

APPENDIX F

2007 FUTURE YEAR MODELING EMISSIONS INVENTORY DEVELOPMENT

SAN ANTONIO EAC REGION ATTAINMENT DEMONSTRATION

MARCH 2004



Appendix F

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BACKGROUND

The Early Action Compacts (EAC) for both Austin and San Antonio require attainment of the National Ambient Air Quality Standards (NAAQS) by 2007. For this reason, development of an accurate 2007 Emission Inventory (EI) is an important part of air quality modeling for attainment demonstration. The impacts of all federal and state air quality policies on emissions of ozone precursors and the pollution control strategies adopted by the nonattainment and EAC areas, included in the photochemical modeling domain, were taken into account when the air quality projections were made for the San Antonio area.

General Refinements to the 2007 Emission Inventory Inputs

All the adjustments and refinement applied to the 1999 EI are also reflected in the 2007 EI. These adjustments and fine tunings have been documented and can be found in Appendix D of this State Implementation Plan (SIP) document.

Adjustments to Temporal Input Data

The adjustment factors were either provided by ENVIRON, or extracted from Texas Commission on Environmental Quality (TCEQ) and EPA default files, or were developed in-house based on the information from local surveys and local data. The EPA default data can be found online.¹ The local weekly and monthly adjustments were based on survey results from the 1999 Net Emission Trends (NET) emissions inventories.

All hourly data was either provided by ENVIRON or extracted from TCEQ default files; there were no survey-based adjustments to the hourly data. The temporal adjustments for tanker truck unloading, Source Classification Code (SCC) 2501060053, were provided by the EPA. These temporal allocations are contained in the following files:

month_prof_042902.db

temporal.pdf

tpri_xref_030701.dbf

tpri_xref_0307 01.xls

week_prof_121400.dbf

wkd_diurnal_prof_121400.dbf²

ON-ROAD SOURCE EMISSIONS FOR 2007 PROJECTION

The mobile sources in 2007 EI account for all federal motor vehicle control programs, including the effects of offset Heavy Duty Diesel Vehicle (HDDV) defeat devices, the low emissions rebuild program, and the HDDV 2004 standard pull-ahead. Emissions from on-road sources are calculated using the EPA's MOBILE6 model.

Regional

On-road emissions for states included in the modeling domain are contained within the 36 km grid system and were provided by TCEQ. ENVIRON, a consultant company, provided emissions for the rural counties of Texas using MOBILE5, which are the best available at this time for these counties.

Mobile source projections for areas outside of Texas were developed with MOBILE6 and were provided by TCEQ to Alamo Area Council Of Governments (AACOG).

¹ Available at: <http://www.epa.gov/ttn/chief/emch/temporal/>

² Email from Gary McGaughy (UT Austin) received on 2/9/04, "Fwd: latest draft 2007 files."

On-Road Mobile Sources of Texas

The Texas link-based information received from Texas Transportation Institute (TTI) was adjusted to account for two state programs: the Texas Low-Emissions Diesel (LED) Fuel program and the Texas Regional Low Reid Vapor Pressure Gasoline Program. The MOBILE6 model contains options for user-specified alternate diesel fuel parameters. This model in conjunction with a post-processing step involved applying adjustment factors to the model's outputs for NOx emissions were used to estimate the effects of TX-LED fuel on the on-road emissions.

AACOG staff integrated MOBILE6 on-road files into the photochemical model for all major urban areas of Texas, when available. The TCEQ directory, "MOBILE6 On-Road Emission Data for Texas Near Nonattainment Area Ozone Episodes Emissions for 1999 Base Case & 2007 Future Case" (updated on December 5, 10, and 13, 2002; originally posted on October 2, 2002), contains MOBILE6-based on-road mobile source emissions data that were used to support photochemical modeling efforts for the Texas near - nonattainment areas of:

- Austin 3-county Region
- Corpus Christi
- San Antonio (Bexar County only)
- Tyler-Longview
- Victoria

The ozone episode for the Austin, Corpus Christi, San Antonio, and Victoria areas extends from Monday September 13, 1999 through Monday September 20, 1999. The ozone episode for the Tyler-Longview area extends from Friday August 13, 1999 through Sunday August 22, 1999. Inventory data exist for both the 1999 "base cases" and 2007 "future cases" of these episodes. Four "day type" inventories are provided for each area and calendar year:

- Weekday (Monday-Thursday)
- Friday
- Saturday
- Sunday

The inventories were developed under contract to the TCEQ TTI and converted into a photochemical model-ready format by TCEQ staff using the 2X version of the Emissions Preprocessor System (EPS2X).

TTI provided AACOG with 2007 on-road emissions for an average September weekday, Friday, Saturday, and Sunday. Since the 1999 modeling episode, including ramp-up period, spanned eight days, the average September weekday file was adjusted to account for temperature differences between Monday (September 13, 1999), Tuesday (September 14, 1999), Wednesday (September 15, 1999), Thursday (September 16, 1999), and Monday (September 20, 1999). This methodology was the same as that used for estimating the 1999 weekday on-road EI.

San Antonio Region

In August 2003, TTI completed the MOBILE6 version 2 gridded on-road input files for Bexar County. The files were made available by the TCEQ and provided in model-ready

format on that agency's file transfer protocol (ftp) web site.³ The TTI files provided on-road emissions for an average September weekday, Friday, Saturday, and Sunday. Pollutant specific factors were used to convert the emissions from the 1999 county-wide MOBILE5 totals to 2007 county-wide MOBILE6 ver. 2 totals for Comal, Guadalupe, and Wilson counties.

Austin Region

The emission files for Bastrop and Caldwell contain pollutant specific factors for converting from the 1999 county-wide M5 totals to 2007 county-wide M6 ver. 2 totals. Travis, Hays, and Williamson county on-road emissions were developed by TCEQ and based on TTI emission estimates.

The TTI files for Austin contained an adjustment made to one roadway. 45% of the MoPac NOx emissions were removed to account for the lesser emissions on MoPac freeway as compared to the greater emissions on the IH-35 expressway. This adjustment was made because the two roads were both categorized as freeways, exaggerating the NOx emissions on MoPac.

Houston/Galveston Region

MOBILE6 on-road files were also obtained for the Houston area.⁴ However, the Houston on-road emission rates were estimated for an August 2007 timeframe. Therefore, several adjustments were necessary to make the files suitable for use in the September 2007 episode.

The August 2007 vehicle emission rates were adjusted to reflect the correct month. This was accomplished using the MOBILE6 model. Two runs were conducted for Houston using MOBILE6: one with appropriate settings (such as hourly temperature) for the August 2007 episode and one with appropriate settings for a September 2007 timeframe. The percent difference between the two was applied, in concert with a Vehicle Miles Traveled (VMT) adjustment to account for the difference between total VMT for the two runs, to the 2000 Houston link-based on-road emission file.

The 2007 MOBILE6 LBASE input files aggregate the 28 vehicle-types (EPA) into 13 (LDGV & LDGT1-4, HDGV2b, HDGV3, DHGV4-8b, LDDV & LDDT12 & LDDT34, HDDV22, HDDV3, HDDV4-7, HDDV8a-b, MC, HDGB, HDDBT, and HDDBS) categories; the 13 roadway-types are aggregated into 2 (freeway & arterial) categories.⁵

³ Available: <ftp://ftp.tceq.state.tx.us> (April 4, 2003)

⁴ Email: from Chris Kite (TCEQ) received 12/10/02 (NNA areas) and 02/28/03 (Houston area).

⁵ Email: from Chris Kite (TCEQ) received 02/28/03, "MOBILE6 LBASE Input Files for Houston."

Table F-1. Photochemical Model Jobs & Files for 2007 EI Development of On-Road Sources.

Region	Job Scripts	Input Files	Description
Regional (outside Texas)		emiss.mv.regional.Mobile6.fy07.xxx	TCEQ processing of emissions.
Texas Rural Counties <i>CAPCO Counties:</i> Bastrop & Caldwell <i>AACOG Counties:</i> Comal, Guadalupe, & Wilson	pream.txnna.4km.HPMS	AMS.mv.HPMS.hourly.xxx.yyyyyy.a0	Process of 1999 MOBILE5 emissions developed by ENVIRON.
	cntlem.txnna.4km.mobile5.HPMS.2007	mvfactors.nonlink.2007.yyyyyy	Contain pollutant specific factors for converting from the 1999 county-wide M5 totals to 2007 county-wide M6 ver. 2 totals (Bastrop, Caldwell, Comal, Guadalupe, & Wilson). ⁶ Also projects other Texas rural county emissions from 1999 to 2007 MOBILE5.
<i>Houston counties:</i> Fort Bend Harris Waller	lbase.mobile6.4km.2007.houston chmspl.mobile6.4km.2007.houston grdem.mobile6.4km.2007.houston	mobile6.2007.55mph.\$county.yyyyyy.lbase_in	Processing of 2007 emissions. 55mph scenario advised by TCEQ. ⁷
	cntlem.mobile6.4km.houston.2007	ctl.onroad.LINKS.daily.yyyyyy	Project emissions from August 2007 to September 2007. ⁸
Bexar and Victoria county	lbase.mobile6.4km.2007.LINKS.b chmspl.mobile6.4km.2007.LINKS.b grdem.mobile6.4km.2007.LINKS.b	m6.2007.\$county.xxx.yyyyyy.lbase_in	Process the MOBILE6 on-road emission inventory by UT based on TTI emissions data. ⁹
	cntlem.mobile6.4km.LINKS.2007	madjin.dummy.\$county.yyyyyy	Adjusts mobile6 on-road emission inventory for individual episode weekdays 2007 for Bexar County. ¹⁰

⁶ Email: Alba Webb (UT Austin) received 11/17/03: "RE:2007 Mobile6.2 Files for Austin/San Antonio",

⁷ Email: from Chris Kite (TCEQ) received 02/28/03, "MOBILE6 LBASE Input Files for Houston."

⁸ Email: from Chris Kite (TCEQ) received 02/28/03, "MOBILE6 LBASE Input Files for Houston."

⁹ Email: from Gary McGaughy (UT Austin) received 09/25/03, "FWD: 2007 Mobile6.2 Files for Austin/San Antonio."

Corpus Christi 2-county region	lbase.mobile6.4km.2007.corpus chmspl.mobile6.4km.2007.corpus grdem.mobile6.4km.2007.corpus	m6.2007.Corpus_2County.xxx.yyyyyy.lbase_in	Process the mobile6 on-road emission inventory based on TTI emissions data. ¹¹
Gregg and Smith counties	lbase.mobile6.12km.LINKS.2007 chmspl.mobile6.12km.LINKS.2007 grdem.mobile6.12km.LINKS.2007	m6.2007.Tyler_2County.xxx.08yy.lbase_in	AACOG process of MOBILE6 emissions with local data for August 2007.
	cntlem.mobile6.12km.LINKS.2007	ctl.onroad.LINKS.daily.yyyyyy	Project emissions from August 2007 to September 2007.
Houston/Galveston 8-county region	lbase.mobile6.12km.houston.2007 chmspl.mobile6.12km.houston.2007 grdem.mobile6.12km.houston.2007	mobile6.2007.55mph.\$county.hourly.08yy.lbase_in	Process of MOBILE6 emissions based on TTI processing with local data for August 2007. ¹²
	cntlem.mobile6.12km.houston.2007	ctl.onroad.LINKS.daily.yyyyyy embr.chmspl.mv.LINKS.12km.\$county.hourly.xxx.yyyyyy.a0	Project emissions from Aug. 2007 to Sept. 2007.
Houston-Galveston 8-County region, Gregg county and Rural Counties	mrguam.mobile6.12km.mv.2007	emiss.mv.mobile6.12km.gregg.xxx.yyyyyy.a0 emiss.mv.mobile6.12km.brazoria.xxx.yyyyyy.a0 emiss.mv.mobile6.12km.chambers.xxx.yyyyyy.a0 emiss.mv.mobile6.12km.fortbend.xxx.yyyyyy.a0 emiss.mv.mobile6.12km.galveston.xxx.yyyyyy.a0 emiss.mv.mobile6.12km.harris.xxx.yyyyyy.a0 emiss.mv.mobile6.12km.liberty.xxx.yyyyyy.a0 emiss.mv.mobile6.12km.montgomery.xxx.yyyyyy.a0 emiss.mv.mobile6.12km.waller.xxx.yyyyyy.a0 emiss.mobile5.mv.HPMS.12km.2007.\$hpms_xxx.yyyyyy.a0	Script for running MRGUAM module Mobile emission inventory (12km level)
All Texas Counties	mrguam.mobile6.4km.mv.2007	emiss.mv.mobile6.4km.bexar.xxx.yyyyyy.a0 emiss.m6.links.4km.Austin_3County.roadnox.yyyyyy emiss.mv.LINKS.4km.nueces.xxx.yyyyyy.a0 emiss.mv.LINKS.4km.sanpatricio.xxx.yyyyyy.a0 emiss.mv.links.4km.vic.yyyyyy emiss.mv.LINKS.4km.fortbend.xxx.yyyyyy.a0	Script for running MRGUAM module for the Mobile emission inventory (4km level) in 2007. Austin files provided by UT and based on TTI emission data, contain IH-35/MoPac adjustment. ¹³ Victoria

¹⁰ Email: from Gary McGaughey (UT Austin) received 09/25/03, "FWD: 2007 Mobile6.2 Files for Austin/San Antonio."

¹¹ Email: from Chris Kite (TCEQ) received 08/29/03, "1999 Gridded Onroad Mobile CAMx Files for NNA Subdomain."

¹² Email: from Chris Kite (TECQ) received 02/28/03, "MOBILE6 LBASE Input Files for Houston."

¹³ Email from Alba Webb (UT) received 01/16/04, "Revised Mobile files."

		emiss.mv.LINKS.4km.harris.xxx.yyyyyy.a0 emiss.mv.LINKS.4km.waller.xxx.yyyyyy.a0 emiss.mv.mobile5.HPMS.2007.\$hpms_day.yyyyyy.a0	emission files provided by UT based on TTI emission data. ¹⁴
Texas and Regional	mrguam.mv.all_reg.mobile6.2007	emiss.mv.all_counties.12km.yyyyyy.a0 emiss.mv.regional.Mobile6.fy07.xxx	Merge Mobile emissions for the Regional Grid, 2007. ¹⁵

¹⁴ Email from Alba Webb (UT) received 03/11/04, "RE: Gifs attached."

¹⁵ Email: from Ron Thomas (TCEQ) received 12/03/03, "more HDD 2007 EI parts."

BIOGENIC SOURCE EMISSIONS FOR 2007 PROJECTION

Emission rates that result from natural processes in vegetation and soils were developed for the year 1999 by TCEQ technical staff using the GLOBEIS mode (TNRCC). Because changes in biogenic emissions are very difficult to predict, the EPA recommends the use of identical biogenic emission rates between base year and future year models. Therefore, the 2007 simulation incorporates TCEQ's 1999 biogenic emissions input files.

POINT SOURCE EMISSIONS FOR 2007 PROJECTION

TCEQ maintains comprehensive, annual point source databases for the State of Texas. In addition, the state agency develops point source projections for use in modeling, SIP development, and other applications. AACOG staff obtained the 2007 Texas electric-generating unit (EGU) and non-electric generating unit (NEGU) emission files developed for the Houston SIP and used the data to update the 2007 emission inventory inputs. These files were supplemented with local data when available. Some examples of local data used are the 2007 emission projections for Lackland Air Force Base hospital EGUs and the City Public Service power plants, which were provided to AACOG by the facilities' staff and incorporated in the 2007 simulation.

Since emission projections must account for growth and control factors, the 2007 point source emissions were developed based on the anticipated impacts of two Texas laws promulgated in 1999: Senate Bill 7 and Senate Bill 766. Senate Bill 7 limits NOx emissions from grandfathered electric generating facilities and Senate Bill 766 increases emission fees on grandfathered non-electric generating facilities.

Bexar County

Tessman Road Landfill Gas (LFG) Power Station

The proposed Tessman Road LFG Power Station is located in Bexar County near Converse, TX. Emissions from station are based on six Deutz TBG 620 V16 engines producing electricity from methane and other landfill gases.

Comparison of the Deutz Engine to Flare Burning

AACOG Solid Waste Advisory Committee (SWAC) stated in the memorandum to the Board of Directors, dated November 29, 2001, that the project will not create a significant impact on the air quality of the area. While the NOx emissions increase, the VOCs and Particular Matter emissions show decreases from the estimated levels for flare burning.

Table F-2. Estimated Emissions of Deutz Engines and those of Flare Burning at the Tessman Rd LFG Power Plant.

Pollutant	Deutz Engine : 6 Engines (tons/day)	Flame Burning Equivalent to 6 Engines (tons/day)
NOx	0.179	0.065
CO	0.596	0.352
VOC	0.049	0.073
PM	0.027	0.055

Toyota Facility

Toyota proposed to build the plant in two phases. Estimates from plant construction emissions are not included. The emissions discussed in this appendix are from operation of the plant only.¹⁶

Phase 1 - Emission estimations from production for period beginning with Start of Production (SOP) in 2006 until Phase 2 SOP:

- VOC = 5 tons/day * 250 days/yr. = 1250 tons per year (Emissions mainly from painting, cleaning, sealers, adhesives, & Natural Gas Combustion.)
- NOx = 0.34 tons/day * 365 days/yr. = 125 tons per year (Emissions mainly from Nat. Gas boilers/space heaters/misc. process heating; this rate is a maximum and will decrease in the summer months.)
- CO = 0.2 tons/day * 365 days/yr. = 73 tons per year (Emissions from same Nat. Gas sources listed above.)
- SO₂ = 1-2 TPY (Emissions from same emitters as Nat. Gas sources listed above.)
- PM = 0.16 tons/day * 250 days/yr. = 40 tons per year (Emissions mainly from combustion, painting, and welding.)

Phase 2 - Production estimation following Phase 2 SOP beginning between 2008-2010. All emissions are projected to double with Phase 2 SOP.

¹⁶ Toyota Motor Manufacturer North America (TMMNA), November 18, 2002.

Table F-3. Photochemical Model Jobs & Files for 2007 EI Development of Point Sources.

Counties/Region	Job Script	Input Files	Description
Regional		lo_pt.grdem.Aug30.reg_12km.reg_egu_hdd2007_noTX lo_pt.grdem.Aug30.reg_12km.reg_negu_hdd2007_noTX pstpnt.out.Aug30.reg_12km.reg_egu_hdd2007_noTX pstpnt.out.Aug30.reg_12km.reg_negu_hdd2007_noTX	HDD EI: Two top files are for low level emissions (<30m above the ground). Two bottom files are for high level emissions (>30m above the ground).
Texas Counties	pts.TX_egus.2007.v15b	tceq_egu_2007_02102004.afs	TCEQ processing emissions data for S and PO. ¹⁷
		control.07TX-HG_egu	SB7 and Ch. 117 NOx rules for EGUs in TX outside of HGA.
		control.HG_NOxCap_EGU	Houston/Galveston 8-county EGUs to the levels of the 2007 & 2010 NOx Cap (MECT), 88% EGU NOx reduction from 2000.
		control.austin_egu	Austin Area NOx control factors for facility specific value. ¹⁸
	pts.TX_new_egus.2007.v15b	afs.hgmcr2004.new_egu_TX.lcp.austin	TCEQ processing of Texas S and PO NEW EGU 2007 point sources. (Original file: afs.hgmcr2004.new_egu_TX.lcp ¹⁹). ^{20*}
	mrguam.pts.nna4km.2007	emiss.pt.TX_negu.008030.2007.v15b emiss.pt.TXnna4km_minorpts.99po.xxx emiss.pt.TXnna4km_offshore.xxx emiss.pt.hrly_egu.000830.2007.v15b	Merging point sources in NNA Texas 4km modeling domain. Elevated CPS emissions not merged. Offshore emissions were not increased.
	pts.TX_egus.2007.v15b ²¹	tceq_egu_2007_02102004.afs	Processing of Texas 2007 S and PO for existing EGUs.
	pts.TX_negu.2007.v15b	afs.tx_negu.agg_re.000818-000906.v15b.3pols.lcp	TCEQ processing of Non-EGUs. ²²
control.00-07.DFW.NEGU.NOx		Cntlem package for DFW NEGUs.	

¹⁷ Ron Thomas & Gabriel Cantu (TCEQ), 2/9/04.

¹⁸ Thomas Pavlovic (UT Austin), 02/11/04.

¹⁹ Ron Thomas & Gabriel Cantu (TCEQ), 2/9/04.

²⁰ Email: from Gary McGaughey (UT Austin) received 02/12/04, "2007 TX pt source data and jobs."

²¹ Ron Thomas and Gabriel Cantu (TCEQ) 02/06/2004

²² Email: from Gary McGaughey (UT Austin) received 02/12/04, "2007 TX pt source data and jobs." Input data received from Ron Thomas and Gabriel Cantu 02/06/2004

Texas Counties	pts.TX_negu.2007.v15b (continued)	control.2007.BPA.NEGU	Includes survey results and BPA NOx emission factors, Chapter 117 limitations to obtain 2000-2007 control factors.
		control.HG_07NOxCap_NEGU	HGA 8-co NEGUs to the levels of the 2007 NOx a 52% reduction from 2000.
		TIPIEGASGrowthFactors00to07	Project from 2000 to 2007 using TIPI factors, EGAS where TIPI data was unavailable.
		AgreedOrdersControlFactors00to07	This packet controls emissions according to Agreed Orders from 2000 emissions to 2007.
		ctl.alco	Control factors set to provide 28.50 TCEQ tpd to 26.66 tpd. ²³
		ctl.lehigh	NOx control factors to revise Lehigh Cement Kiln. ²⁴
Bexar County	afs.toyota	afs.toyota.2007	Process of the afs (geo-coded) for Toyota Phase1.
	afs.tessman	afs.tessman.2007	Process of the afs (geo-coded) emissions from Tessman Road LFG Power Station.
Regional	mrguam.pts.all_reg.2007	emiss.pt.hrly_egu.000830.2007.v15b emiss.pt.hrly_new_egu.000830.2007.v15b emiss.pt.TX_negu.008030.2007.v15b emiss.pt.TX_offshore.xxx lo_pt.grdem.Aug30.reg_12km.reg_egu_hdd2007_noTX lo_pt.grdem.Aug30.reg_12km.reg_negu_hdd2007_noTX	Regional low- level point sources where developed by TCEQ. ²⁵

*The input afs file is the originals TCEQ file with NOx emissions for AE Sand Hills multiplied by factor of 1.0798 to bring the total from the TCEQ value of 0.9502 tpd to 1.0260 tpd. (Thomas Pavlovik, 2/11/04).

²³ Email: from Thomas 02/12/2004.

²⁴ Email: from Gary McGaughey (UT Austin), received 02/12/04, "2007 TX pt source data and jobs." Original data supplied by Bill Gill (CAPCO).

²⁵ Email: from Ronald Thomas (TCEQ), received 01/12/04, "Updated 2007 HDD points."

AREA SOURCE EMISSIONS FOR 2007 PROJECTION

Regional

Area emissions for states outside of Texas, but within the 36-km grid modeling domain, were projected to 2007. The Heavy Duty Diesel Emissions Inventory²⁶ (HDD EI) was used for emissions outside of the state of Texas.

San Antonio Region

Area source emission projections were calculated for 2007 using the Economic Growth Analysis System (E-GAS) model, with the exception of area source population based emissions. EPA endorses the use of E-GAS when emission growth estimates for area source are not readily obtainable by conducting surveys or tapping other local sources. E-GAS generates surrogate growth indicators via the following information [Pechan, 2001]:

Constant dollar output/value added estimates for 172 economic sectors;
Physical output estimates, such as gasoline consumption, for some major emitting source categories;

Estimates of energy consumption by fuel type;
Population; and

Personal consumption expenditures for gasoline and oil

Using EGAS, the 2007 projected emissions were figured as follows:

$$\begin{array}{rcccl} \text{x.xxxx tons/yr. (2007} & = & \text{y.yyyy (Adjusted} & \times & \text{z.zzzz tons/yr.} \\ \text{VOC Emissions)} & & \text{EGAS Growth} & & \text{(1999 VOC Emissions)} \\ & & \text{Factor for 2007)} & & \end{array}$$

The EGAS model supplied growth factors for projecting of all area source emissions except Architectural Surface Coatings and Consumer/Commercial Solvents. For these categories, population base projection methodology was used. The emissions were multiplied by the percent increase in population between 1999 and 2007.

Modeling performed by AACOG accounted for the State's Stage I Vapor Recovery Rule. The rule requires vapor recovery equipment for large retail gasoline outlets and bulk terminals.²⁷ A methodology for modeling the state low NOx water heater regulation, slated for implementation in 2002, has not yet been determined for this area. Therefore, this rule has not been included in the 2007 base case. It is anticipated that the low NOx water heater rule will have little affect on ozone levels in the San Antonio EAC Region (SAER).

Several state regulations were also accounted for in the development of the projected area source emissions as directed by TCEQ. Rate of Progress control factors (ENVIRON) were used for several area sources in developing the 2007 projections. The controls account for reduced pollutant emissions by improved future techniques and/or regulations. The following list details the categories subject to the rate of progress control factors:

LUST
Architectural Coatings
Traffic Markings
High Performance Maintenance

²⁶ Email from R. Thomas.

²⁷ Available online: <http://tnrcc.state.tx.us/exec/media/press/o6-99cleangas.html>

Other Specific Purpose Coatings

Another regulation is the Regulation V Rule which affects only “Factory Finished Wood” in the “Surface Coatings” subcategory. The emissions were ensured to reflect an emission reduction by 99%.

Degreasing

The reductions applied to degreasing equipment are based on the Texas Administrative Code (TAC) Chapter 106 and 115. The emission reductions of 85% apply only to the growth from 1999 to 2007. This calculated to a 5.128 tons/day reduction which is 30.52% of the 2007 base case emissions. Appendix I of this SIP covers the degreasing control strategy in more detail.

Table F-4. Photochemical Model Jobs & Files for 2007 EI Development of Area Sources.

Region	Job Script	Input Files	Description
Regional (outside Texas)		emiss.ar.regional.hdd.fy07.xxx	Processing of emission files. ²⁸
Regional	mrguam.ar.all_reg.07po	emiss.ar.reg_tx.net07.02062004.xxx emiss.nr.reg_tx.net07.02062004.xxx emiss.ar.regional.hdd.fy07.xxx emiss.offr.regional.NonRoad.fy07.xxx emiss.offr.reg_hdd_nonNR.fy07.xxx	Merges Area and Non-road emissions for the Regional Grid in 2007. Includes updated regional HDD (non-Texas) emissions for 2007.
Texas counties	ar.reg_tx.eps2.2007.02062004	ams.TX_07.area07_b3	Process of the regional area source inside of Texas. Input: TCEQ 2007 Area Source Updates, Feb. 2004, received from Jim Mackay.
AACOG 12-County Region	ar.sa.07	ams.aacog.area.b	Process of the ams non-population based.
		ctl.aacog.area.egas	Project with EGAS growth factors (PECHAN).
		ctl.aacog.area.pop	Zero-out population-based emissions.
		ctl.aacog.area.rop	Rate of progress controls.
		ctl.stage1_125.aacog	Accounts for Stage I reductions.
	ar.sa.pop.07	ams.aacog.area.2007	Processing of the ams population based.
		ctl.aacog.area.rop	Rate of progress controls.
	afsar.sa.07	afs.capco.aacog.area	Process of the afs (geo-coded) with local data for 2007. No CAPCO (1999 AACOG EI).
		ctl.aacog.area.egas	Non-population-based area sources projected with EGAS growth factors (PECHAN).
		ctl.aacog.area.rop	Rate of progress controls. ²⁹
		ctl.stage1_125.aacog	Stage1 controls at 125,000 gallons or more throughput.
		ctl.degreasing.eq.2007	Degreasing reductions applied to growth from 1999 to 2007 only.
ctl.aacog.obvr.0709xxx		OBVR controls (4 county San Antonio EAC region) based on Mobile6 database.	

²⁸ Email: from Gary McGaughey (UT Austin), received 02/16/04, "RE: 2007 TX pt source data and jobs," containing TCEQ 2007 Nonroad Source Updates (02/04) from Jim Mackay, located at ftp://ftp.tnrc.state.tx.us/pub/OEPAA/TAD/Modeling/file_transfer/TxareaNR/files

²⁹ Package to apply Rate of Progress (ROP) Controls, prepared by Steven Smeltzer, June. 17, 2003, AACOG. Also applying ROP controls seven area source categories in the San Antonio 4 county area prepared by ENVIRON, Aug. 28, 2001

Austin 5-county Metropolitan Statistical Area (MSA)	afsar.austin.07	2007_weekday_area_capco_02242004.afs	Process of the afs (geo-coded) area sources for Austin 5 county area with local data for 2007. ³⁰
	ar.aust.07.b	2007_weekday_area_capco_02242004_withlawn.ams	Process of the ams area sources for Austin 5 county area with local data for 2007
Corpus Christi 2-County Region	ar.cc.07	ams-area-nsp.prn	Process the area emissions with local data.
		ctl.area.regional	EGAS 4.0 Model Projection of regional EI from 1999 to 2007 (PECHAN).
Victoria 7-County Region		Vict_area_2007.ams Vct_2007_fire.ams	Emissions files provided by UT, includes local data. ³¹

³⁰ Source: Gary McGaughey (UT Austin) Feb. 24, 2004

³¹ Email: from Gary McGaughey (UT Austin), received 11/16/03.

NON-ROAD SOURCE EMISSIONS FOR 2007 PROJECTION

Non-road projected 2007 emissions for states outside of Texas, but within the 36-km grid-system modeling domain, were provided by TCEQ. The Heavy Duty Diesel Emissions Inventory (HDD EI) was used for emissions outside of the state of Texas.

AACOG Region

To project the non-road emissions for the AACOG counties, the EPA's NONROAD Model was employed. NONROAD runs were conducted for a typical summer day (weekday and weekend day) in 1999 and in 2007. A projection factor resulted from the ratio of the 1999 results to 2007 results by SCC. The factors were then applied to the 1999 emissions to form estimates for 2007. The exceptions to this are where local data was incorporated.

Diesel Construction & Quarry Equipment

The 1999 data for quarry equipment was updated with local surveys, permit data and aerial photography as described in Appendix D, 1999 Base Case Emission Inventory Development.

Tractors and Combines

The 1999 data for quarry equipment was processed separately because they were combined into one category for 2007; thus emissions could not be projected from the 1999 emissions.

Toyota Facility Non-Road Emission Estimates for 2007

Table F-5 summarizes the 2007 non-road emissions estimates for the planned Toyota production plant in Bexar County, Texas. The subsequent documentation explains the methodology in calculating the emissions.

Table F-5. 2007 Non-Road Source Emissions for Toyota Facility by SCC.

SCC	Equipment description	Est Equip Pop	NOx Emissions (tons/day)	CO Emissions (tons/day)	VOC Emissions (tons/day)
2265003020	4-Str Forklifts	2.3	0.001134	0.057436	0.002539
2267003020	LPG – Forklifts	39.6	0.083179	0.312698	0.000107
2268003020	CNG – Forklifts	4.6	0.005978	0.022539	0.000008
2270003020	Dsl – Forklifts	12.7	0.013099	0.017362	0.001344
2265003010	4-Str Aerial Lifts	4.0	0.000315	0.023246	0.000822
2267003010	LPG - Aerial Lifts	2.1	0.001034	0.003813	0.000001
2270003010	Dsl - Aerial Lifts	4.1	0.001159	0.001003	0.000239
2260003030	2-Str Sweepers/Scrubbers	0.4	0.000001	0.000106	0.000017
2265003030	4-Str Sweepers/Scrubbers	2.3	0.000237	0.019885	0.000599
2267003030	LPG - Sweepers/Scrubbers	0.7	0.000740	0.002769	0.000001
2268003030	CNG - Sweepers/Scrubbers	0.0	0.000000	0.000000	0.000000
2270003030	Dsl - Sweepers/Scrubbers	4.2	0.006187	0.004507	0.000826
2265003070	4-Str Terminal Tractors	0.7	0.000135	0.006891	0.000301
2267003070	LPG - Terminal Tractors	0.1	0.000466	0.001741	0.000001
2268003070	CNG - Terminal Tractors	0.0	0.000000	0.000000	0.000000
2260003040	2-Str Other General Industrial Eqp	0.0	0.000000	0.000000	0.000000
2265003040	4-Str Other General Industrial Eqp	9.8	0.000203	0.038259	0.001020
2267003040	LPG - Other General Industrial Eqp	0.2	0.000220	0.000826	0.000000
2268003040	CNG - Other General Industrial Eqp	0.0	0.000000	0.000000	0.000000
2270003040	Dsl - Other General Industrial Eqp	8.3	0.007399	0.002255	0.000618
2265003050	4-Str Other Material Handling Eqp	0.2	0.000025	0.001946	0.000065
2267003050	LPG - Other Material Handling Eqp	0.1	0.000055	0.000204	0.000000
2270003050	Dsl - Other Material Handling Eqp	0.6	0.000431	0.000286	0.000072
TOTAL			0.121999	0.517774	0.008580

Equipment Categories

The equipment categories chosen in this non-road emissions estimate are the same categories used in the Industrial Equipment Section of EPA’s NONROAD Model.

Equipment Populations

The first step in this process is the estimation of plant equipment populations for each equipment category. A ratio of the number of Toyota employees to the number of manufacturing employees (~SIC 20) in Texas was used to estimate the plant equipment population. The populations for each category were calculated based on the following formula:

$$\text{Equipment (Type N) Population} \times \left(\frac{\text{Toyota Plant Employees}}{\text{Industrial Workers in Texas}} \right) = \text{Equipment Population In Texas}$$

Example:

The Texas equipment population for diesel-powered forklifts was 6,227. The number of manufacturing employees in Texas was 982,205. The estimated Toyota plant

employment population is 2000. Using this information, an estimate of diesel powered forklifts for the planned Toyota Plant can be calculated as follows:

$$\begin{aligned} \text{Toyota Diesel Fork Lift Population} &= 6,227 \text{ Diesel Forklifts in Texas} \\ \text{x (2,000 Toyota Emp./ 982,205 Ind. Workers in TX.)} & \\ &= 12.68 \text{ Diesel Forklifts for Toyota} \end{aligned}$$

Emissions

A run of the NONROAD model was conducted to estimate CO, NOx, and VOC emissions for a typical weekday in the summer season 2007 for the state of Texas. A ratio of the estimated equipment population for Toyota and the equipment population of Texas was then used in the calculation of emissions. The emissions for each category were based on the following formula:

$$\begin{aligned} \text{Emissions (Tons/Day) of Equip (Type N)} &= \text{Texas Emissions} \\ \text{x (Est. Toyota Equip Population} & \\ \text{/ Texas Equip Population)} & \end{aligned}$$

Example:

$$\begin{aligned} \text{Toyota NOx Emissions of Diesel Forklifts} &= 6.4319 \text{ Texas NOx tons/day} \\ \text{x (12.68 Dsl. Toyota / 6227 Dsl. TX. Forklifts)} & \\ &= 0.0131 \text{ tons/Day of NOx} \end{aligned}$$

Houston/Galveston Region & Rural Texas Counties

The Houston/Galveston county emissions were processed with the Texas rural county files and are based on TEXAQS. There are several control-packages that account for minor adjustments to these emission files. This is the same method used in the Houston SIP. The first is the Nonroad TCAS gas controls for Texas attainment counties. The California Spark control package is for the Houston/Galveston area and applies to large construction, Industrial, commercial, & lawn and garden sources. The next control package is also for the Houston/ Galveston area and applies to gas can emission reductions. The last one is for the VMEP Plus factor any applies to Houston counties. This factor reduces the NOx by about 33 t/d and the VOCs by about 1.86 t/d from the nonroad emissions. Refer to Table F-3 for the specifics on these control packages.

Table F-6. Photochemical Model Jobs & Files for 2007 EI Development of Non-Road Sources.

Counties	Job Script	Input Files	Description
Regional (outside Texas)		emiss.offr.reg_hdd_nonNR.fy07.xxx emiss.offr.regional.NonRoad.fy07.xxx	Process emission files. ³²
Texas Counties	nr.reg_tx.eps2.2007.02062004	ams.TX_07.NR07_b4b	Process 2007 nonroad source updates (orig. 02/04 Jim Mackay). ³³
		control.nonr.att.tcas_gas.07	Nonroad TCAS gas controls for TX attainment counties.
		control.nonr.HG.CaliSpark	California Sparkplug Engines rule:lg const., ind., and comm. HDG 2/4 stk gas vehicles to get 2.8 t/d NOx, 7.58 t/d VOC. ³⁴
		control.nonr.HG.gascan	Hou./Gal. Gas-can 0.757 VOC reduction factors: 1-(0.45*0.54). ³⁵
		control.nonr.hg.VMEPplus	Voluntary Mobile Emission Reduction Program (VMEP): TERP, accelerated Tier2/Tier3 purchases, water heater rule, and stationary compression ignition (CI) engines for HGA.
Victoria 7-County Region		VCT07_NR02Ayyyyyy.VOC_TPD.ams Vict_nr.ams2007	Emission processing. Top file contains day-specific emissions data. Bottom file is average data.
Corpus Christi 2-County Region	nr.cc.07	ams-nonroad-nsp.prn	Processing of the ams emissions for non-geocoded emissions (ENVIRON).
		ctl.othercounties.nonroad	Project emissions to from 1999 to 2007 (based on Nonroad Model).
CAPCO 5-county MSA	afs_nr.aust.2007	2007_nonroad_final_capco.afs.xxx	Process the afs (geo-coded) non-road sources with local data. ³⁶
	nr.austin.07	2007_nonroad_final_capco.ams.xxx	Process the geo-coded non-road sources for Austin 5 county area with local data.
CAPCO Rural counties	nr.capco.07	ams.capco.nonroad.b	Processing of the ams emissions with local data (CAPCO EI)
CAPCO Rural counties	nr.capco.07	ctl.othercounties.nonroad	Project emissions from 1999 to 2007 (Nonroad Model based). Cntlem Package to update Non-Road Sources for all Texas counties with Non-Road Model, 2000
AACOG 12-County Region	afs.toyota	afs.toyota.2007	Process of the afs (geo-coded) non-road and area sources for Toyota Phase1. ³⁷

³² Email: from Gary McGaughey (UT Austin) received 02/16/04, "RE: 2007 TX pt source data and jobs," containing TCEQ 2007 Nonroad Source Updates (02/04) from Jim Mackay, located at ftp://ftp.tnrcc.state.tx.us/pub/OEPAA/TAD/Modeling/file_transfer/TxareaNR/files

³³ Email: from Alba Webb (UT Austin) received 02/12/04, "RE: 2007 TX pt source data and jobs."

³⁴ Alison Pollack (TCEQ) information, 07/10/00.

³⁵ Karla (TCEQ), received 01/21/03.

³⁶ Email: from Gary McGaughey (UT Austin) received 01/26/04, "RE: Area and Nonroad ams/afs and cntlem files."

AACOG 12-County Region	afs_nr.sa.2007	afs.nonroad.capco.aacog.a	Processing of the afs (geo-coded) emissions with local data.
		ctl.zero.austin	Remove Austin emissions (in different job script.)
		ctl.construction.99	Adjust diesel construction equipment emissions for recalculation of equipment population.
		ctl.aacog.nonroad	Project emissions from 1999 to 2007 with the Nonroad Model.
		ctl.aacog	Cntlem Package to update Non-Road Sources in the regional area with Non-Road Model & Railroad Equipment.
	afs.quarry.2007	afs.quarry.aacog	Processing of the afs (geo-coded) quarry emission with 2007 local data.
		ctl.aacog.nonroad	Project emissions from 1999 to 2007 with the Nonroad Model.
	afs_tractor.combine.sa.07	afs.tractors_combines.sa	Processing of the geo-coded emission sources with local data.
		ctl.aacog.nonroad	Project emissions from 1999 to 2007 with the Nonroad Model.
	nr.sa.07	ams.aacog.nonroad.b	Processing of the ams emissions with local data.
		ctl.construction.99	Adjust diesel construction equipment emissions for recalculation of equipment population.
		ctl.aacog.nonroad	Project emissions from 1999 to 2007 with the Nonroad Model.
	tractors_combines.s.a.2007	ams.tractors_combines.sa	Processing of the ams emissions for the non-geocoded emissions.
		ctl.aacog.nonroad	Project emissions from 1999 to 2007 with the Nonroad Model.

³⁷ The area sources are based on permitted values provided by Toyota , and non-road sources are based on employment data and the Non-road Model 2002 version 2.2.0 (industrial equipment - SIC Code 20).

Table F-7. 2007 Emissions by Source Category for Texas for Sept. 13 (Monday)

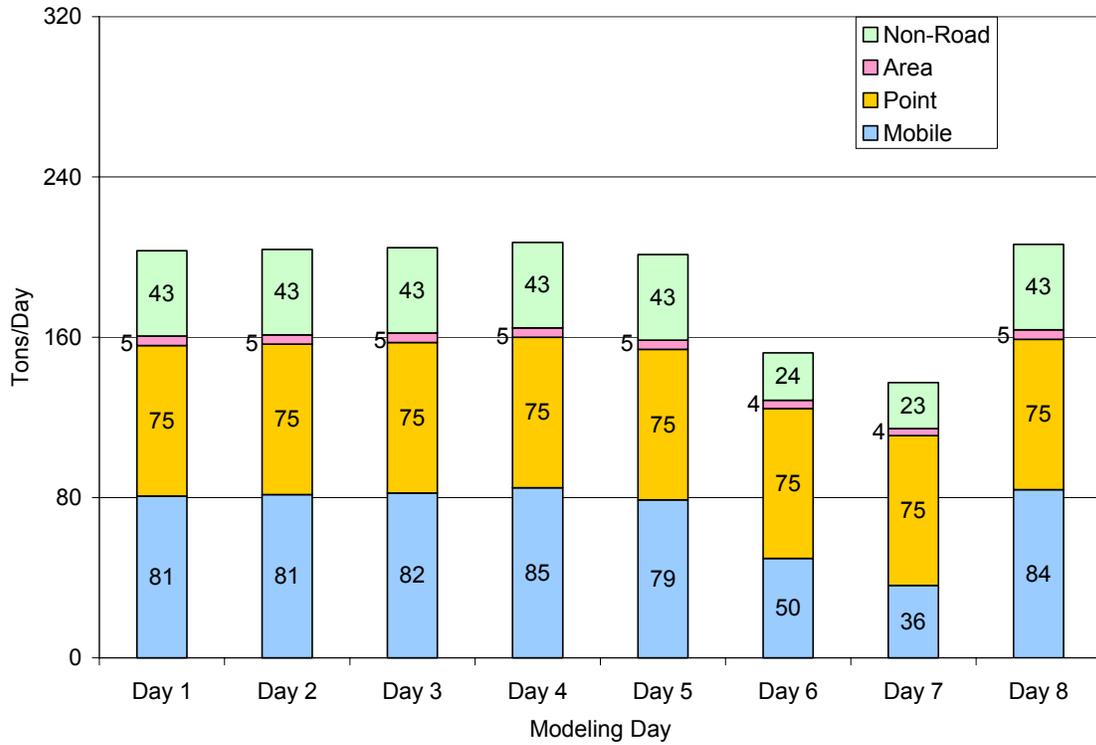
County FIPS Code	Non-Road Emissions		Area Emissions		Mobile Emissions		Point Emissions	
	NOx	VOC	NOx	VOC	NOx	VOC	NOx	VOC
48001	3.8	0.5	0.5	6.3	2.0	1.5	2.4	1.3
48005	1.9	2.3	0.3	6.5	4.8	2.3	6.1	10.5
48007	0.8	4.9	0.3	1.5	0.7	0.4	1.1	0.8
48009	0.5	0.4	0.2	15.9	0.7	0.5	0.0	0.0
48011	0.4	0.0	0.0	0.1	0.2	0.1	0.0	0.0
48015	5.9	0.7	1.1	3.5	3.3	1.0	0.1	1.2
48023	0.7	0.5	0.3	2.2	0.4	0.2	0.0	0.0
48025	0.7	0.2	1.3	8.6	1.2	0.6	1.4	0.0
48027	10.5	3.2	0.7	16.0	11.6	6.1	0.4	2.8
48033	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
48035	4.8	1.2	0.1	1.8	0.7	0.5	5.7	0.2
48037	6.8	1.6	0.3	7.9	8.6	3.5	0.6	1.9
48039	6.9	4.7	5.0	15.1	6.2	3.4	33.3	23.4
48041	3.5	2.2	1.0	11.7	6.5	3.2	4.0	0.2
48045	0.1	0.0	0.0	0.5	0.1	0.0	0.0	0.0
48047	0.2	0.7	1.5	2.4	0.8	0.6	2.0	1.0
48049	1.6	1.1	2.7	10.2	1.8	1.2	0.5	1.7
48051	4.4	0.5	0.7	6.5	1.1	0.5	2.0	0.9
48059	3.2	0.2	0.5	5.5	3.2	0.9	0.6	0.1
48061	7.0	10.7	0.8	18.5	8.8	7.7	2.5	2.3
48063	1.8	0.8	0.0	1.2	0.6	0.3	0.0	0.0
48065	2.3	0.1	0.7	2.7	0.5	0.2	1.4	0.3
48067	5.7	1.1	0.3	3.8	2.1	1.2	6.4	8.7
48071	0.9	2.9	6.2	5.2	3.8	1.8	8.2	11.0
48073	3.6	0.6	0.6	5.7	2.1	1.5	7.4	0.7
48075	2.3	0.2	0.1	1.4	0.9	0.4	0.0	0.0
48077	2.2	0.5	0.3	6.4	1.7	1.1	0.6	0.2
48081	0.1	0.4	0.2	1.7	0.3	0.2	3.1	0.5
48083	1.3	0.3	1.7	5.9	0.7	0.5	0.3	0.0
48085	20.3	6.2	2.3	15.8	16.0	8.8	3.1	1.4
48087	0.5	0.1	1.5	2.7	0.2	0.1	0.0	0.0
48089	1.9	1.0	1.1	3.5	4.5	1.2	2.3	1.4
48093	0.8	0.3	0.7	2.8	0.9	0.6	0.0	0.0
48095	0.5	0.4	0.2	2.0	0.4	0.3	0.1	0.0
48097	3.1	1.3	0.3	11.0	3.1	1.7	0.0	0.2
48099	1.0	0.3	0.2	3.6	1.4	1.2	0.0	0.3
48101	0.3	0.1	0.2	0.9	0.2	0.1	0.0	0.0
48105	0.1	0.4	16.9	23.0	1.6	0.5	0.6	0.0
48107	0.2	0.0	0.0	1.0	0.1	0.1	0.0	0.0
48113	62.9	29.3	17.8	73.6	89.4	44.9	14.3	13.2
48119	0.2	0.0	0.0	0.7	0.4	0.2	0.0	0.0
48121	9.6	5.1	2.5	19.0	14.8	7.8	2.0	1.9
48125	0.3	0.1	0.0	1.2	0.3	0.1	0.0	0.0
48127	0.1	0.1	0.6	3.1	0.5	0.3	0.6	0.1
48129	2.5	0.8	0.0	0.8	1.3	0.5	0.0	0.0
48131	0.9	0.1	2.1	6.3	0.7	0.5	1.1	1.7

48133	3.3	0.4	3.9	8.7	4.1	1.1	1.2	0.6
48137	0.0	0.0	1.5	2.2	0.1	0.1	5.1	1.9
48139	11.2	2.2	0.3	10.3	6.3	3.0	39.1	5.7
48143	0.8	0.6	1.1	4.7	1.7	1.0	0.6	0.3
48145	3.7	0.3	0.1	2.4	1.0	0.6	0.0	0.0
48147	1.1	0.4	0.3	3.9	1.5	0.9	16.5	0.4
48151	2.0	0.2	0.1	3.0	0.3	0.2	0.4	0.1
48153	0.3	0.0	0.0	0.5	0.1	0.1	0.0	0.0
48155	0.3	0.1	0.3	1.2	0.2	0.1	0.0	0.0
48157	6.5	2.9	1.7	14.6	9.4	4.8	16.0	3.5
48159	0.4	0.5	0.2	1.7	1.1	0.5	0.5	0.2
48161	2.3	0.3	3.8	7.6	3.2	1.1	45.0	5.1
48167	4.3	9.2	4.3	12.1	5.7	3.3	24.4	37.3
48169	0.4	0.0	0.0	1.9	0.2	0.1	0.0	0.0
48177	2.2	0.8	0.1	2.8	2.8	0.9	0.0	0.4
48179	3.3	0.4	4.4	15.4	2.1	1.0	18.5	8.8
48181	7.3	2.9	0.7	13.4	7.3	3.8	1.5	0.2
48183	5.0	1.3	2.5	18.8	6.3	3.3	9.8	4.3
48185	7.5	0.7	1.1	3.1	1.5	0.7	24.9	1.5
48191	1.5	0.2	0.0	1.2	0.5	0.2	0.0	0.0
48193	0.4	0.1	0.1	1.3	0.4	0.3	0.0	0.0
48195	0.4	0.1	1.1	1.9	0.1	0.1	2.0	0.2
48197	2.7	0.2	0.2	2.1	0.8	0.4	0.4	0.1
48199	2.7	0.4	0.5	4.8	2.2	1.3	1.3	1.9
48201	51.7	26.6	20.6	115.7	96.9	57.5	84.3	142.6
48203	5.1	1.3	2.7	10.9	9.6	2.8	34.0	20.1
48207	1.2	0.3	0.2	3.3	0.5	0.3	3.2	0.1
48211	3.5	0.2	5.2	5.9	0.4	0.2	7.7	2.0
48213	3.6	2.1	1.1	8.0	2.9	2.0	6.5	0.7
48215	13.9	12.7	6.1	32.8	16.0	14.3	8.5	2.8
48217	5.8	1.4	0.2	4.6	4.4	1.8	0.0	0.2
48221	0.7	0.4	1.1	3.1	1.4	0.8	20.5	0.7
48223	1.9	0.7	0.1	4.2	3.6	1.6	1.0	0.1
48225	2.2	0.9	0.2	2.8	1.3	0.6	0.0	1.9
48227	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
48231	2.5	2.0	0.3	9.6	5.8	2.8	0.3	0.1
48233	0.1	0.0	0.8	3.7	0.2	0.1	0.0	0.0
48235	0.1	0.0	0.8	5.4	0.2	0.1	1.2	0.3
48237	0.1	0.1	4.6	11.4	0.5	0.3	2.9	1.5
48241	5.3	1.2	0.3	3.0	1.9	1.2	7.3	3.0
48245	7.3	4.9	8.4	18.0	13.4	6.6	65.5	66.9
48247	0.1	0.3	0.7	1.5	0.2	0.2	0.7	0.1
48249	1.8	0.4	1.4	5.0	2.3	1.2	5.0	1.5
48251	7.5	1.0	0.3	8.7	4.6	2.5	5.7	0.8
48253	1.2	0.3	0.1	5.0	1.3	0.7	3.0	0.1
48257	3.9	1.0	0.2	10.7	4.9	2.6	10.5	2.3
48261	1.7	5.4	0.4	1.3	0.7	0.5	1.5	0.7
48263	0.1	0.0	0.0	1.7	0.1	0.1	2.6	0.2
48267	0.1	1.0	0.0	0.8	1.8	0.5	0.1	0.0

48269	0.1	0.0	0.2	1.9	0.2	0.1	0.0	0.0
48271	2.6	0.1	0.0	0.3	0.3	0.2	0.0	0.0
48273	1.4	2.9	1.1	4.1	1.5	0.9	9.2	2.4
48275	0.9	0.2	0.3	2.6	0.3	0.2	0.0	0.0
48277	6.0	1.1	0.2	6.7	2.4	1.5	6.3	1.2
48281	1.1	0.2	0.0	1.4	1.0	0.6	0.0	0.0
48283	1.1	0.5	0.9	2.4	1.4	0.6	0.0	0.0
48289	3.8	0.3	1.1	3.8	2.8	1.0	0.8	0.3
48291	3.1	1.0	0.5	5.5	2.8	1.6	4.3	2.4
48293	3.0	0.6	1.3	4.6	0.8	0.6	34.4	0.9
48295	1.6	0.1	3.8	5.5	0.2	0.1	1.1	0.1
48297	3.9	1.4	1.3	3.4	1.8	0.9	2.8	3.5
48307	1.0	0.2	0.2	2.0	0.6	0.4	0.0	0.0
48309	8.7	4.0	0.6	16.7	11.8	6.0	35.7	0.7
48311	1.0	0.4	2.4	4.6	0.1	0.1	0.5	0.3
48313	0.4	0.1	0.2	1.6	1.8	0.6	0.4	0.0
48315	1.6	0.6	0.3	1.7	0.6	0.4	7.0	0.9
48319	0.1	0.3	0.0	0.6	0.2	0.2	0.0	0.0
48321	7.7	6.4	1.2	6.2	1.8	0.9	8.5	1.3
48323	0.4	0.6	0.4	3.6	1.4	0.9	0.1	0.0
48327	0.1	0.0	0.0	0.7	0.3	0.2	0.0	0.0
48331	6.8	0.5	0.1	7.8	1.5	0.8	13.2	0.2
48333	0.9	0.1	0.0	0.9	0.5	0.3	0.0	0.0
48335	0.9	0.2	0.0	8.3	1.9	0.5	22.9	0.4
48337	3.7	0.7	0.3	9.4	1.3	0.9	0.3	0.9
48339	4.3	3.4	1.8	12.8	11.8	6.0	4.6	3.4
48343	1.4	0.5	0.0	1.8	1.2	0.5	0.5	0.4
48345	0.3	0.0	0.0	0.8	0.2	0.1	0.0	0.0
48347	1.3	1.2	0.9	7.2	3.8	1.8	2.8	5.6
48349	4.9	1.3	0.2	8.5	3.0	1.5	5.4	2.6
48351	0.5	0.5	0.2	1.8	0.7	0.5	4.2	3.1
48353	2.8	0.3	0.3	4.6	2.9	0.9	7.5	0.4
48355	54.5	22.7	0.9	49.8	14.0	8.3	78.1	29.7
48357	1.8	0.3	3.8	7.9	0.6	0.3	3.2	0.3
48361	4.1	1.5	0.5	3.9	5.9	2.5	42.5	16.7
48363	3.6	1.6	5.7	9.6	1.6	0.9	6.1	0.6
48365	1.7	1.1	8.0	13.3	2.0	1.1	13.0	4.1
48367	4.3	1.1	3.9	8.9	4.5	2.3	6.9	1.1
48373	0.8	2.1	0.5	3.8	3.4	1.6	2.5	6.2
48379	0.2	0.7	0.1	0.7	0.6	0.3	0.2	0.0
48385	0.1	0.6	0.0	0.4	0.2	0.1	0.0	0.0
48387	0.6	0.2	0.0	2.0	0.8	0.5	2.2	0.0
48391	3.1	1.1	1.6	5.2	1.2	0.6	5.0	2.9
48393	2.1	0.1	2.4	3.2	0.2	0.1	0.6	0.0
48395	6.9	0.5	0.4	2.5	1.3	0.6	6.9	0.8
48397	1.3	0.7	0.1	2.5	2.2	1.1	0.0	0.0
48399	1.2	0.3	0.2	4.7	0.6	0.4	0.2	0.1
48401	4.9	1.1	4.7	8.4	2.2	1.5	62.9	3.4
48403	1.5	2.1	0.0	1.0	0.7	0.3	0.2	1.0

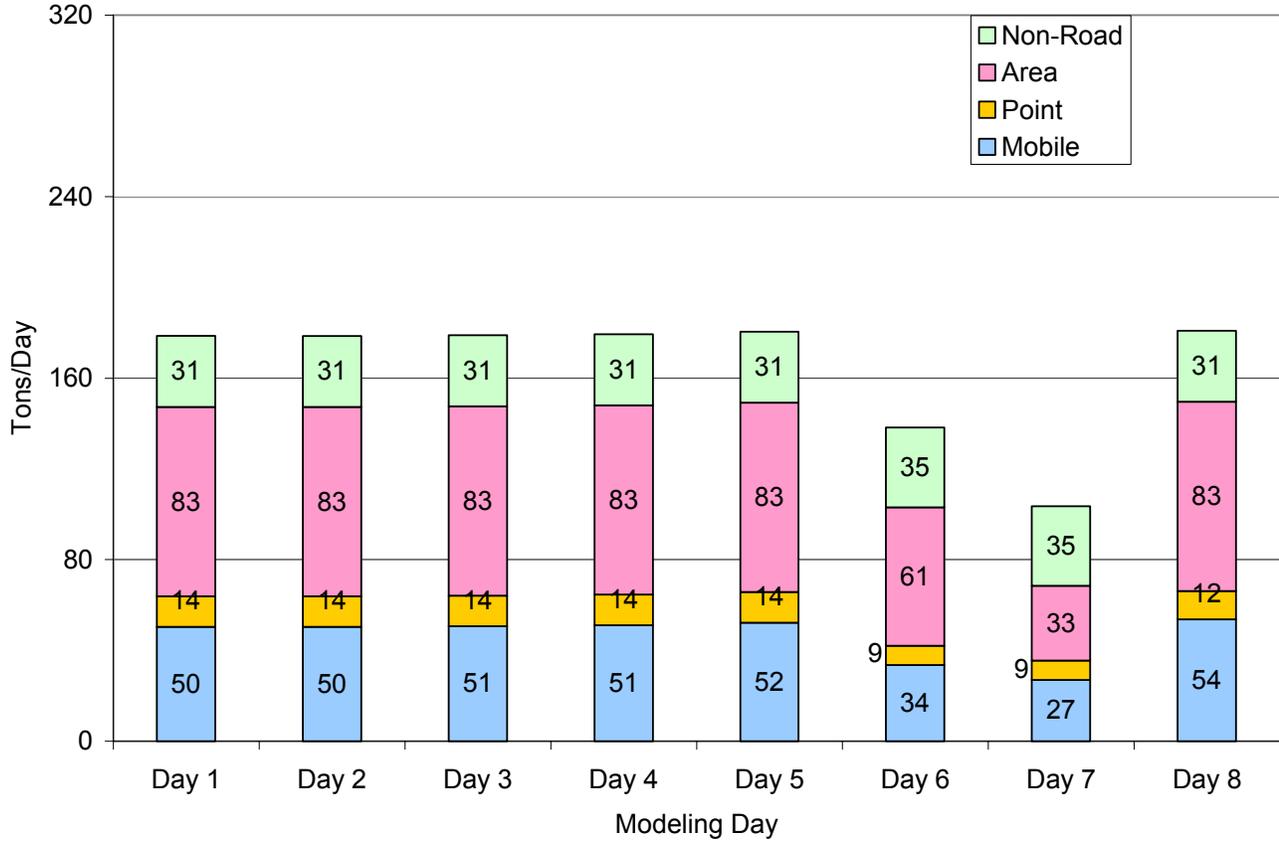
48405	1.2	0.9	0.0	0.8	0.6	0.3	0.0	0.0
48407	0.2	0.8	0.2	1.5	1.6	0.7	0.0	0.0
48409	21.7	16.0	0.2	16.2	3.5	2.0	12.2	1.4
48411	0.3	0.4	0.0	0.9	0.3	0.2	0.0	0.0
48413	0.2	0.0	2.5	3.8	0.2	0.1	0.9	0.2
48415	3.8	0.4	0.1	10.5	1.3	0.7	4.5	1.8
48417	0.3	0.1	0.9	8.8	0.4	0.2	1.1	0.2
48419	2.1	0.7	0.9	3.7	1.7	0.7	0.5	0.0
48423	6.5	2.5	1.0	13.7	10.8	6.2	4.1	9.3
48425	0.2	1.0	0.0	0.5	0.4	0.2	0.0	0.0
48427	1.0	0.3	4.2	7.3	1.5	1.3	4.8	0.5
48429	0.7	0.5	2.9	8.0	0.5	0.3	0.2	0.1
48431	0.1	0.0	2.4	6.5	0.3	0.2	0.0	0.0
48433	0.3	0.1	0.0	2.9	0.2	0.1	0.0	0.0
48435	0.1	0.1	13.1	12.8	1.8	0.5	5.3	1.1
48439	52.3	18.0	9.0	58.1	63.2	31.4	9.9	10.0
48441	6.0	2.9	0.5	14.9	9.7	4.3	0.1	1.4
48447	0.4	0.1	0.3	4.5	0.1	0.1	0.0	0.0
48449	1.7	0.8	0.1	3.1	3.1	1.2	73.6	1.5
48451	2.6	1.9	0.6	11.6	5.1	2.6	2.0	0.1
48455	1.2	1.9	0.0	1.1	0.7	0.3	0.7	0.4
48457	0.2	0.8	0.1	2.0	0.8	0.5	0.0	0.0
48459	3.6	0.4	3.2	9.5	1.6	1.0	0.8	0.6
48463	4.5	2.2	0.1	2.6	1.1	0.9	0.0	0.0
48465	2.0	2.0	0.7	3.3	1.4	0.8	0.0	0.0
48467	3.1	0.5	0.3	5.3	4.5	2.3	0.9	0.9
48471	2.0	1.1	0.2	3.4	4.5	1.7	0.1	1.2
48473	2.2	1.2	0.4	2.0	1.1	1.2	2.6	0.7
48477	2.3	1.6	0.7	4.4	2.1	1.0	0.0	0.0
48479	4.2	2.3	12.7	22.6	6.9	4.4	2.7	0.2
48481	2.6	0.8	2.0	7.9	2.9	1.4	3.6	1.8
48483	0.6	0.1	3.3	5.6	2.6	0.6	0.9	0.0
48485	3.4	1.3	0.7	33.3	6.6	4.3	20.7	6.8
48487	2.9	0.4	0.5	6.1	1.4	0.9	17.7	0.2
48489	2.0	2.3	0.2	3.0	0.7	0.6	0.3	0.1
48497	5.6	1.0	13.0	18.4	3.1	1.9	8.3	2.2
48499	2.8	2.4	0.4	5.3	1.3	1.0	0.0	0.0
48503	0.8	0.6	1.3	14.0	0.8	0.5	13.1	1.5
48505	0.3	1.8	8.3	8.4	0.6	0.5	0.8	0.2
48507	0.3	0.1	0.5	2.7	0.6	0.4	0.0	0.0

Figure F-1. 2007 Estimated NOx Emissions in Tons/Day for the San Antonio EAC Region during the September Episode.



Modeling Day	Mobile	Point	Area	Non-Road	Total
Day 1	80.8	75.1	4.7	42.6	203.2
Day 2	81.5	75.1	4.7	42.6	203.9
Day 3	82.3	75.1	4.7	42.6	204.7
Day 4	85.0	75.1	4.7	42.6	207.4
Day 5	78.9	75.1	4.7	42.6	201.3
Day 6	49.7	74.7	4.1	23.7	152.2
Day 7	36.2	74.7	3.5	23.0	137.4
Day 8	84.0	75.1	4.7	42.6	206.4

Figure F-2. 2007 Estimated VOC Emissions in Tons/Day for the San Antonio EAC Region during the September Episode.



Modeling Day	Mobile	Point	Area	Non-Road	Total
Day 1	50.4	13.5	83.4	31.3	178.6
Day 2	50.3	13.5	83.4	31.3	178.6
Day 3	50.7	13.5	83.4	31.3	178.9
Day 4	51.1	13.5	83.4	31.3	179.4
Day 5	52.2	13.5	83.4	31.3	180.5
Day 6	33.5	8.5	61.0	35.2	138.2
Day 7	26.9	8.5	33.0	35.0	103.5
Day 8	53.7	12.5	83.4	31.3	180.9

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