumes that marginal areas will be in attainment of
14 the standard within three years of designation without
15 any additional control measures. Marginal areas are
16 not required to submit an attainment demonstration,
17 reasonably available control technologies and measures,
18 reasonable further progress demonstration, and
19 contingency measures.

20 Many of the specific marginal area requirements
21 have been addressed in prior air-quality plans. The
22 marginal area requirements addressed in this plan
23 include an emissions statement; a baseline emissions
24 inventory, which is the 2011 periodic emissions
25 inventory developed by the Maricopa County Air Quality

1 Department; periodic emissions inventory no later than
2 every three years until attainment of the standard, so
3 the next periodic inventory that will be due will be
4 for 2014. Also included are a pre-1990 reasonable
5 available control technology fix-up, as well as a
6 nonattainment area preconstruction permit program, and
7 new source review rules.

8 Additionally, there are pre-1990 corrections to
9 previously required vehicle inspection and maintenance
10 programs. The Arizona Department of Environmental
11 Quality currently runs an enhanced vehicle inspection
12 and maintenance program that is authorized through
13 January 1, 2017. The plan meets transportation
14 conformity requirements, and also there are offset
15 requirements for major sources of volatile organic
16 compounds.

17 If the region fails to attain the standard by
18 December 31, 2015, the region may be bumped up to the
19 moderate area category with additional requirements to
20 meet.

21 Upon application by the State, EPA may extend
22 the attainment date for one additional year if the
23 State has complied with all applicable requirements and
24 commitments pertaining to the area in the applicable
25 implementation plan, and no more than one exceedance of

1 the ozone standard has occurred in the area preceding
2 the extension year. No more than two one-year
3 extensions of the attainment date may be issued.

4 The EPA proposed marginal area plan due date is
5 July 20, 2014. Here is the schedule for the MAG 2014
6 Eight-Hour Ozone Plan:

7 On April 14, 2014, draft plan was made
8 available for public review.

9 On April 22, 2014, an air-quality workshop was
10 held.

11 And on May 15, 2014, a public hearing was held.

12 On May 22, 2014, the MAG Air-Quality Technical
13 Advisory Committee may make a recommendation on the
14 plan.

15 On June 11, 2014, the MAG Management Committee
16 may also make a recommendation on the plan.

17 And then on June 25, 2014, the MAG Regional
18 Council may adopt the plan.

19 On June 27, 2014, MAG would submit the plan
20 to ADEQ and the EPA before the plan due date of
21 July 20, 2014.

22 That concludes my overview.

23 MS. BAUER: Thank you very much, Matt.

24 At this time, public comments are invited.

25 Again, if you would like to speak, please fill out a

1 speaker form and place it in the box and adhere to the
2 three-minute time limit. So now we are going to check
3 to see if we have some forms. We don't have any forms
4 that have been submitted this evening. And so I would
5 just like to look around the room and make sure that no
6 one would like to comment.

7 With no forms and no public comments
8 forthcoming, we want to tell you that the Maricopa
9 Association of Governments greatly appreciates your
10 interest in regional air-quality issues. The MAG
11 Air-Quality Technical Advisory Committee will be
12 meeting on May 22, and we will convey to them that we
13 have not received any comments at this public hearing.

14 A response to comments, should we receive some
15 additional written comments this evening, will be
16 included and presented to the committee and also
17 included in the plan documents.

18 Thank you again for your participation this
19 evening. And with that, the public hearing is closed.

20 (Conclusion of Public Hearing at
21 5:40 p.m.)
22
23
24
25

STATE OF ARIZONA)
) SS.
COUNTY OF MARICOPA)

BE IT KNOWN that the foregoing transcript was taken before me, Debora Mitchell, a Certified Court Reporter, in and for the County of Maricopa, State of Arizona; that the foregoing proceedings were taken down by me using the Voice Writing method and translated into text via speech recognition under my direction; and that the foregoing typewritten pages are a full, true, and accurate transcript of all proceedings, all done to the best of my ability.

I FURTHER CERTIFY that I am in no way related to any of the parties hereto, nor am I in any way interested in the outcome hereof.

DATED at Phoenix, Arizona, this 16th day of May, 2014.



Debora Mitchell - Digital Signature

AZ Certified Reporter No. 50768



302 North 1st Avenue, Suite 300 ▲ Phoenix, Arizona 85003
 Phone (602) 254-6300 ▲ FAX (602) 254-6490
 mag@mag.maricopa.gov

Meeting: Public Hearing on the MAG 2014 Eight-Hour Ozone Plan - Submittal of Marginal Area Requirements for the Maricopa Nonattainment Area

Room: Saguaro Room

Date: May 15, 2014

PLEASE SIGN IN BELOW:

NAME	ORGANIZATION/AFFILIATION	MAILING ADDRESS
STEVE CALDEROD	ADEQ	1110 W WASHINGTON ST. PHOENIX, AZ 85007
Cory Martin Ferri	MCAQD	1001 N Central Phx
Nancy Nesky	APS	400 N. 5th St MS 9303 Phx 85004

**RESPONSE TO PUBLIC COMMENTS ON THE
DRAFT MAG 2014 EIGHT-HOUR OZONE PLAN – SUBMITTAL OF MARGINAL
AREA REQUIREMENTS FOR THE MARICOPA NONATTAINMENT AREA**

MAY 15, 2014 PUBLIC HEARING

The Maricopa Association of Governments (MAG) appreciates the comments made during the public comment period for the Draft MAG 2014 Eight-Hour Ozone Plan – Submittal of Marginal Area Requirements for the Maricopa Nonattainment Area. An advertised public hearing was conducted on May 15, 2014. One submittal of written comments was received.

COMMENTS FROM THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
(Email from Lisa M. Tomczak dated April 15, 2014)

Comment: ADEQ should comment that this attached Appendix that contains the actual Legislative authorization of VEI through 1/1/17 and the statute where it is codified should be included in MAG's Appendix A, Exhibit 4 along with ADEQ's 2009 submittal letter. All MAG has in its appendix right now is ADEQ's letter referencing these items. ADEQ needs to forward the attachment to MAG.

Response: The additional documentation provided by ADEQ has been included in Appendix A, Exhibit 4.

Comment: Also, MAG could add a sentence at the end of Paragraph #2 on the first page: "On March 26, 2014 [sic], EPA published in the Federal Register the Notice of Proposed Rulemaking to..."

Response: The following sentence has been added to the end of paragraph referenced by ADEQ, "The notice was published in the Federal Register on March 26, 2014."

From: [Lisa M. Tomczak](#)
To: [Matthew Poppen](#)
Subject: FW: Transmittal of the Preliminary Draft MAG 2014 Eight-Hour Ozone Plan - Submittal of Marginal Area Requirements
Date: Tuesday, April 15, 2014 7:54:13 AM
Attachments: [090603 Revised Appendix D of the CO LMP 05-09 \(4\).pdf](#)

Matt,

These are some comments that Diane had on the preliminary draft. I'm not sure if Bruce or Steve sent this to you or not. It's past the date but I want to make sure you have our comments nonetheless. I could be wrong but I don't think it's a make or break situation if our comments aren't not incorporated until the final.

Thanks,
Lisa

Lisa Tomczak
Planning Unit Supervisor
Air Quality Division
(602) 771-4450

From: Diane Arnst
Sent: Monday, April 07, 2014 2:01 PM
To: Bruce J. Friedl
Cc: Eric C. Massey; Trevor Baggione
Subject: RE: Transmittal of the Preliminary Draft MAG 2014 Eight-Hour Ozone Plan - Submittal of Marginal Area Requirements

ADEQ should comment that this attached Appendix that contains the actual Legislative authorization of VEI through 1/1/17 and the statute where it was codified should be included in MAG's Appendix A, Exhibit 4 along with ADEQ's 2009 submittal letter. All MAG has in its appendix right now is ADEQ's letter referencing these items. ADEQ needs to forward the attachment to MAG.

Also, MAG could add a sentence at the end of Paragraph #2 on the first page: "On March 26, 2014, EPA published in the Federal Register the Notice of Proposed Rulemaking to..."

From: Bruce J. Friedl
Sent: Friday, April 04, 2014 12:21 PM
To: Diane Arnst
Subject: FW: Transmittal of the Preliminary Draft MAG 2014 Eight-Hour Ozone Plan - Submittal of Marginal Area Requirements

FYI

From: Matthew Poppen [<mailto:MPoppen@azmag.gov>]
Sent: Friday, April 04, 2014 12:14 PM
To: Corky Martinkovic - AQDX (CorkyMartinkovic@mail.maricopa.gov); JJoo@azdot.gov; Steve M. Calderon
Cc: Eric C. Massey; Trevor Baggione; Bruce J. Friedl; Jo Crumbaker - AQDX (JCrumbaker@mail.maricopa.gov); bdowning@mail.maricopa.gov; tomekren@mail.maricopa.gov; Bdavis@mail.maricopa.gov; Michael.Sundblom@pinalcountyaz.gov; Scott DiBiase (Scott.DiBiase@pinalcountyaz.gov); Colleen McKaughan (McKaughan.Colleen@epamail.epa.gov); Lakin.Matthew@epa.gov; Tax, Wienke (Tax.Wienke@epa.gov); Wehling.Jefferson@epa.gov; Vagenas.Ginger@epa.gov; phil.mcneely@phoenix.gov; Posmon@azleg.gov; tstowe@azleg.gov; Lindy Bauer; Cathy Arthur
Subject: Transmittal of the Preliminary Draft MAG 2014 Eight-Hour Ozone Plan - Submittal of Marginal Area Requirements

Dear MAG Air Quality Planning Team,

MAG has prepared the Preliminary Draft MAG 2014 Eight-Hour Ozone Plan - Submittal of Marginal Area Requirements. Please review the preliminary draft plan and provide your written comments to me by Tuesday, April 8, 2014.

The preliminary draft plan has incorporated text addressing New Source Review requirements as provided by the Arizona Department of Environmental Quality. The plan also addresses other requirements for a Marginal nonattainment area, such as an Emissions Statement, Baseline Emissions Inventory, Periodic Emissions Inventory, Corrections to Pre-1990 Reasonably Available Control Technology, Corrections to Pre-1990 Previously Required Vehicle Inspection and Maintenance Programs, and Transportation Conformity.

The Preliminary Draft MAG 2014 Eight-Hour Ozone Plan - Submittal of Marginal Area Requirements may be downloaded from the following link:

http://www.azmag.gov/Documents-Ext/Preliminary-Draft-MAG-2014-EightHour-Ozone-Plan_Submittal-of-Marginal-Area-Requirements_April-4-2014.pdf

It is important to note that this is a draft document that is subject to change in response to comments received. If you have any questions, please contact me at (602) 254-6300. Thank you.

Matthew Poppen
Senior Air Quality Policy Manager
Maricopa Association of Governments
302 N 1st Avenue, Suite 300
Phoenix, Arizona 85003
Ph. 602-254-6300
Fx. 602-254-6490

ATTACHMENT TO ADEQ COMMENTS

Appendix D (Revised)

Letter from Arizona Department of Environmental Quality re: Vehicle
Emissions Inspection Program (VEIP)

*Revised to include supporting documents authorizing the VEIP from 2009 to
2017 (Chapter 171, Senate Bill 1531 from the 48th Regular Session of the
Arizona Legislature and Arizona Revised Statute text A.R.S. 41-3017.01)*



Janet Napolitano
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.azdeq.gov



Stephen A. Owens
Director

March 10, 2008

Ms. Deborah Jordan, Director
Air Division
U.S. Environmental Protection Agency, Region IX, Air-4
75 Hawthorne Street
San Francisco, California 94105

SUBJECT: Vehicle Emissions Inspection Program

Dear Ms. Jordan:

The purpose of this letter is to give a brief overview of the recent legislative changes to Arizona's Vehicle Emissions Inspection Program (VEIP) and explain why the State is prohibited from taking further action to extend the Program at this time.

The VEIP is an integral component of Arizona's State Implementation Plans for the Phoenix carbon monoxide (CO) maintenance area and PM10 nonattainment area and the Tucson CO maintenance area. Continuation of the Program is essential to achieve attainment status for Phoenix and continuation of attainment of the CO national ambient air quality standard for Phoenix and Tucson.

The VEIP precedes the formation of ADEQ, and has been in place since 1976. The VEIP has consistently received support for necessary program updates from the Legislature. In 2007, the Arizona Legislature approved SB 1531, which authorized the VEIP through January 1, 2017, and subjecting the Program to the state agency sunset provisions (see Enclosure 1, Arizona Revised States § 41-2951, et seq.), rather than a simple repeal.

Though a sunset date for VEIP does exist, the Arizona Department of Environmental Quality maintains that the Arizona Legislature's practice of approving VEIP legislation, when necessary to support the SIP, has established a sufficient precedent to enable EPA to move forward in approving the appropriate SIP revisions for the Phoenix and Tucson areas. If you have any questions, please call me at (602) 771-2308.

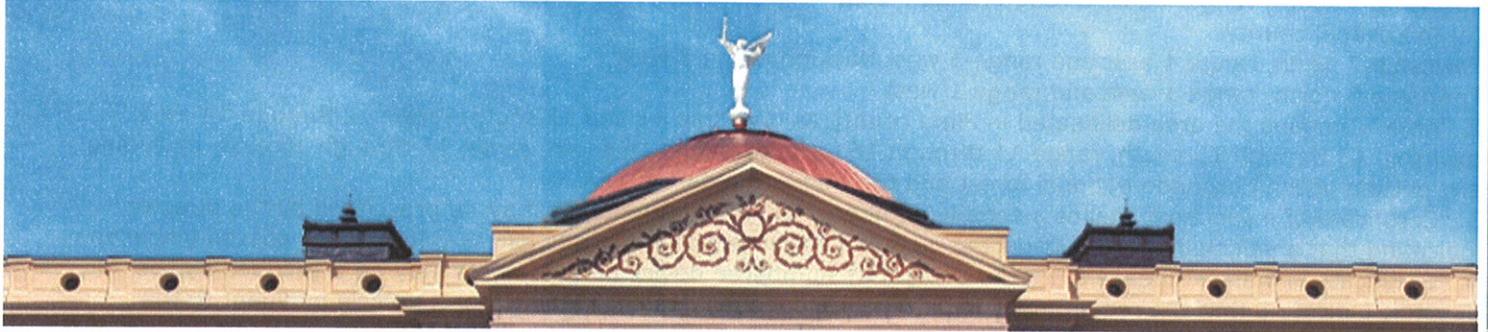
Sincerely,

Nancy C. Wrona, Director
Air Quality Division

cc: Lindy Bauer, MAG
Lee Comrie, PAG
Colleen McKaughan, EPA

Northern Regional Office
1801 W. Route 66 • Suite 117 • Flagstaff, AZ 86001
(928) 779-0313

Southern Regional Office
400 West Congress Street • Suite 433 • Tucson, AZ 85701
(520) 628-6733



Forty-ninth Legislature - First Regular Session

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House Engrossed Senate Bill
-----State of Arizona
Senate
Forty-eighth Legislature
First Regular Session
2007
-----CHAPTER 171
-----SENATE BILL 1531
-----**AN ACT**

REPEALING SECTION 41-3009.03, ARIZONA REVISED STATUTES; AMENDING TITLE 41, CHAPTER 27, ARTICLE 2, ARIZONA REVISED STATUTES, BY ADDING SECTION 41-3019.03; AMENDING SECTION 49-541, ARIZONA REVISED STATUTES; AMENDING SECTION 49-542, ARIZONA REVISED STATUTES, AS AMENDED BY LAWS 2004, CHAPTER 73, SECTION 1; AMENDING SECTION 49-542, ARIZONA REVISED STATUTES, AS AMENDED BY LAWS 2005, CHAPTER 76, SECTION 1; AMENDING SECTION 49-543, ARIZONA REVISED STATUTES; RELATING TO VEHICLE EMISSIONS INSPECTIONS; PROVIDING FOR CONDITIONAL ENACTMENT.

(TEXT OF BILL BEGINS ON NEXT PAGE)

Be it enacted by the Legislature of the State of Arizona:

Section 1. Repeal

Section 41-3009.03, Arizona Revised Statutes, is repealed.

Sec. 2. Title 41, chapter 27, article 2, Arizona Revised Statutes, is amended by adding section 41-3019.03, to read: 41-3019.03. **Vehicle emissions inspection program; termination January 1, 2017**

A. THE VEHICLE EMISSIONS INSPECTION PROGRAM TERMINATES ON JANUARY 1, 2017.

B. TITLE 49, CHAPTER 3, ARTICLE 5 IS REPEALED ON JULY 1, 2017.

Sec. 3. Section 49-541, Arizona Revised Statutes, is amended to read:

49-541. Definitions

In this article, unless the context otherwise requires:

1. "Area A" means the area delineated as follows:

(a) In Maricopa county:

Township 8 north, range 2 east and range 3 east
 Township 7 north, range 2 west through range 5 east
 Township 6 north, range 5 west through range 6 east
 Township 5 north, range 5 west through range 7 east
 Township 4 north, range 5 west through range 8 east
 Township 3 north, range 5 west through range 8 east
 Township 2 north, range 5 west through range 8 east
 Township 1 north, range 5 west through range 7 east
 Township 1 south, range 5 west through range 7 east
 Township 2 south, range 5 west through range 7 east
 Township 3 south, range 5 west through range 1 east
 Township 4 south, range 5 west through range 1 east

(b) In Pinal county:

Township 1 north, range 8 east and range 9 east
Township 1 south, range 8 east and range 9 east
Township 2 south, range 8 east and range 9 east
Township 3 south, range 7 east through range 9 east

(c) In Yavapai county:

Township 7 north, range 1 east and range 1 west through range 2 west

Township 6 north, range 1 east and range 1 west

2. "Area B" means the area delineated in Pima county as township 11 and 12 south, range 12 through 14 east; township 13 through 15 south, range 11 through 16 east; township 16 south, range 12 through 16 east, excluding any portion of the Coronado national forest and the Saguaro national park.

3. "Certificate of inspection" means a serially numbered device or symbol, as may be prescribed by the director, indicating that a vehicle has been inspected pursuant to the provisions of section 49-546 and has passed inspection.

4. "Certificate of waiver" means a **serially** UNIQUELY numbered device or symbol, as may be prescribed by the director, indicating that the requirement of passing reinspection has been waived for a vehicle pursuant to the provisions of this article.

5. "Conditioning mode" means either a fast idle test condition or a loaded test condition.

6. "Curb idle test condition" means an exhaust emissions test conducted with the engine of a vehicle running at the manufacturer's specified idle speed plus or minus one hundred revolutions per minute but without pressure exerted on the accelerator.

7. "Emissions inspection station permit" means a certificate issued by the director authorizing the holder to perform vehicular inspections pursuant to this article.

8. "Fast idle test condition" means an exhaust emissions test conducted with the engine of the vehicle running under an accelerated condition to an extent prescribed by the director.

9. "Fleet emissions inspection station" means any inspection facility operated under a permit issued to a qualified fleet owner or lessee as determined by the director.

10. "Golf cart" means a motor vehicle which has not less than three wheels in contact with the ground, has an unladen weight of less than thirteen hundred pounds, is designed to be and is operated at not more than fifteen miles an hour and is designed to carry golf equipment and persons.

11. "Gross weight" has the same meaning prescribed in section 28-5431.

12. "Independent contractor" means any person, business, firm, partnership or corporation with which the director may enter into an agreement providing for the construction, equipment, maintenance, personnel, management and operation of official emissions inspection stations pursuant to section 49-545.

13. "Loaded test condition" means an exhaust emissions test conducted at cruise or transient conditions as prescribed by the director.

14. "Official emissions inspection station" means an inspection facility, other than a fleet emissions inspection station, whether placed in a permanent structure or in a mobile unit for conveyance among various locations within this state, for the purpose of conducting emissions inspections of all vehicles required to be inspected pursuant to this article.

15. "Tampering" means removing, defeating or altering an emissions control device which was installed at the time a vehicle was manufactured.

16. "Vehicle" means any automobile, truck, truck tractor, motor bus or self-propelled or motor-driven vehicle registered or to be registered in this state and used upon the public highways of this state for the purpose of transporting persons or property, except implements of husbandry, road rollers or road machinery temporarily operated upon the highway.

17. "Vehicle emissions control area" means area A or area B.

Sec. 4. Section 49-542, Arizona Revised Statutes, as amended by Laws 2004, chapter 73, section 1, is amended to read:

49-542. Emissions inspection program; powers and duties of director; administration; periodic inspection; minimum standards and rules; exceptions

A. The director shall administer a comprehensive annual or biennial emissions inspection program which shall require the inspection of vehicles in this state pursuant to this article and applicable administrative rules. Such inspection is required in area A and area B, for those vehicles owned by a person who is subject to section 15-1444 or 15-1627 and for those vehicles registered outside of area A or area B but used to commute to the driver's principal place of employment located within area A or area B. Inspection in other counties of the state shall commence upon application by a county board of supervisors for participation in such inspection program, subject to approval by the director. In all counties with a population of three hundred fifty thousand or fewer persons according to the most recent United States decennial census, except for the portion of counties that contain any portion of area A, the director shall as conditions dictate provide for testing to determine the effect of vehicle related pollution on ambient air quality in all communities with a metropolitan area population of twenty thousand persons or more according to the most recent United States decennial census. If such testing detects the violation of state ambient air quality standards by vehicle related pollution, the director shall forward a full report of such violation to the president of the senate, the speaker of the house of representatives and the governor.

B. The state's annual or biennial emissions inspection program shall provide for vehicle inspections at official emissions inspection stations or at fleet emissions inspection stations. Each inspection station in area A shall employ at least one mechanic who is available during the station's hours of operation to provide technical advice and

assistance for persons who fail the emissions test. The director may enter into agreements with the department of transportation or with county assessors for the use of official emissions inspection stations for the purpose of conducting vehicle registrations. An official or fleet emissions inspection station permit shall not be sold, assigned, transferred, conveyed or removed to another location except on such terms and conditions as the director may prescribe.

C. Vehicles required to be inspected and registered in this state, except those provided for in section 49-546, shall be inspected, for the purpose of complying with the registration or reregistration requirement pursuant to subsection D of this section, in accordance with the provisions of this article no more than ninety days prior to each reregistration expiration date. A vehicle may be submitted voluntarily for inspection more than ninety days before the reregistration expiration date on payment of the prescribed inspection fee. Such voluntary inspection shall not be considered as compliance with the registration or reregistration requirement pursuant to subsection D of this section.

D. A vehicle shall not be registered or reregistered until such vehicle has passed the emissions inspection and the tampering inspection prescribed in subsection G of this section or has been issued a certificate of waiver. A certificate of waiver shall only be issued one time to a vehicle after January 1, 1997. If any vehicle to be registered or reregistered is being sold by a dealer licensed to sell motor vehicles pursuant to title 28, the cost of any inspection and any repairs necessary to pass the inspection shall be borne by the dealer. A dealer who is licensed to sell motor vehicles pursuant to title 28 and whose place of business is located in area A or area B shall not deliver any vehicle to the retail purchaser until the vehicle passes any inspection required by this article or the vehicle is exempt under subsection J of this section.

E. On the registration or reregistration of a vehicle which has complied with the minimum emissions standards pursuant to this section or is otherwise exempt under this section, the registering officer shall issue an air quality compliance sticker to the registered owner which shall be placed on the vehicle as prescribed by rule adopted by the department of transportation or issue a modified year validating tab as prescribed by rule adopted by the department of transportation. Those persons who reside outside of area A or area B but who elect to test their vehicle or are required to test their vehicle pursuant to this section and who comply with the minimum emissions standards pursuant to this section or are otherwise exempt under this section shall remit a compliance form, as prescribed by the department of transportation, and proof of compliance issued at an official emissions inspection station to the department of transportation along with the appropriate fees. The department of transportation shall then issue the person an air quality compliance sticker which shall be placed on the vehicle as prescribed by rule adopted by the department of transportation. The registering officer or the department of transportation shall collect an air quality compliance fee of twenty-five cents. The registering officer or the department of transportation shall deposit, pursuant to sections 35-146 and 35-147, the air quality compliance fee in the state highway fund established by section 28-6991. The department of transportation shall deposit, pursuant to sections 35-146 and 35-147, any emissions inspection fee in the emissions inspection fund. The provisions of this subsection do not apply to those vehicles registered pursuant to title 28, chapter 7, article 7 or 8, the sale of vehicles between motor vehicle dealers or vehicles leased to a person residing outside of area A or area B by a leasing company whose place of business is in area A or area B.

F. The director shall adopt minimum emissions standards pursuant to section 49-447 with which the various classes of vehicles shall be required to comply as follows:

1. For the purpose of determining compliance with minimum emissions standards in area B:

(a) A motor vehicle manufactured in or before the 1980 model year, other than a diesel powered vehicle, shall be required to take and pass the curb idle test condition. A diesel powered vehicle is subject to only a loaded test condition. The conditioning mode shall, at the option of the vehicle owner or owner's agent, be administered only after the vehicle has failed the curb idle test condition. Upon completion of such conditioning mode, a vehicle that has failed the curb idle test condition may be retested in the curb idle test condition. If the vehicle passes such retest, it shall be deemed in compliance with minimum emissions standards unless the vehicle fails the tampering inspection pursuant to subsection G of this section.

(b) A motor vehicle manufactured in or after the 1981 model year, other than a diesel powered vehicle, shall be required to take and pass the curb idle test condition and the loaded test condition or an ~~on-board~~ ONBOARD diagnostic check as may be required pursuant to title II of the clean air act.

2. For purposes of determining compliance with minimum emissions standards and functional tests in area A:

(a) Motor vehicles manufactured in or after model year 1981 with a gross vehicle weight rating of eighty-five hundred pounds or less, other than diesel powered vehicles, shall be required to take and pass a transient loaded emissions test or an ~~on-board~~ ONBOARD diagnostic check as may be required pursuant to title II of the clean air act.

(b) Motor vehicles other than those prescribed by subdivision (a) of this paragraph and other than diesel powered vehicles shall be required to take and pass a steady state loaded test and a curb idle emissions test.

(c) ~~Notwithstanding the requirement of subsection C of this section that the first emissions inspection after the purchase of a new vehicle be for the second registration year for that vehicle;~~ A diesel powered motor vehicle applying for registration or reregistration in area A ~~more than thirty-three months after the date of initial registration~~ shall be required to take and pass an annual emissions test conducted at an official emissions inspection station or a fleet emissions inspection station as follows:

(i) A loaded, transient or any other form of test as provided for in rules adopted by the director for vehicles with a gross vehicle weight rating of eight thousand five hundred pounds or less.

(ii) A test that conforms with the society for automotive engineers standard J1667 for vehicles with a gross vehicle

weight rating of more than eight thousand five hundred pounds.

(d) Motor vehicles by specific class or model year shall be required to take and pass any of the following tests:

(i) An evaporative system purge test.

(ii) An evaporative system integrity test.

(e) An ~~on-board~~ ONBOARD diagnostic check as may be required pursuant to title II of the clean air act ~~may be conducted for advisory purposes.~~

3. A motorcycle or constant four wheel drive vehicle shall be required to take and pass a curb idle emissions test OR AN ONBOARD DIAGNOSTIC CHECK AS REQUIRED PURSUANT TO TITLE II OF THE CLEAN AIR ACT.

4. Fleet operators in area B ~~which have~~ MUST COMPLY WITH THIS SECTION, EXCEPT THAT USED VEHICLES SOLD BY A MOTOR VEHICLE DEALER WHO IS A FLEET OPERATOR AND WHO HAS been issued a permit under section 49-546 ~~are required to test their vehicles~~ SHALL BE TESTED as follows:

(a) A motor vehicle manufactured in or before the 1980 model year shall take and pass only the curb idle test condition, except that a diesel powered vehicle is subject to only a loaded test condition.

(b) A motor vehicle manufactured in or after the 1981 model year shall take and pass the curb idle test condition and a twenty-five hundred revolutions per minute unloaded test condition.

5. Vehicles owned or operated by the United States, this state or a political subdivision of this state shall comply with this subsection without regard to whether those vehicles are required to be registered in this state, except that alternative fuel vehicles of a school district that is located in area A shall be required to take and pass the curb idle test condition and the loaded test condition.

6. Fleet operators in area A shall comply with this section, except that used vehicles sold by a motor vehicle dealer who is a fleet operator and who has been issued a permit pursuant to section 49-546 for purposes of determining compliance with minimum emission standards in area A shall ~~test their vehicles~~ BE TESTED as follows:

(a) A motor vehicle manufactured in or before the 1980 model year shall take and pass the curb idle test condition, except that a diesel powered vehicle is subject to only a loaded test condition.

(b) A motor vehicle manufactured in or after the 1981 model year shall take and pass the curb idle test condition and a two thousand five hundred revolutions per minute unloaded test condition.

7. Beginning on January 1, 2004 and except for any registered owner or lessee of a fleet of less than twenty-five vehicles, a diesel powered motor vehicle with a gross vehicle weight of more than twenty-six thousand pounds and for which gross weight fees are paid pursuant to title 28, chapter 15, article 2 in area A shall not be allowed to operate in area A unless it was manufactured in or after the 1988 model year or is powered by an engine that is certified to meet or surpass emissions standards contained in 40 Code of Federal Regulations section 86.088-11. This paragraph does not apply to vehicles that are registered pursuant to title 28, chapter 7, article 7 or 8.

8. Beginning on January 1, 2006 for any registered owner or lessee of a fleet of less than twenty-five vehicles, a diesel powered motor vehicle with a gross vehicle weight of more than twenty-six thousand pounds and for which gross weight fees are paid pursuant to title 28, chapter 15, article 2 in area A shall not be allowed to operate in area A unless it was manufactured in or after the 1988 model year or is powered by an engine that is certified to meet or surpass emissions standards contained in 40 Code of Federal Regulations section 86.088-11. This paragraph does not apply to vehicles that are registered pursuant to title 28, chapter 7, article 7 or 8.

G. In addition to an emissions inspection, a vehicle is subject to a tampering inspection on at least a biennial basis if the vehicle was manufactured after the 1974 model year and the vehicle is not subject to a transient loaded emissions test OR AN ONBOARD DIAGNOSTIC CHECK AS REQUIRED PURSUANT TO TITLE II OF THE CLEAN AIR ACT. The director shall adopt vehicle configuration guidelines for the tampering inspection which shall be based on the original configuration of the vehicle when manufactured. The tampering inspection shall consist of the following:

1. A visual check to determine the presence of properly installed catalytic converters.

2. An examination to determine the presence of an operational air pump.

3. In area A, if the vehicle was manufactured after the 1974 model year and is not subject to a transient loaded emissions test OR AN ONBOARD DIAGNOSTIC CHECK AS REQUIRED PURSUANT TO TITLE II OF THE CLEAN AIR ACT, a visual inspection for the presence or malfunction of the positive crankcase ventilation system and the evaporative control system.

H. Vehicles required to be inspected shall undergo a functional test of the gas cap to determine if the cap holds pressure within limits prescribed by the director, except for any vehicle that is subject to an evaporative system integrity test.

I. Motor vehicles failing the initial or subsequent test are not subject to a penalty fee for late registration renewal if the original testing was accomplished before the expiration date and if the registration renewal is received by the motor vehicle division or the county assessor within thirty days of the original test.

J. The director may adopt rules for purposes of implementation, administration, regulation and enforcement of the provisions of this article including:

1. The submission of records relating to the emissions inspection of vehicles inspected by another jurisdiction in accordance with another inspection law and the acceptance of such inspection for compliance with the provisions of this article.

2. The exemption from inspection of:

(a) A motor vehicle manufactured in or before the 1966 model year.

(b) New vehicles originally registered at the time of initial retail sale and titling in this state pursuant to section 28-2153 or 28-2154.

(c) Vehicles registered pursuant to title 28, chapter 7, article 7 or 8.

~~(d) During each calendar year vehicles of that model year and vehicles from the prior four model years.~~

(d) NEW VEHICLES BEFORE THE SIXTH REGISTRATION YEAR AFTER INITIAL PURCHASE OR LEASE.

(e) Vehicles which will not be available within the state during the ninety days prior to registration.

(f) Golf carts.

(g) Electrically-powered vehicles.

(h) Vehicles with an engine displacement of less than ninety cubic centimeters.

(i) The sale of vehicles between motor vehicle dealers.

(j) Vehicles leased to a person residing outside of area A or area B by a leasing company whose place of business is in area A or area B.

3. Compiling and maintaining records of emissions test results after servicing.

4. A procedure which shall allow the vehicle service and repair industry to compare the calibration accuracy of its emissions testing equipment with the department's calibration standards.

5. Training requirements for automotive repair personnel using emissions measuring equipment whose calibration accuracy has been compared with the department's calibration standards.

6. Any other rule which may be required to accomplish the provisions of this article.

K. The director shall, after consultation with automobile manufacturers and the vehicle service and repair industry, establish by rule a definition of "low emissions tune-up" for motor vehicles subject to inspection under this article. The definition shall specify repair procedures which, when implemented, will reduce vehicle emissions.

L. The director shall adopt rules which specify that the estimated retail cost of all recommended maintenance and repairs shall not exceed the amounts prescribed in this subsection, except that if a vehicle fails a tampering inspection there is no limit on the cost of recommended maintenance and repairs. The director shall issue a certificate of waiver for a vehicle which has failed reinspection, if the director has determined that all recommended maintenance and repairs have been performed. If, after reinspection, the director has determined that the vehicle is in compliance with minimum emissions standards or that all recommended maintenance and repairs for compliance with minimum emissions standards have been performed, but that tampering discovered at a tampering inspection has not been repaired, the director may issue a certificate of waiver if the owner of the vehicle provides to the director a written statement from an automobile parts or repair business that an emissions control device which is necessary to repair the tampering is not available and cannot be obtained from any usual source of supply before the vehicle's current registration expires. Rules adopted by the director for the purpose of establishing the estimated retail cost of all recommended maintenance and repairs pursuant to this subsection shall specify that:

1. In area A the cost shall not exceed:

(a) Five hundred dollars for a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds.

(b) Five hundred dollars for a diesel powered vehicle with tandem axles.

(c) For a vehicle other than a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds and other than a diesel powered vehicle with tandem axles:

(i) Two hundred dollars for such a vehicle manufactured in or before the 1974 model year.

(ii) Three hundred dollars for such a vehicle manufactured in the 1975 through 1979 model years.

(iii) Four hundred fifty dollars for such a vehicle manufactured in or after the 1980 model year.

2. In area B the cost shall not exceed:

(a) Three hundred dollars for a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds.

(b) Three hundred dollars for a diesel powered vehicle with tandem axles.

3. For a vehicle other than a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds and other than a diesel powered vehicle with tandem axles:

(a) Fifty dollars for such a vehicle manufactured in or before the 1974 model year.

(b) Two hundred dollars for such a vehicle manufactured in the 1975 through 1979 model years.

(c) Three hundred dollars for such a vehicle manufactured in or after the 1980 model year.

M. Each person whose vehicle has failed an emissions inspection shall be provided a list of those general recommended tune-up procedures for vehicles which are designed to reduce vehicle emissions levels. The list shall include the following notice: "This test is the result of federal law. You may wish to contact your representative in the United States Congress."

N. Notwithstanding any other provisions of this article, the director may adopt rules allowing exemptions from the requirement that all vehicles must meet the minimum standards for registration or reregistration.

O. The director of environmental quality shall establish, in cooperation with the assistant director for the motor vehicle division of the department of transportation:

1. An adequate method for identifying bona fide residents residing outside of area A or area B to ensure that such residents are exempt from compliance with the inspection program established by this article and rules adopted under this article.

2. A written notice that shall accompany the vehicle registration application forms that are sent to vehicle owners pursuant to section 28-2151 and that shall accompany or be included as part of the vehicle emissions test results that are provided to vehicle owners at the time of the vehicle emissions test. This written notice shall describe at least the following:

(a) The restriction of the waiver program to one time per vehicle and a brief description of the implications of this limit.

(b) The availability and a brief description of the vehicle repair and retrofit program established pursuant to section 49-474.03.

(c) Notice that many vehicles carry extended warranties for vehicle emissions systems, and those warranties are described in the vehicle's owner's manual or other literature.

(d) A description of the catalytic converter replacement program established pursuant to section 49-474.03.

P. Notwithstanding any other law, if area A or area B is reclassified as an attainment area, emissions testing conducted pursuant to this article shall continue for vehicles registered inside that reclassified area, vehicles owned by a person who is subject to section 15-1444 or 15-1627 and vehicles registered outside of that reclassified area but used to commute to the driver's principal place of employment located within that reclassified area.

Q. A fleet operator who is issued a permit pursuant to section 49-546 may electronically transmit emissions inspection data to the department of transportation pursuant to rules adopted by the director of the department of transportation in consultation with the director of environmental quality.

R. The director shall prohibit a certificate of waiver pursuant to subsection L of this section for any vehicle which has failed inspection in area A due to the catalytic converter system.

S. The director shall establish provisions for rapid testing of certain vehicles and to allow fleet operators, singly or in combination, to contract directly for vehicle emissions testing.

T. Each vehicle emissions control station in area A shall have a sign posted to be visible to persons who are having their vehicles tested. This sign shall state that enhanced testing procedures are a direct result of federal law.

U. The initial adoption of rules pursuant to this section shall be deemed emergency rules pursuant to section 41-1026.

V. The director of environmental quality and the director of the department of transportation shall implement a system to exchange information relating to the waiver program, including information relating to vehicle emissions test results and vehicle registration information.

W. Any person who sells a vehicle that has been issued a certificate of waiver pursuant to this section after January 1, 1997 and who knows that a certificate of waiver has been issued after January 1, 1997 for that vehicle shall disclose to the buyer before completion of the sale that a certificate of waiver has been issued for that vehicle.

X. Vehicles that fail the emissions test at emission levels higher than twice the standard established for that vehicle class by the department pursuant to section 49-447 are not eligible for a certificate of waiver pursuant to this section unless the vehicle is repaired sufficiently to achieve an emissions level below twice the standard for that class of vehicle.

Sec. 5. Section 49-542, Arizona Revised Statutes, as amended by Laws 2005, chapter 76, section 1, is amended to read:

49-542. Emissions inspection program; powers and duties of director; administration; periodic inspection; minimum standards and rules; exceptions; definition

A. The director shall administer a comprehensive annual or biennial emissions inspection program which shall require the inspection of vehicles in this state pursuant to this article and applicable administrative rules. Such inspection is required in area A and area B, for those vehicles owned by a person who is subject to section 15-1444 or 15-1627 and for those vehicles registered outside of area A or area B but used to commute to the driver's principal place of employment located within area A or area B. Inspection in other counties of the state shall commence upon application by a county board of supervisors for participation in such inspection program, subject to approval by the director. In all counties with a population of three hundred fifty thousand or fewer persons according to the most recent United States decennial census, except for the portion of counties that contain any portion of area A, the director shall as conditions dictate provide for testing to determine the effect of vehicle related pollution on ambient air quality in all communities with a metropolitan area population of twenty thousand persons or more according to the most recent United States decennial census. If such testing detects the violation of state ambient air quality standards by vehicle related pollution, the director shall forward a full report of such violation to the president of the senate, the speaker of the house of representatives and the governor.

B. The state's annual or biennial emissions inspection program shall provide for vehicle inspections at official emissions inspection stations or at fleet emissions inspection stations. Each inspection station in area A shall employ at least one mechanic who is available during the station's hours of operation to provide technical advice and assistance for persons who fail the emissions test. The director may enter into agreements with the department of transportation or with county assessors for the use of official emissions inspection stations for the purpose of conducting vehicle registrations. An official or fleet emissions inspection station permit shall not be sold, assigned, transferred, conveyed or removed to another location except on such terms and conditions as the director may prescribe.

C. Vehicles required to be inspected and registered in this state, except those provided for in section 49-546, shall be inspected, for the purpose of complying with the registration or reregistration requirement pursuant to subsection D of this section, in accordance with the provisions of this article no more than ninety days prior to each reregistration expiration date. A vehicle may be submitted voluntarily for inspection more than ninety days before the reregistration expiration date on payment of the prescribed inspection fee. Such voluntary inspection shall not be considered as compliance with the registration or reregistration requirement pursuant to subsection D of this section.

D. A vehicle shall not be registered or reregistered until such vehicle has passed the emissions inspection and the tampering inspection prescribed in subsection G of this section or has been issued a certificate of waiver. A certificate of waiver shall only be issued one time to a vehicle after January 1, 1997. If any vehicle to be registered or

reregistered is being sold by a dealer licensed to sell motor vehicles pursuant to title 28, the cost of any inspection and any repairs necessary to pass the inspection shall be borne by the dealer. A dealer who is licensed to sell motor vehicles pursuant to title 28 and whose place of business is located in area A or area B shall not deliver any vehicle to the retail purchaser until the vehicle passes any inspection required by this article or the vehicle is exempt under subsection J of this section.

E. On the registration or reregistration of a vehicle which has complied with the minimum emissions standards pursuant to this section or is otherwise exempt under this section, the registering officer shall issue an air quality compliance sticker to the registered owner which shall be placed on the vehicle as prescribed by rule adopted by the department of transportation or issue a modified year validating tab as prescribed by rule adopted by the department of transportation. Those persons who reside outside of area A or area B but who elect to test their vehicle or are required to test their vehicle pursuant to this section and who comply with the minimum emissions standards pursuant to this section or are otherwise exempt under this section shall remit a compliance form, as prescribed by the department of transportation, and proof of compliance issued at an official emissions inspection station to the department of transportation along with the appropriate fees. The department of transportation shall then issue the person an air quality compliance sticker which shall be placed on the vehicle as prescribed by rule adopted by the department of transportation. The registering officer or the department of transportation shall collect an air quality compliance fee of twenty-five cents. The registering officer or the department of transportation shall deposit, pursuant to sections 35-146 and 35-147, the air quality compliance fee in the state highway fund established by section 28-6991. The department of transportation shall deposit, pursuant to sections 35-146 and 35-147, any emissions inspection fee in the emissions inspection fund. The provisions of this subsection do not apply to those vehicles registered pursuant to title 28, chapter 7, article 7 or 8, the sale of vehicles between motor vehicle dealers or vehicles leased to a person residing outside of area A or area B by a leasing company whose place of business is in area A or area B.

F. The director shall adopt minimum emissions standards pursuant to section 49-447 with which the various classes of vehicles shall be required to comply as follows:

1. For the purpose of determining compliance with minimum emissions standards in area B:

(a) A motor vehicle manufactured in or before the 1980 model year, other than a diesel powered vehicle, shall be required to take and pass the curb idle test condition. A diesel powered vehicle is subject to only a loaded test condition. The conditioning mode shall, at the option of the vehicle owner or owner's agent, be administered only after the vehicle has failed the curb idle test condition. Upon completion of such conditioning mode, a vehicle that has failed the curb idle test condition may be retested in the curb idle test condition. If the vehicle passes such retest, it shall be deemed in compliance with minimum emissions standards unless the vehicle fails the tampering inspection pursuant to subsection G of this section.

(b) A motor vehicle manufactured in or after the 1981 model year, other than a diesel powered vehicle, shall be required to take and pass the curb idle test condition and the loaded test condition or an onboard diagnostic check as may be required pursuant to title II of the clean air act.

2. For purposes of determining compliance with minimum emissions standards and functional tests in area A:

(a) Motor vehicles manufactured in or after model year 1981 with a gross vehicle weight rating of eighty-five hundred pounds or less, other than diesel powered vehicles, shall be required to take and pass a transient loaded emissions test or an onboard diagnostic check as may be required pursuant to title II of the clean air act.

(b) Motor vehicles other than those prescribed by subdivision (a) of this paragraph and other than diesel powered vehicles shall be required to take and pass a steady state loaded test and a curb idle emissions test.

(c) ~~Notwithstanding the requirement of subsection C of this section that the first emissions inspection after the purchase of a new vehicle be for the second registration year for that vehicle,~~ A diesel powered motor vehicle applying for registration or reregistration in area A ~~more than thirty-three months after the date of initial registration~~ shall be required to take and pass an annual emissions test conducted at an official emissions inspection station or a fleet emissions inspection station as follows:

(i) A loaded, transient or any other form of test as provided for in rules adopted by the director for vehicles with a gross vehicle weight rating of eight thousand five hundred pounds or less.

(ii) A test that conforms with the society for automotive engineers standard J1667 for vehicles with a gross vehicle weight rating of more than eight thousand five hundred pounds.

(d) Motor vehicles by specific class or model year shall be required to take and pass any of the following tests:

(i) An evaporative system purge test.

(ii) An evaporative system integrity test.

(e) An onboard diagnostic check as may be required pursuant to title II of the clean air act ~~may be conducted for advisory purposes.~~

3. A motorcycle in area A or any constant four wheel drive vehicle shall be required to take and pass a curb idle emissions test ~~OR AN ONBOARD DIAGNOSTIC CHECK AS REQUIRED PURSUANT TO TITLE II OF THE CLEAN AIR ACT.~~

4. Fleet operators in area B ~~which have~~ **MUST COMPLY WITH THIS SECTION, EXCEPT THAT USED VEHICLES SOLD BY A MOTOR VEHICLE DEALER WHO IS A FLEET OPERATOR AND WHO HAS** been issued a permit under section 49-546 ~~are required to test their vehicles~~ **SHALL BE TESTED** as follows:

(a) A motor vehicle manufactured in or before the 1980 model year shall take and pass only the curb idle test condition, except that a diesel powered vehicle is subject to only a loaded test condition.

(b) A motor vehicle manufactured in or after the 1981 model year shall take and pass the curb idle test condition and

a twenty-five hundred revolutions per minute unloaded test condition.

5. Vehicles owned or operated by the United States, this state or a political subdivision of this state shall comply with this subsection without regard to whether those vehicles are required to be registered in this state, except that alternative fuel vehicles of a school district that is located in area A shall be required to take and pass the curb idle test condition and the loaded test condition.

6. Fleet operators in area A shall comply with this section, except that used vehicles sold by a motor vehicle dealer who is a fleet operator and who has been issued a permit pursuant to section 49-546 for purposes of determining compliance with minimum emission standards in area A shall ~~test their vehicles~~ BE TESTED as follows:

(a) A motor vehicle manufactured in or before the 1980 model year shall take and pass the curb idle test condition, except that a diesel powered vehicle is subject to only a loaded test condition.

(b) A motor vehicle manufactured in or after the 1981 model year shall take and pass the curb idle test condition and a two thousand five hundred revolutions per minute unloaded test condition.

7. Beginning on January 1, 2004 and except for any registered owner or lessee of a fleet of less than twenty-five vehicles, a diesel powered motor vehicle with a gross vehicle weight of more than twenty-six thousand pounds and for which gross weight fees are paid pursuant to title 28, chapter 15, article 2 in area A shall not be allowed to operate in area A unless it was manufactured in or after the 1988 model year or is powered by an engine that is certified to meet or surpass emissions standards contained in 40 Code of Federal Regulations section 86.088-11. This paragraph does not apply to vehicles that are registered pursuant to title 28, chapter 7, article 7 or 8.

8. Beginning on January 1, 2006 for any registered owner or lessee of a fleet of less than twenty-five vehicles, a diesel powered motor vehicle with a gross vehicle weight of more than twenty-six thousand pounds and for which gross weight fees are paid pursuant to title 28, chapter 15, article 2 in area A shall not be allowed to operate in area A unless it was manufactured in or after the 1988 model year or is powered by an engine that is certified to meet or surpass emissions standards contained in 40 Code of Federal Regulations section 86.088-11. This paragraph does not apply to vehicles that are registered pursuant to title 28, chapter 7, article 7 or 8.

G. In addition to an emissions inspection, a vehicle is subject to a tampering inspection on at least a biennial basis if the vehicle was manufactured after the 1974 model year and the vehicle is not subject to a transient loaded emissions test OR AN ONBOARD DIAGNOSTIC CHECK AS REQUIRED PURSUANT TO TITLE II OF THE CLEAN AIR ACT. The director shall adopt vehicle configuration guidelines for the tampering inspection which shall be based on the original configuration of the vehicle when manufactured. The tampering inspection shall consist of the following:

1. A visual check to determine the presence of properly installed catalytic converters.

2. An examination to determine the presence of an operational air pump.

3. In area A, if the vehicle was manufactured after the 1974 model year and is not subject to a transient loaded emissions test OR AN ONBOARD DIAGNOSTIC CHECK AS REQUIRED PURSUANT TO TITLE II OF THE CLEAN AIR ACT, a visual inspection for the presence or malfunction of the positive crankcase ventilation system and the evaporative control system.

H. Vehicles required to be inspected shall undergo a functional test of the gas cap to determine if the cap holds pressure within limits prescribed by the director, except for any vehicle that is subject to an evaporative system integrity test.

I. Motor vehicles failing the initial or subsequent test are not subject to a penalty fee for late registration renewal if the original testing was accomplished before the expiration date and if the registration renewal is received by the motor vehicle division or the county assessor within thirty days of the original test.

J. The director may adopt rules for purposes of implementation, administration, regulation and enforcement of the provisions of this article including:

1. The submission of records relating to the emissions inspection of vehicles inspected by another jurisdiction in accordance with another inspection law and the acceptance of such inspection for compliance with the provisions of this article.

2. The exemption from inspection of:

(a) A motor vehicle manufactured in or before the 1966 model year.

(b) New vehicles originally registered at the time of initial retail sale and titling in this state pursuant to section 28-2153 or 28-2154.

(c) Vehicles registered pursuant to title 28, chapter 7, article 7 or 8.

~~(d) During each calendar year vehicles of that model year and vehicles from the prior four model years:~~

(d) NEW VEHICLES BEFORE THE SIXTH REGISTRATION YEAR AFTER INITIAL PURCHASE OR LEASE.

(e) Vehicles which will not be available within the state during the ninety days prior to registration.

(f) Golf carts.

(g) Electrically-powered vehicles.

(h) Vehicles with an engine displacement of less than ninety cubic centimeters.

(i) The sale of vehicles between motor vehicle dealers.

(j) Vehicles leased to a person residing outside of area A or area B by a leasing company whose place of business is in area A or area B.

(k) Collectible vehicles.

(l) Motorcycles in area B.

3. Compiling and maintaining records of emissions test results after servicing.

4. A procedure which shall allow the vehicle service and repair industry to compare the calibration accuracy of its

emissions testing equipment with the department's calibration standards.

5. Training requirements for automotive repair personnel using emissions measuring equipment whose calibration accuracy has been compared with the department's calibration standards.

6. Any other rule which may be required to accomplish the provisions of this article.

K. The director shall, after consultation with automobile manufacturers and the vehicle service and repair industry, establish by rule a definition of "low emissions tune-up" for motor vehicles subject to inspection under this article. The definition shall specify repair procedures which, when implemented, will reduce vehicle emissions.

L. The director shall adopt rules which specify that the estimated retail cost of all recommended maintenance and repairs shall not exceed the amounts prescribed in this subsection, except that if a vehicle fails a tampering inspection there is no limit on the cost of recommended maintenance and repairs. The director shall issue a certificate of waiver for a vehicle which has failed reinspection, if the director has determined that all recommended maintenance and repairs have been performed. If, after reinspection, the director has determined that the vehicle is in compliance with minimum emissions standards or that all recommended maintenance and repairs for compliance with minimum emissions standards have been performed, but that tampering discovered at a tampering inspection has not been repaired, the director may issue a certificate of waiver if the owner of the vehicle provides to the director a written statement from an automobile parts or repair business that an emissions control device which is necessary to repair the tampering is not available and cannot be obtained from any usual source of supply before the vehicle's current registration expires. Rules adopted by the director for the purpose of establishing the estimated retail cost of all recommended maintenance and repairs pursuant to this subsection shall specify that:

1. In area A the cost shall not exceed:

(a) Five hundred dollars for a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds.

(b) Five hundred dollars for a diesel powered vehicle with tandem axles.

(c) For a vehicle other than a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds and other than a diesel powered vehicle with tandem axles:

(i) Two hundred dollars for such a vehicle manufactured in or before the 1974 model year.

(ii) Three hundred dollars for such a vehicle manufactured in the 1975 through 1979 model years.

(iii) Four hundred fifty dollars for such a vehicle manufactured in or after the 1980 model year.

2. In area B the cost shall not exceed:

(a) Three hundred dollars for a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds.

(b) Three hundred dollars for a diesel powered vehicle with tandem axles.

3. For a vehicle other than a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds and other than a diesel powered vehicle with tandem axles:

(a) Fifty dollars for such a vehicle manufactured in or before the 1974 model year.

(b) Two hundred dollars for such a vehicle manufactured in the 1975 through 1979 model years.

(c) Three hundred dollars for such a vehicle manufactured in or after the 1980 model year.

M. Each person whose vehicle has failed an emissions inspection shall be provided a list of those general recommended tune-up procedures for vehicles which are designed to reduce vehicle emissions levels. The list shall include the following notice: "This test is the result of federal law. You may wish to contact your representative in the United States Congress."

N. Notwithstanding any other provisions of this article, the director may adopt rules allowing exemptions from the requirement that all vehicles must meet the minimum standards for registration or reregistration.

O. The director of environmental quality shall establish, in cooperation with the assistant director for the motor vehicle division of the department of transportation:

1. An adequate method for identifying bona fide residents residing outside of area A or area B to ensure that such residents are exempt from compliance with the inspection program established by this article and rules adopted under this article.

2. A written notice that shall accompany the vehicle registration application forms that are sent to vehicle owners pursuant to section 28-2151 and that shall accompany or be included as part of the vehicle emissions test results that are provided to vehicle owners at the time of the vehicle emissions test. This written notice shall describe at least the following:

(a) The restriction of the waiver program to one time per vehicle and a brief description of the implications of this limit.

(b) The availability and a brief description of the vehicle repair and retrofit program established pursuant to section 49-474.03.

(c) Notice that many vehicles carry extended warranties for vehicle emissions systems, and those warranties are described in the vehicle's owner's manual or other literature.

(d) A description of the catalytic converter replacement program established pursuant to section 49-474.03.

P. Notwithstanding any other law, if area A or area B is reclassified as an attainment area, emissions testing conducted pursuant to this article shall continue for vehicles registered inside that reclassified area, vehicles owned by a person who is subject to section 15-1444 or 15-1627 and vehicles registered outside of that reclassified area but used to commute to the driver's principal place of employment located within that reclassified area.

Q. A fleet operator who is issued a permit pursuant to section 49-546 may electronically transmit emissions inspection data to the department of transportation pursuant to rules adopted by the director of the department of transportation in consultation with the director of environmental quality.

R. The director shall prohibit a certificate of waiver pursuant to subsection L of this section for any vehicle which has failed inspection in area A due to the catalytic converter system.

S. The director shall establish provisions for rapid testing of certain vehicles and to allow fleet operators, singly or in combination, to contract directly for vehicle emissions testing.

T. Each vehicle emissions control station in area A shall have a sign posted to be visible to persons who are having their vehicles tested. This sign shall state that enhanced testing procedures are a direct result of federal law.

U. The initial adoption of rules pursuant to this section shall be deemed emergency rules pursuant to section 41-1026.

V. The director of environmental quality and the director of the department of transportation shall implement a system to exchange information relating to the waiver program, including information relating to vehicle emissions test results and vehicle registration information.

W. Any person who sells a vehicle that has been issued a certificate of waiver pursuant to this section after January 1, 1997 and who knows that a certificate of waiver has been issued after January 1, 1997 for that vehicle shall disclose to the buyer before completion of the sale that a certificate of waiver has been issued for that vehicle.

X. Vehicles that fail the emissions test at emission levels higher than twice the standard established for that vehicle class by the department pursuant to section 49-447 are not eligible for a certificate of waiver pursuant to this section unless the vehicle is repaired sufficiently to achieve an emissions level below twice the standard for that class of vehicle.

Y. If an insurer notifies the department of transportation of the cancellation or nonrenewal of collectible vehicle or classic automobile insurance coverage for a collectible vehicle, the department of transportation shall cancel the registration of the vehicle and the vehicle's exemption from emissions testing pursuant to this section unless evidence of coverage is presented to the department of transportation within sixty days.

Z. For the purposes of this section, "collectible vehicle" means a vehicle that complies with both of the following:

1. Either:

(a) Bears a model year date of original manufacture that is at least fifteen years old.

(b) Is of unique or rare design, of limited production and an object of curiosity.

2. Meets both of the following criteria:

(a) Is maintained primarily for use in car club activities, exhibitions, parades or other functions of public interest or for a private collection and is used only infrequently for other purposes.

(b) Has a collectible vehicle or classic automobile insurance coverage that restricts the collectible vehicle mileage or use, or both, and requires the owner to have another vehicle for personal use.

Sec. 6. Section 49-543, Arizona Revised Statutes, is amended to read:

49-543. Emissions inspection costs; disposition; fleet inspection; certificates

A. The director shall fix, regulate and alter in accordance with this section the fees required to be paid for the full costs of the vehicle emissions inspection program pursuant to this article including administration, implementation and enforcement.

B. Except as provided in section 49-542.05, the registration renewal notice required for the second through fifth registration year of a new vehicle shall include a notice to the vehicle owner that even though an emissions inspection test is not required pursuant to section 49-542, subsection J, paragraph 2, subdivision (d) the owner may choose to have an emissions inspection because of vehicle emissions performance warranty limitations on emissions components of the vehicle.

C. The fees charged for official emissions inspection shall be uniform as applied to each class of vehicle, which shall be defined by the director. Except for fees collected by the director pursuant to section 49-546, the inspection fees required to be paid pursuant to this article may be collected with the registration fee by the registering officer at the time and place of motor vehicle registration pursuant to title 28, chapter 7, article 5 and deposited, pursuant to sections 35-146 and 35-147, in the emissions inspection fund in accordance with the rules adopted by the director or may be collected by the independent contractor at the time of inspection ~~by means of an approved check or cash.~~

D. Any person, except a person who has been issued a certificate of waiver pursuant to section 49-542, subsection L, whose vehicle has been inspected at an official emissions inspection station, if the vehicle was not found to comply with the minimum standards, shall have the vehicle repaired, including recommended repair or replacement of emissions control devices as a result of tampering, and have the right within sixty consecutive calendar days but not thereafter to return the vehicle for one reinspection without charge. The department may provide for additional reinspections without charge. A vehicle shall not be deemed to pass a reinspection unless the tampering discovered during the tampering inspection is repaired with new or reconditioned emissions control devices.

E. The department shall issue certificates of inspection to owners of fleet emissions inspection stations. Each certificate shall be validated by the fleet emissions inspection stations in a manner required by the director at the time that each owner's fleet vehicle has been inspected or has passed inspection. The validated certificate of inspection shall indicate at the time of registration that the owner's fleet vehicle has been inspected and that the vehicle has passed inspection.

F. The director shall fix an emissions inspection fee before inspection certificates may be issued to the owner of any fleet emissions inspection station. Such fee shall be uniform for each inspection certificate issued and shall be based on the director's estimated costs to the state of administering and enforcing this article as ~~they apply~~ **IT APPLIES** to fleet emissions inspection stations and the vehicles inspected in fleet emissions inspection stations. The director shall deposit, pursuant to sections 35-146 and 35-147, all such monies collected by the director pursuant to this article in

the emissions inspection fund.

Sec. 7. Purpose

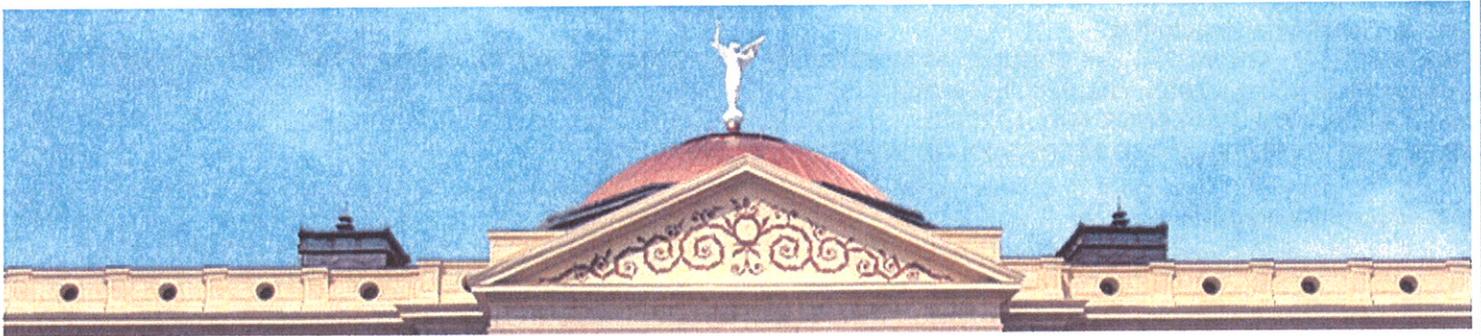
Pursuant to section 41-2955, subsection B, Arizona Revised Statutes, the legislature continues the vehicle emissions inspection program to identify violations and compel compliance with vehicle emissions requirements.

Sec. 8. Conditional enactment

Section 49-542, Arizona Revised Statutes, as amended by Laws 2005, chapter 76, section 1 and this act, is effective as prescribed in Laws 2005, chapter 76, section 2.

APPROVED BY THE GOVERNOR MAY 1, 2007.

FILED IN THE OFFICE OF THE SECRETARY OF STATE MAY 1, 2007.



Forty-ninth Legislature - First Special Session

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41-3017.01. Vehicle emissions inspection program; termination January 1, 2017

- A. The vehicle emissions inspection program terminates on January 1, 2017.
- B. Title 49, chapter 3, article 5 is repealed on July 1, 2017.

APPENDIX B

EXHIBIT 2:

Certification of Adoption

RESOLUTION TO ADOPT THE MAG 2014 EIGHT-HOUR OZONE PLAN-SUBMITTAL OF MARGINAL AREA REQUIREMENTS FOR THE MARICOPA NONATTAINMENT AREA

WHEREAS, the Maricopa Association of Governments (MAG) is a Council of Governments composed of twenty-seven cities and towns within Maricopa County and portions of Pinal County, Maricopa County, Pinal County, the Gila River Indian Community, the Salt River Pima-Maricopa Indian Community, Fort McDowell Yavapai Nation, Arizona Department of Transportation, and Citizens Transportation Oversight Committee; and

WHEREAS, the Governor of Arizona designated MAG as the regional air quality planning agency and metropolitan planning organization for transportation for all jurisdictions in Maricopa County, including the Phoenix urbanized area and the contiguous urbanized area in Pinal County, including the Town of Florence and City of Maricopa; and

WHEREAS, the Environmental Protection Agency designated the Maricopa nonattainment area as a Marginal Area for the eight-hour ozone standard of 0.075 parts per million in 2012 in accordance with the Clean Air Act; and

WHEREAS, the Environmental Protection Agency assumes that Marginal Areas will be in attainment of the eight-hour ozone standard within three years of designation without any additional control measures; and

WHEREAS, MAG has prepared the MAG 2014 Eight-Hour Ozone Plan-Submittal of Marginal Area Requirements for the Maricopa Nonattainment Area; and

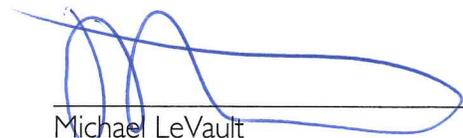
WHEREAS, A.R.S. 49-406 H. requires that the governing body of the metropolitan planning organization adopt the nonattainment area plan.

NOW THEREFORE, BE IT RESOLVED BY THE MARICOPA ASSOCIATION OF GOVERNMENTS REGIONAL COUNCIL as follows:

SECTION 1. That the MAG Regional Council adopts the MAG 2014 Eight-Hour Ozone Plan-Submittal of Marginal Area Requirements for the Maricopa Nonattainment Area.

SECTION 2. That the MAG Regional Council authorizes the submission of the plan to the Arizona Department of Environmental Quality and the U.S. Environmental Protection Agency.

PASSED AND ADOPTED BY THE REGIONAL COUNCIL OF THE MARICOPA ASSOCIATION OF GOVERNMENTS THIS TWENTY-FIFTH DAY OF JUNE 2014.



Michael LeVault
Chair, MAG Regional Council
Mayor of Youngtown

ATTEST:



Dennis Smith
Executive Director, MAG

**CERTIFICATION OF ADOPTION OF THE MAG 2014 EIGHT-HOUR OZONE PLAN-
SUBMITTAL OF MARGINAL AREA REQUIREMENTS FOR THE MARICOPA
NONATTAINMENT AREA**

An Excerpt from the June 25, 2014 MAG Regional Council Meeting Minutes

Mayor Gail Barney moved to adopt the MAG 2014 Eight-Hour Ozone Plan-Submittal of Marginal Area Requirements for the Maricopa Nonattainment Area. Mayor Bob Barrett seconded, and the motion passed unanimously.

I certify that on June 25, 2014, the MAG Regional Council adopted the MAG 2014 Eight-Hour Ozone Plan-Submittal of Marginal Area Requirements for the Maricopa Nonattainment Area.



Dennis Smith
MAG Executive Director

06/26/14

Date