REVISIONS TO THE STATE IMPLEMENTATION PLAN (SIP) FOR THE CONTROL OF OZONE AIR POLLUTION

5 PERCENT INCREMENT OF PROGRESS DEMONSTRATION DALLAS-FORT WORTH OZONE NONATTAINMENT AREA 8-HOUR OZONE STANDARD

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PROJECT NO. 2004-096-SIP-AI

Adopted
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EXECUTIVE SUMMARY

On April 15, 2004, EPA designated several counties in the North Texas area as nonattainment for the 8-hour ozone standard. Those counties are: Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall and Tarrant. The 9-county DFW area was classified as moderate for the 8-hour ozone standard and must attain the 8-hour NAAQS by June 15, 2010. In accordance with the EPA's 8-hour ozone rule, the area should monitor attainment in the ozone season of the year prior to 2010.

On April 30, 2004, EPA promulgated its Phase I 8-Hour Implementation Rule. In 40 CFR § 51.905(a)(ii) and subsequent guidance, EPA provided three options for areas without an approved 1-hour ozone attainment plan:

A) Submit a 1-hour ozone attainment demonstration no later than one year after designation (by June 15, 2005);
B) Submit an 8-hour ozone plan no later than one year after designation (by June 15, 2005) that provides a 5 percent increment of progress from the area's 2002 emissions baseline that are in addition to federal measures and state measures already approved by EPA, and to achieve these reductions by June 15, 2007; or
C) Submit an 8-hour ozone attainment demonstration by June 15, 2005.

This SIP revision contains information and control measures to meet option B, which represents the best path forward for the DFW area at the present time. In light of EPA's pending revocation of the 1-hour ozone standard in June 2005, the agency's resources should be focused on the more protective 8-hour ozone standard. The TCEQ is evaluating the performance of the DFW photochemical model to determine the viability of the 1999 episode for the development of local control strategies. Furthermore, a 2007 projected Ozone Season Day inventory demonstrates a downward trend of emissions. For these reasons, the commission, in coordination with EPA,selected option B, the 5 Percent Increment of Progress (IOP) plan, as a technically sound and expeditious approach to starting to achieve the reductions ultimately needed for attainment of the 8-hour ozone standard.

This revision contains several elements:

- 2002 Periodic Emissions Inventory (PEI) for the 9-county DFW ozone nonattainment area;
- An IOP plan that achieves a 5 percent reduction in emissions from the 2002 emissions inventory baseline;
- Control measures that achieve the necessary NO_x and VOC emission reductions;
- Rules and programs necessary to implement the 5 percent IOP control measures; and
- Motor vehicle emissions budgets (MVEBs) for use in transportation conformity demonstrations.

EMISSIONS INVENTORY

The 1990 Amendments to the FCAA require that emissions inventories (EIs) be prepared for ozone nonattainment areas. Because ozone is photochemically produced in the atmosphere when VOCs are mixed with NO_X in the presence of sunlight, the commission must compile information on the important

sources of these precursor pollutants. The EI identifies the source types present in an area, the amount of each pollutant emitted, and the types of processes and control devices employed at each plant or source category. The EI provides data for a variety of air quality planning tasks, including establishing baseline emission levels, calculating reduction targets, control strategy development for achieving the required emission reductions, emission inputs into air quality simulation models, and tracking actual emission reductions against the established emissions growth and control budgets. The total inventory of emissions of VOC, NO_x, and other pollutants for an area is summarized from the estimates developed for five general categories of emissions sources: point, area, onroad mobile, nonroad mobile, and biogenic.

In accordance with the EPA's Consolidated Emissions Reporting Rule (CERR), the Texas 2002 Periodic Emissions Inventory (PEI) has been developed for VOC, NO_x, and other pollutants from point, area, onroad mobile, nonroad mobile, and biogenic sources. As directed by the CERR, the PEI includes statewide coverage, thus reporting emissions for the 1-hour ozone nonattainment areas as well as the 8-hour ozone nonattainment areas in Texas. Emissions are reported on a daily basis averaged over the peak ozone season.

In addition, the EPA requires that the 5 Percent IOP SIP establish MVEBs for transportation conformity purposes. A MVEB is the onroad mobile source allocation of the total allowable emissions for each applicable criteria pollutant or precursor, as defined in the SIP. Transportation conformity determinations must be performed using the budget test, once EPA determines the budget(s) adequate for transportation conformity purposes. To pass the budget test, areas must demonstrate that the estimated emissions from transportation plans, programs and projects do not cause the MVEB to be exceeded. This SIP revision establishes a 2007 MVEB for the DFW area, which is necessary to prevent a transportation conformity lapse after June 15, 2005.

2007 DFW Motor Vehicle Emissions Budgets

	VOC (tpd)	NO_x (tpd)
2007 onroad mobile source inventory, unadjusted	104.14	206.72
TERP credits	0	–5.4
2007 MVEB	**104.14**	**201.32**

EPA requires that the 2002 PEI for the nine county DFW area and the MVEB be available for public comment and be submitted as part of this five percent IOP SIP. In March 2005, it was discovered that incorrect diesel fraction inputs were used in the development of both the 2002 and 2007 onroad mobile inventories that were included in the 5 Percent IOP SIP proposal. The TCEQ and NCTCOG worked together to correct the problem and the updated onroad mobile figures are included below in the NO_x and VOC emission summaries for each source category for both the 2002 base year and the 2007 future year. See Tables 2-4 and 2-5.

According to the guidance, states should ensure that the projected future inventory is at least 5 percent less than the 2002 inventory or the appropriate percentage of NOx and VOC if a combination of pollutants is used. That is, the 2007 projected inventory must be no greater than 95 percent of the 2002 inventory.

This SIP revision demonstrates that Texas has met this requirement. The percentage reductions in the VOC and NOx inventory from 2002 (adjusted to include VOC emissions from portable fuel containers and NOx emissions from Alcoa outside the 9-county DFW nonattainment area) to 2007 (adjusted for 5 percent control strategies) are summarized below:

DFW Reductions from 2002 to 2007

Pollutant	Adjusted 2002 inventory (tpd)	Adjusted 2007 inventory (tpd)	Percentage reduction from 2002 to 2007
VOC	465.75	403.19	13.4%
NO_x	622.22	422.02	32.2%

This tables shows that the 2007 inventories for both VOC and NO_x in comparison to the 2002 inventories have each decreased by much more than 5 percent.

DATA ANALYSIS

In its guidance for the 5 Percent IOP plan, EPA states that reductions from outside the nonattainment area that are not already in the approved SIP are creditable if consistent with previous EPA guidance, provided they occur within 100 km of the nonattainment area for VOCs or within 200 kilometers for NO_x. A demonstration must be made that, in addition to the 100km/200km criteria, the reductions have been shown to impact the nonattainment area. The guidance states that this demonstration may be met by analyzing wind rose data, available modeling, or similar technical documentation. As provided for by this guidance, wind rose data and other analysis are used to calculate the reductions from the new portable fuel container rule and the shut-down of the existing boilers at the Alcoa facility in Milam County.

The guidance also states that the emissions from the source or sources where the reductions are occurring must be added to the baseline inventory. Furthermore, all measures for inclusion should meet the general criteria for SIP approval of being permanent, quantifiable and enforceable.

REQUIRED CONTROL STRATEGY ELEMENTS

Existing Creditable Measures

NO_x Control Measures

Texas Emission Reduction Plan (TERP)

The 5 Percent IOP plan relies upon NO_x reductions from the TERP. During the first part of FY 2004, a total of 43 projects in the eligible 41 counties were awarded funding for $15.3 million. The projected NO_x reductions are 3,047 tons, at an average cost per ton of $5,008. In March 2004, 479 applications requesting over $350 million were received and reviewed. The 171 projects funded are anticipated to result in over 10,000 tons of NO_x reductions, at an average cost per ton of $5,980. Overall, as of mid-January, there were contracts in place for 282 projects, totaling over $120 million for projected reductions in NO_x emissions of over 21,100 tons, at an average cost per ton of NO_x reduced of $5,714. For the DFW area, this means approximately 5.2 tpd of NO_x are projected to be reduced in 2007 from the over 100 TERP projects in place in the DFW area. Accounting for these projects already funded and, based on the approach established for allocating future TERP funds, TERP funding will be sufficient to achieve over 22.2 tpd of reductions in the DFW area by 2007.

Energy Efficiency

Energy efficiency measures are a critical part of the commission's plan for clean air. Not only do they decrease NO_x emissions, they also produce reductions in other criteria pollutants such as PM, SO_2, VOC, and CO. The primary benefit of energy efficiency is its ability to decrease the demand for electrical generation, which provides for greater reliability, with the secondary benefit being emission reductions. When combined, various efficiency measures have the potential to add up to significant energy savings as well as emission reductions, thereby contributing to the overall goal of clean air in Texas.

The database and applications developed and used by the E-calc system were used to calculate NO_x reductions in the DFW nonattainment area. These reductions are enforceable and permanent because SB 5 mandates the statewide adoption of the International Residential Code (IRC) and the International Energy Conservation Code (IECC) for residential, commercial, and industrial buildings. The NO_x reductions were calculated based on electricity and natural gas savings from implementation of the 2000 construction code to single and multi-family residences in 2003. The resulting annual NO_x reductions for 2007 was calculated to be 0.72 tpd.

VOC Control Measures

Statewide Portable Fuel Container Rule

The portable fuel container rule establishes new requirements relating to the design criteria for portable fuel containers and portable fuel container spouts. The new rules will establish design criteria for "no-spill" portable fuel containers based in large part on the CARB standards. By December 31, 2005, these new rules will limit the type of portable fuel containers and portable fuel container spouts sold, offered for sale, manufactured, and/or distributed in the State of Texas. Fuel released into the environment leads to the contamination of both the state's air and water. These rules will ensure that portable fuel containers manufactured under these standards will release fewer amounts of fuel as the result of spillage and evaporation.

Measures Requiring Rulemaking

NO_x Control Measures

Lean-Burn and Rich-Burn Engines

The reductions relied upon in the 5 percent IOP plan include the implementation of new NO_x emission specifications and other compliance demonstration requirements for certain industrial, commercial, and institutional gas-fired stationary, reciprocating internal combustion engines. The rule associated with the adopted requirements are in Chapter 117, Subchapter B, Division 3 and apply to sites located in Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties. The adopted rule requires each gas-fired rich-burn engine placed into service before January 1, 2000 and gas-fired lean-burn engine to achieve a 2.0 grams NO_x per horsepower hour (g/hp-hr) emission limit. The adopted rule also requires gas-fired rich-burn engines placed into service on or after January 1, 2000 to achieve 0.5 g/hp-hr. A CO limit of 3.0 g/hp-hr limit applies to all gas-fired lean-burn and rich-burn engines as well as certain demonstration of compliance requirements. The NO_x emission reductions resulting from the implementation of this rule are 1.87 tpd.

Alcoa, Milam County

EPA's guidance for the 5 Percent IOP plan allows credit to be taken for NO_x reductions occurring within 200 km of the ozone nonattainment area. The Alcoa plant in Rockdale, Milam County is within 200 km of the boundary of the DFW ozone nonattainment area. As the result of enforcement actions, Alcoa is required to make reductions from its three lignite-fired boilers (Sandow Units 1, 2, and 3).

EPA's 5 Percent IOP guidance also requires that emissions from the source contributing the emissions

credits be added to the 2002 baseline inventory. The 2002 NO_x and VOC emissions inventories for Alcoa, 23.17 tpd and 2.13 tpd, respectively, have been added to the 2002 CERR inventory. All control measures that are a part of the 5 Percent IOP plan must be implemented by June 15, 2007. Alcoa has chosen to replace the existing boilers. Only one boiler will be replaced by June 15, 2007, and therefore only reductions for one boiler will be claimed for credit in this SIP.

VOC Control Measures

Surface Coating

Various rules for surface coating operations have been in effect for the four core DFW counties in order to meet RACT and Control Technique Guideline (CTG) requirements. In rulemaking concurrent to this SIP, the commission is adopting a rule to extend the requirements for surface coating to the five newly designated DFW nonattainment counties. This control measure will result in 0.3 tpd VOC reductions.

Stage I Gasoline Unloading

Rules have already been in effect for Stage I gasoline unloading operations in the four core DFW counties, with an exemption for operations with a throughput equal to or less than 10,000 gallons per month. In rulemaking concurrent to this SIP, the commission is adopting a rule revision to extend these Stage I requirements, with the 10,000 gallons per month exemption, to the five newly designated DFW nonattainment counties. This control measure will result in 1.49 tpd VOC reductions.

SUMMARY

The control measures developed as part of this SIP and summarized in the following table will achieve the required 5 percent reductions from the 2002 baseline, and therefore satisfy the conditions of the 5 Percent IOP plan.

Source of reductions	**TPD NO_x**	**TPD VOC**
Eligible existing measures		
Alcoa (within 200 km radius)	3.9	
TERP	22.2	
Energy efficiency	0.72	
Portable fuel containers (9-county area)		2.79
Portable fuel containers (within 100 km radius)		0.63
Subtotal	26.82	3.42
Control measures requiring rulemaking		
Nine county lean-burn and rich-burn engine rule	1.87	
Expand surface coating rule to 5 counties		0.3
Lower Stage I exemption throughput to 10,000 gal/mo. in 5 counties (same as in 4 core counties)		1.49
Subtotal	1.87	1.79

TOTAL IDENTIFIED REDUCTIONS	**28.69**	**5.21**
Minimum reductions required to meet 5%	28.69	1.86
SURPLUS REDUCTIONS	**0**	**3.35**

FUTURE ATTAINMENT PLANS

Path Forward For The 8-Hour Attainment Demonstration

This 5 Percent Increment of Progress SIP revision is a first step in addressing the 8-hour ozone standard. The 8-hour ozone attainment demonstration SIP revision will be submitted to EPA by the required date of June 15, 2007. The TCEQ continues to evaluate existing modeling episodes for application in developing an 8-hour ozone attainment demonstration. The TCEQ will be working towards an 8-hour ozone attainment demonstration which may include an evaluation of potential control measures, an assessment of the need for additional regional control strategies, and an analysis of the contribution to ozone formation from areas other than Texas.

FUTURE INITIATIVES

The TCEQ is committed to researching emerging technologies, building the science for ozone modeling and analysis, and addressing industrial, onroad and nonroad mobile, and area sources of emissions, all in an effort to improve air quality in Texas. The New Technology Research and Development (NTRD) program promotes commercialization technologies that will support projects that are eligible for funding under the TERP Emissions Reduction Incentive Grants Program and works to streamline and expedite the process through which the TCEQ and the EPA provide recognition and SIP credit for new, innovative and creative technological advancement.

The Texas 2000 Air Quality Study, the most comprehensive and successful air quality study conducted to date in the U.S., with over 40 research organizations and over 250 scientists, has provided and will continue to provide a large part of the scientific basis for reassessing the ozone problem in eastern Texas. The second phase of this study, Texas Air Quality Study II (TexAQS II), is scheduled for 2005 and 2006 and will cover the area of Texas east of, and including the, I-35/37 corridor. The TCEQ will be involved in this research in order to improve regulatory analysis and prediction tools used for developing SIPs.

The commission is committed to working in cooperation with the regulated community, academia, research consortiums, and others to ensure that the modeling used to develop effective control strategies will use the most current scientific methodologies and information to replicate high ozone episodes in a given area.

SECTION V: LEGAL AUTHORITY

A. General

The TCEQ has the legal authority to implement, maintain and enforce the national ambient air quality standards.

The first air pollution control act, known as the Clean Air Act of Texas, was passed by the Texas Legislature in 1965. In 1967, the Clean Air Act of Texas was superseded by a more comprehensive statute, the Texas Clean Air Act (TCAA), found in Article 4477-5, Vernon's Texas Civil Statutes. The Legislature amended the TCAA in 1969, 1971, 1973, 1979, 1985, 1987, 1989, 1991, 1993, 1995, 1997 and 1999. In 1989, the TCAA was codified as Chapter 382 of the Texas Health & Safety Code.

Originally, the TCAA stated that the Texas Air Control Board (TACB) is the state air pollution control agency and is principal authority in the state on matters relating to the quality of air resources. In 1991, the Legislature abolished the TACB effective September 1, 1993 and its powers, duties, responsibilities and functions were transferred to the Texas Natural Resource Conservation Commission (TNRCC). With the creation of the TNRCC, the authority over air quality is found in both the Texas Water Code and the TCAA. Specifically, the authority of the TNRCC is found in Chapters 5 and 7. Chapter 5, Subchapters A - F, and H - J and L, include the general provisions, organization and general powers and duties of the TNRCC, and the responsibilities and authority of the Executive Director. This Chapter also authorizes the TNRCC to implement action when emergency conditions arise, and to conduct hearings. Chapter 7 gives the TNRCC enforcement authority. In 2001, the 77th Texas Legislature continued the existence of the TNRCC until September 1, 2013, and changed the name of the TNRCC to the Texas Commission on Environmental Quality (TCEQ).

The TCAA specifically authorizes the TCEQ to establish the level of quality to be maintained in the state's air and to control the quality of the state's air by preparing and developing a general, comprehensive plan. The TCAA, Subchapters A - D, also authorize the TCEQ to collect information to enable the commission to develop an inventory of emissions; conduct research and investigations; enter property and examine records; to prescribe monitoring requirements; to institute enforcement proceedings; to enter into contracts and execute instruments; to formulate rules; to issue orders taking into consideration factors bearing upon health, welfare, social and economic factors, and practicability and reasonableness; to conduct hearings; to establish air quality control regions; to encourage cooperation with citizens' groups and other agencies and political subdivisions of the state as well as with industries and the Federal Government; to establish and operate a system of permits for construction or modification of facilities.

Local government authority is found in Subchapter E of the TCAA. Local governments have the same power as the TCEQ to enter property and make inspections. They also may make recommendations to the Commission concerning any action of the TCEQ that affects their territorial jurisdiction, may bring enforcement actions, and may execute cooperative agreements with the TCEQ or other local governments. In addition, a city or town may enact and enforce ordinances for the control and abatement of air pollution not inconsistent with the provisions of the TCAA, the rules or orders of the Commission.

B. Applicable Law

The following statutes and rules provide necessary authority to adopt and implement the SIP. The rules listed below have previously been submitted as part of the SIP.

Statutes

TEXAS HEALTH & SAFETY CODE, Chapter 382	September 1, 2001
TEXAS WATER CODE	September 1, 2001

All sections of each subchapter are included, unless otherwise noted.

Chapter 5: Texas Natural Resource Conservation Commission
Subchapter A: General Provisions
Subchapter B: Organization of the Texas Natural Resource Conservation Commission
Subchapter C: Texas Natural Resource Conservation Commission
Subchapter D: General Powers and Duties of the Commission
Subchapter E: Administrative Provisions for Commission
Subchapter F: Executive Director (except §§ 5.225, 5.226, 5.227, 5.2275, 5.232, and 5.236)
Subchapter H: Delegation of Hearings
Subchapter I: Judicial Review
Subchapter J: Consolidated Permit Processing
Subchapter L: Emergency and Temporary Orders (§§ 5.514, 5.5145 and 5.515 only)

Chapter 7: Enforcement
Subchapter A: General Provisions (§§ 7.001, 7.002, 7.0025, 7.004, 7.005 only)
Subchapter B: Corrective Action and Injunctive Relief (§ 7.032 only)
Subchapter C: Administrative Penalties, §§ 7.051- 7.075
Subchapter E Criminal Offenses and Penalties: §§ 7.177, 7.179-7.181

Rules
All of the following rules are found in Title 30, Texas Administrative Code, as of the following effective dates:

Chapter 7, Memoranda of Understanding, §§ 7.110 and 7.119	May 2, 2002
Chapter 35, Subchapters A-C, K: Emergency and Temporary Orders and Permits; Temporary Suspension or Amendment of Permit Conditions	December 10, 1998
Chapter 39, Public Notice, §§ 39.201; 39.401; 39.403(a) and (b)(8)-(10); 39.405(f)(1) and (g);39.409; 39.411 (a), (b)(1)-(6) and (8)-(10) and ©)(1)-(6) and (d); 39.413(9), (11), (12) and (14); 39.418(a) and (b)(3) and (4); 39.419(a), (b),(d) and (e); 39.420(a), (b) and ©)(3) and (4); 39.423 (a) and (b); 39.601; 39.602; 39.603; 39.604; and 39.605	September 23, 1999
Chapter 55, Request for Contested Case Hearings; Public Comment, §§ 55.1; 55.21(a) - (d), (e)(2), (3) and (12), (f) and (g); 55.101(a), (b), ©)(6) - (8); 55.103; 55.150; 55.152(a)(1), (2) and (6) and (b); 55.154; 55.156; 55.200; 55.201(a) - (h); 55.203; 55.205; 55.206; 55.209 and 55.211	October 20, 1999

LIST OF ACRONYMS

ACT - Alternative Control Techniques
AFV - Alternative Fuel Vehicle
AIRS - Aerometric Information Retrieval System
APA - Administrative Procedure Act
ARACT - Alternate Reasonably Available Control Technology
ARPDB - Acid Rain Program Data Base
ASC - Area Source Categories
ASE - Alliance to Save Energy
ASM - Acceleration Simulation Mode (I/M Test)
ATC - Air Traffic Control
BACT - Best Available Control Technology
BEIS-2 - Biogenic Emissions Inventory System, version2
BELD - Biogenic Emissions Land Cover Database
BIOME - Biogenic Model for Emissions
BPA - Beaumont-Port Arthur
Cal LEV - California Low Emission Vehicle
CAM - Compliance Assurance Monitoring
CAMS - Continuous Air Monitoring Station
CAMx - Comprehensive Air Model with Extensions
CARB - California Air Resources Board
CARE - Clean Air Responsibility Enterprise
CB-IV HC - Carbon Bond IV Hydrocarbon
CFR - Code of Federal Regulations
CEMS - Continuous Emissions Monitoring System
CERR - Consolidated Emissions Reporting Rule
CMAQ - Congestion Mitigation and Air Quality
CMSA - Consolidated Metropolitan Statistical Area
CNG - Compressed Natural Gas
CO - Carbon Monoxide
COAST - Coastal Oxidant Assessment for Southeast Texas
CTG - Control Technique Guidelines
DART - Dallas Area Rapid Transit
DERC - Discreet Emission Reduction Credit
DFW - Dallas-Fort Worth
DFWN - Dallas-Fort Worth North
DFWRTM - Dallas-Fort Worth Regional Travel Model
DOW - Day of Week
DRI - Desert Research Institute
DV - Design Value
EBT - Emissions Banking and Trading
Ecalc - Texas Energy and Emissions Reduction Calculator
EDMS - Emissions and Dispersion Modeling System
EF - Emission Factor
EGAS - Economic Growth Analysis System
EGF - Electric Generating Facilities

EGU - Electric Generating Units
EI - Emissions Inventory
EIQ - Emissions Inventory Questionnaire
ELP - El Paso
EPA - U.S. Environmental Protection Agency
EPN - Emission Point Number
ERC - Emission Reduction Credit
ERCOT - Electric Reliability Council of Texas
ESL - Energy Systems Laboratory
ETR - Employer Trip Reduction
FAA - Federal Aviation Administration
FCAA - Federal Clean Air Act
FMVCP - Federal Motor Vehicle Control Program
FR - Federal Register
FTP - File Transfer Protocol
GIS - Geographic Information System
g/hp-hr - Grams Per Horsepower-Hour
GloBEIS - Global Biosphere Emissions and Interactions System
GSE - Ground Support Equipment
HAP - Hazardous Air Pollutant
HAXL - Houston Air Excellence in Leadership
HB - House Bill
HC - Hydrocarbon
HDD - Heavy-duty Diesel
HDDV - Heavy-duty Diesel Vehicle
HDEWG - Heavy Duty Engine Working Group
HDV - Heavy-duty Vehicle
HGB - Houston-Galveston-Brazoria
H-GAC - Houston-Galveston Area Council
HON - Hazardous Organic NESHAPS
HOV - High Occupancy Vehicle
HP - Horsepower
HPMS - Highway Performance Monitoring System
HRM - Houston Regional Monitoring
IIG - Interim Implementation Guidance
IIP - Interim Implementation Plan
I/M - Inspection and Maintenance
INIT - Initial Condition Tracer
IOP - Increment of Progress
ITWS - Integrated Terminal Weather System
IWW - Industrial Wastewater
KG/HA - Kilograms/hectare
KM - Kilometer
LDT - Light-duty Truck
LED - Low Emission Diesel
LEV - Low Emission Vehicle
LNG - Liquefied Natural Gas
LTO - Landing/Takeoff

m - Meter
MACT - Maximum Achievable Control Technology
MAPPER - Measurement-based Analysis of Preferences in Planned Emissions Reductions
MERC - Mobile Emission Reduction Credit
MIR - Maximum Incremental Reactivity
MMBtu - Million British Thermal Unit
MPA - Metropolitan Planning Area
MY - Model Year
NAAQS - National Ambient Air Quality Standard
NCDC - National Climatic Data Center
NCTCOG - North Central Texas Council of Governments
NEGU - Non-electric Generating Units
NEI - National Emissions Inventory
NESHAPS - National Emission Standards for Hazardous Air Pollutants
NEVES - Nonroad Engine and Vehicle Emission Study
NLEV - National Low Emission Vehicle
NSR - New Source Review
NO_x - Nitrogen Oxides or Oxides of Nitrogen
NO_y - Nitrogen Species
NSR - New Source Review
NTCASC - North Texas Clean Air Steering Committee
NWS - National Weather Service
O_3 - Ozone
OAQPS - Office of Air Quality Planning and Standards
OBD - On-Board Diagnostics
OSAT - Ozone Source Apportionment Technology
OTAG - Ozone Transport Assessment Group
PAMs - Photochemical Assessment Monitoring Sites
PEI - Periodic Emissions Inventory
PM_{10} - Particulate Matter less than 10 microns
$PM_{2.5}$ - Particulate Matter less than 2.5 microns
ppb - Parts Per Billion
ppm - Parts Per Million
ppmv - Parts Per Million by Volume
PSDB - Point Source Database
PSIA - Pounds per Square Inch Absolute
QA/QC - Quality Assurance/Quality Control
RACT - Reasonably Available Control Technology
RAQPC - Regional Air Quality Planning Committee
RCTSS - Regional Computerized Traffic Signal System
RFG - Reformulated Gasoline
REMI - Regional Economic Modeling, Inc.
ROP - Rate-of-Progress
RSD - Remote Sensing Device
RVP - Reid Vapor Pressure
SB - Senate Bill
SCAQMD - South Coast Air Quality Management District [Los Angeles area]
SCC - Source Classification Code

SCRAM - Support Center for Regulatory Air Models
SETRPC - Southeast Texas Regional Planning Commission
SIC - Standard Industrial Classification
SIP - State Implementation Plan
SO_2 - Sulfur Dioxide
SO_x - Sulfur Compounds
SOCMI - Synthetic Organic Chemical Manufacturing Industry
SP - Smog Production algorithm
STARS - State of Texas Air Reporting System
SULEV - Super-Ultra-Low Emission Vehicle
TAC - Texas Administrative Code
TACB - Texas Air Control Board
TAFF - Texas Alternative Fuel Fleet
TCAA - Texas Clean Air Act
TCEQ - Texas Commission on Environmental Quality (commission)
TCF - Texas Clean Fleet
TCM - Transportation Control Measure
TERP - Texas Emissions Reduction Plan
TIP - Transportation Improvement Program
TIPI - Texas Industrial Production Index
TMC - Texas Motorist's Choice
TNMOC - Total nonmethane organic compounds
TNRCC - Texas Natural Resource Conservation Commission
TPOD - Tons Per Ozone Day
TPY - Tons Per Year
TSP - Total Suspended Particulate
TTI - Texas Transportation Institute
UAM - Urban Airshed Model
USDA - United States Department of Agriculture
USGS - United States Geological Survey
UTM - Universal Transverse Mercator
VAVR - Voluntary Accelerated Vehicle Retirement
VERP - Voluntary Emission Reduction Permit
VMAS - Vehicle Mass Analysis System
VMEP - Voluntary Mobile Source Emissions Reduction Program
VMT - Vehicle Miles Traveled
VNR or VNRAT- VOC-NO_x ratios
VOC - Volatile Organic Compound
WOE - Weight of Evidence

5 PERCENT INCREMENT OF PROGRESS DEMONSTRATION
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CHAPTER 1: GENERAL

1.1 BACKGROUND

"The History of the Texas State Implementation Plan (SIP), " a comprehensive overview of the SIP revisions submitted to EPA by the State of Texas, is available at the following web site:
http://www.tnrcc.state.tx.us/oprd/sips/sipintro.html#History

The Dallas-Fort Worth (DFW) area (consisting of Collin, Dallas, Denton, and Tarrant Counties) was classified as a moderate ozone nonattainment area in accordance with the Federal Clean Air Act (FCAA) Amendments of 1990. As a moderate area, DFW was required to demonstrate attainment of the 1-hour ozone standard by November 15, 1996. Ambient air monitoring data for the years 1994-96 showed that the 1-hour ozone standard was exceeded more than one day per year over this three-year period. As a result, the EPA reclassified the DFW area from moderate to serious, effective March 20, 1998, for failure to attain the 1-hour ozone standard by the November 1996 deadline. The EPA required that a SIP revision be submitted within one year, showing attainment of the National Ambient Air Quality Standard (NAAQS) and addressing requirements for serious areas. TCEQ submitted a SIP revision containing a Post-1996 Rate-of-Progress (ROP) SIP demonstration to the EPA on March 18, 1999. This SIP revision contained photochemical modeling. The modeling indicated that additional nitrogen oxides (NO_x) reductions would be needed to attain the standard by November 1999. The following rules were developed and included in the SIP:

- Reasonably Available Control Technology (RACT) for NO_x point sources
- Nonattainment New Source Review (NSR) for NO_x point sources
- Revisions resulting from the change in the major source threshold for RACT for Volatile Organic Compounds (VOCs)

The commission indicated that due to time constraints, the Post-1996 ROP SIP would not have all rules necessary to bring the DFW area into attainment by the November 1999 deadline and that a complete attainment demonstration would be submitted in the spring of 2000. The EPA determined that the Post-1996 ROP SIP was incomplete and began an 18-month sanctions clock effective May 13, 1999.

The attainment deadline for serious areas under the 1-hour ozone standard was November 15, 1999. The November 15, 1999, deadline passed, and EPA has not made a determination regarding the DFW area attainment status. Technical data became available suggesting that DFW is significantly impacted by transport and regional background levels of ozone. Therefore, the reductions from the strategies needed for the HGB area and the regional rules were seen as a necessary and integral component in the strategy for DFW's attainment of the 1-hour ozone standard.

In order to develop local control strategy options to augment federal and state programs, the DFW area established the North Texas Clean Air Steering Committee (NTCASC) made up of local elected officials, business leaders, and other community stakeholders. Specific control strategies were identified for review by technical subcommittee members. In addition, the North Central Texas Council of Governments (NCTCOG) hired an environmental consultant to assist with the analysis and evaluation of control strategy options.

The Post-1996 ROP SIP was not approved by EPA prior to the next commission action. On April 19, 2000, the commission adopted a SIP revision and associated rules for the DFW ozone attainment demonstration. The April 2000 Attainment Demonstration SIP contained the following control strategy elements:

- **Federal measures**
  - Onroad mobile:
    Phase II RFG
    Tier II vehicle emission standards and federal low-sulfur gasoline NLEV standards
    Heavy-duty diesel standards
  - Nonroad mobile:
    Lawn and garden equipment standards
    Tier 3 heavy-duty diesel equipment standards
    Locomotives standards
    Recreational marine standards
    Standards for compression ignition vehicles and equipment
    Standards for spark ignition vehicles and equipment

- **State measures**
  - Point sources:
    Electric generating facilities requirements
    Cement kiln requirements
  - Onroad mobile:
    Texas low emission diesel
    Expanded vehicle inspection and maintenance (I/M) testing in 9 DFW counties
    Reduced speed limits
    Transportation control measures
    Voluntary mobile source emission reduction program (VMEP) measures such as telecommuting, vanpooling
  - Nonroad mobile:
    Texas low emission diesel
    Airport ground support equipment agreed orders
    California rule for gasoline-fueled, large spark ignition engines
    Operating restrictions for certain heavy-duty diesel equipment
    Accelerated purchase of certain Tier 2/Tier 3 diesel equipment
  - Area:
    Energy conservation efforts for buildings, including 2000 International Energy Conservation Code (IECC), and low-NO_x water heaters

The April 2000 Attainment Demonstration SIP contained the following elements:

- Photochemical modeling of specific control measures and future state and national rules for attainment of the 1-hour ozone standard in the DFW area by the attainment deadline of November 15, 2007.

- A modeling demonstration that showed that air quality in the DFW area was influenced at times by transport from the HGB area. Under EPA's July 16, 1998, transport policy, if photochemical modeling demonstrated that emissions from an upwind area located in the same state and with a later attainment date interfered with the downwind area's ability to attain, the downwind area's attainment date could be extended to no later than that of the upwind area. For the DFW area, this extended the attainment date to November 15, 2007, the same attainment date as the HGB area.
- Identification of the level of reductions of VOC and NO_x emissions necessary to attain the 1-hour ozone standard by 2007. The reductions of 141 tpd NO_x from federal measures and 225 tpd NO_x from state measures resulted in a total of 366 tpd NO_x reductions for the attainment demonstration.

- A 2007 motor vehicle emission budget for transportation conformity.

- A commitment to perform and submit a mid-course review by May 1, 2004.

At the time it was submitted, the April 2000 Attainment Demonstration SIP would have allowed EPA to determine that the DFW area should not have been bumped up from serious to severe under the conditions of EPA's July 16, 1998, transport policy. The new attainment date for the DFW area would have been no later than November 15, 2007, the attainment date for HGB area.

In this same SIP revision, the commission repealed the airport ground support equipment (GSE) rule for the DFW area because agreed orders were signed with the area's major airlines, airports, and governmental entities to achieve the same NO_x reductions that would have been required by the rule.

The April 2000 Attainment Demonstration SIP was not approved by EPA prior to the next commission action. In August 2001, the commission adopted revisions to the DFW SIP which repealed two of the rules adopted as part of the April 2000, SIP revision. The first rule restricted the use of construction and industrial equipment (nonroad, heavy-duty diesel equipment rated at 50 hp and greater). The second rule required the replacement of diesel-powered construction, industrial, commercial, and lawn and garden equipment rated at 50 hp and greater with newer Tier 2 and Tier 3 equipment, with the amount and timing of reductions depending on the horsepower rating of the engine fleet. These repeals were required by Senate Bill 5 (SB5), passed by the 77th Legislature of the State of Texas in May 2001. This legislative requirement was implemented by submitting the rule repeals to EPA as part of the August 2001, SIP revision. The Texas Emissions Reduction Plan (TERP) grant incentive program established by SB 5 replaced the above-referenced rules. Therefore, the NO_x reductions previously claimed from the repealed rules are being achieved through an alternate but equivalent federally enforceable mechanism.

On March 5, 2003, the SIP was further revised as follows:

(1) Adoption of Chapter 117 NO_x emission limits for cement kilns;

(2) Estimation of NO_x reductions from energy efficiency measures, using a methodology which is to be further refined before energy efficiency credit is formally requested in the SIP; and a

(3) Commitment to perform modeling with MOBILE6, the latest version of EPA's emission factor model for mobile sources.

Meanwhile, environmental groups challenged EPA's extension of attainment dates based on transport. Beaumont-Port Arthur (BPA) was one of three areas in the nation for which suits were filed. On December 11, 2002, the United States Fifth Circuit Court of Appeals ruled that EPA [is] was not authorized by the FCAA to extend the BPA's attainment date based on transport. EPA published a final action in the Federal Register on March 30, 2004, reclassifying BPA to serious with an attainment date of November 15, 2005, and requiring a new attainment demonstration to be submitted by April 30, 2005. Although the court decision is relevant specifically for BPA, the direct implication for DFW is that EPA cannot approve extensions of the DFW 1-hour ozone attainment date past 1999, the date mandated by the FCAA for serious areas.

Because EPA had never approved the commission's commitment to perform a mid-course review for the DFW area and because of uncertainties regarding the transition from the 1-hour to the 8-hour ozone

standard, the commission did not submit a mid-course review for the DFW area.

On April 15, 2004, EPA designated several counties in the North Texas area as nonattainment for the 8-hour ozone standard. Those counties are: Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall and Tarrant. The newly expanded 9-county DFW area was classified as moderate for the 8-hour ozone standard and must attain the 8-hour NAAQS by June 15, 2010. In accordance with the EPA's 8-hour ozone rule, the area should monitor attainment in the ozone season of the year prior to 2010.

Current Revision

On April 30, 2004, EPA promulgated its Phase I 8-Hour Implementation Rule. In 40 CFR § 51.905(a)(ii) and subsequent guidance, EPA provided three options for areas that do not have an approved 1-hour ozone attainment plan:

A) Submit a 1-hour ozone attainment demonstration no later than one year after designation (by June 15, 2005);
B) Submit an 8-hour ozone plan no later than one year after designation (by June 15, 2005) that provides a 5 percent increment of progress from the area's 2002 emissions baseline that are in addition to federal measures and state measures already approved by EPA, and to achieve these reductions by June 15, 2007; or
C) Submit an 8-hour ozone attainment demonstration by June 15, 2005.

This SIP revision contains information and control measures to meet option B, which represents the best path forward for the DFW area at the present time. In light of EPA's pending revocation of the 1-hour ozone standard in June 2005, the agency's resources should be focused on the more protective 8-hour ozone standard. EPA has not yet issued Phase II of its 8-hour Implementation Rule for states to use in developing 8-hour ozone attainment demonstrations. Phase II is expected to be promulgated by EPA in 2005. The TCEQ is evaluating the performance of the DFW photochemical model to determine the viability of the 1999 episode for the development of local control strategies. Furthermore, a 2007 projected Ozone Season Day inventory demonstrates a downward trend of emissions. For these reasons, the commission, in coordination with EPA, selected option B, the 5 Percent Increment of Progress (IOP) plan, as a technically sound and expeditious approach to starting to achieve the reductions ultimately needed for attainment of the 8-hour ozone standard.

This revision contains several elements:

- 2002 Periodic Emissions Inventory (PEI) for the 9-county DFW ozone nonattainment area;
- An IOP plan that achieves a 5 percent reduction in emissions from the 2002 emissions inventory baseline;
- Control measures that achieve the necessary NO_x and VOC emission reductions;
- Rules and programs necessary to implement the 5 percent IOP control measures; and
- Motor vehicle emissions budgets (MVEBs) for use in transportation conformity demonstrations.

1.2 HEALTH EFFECTS

In 1997, EPA revised the NAAQSs for ozone to incorporate scientific data that indicated longer-term exposures to moderate levels of ozone could cause health effects. Ozone can cause acute respiratory

effects and aggravate asthma. To support the 8-hour ozone standard, EPA provided information indicating ozone can temporarily decrease lung capacity in some healthy adults and cause inflammation of lung tissue.

Children may be at higher risk from exposure to ozone. Children breathe more air per pound of body weight than adults. Since children's respiratory systems are still developing, they may be more susceptible than adults to changing air quality. The most likely time of year for elevated ozone readings in Texas is the last half of August to early October which coincides with school starting and an increase in school related activities.

Adults most at risk to ozone exposure are outdoor workers, people outside exercising, and individuals with preexisting respiratory diseases.

Ground-level ozone interferes with the ability of plants to produce and store food.

1.3 PUBLIC HEARING INFORMATION

The commission held public hearings at the following times and locations:

CITY	DATE	TIME	LOCATION
Arlington	January 3, 2005	5:30 p.m.	North Central Texas Council of Governments 616 Six Flags Drive 3rd Floor
Austin	January 4, 2005	10:00 a.m.	Texas Commission on Environmental Quality 12100 North I-35 Building F, Room 2210
Houston	January 5, 2005	2:30 p.m.	Houston-Galveston Area Council 3555 Timmons Lane Conference Room A, 2nd Floor

Written comments were also accepted via mail, fax, or e-mail. The public comment period closed on January 6, 2005.

1.4 SOCIAL AND ECONOMIC CONSIDERATIONS

For a detailed explanation of the social and economic issues involved with any of the measures, please refer to the preambles that precede each proposed rule package accompanying this SIP.

1.5 FISCAL AND MANPOWER RESOURCES

The state has determined that its fiscal and manpower resources are adequate and will not be adversely affected through the implementation of this plan.

CHAPTER 2: EMISSIONS INVENTORY

2.1 OVERVIEW

The 1990 Amendments to the FCAA require that emissions inventories (EIs) be prepared for ozone nonattainment areas. Because ozone is photochemically produced in the atmosphere when VOCs are mixed with NO_X in the presence of sunlight, the commission must compile information on the important sources of these precursor pollutants. The EI identifies the source types present in an area, the amount of each pollutant emitted, and the types of processes and control devices employed at each plant or source category. The EI provides data for a variety of air quality planning tasks, including establishing baseline emission levels, calculating reduction targets, control strategy development for achieving the required emission reductions, emission inputs into air quality simulation models, and tracking actual emission reductions against the established emissions growth and control budgets. The total inventory of emissions of VOC, NO_x, and other pollutants for an area is summarized from the estimates developed for five general categories of emissions sources: point, area, onroad, nonroad, and biogenic.

In accordance with the EPA's Consolidated Emissions Reporting Rule (CERR), the Texas 2002 Periodic Emissions Inventory (PEI) has been developed for VOC, NO_x, and other pollutants from point, area, onroad mobile, nonroad mobile, and biogenic sources. As directed by the CERR, the PEI includes statewide coverage, thus reporting emissions for the 1-hour ozone nonattainment areas as well as the 8-hour ozone nonattainment areas in Texas. Emissions are reported on a daily basis averaged over the peak ozone season.

EPA requires that the 2002 PEI for the nine county DFW area be available for public comment and be submitted as part of this five percent IOP SIP. This chapter describes and summarizes the 2002 PEI for the various source categories for the DFW area. References to appendices containing more detailed emissions information are included. Chapter 5 describes the methodology for calculating increment of progress for the DFW area.

2.2 POINT SOURCES

Major point sources are defined for inventory reporting purposes in nonattainment areas as industrial, commercial, or institutional sources that emit actual levels of criteria pollutants at or above the following amounts: 10 tons per year (tpy) of VOC, 25 tpy of NO_X, or 100 tpy of other criteria pollutants (CO, SO_2, PM_{10}, $PM_{2.5}$, or lead). For the attainment areas of the state, any company that emits a minimum of 100 tpy of any criteria pollutant must complete an emissions inventory questionnaire (EIQ). Any source emitting or with the potential to emit at least 10 tpy of any single Hazardous Air Pollutant (HAP) or 25 tpy of aggregate HAP is also required to report emissions.

In order to collect emissions and industrial process operating data for these plants, the commission mails EIQs to all sources identified as having triggered the above level of emissions. Companies are asked to report not only emissions data for all emissions generating units and emission points, but also the type and, for a representative sample of sources, the amount of materials used in processes that result in emissions. Information is also requested in the EIQ on process equipment descriptions, operation schedules, emission control devices currently in use, abatement device control efficiency, and stack parameters such as location, height, and exhaust gas flow rate. All data submitted via the EIQ is quality assured and entered into State of Texas Air Reporting System (STARS).

The commission developed the 2007 future year point source emission estimates by projecting the 2002 base year point source inventory, accounting for growth and controls. The growth is projected by

multiplying the base case EI by growth factors that represent the projection of industrial expansion to the year 2007. The controls that are applied represent all of the NO_x and VOC controls that are already in place, by TCEQ rule and regulation, requiring reductions between 2002 and 2007. The following paragraphs discuss the projection methodologies.

Growth in NO_x and VOC emissions in the DFW area was partially accounted for through the emissions banked in the Emissions Banking and Trading (EBT) database. Emission Reduction Credit (ERC) and Discreet Emission Reduction Credit (DERC) totals as of September 8, 2004 were used. These banked emissions could return to the airshed as actual emissions in the future. As required in 30 TAC Chapter 101, an ERC must be surplus to any federal, state or local rule. The credits that are in the bank have been devalued to show surplus using the Chapter 117 emission rate limitations. Additionally, the DERCs are subject to Chapter 101 10 percent environmental contributions, and a NSR permitting offset ratio of 1.15:1 was applied to the ERCs. A total of 19.07 tons per day (tpd) of NO_x and 0.44 tpd of VOC were added to the 2007 DFW EI to account for these banked emissions. This adjustment presumes that all of the credits will be used within one year. However, such a worst-case scenario is unlikely, especially since the majority of the credits are DERCs, which are used after one use.

The commission also accounted for growth in the DFW area by including emissions from newly-permitted electric generating units (EGU). Electric generation capacity growth in Texas has come primarily from new, cleaner, more efficient EGUs, typically natural gas fired combined cycle plants, rather than from existing EGUs. With a few exceptions, new EGUs have been located in attainment counties because of strict nonattainment New Source Review (NSR) permitting requirements.

An Electric Reliability Council of Texas (ERCOT) report of projected electricity use estimates that in Texas, demand will be 75 percent of capacity in 2007 (Reference: ERCOT, The Texas Connection report, "Report on Existing and Potential Electric System Constraints and Needs Within the ERCOT Region," October 1, 2003). To account for growth in EGU emissions, the commission added to the 2007 future case EI, 75 percent of the permit allowable emissions from EGUs that were not in the 2002 base case, but that had received NSR permits prior to April 2004. This approach is more realistic and reasonable because it does not account for the decrease in emissions from less efficient existing EGUs that the new generation will displace. Plus, this approach assumes that all newly-permitted EGUs will ultimately be built and operated. This approach is more realistic and reasonable than assuming that all new EGUs will be operating at 100 percent of their permitted allowables while existing EGUs are operating at 2002 levels. In the 9-county DFW area, allowable emissions from newly-permitted EGU's total 8.61 tpd of NO_x and 1.88 tpd of VOC.

The NEGU emissions were grown from 2002 to 2007 using factors derived from the Texas Industrial Production Index (TIPI). If TIPI 2-digit Standard Industrial Classification (SIC) factors were unavailable, Economic Growth Analysis System (EGAS) 4.0 growth factors were used. TIPI was used where possible, because its data are more recent than those in the EGAS 4.0 model. The EGAS model was last updated on January 26, 2001, and uses data and data models that date from the early 1980s to 1999. The Regional Economic Modeling, Inc. (REMI) model, which is the economic basis of EGAS 4.0, uses economic data that date from 1969 to 1996. Also, EGAS uses historical emissions data from the National Emissions Inventory (NEI) ranging from 1972 to 1992. (See the EGAS 4.0 Reference Manual, available on EPA's Clearinghouse for Inventories & Emission Factors (CHIEF) web site). TIPI uses more recent economic data from November 2003. TIPI-EGAS is the combination of these two databases. TIPI data from January 1967 through November 2003 was used in a linear regression analysis to project emissions from 2002 to 2007. According to the Federal Reserve Bank of Dallas, TIPI is a value-added index based on a weighted average of employment, man hours, and some production data. The underlying process to

derive TIPI data is the same as the Bureau of Economic Analysis gross-state product used in EGAS.

Chapter 117 NO_x rules affect EGUs and NEGUs in the DFW area. Distinct Chapter 117 controls were applied to the baseline inventory emissions to simulate these rules. The NEGU equipment regulated by Chapter 117, relevant to this exercise, are industrial boilers larger than 40 MMBtu/hr and placed into service prior to 1992 and industrial engines larger than 300 horsepower (hp) and placed into service prior to 1992. A total of 13 of these pieces of equipment still existed in the 2002 EI. In the 2002 inventory, EGUs accounted for 32.59 tpd NO_x and 1.76 tpd VOC, while NEGUs contributed 46.72 tpd NO_x and 26.54 tpd VOC. The 2005 allowed emission factor (EF), e.g., lb/MMBtu or g/hp-hr, for a piece of equipment is dictated by Chapter 117. To determine the reduction to apply to the unit from 2002, EFs used to calculate reported emissions in the 2002 point source inventory were compared to the Chapter 117 EFs, and the required reduction percentages necessary, if any, were calculated and applied. No VOC controls were applied.

Each EGU is subject to either a Chapter 117 limitation by 2005 or a SB7 allowance. EGUs in the DFW four county 1-hour ozone nonattainment area are subject to the Chapter 117 emission limitations. The EGUs in the other 5 counties are subject to the SB7 rules. For EGUs that are Acid Rain units, the EFs can be found in the third quarter 2002 Acid Rain Program Scorecard data on EPA's Clean Air Markets web page. Each EGU was assigned a reduction factor based on the actual EF compared to the Chapter 117 EF limitation.

The following TCEQ web page contains rules, guidance documents, and a listing of 2002 and other historical point source inventories of major pollutants (e.g. NO_x, VOC, SO_2, etc.):

http://www.tnrcc.state.tx.us/air/aqp/psei.html#tools

2.3 AREA SOURCES

Area sources of emissions are those that fall below the point source reporting levels and that are too numerous or too small to identify individually. Area sources are commercial, small-scale industrial, and residential categories that use materials or operate processes generating emissions. Area sources are divided into two groups characterized by the emission mechanism: hydrocarbon evaporative emissions or fuel combustion emissions. Examples of hydrocarbon evaporative emission sources include: printing operations, industrial coatings, degreasing solvents, house paints, leaking underground storage tanks, and gasoline service station underground tank filling and vehicle refueling operations. Fuel combustion emission sources include stationary source fossil fuel combustion at residences and businesses, outdoor burning, structural fires, and wildfires.

Emissions calculations of area sources are estimated as county-wide totals rather than as individual source emissions. These emissions, with some exceptions, may be calculated by multiplication of an established, EPA approved, emission factor (emissions per unit of activity) by the appropriate activity or activity surrogate responsible for generating emissions. Actual activity data is used when available. Examples include gallons of gasoline sold in a county, amount of printer ink used, number of wildfire acres burned, and amount of oil and natural gas produced. When actual activity data is unavailable, surrogates are used. These include total county population and employment data by industry type. Often actual activity data is available only at the state or national level and must be adapted to the county level using an appropriate surrogate.

The EPA's 2002 NEI was the starting point for the area source 2002 EI. NEI categories and emissions were reviewed and subsequently updated with current methodologies and local activity data when it was

available. Major efforts were made to locate appropriate activity data. Specific categories were updated using information and data that represent 2002 activities. Some of these categories benefitted from contracted work completed for year 2002 or for a prior year. For some categories with emissions developed from these previous contracts the emissions were grown to 2002. For other less significant categories emissions were grown from the 1999 EI to 2002. The EPA's EGAS growth factors were used for growing these less significant categories. Use of these various methodologies resulted in the 2002 area source EI being compiled from several sources of data, including work from various contracts, TCEQ research, and the NEI.

For those area source categories affected by TCEQ rules, Rule Effectiveness factors were applied to the uncontrolled emissions. These factors address the efficiency of the controls and the percentage of the category's population affected by the rule.

The future year 2007 EI for area sources was compiled using the EGAS growth factors. The EGAS contains individual growth factors for each category and for each forecasting year. This is the EPA standard and accepted method for developing future year EIs.

Quality assurance of area source emissions involves ensuring that the activity data used for each separate category is current and valid. Data such as current population figures, fuel usage, and material usage routinely change annually. Sources of this information were contacted for updates as part of the inventory development process. Current EPA documents were also obtained to keep abreast of changes in emission factors. Other routine efforts such as checking calculations for errors and conducting reasonableness and completeness checks were implemented.

Complete documentation of the area source inventories is available in Appendix A. Additional data relating to area source development are available from the commission upon request.

2.4 ONROAD MOBILE SOURCES

Onroad mobile sources consist of automobiles, trucks, motorcycles, and other motor vehicles traveling on roadways. Combustion related emissions are estimated for vehicle engine exhaust; evaporative hydrocarbon emissions are estimated for the fuel tank and other evaporative leak sources on the vehicle. Emission factors have been developed using the EPA's onroad mobile emissions factor model, MOBILE6. Various inputs are provided to the model to simulate the vehicle fleet driving in each particular nonattainment area. Inputs include such parameters as vehicle speeds by roadway type, vehicle registration by vehicle type and age, percentage of vehicles in cold start mode, percentage of miles traveled by vehicle, type of vehicle I/M program in place, and gasoline vapor pressure. All of these inputs have an impact on the emission factor calculated by the MOBILE6 model, and every effort is made to input parameters reflecting local conditions.

The 2002 CERR for the onroad mobile EI was modeled using the newest EPA onroad emission factor model, MOBILE6.2, to estimate emission factors. The areas covered in the CERR analysis were Collin, Dallas, Denton, Ellis, Henderson, Hood, Hunt, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties. The methodology used to develop the 2002 CERR was in accordance with the CERR (40 CFR Part 51, June 10, 2002) guidance report. This emissions inventory analysis documents estimates of emissions of VOC and NO_X.

Nine of the 12 counties in the 2002 CERR (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties) were used to evaluate the 2002 and 2007 analysis years used in the five percent IOP due to the nonattainment status under the 8-hour ozone standard. The total onroad emissions

of NO_x for 2002 and 2007 analysis years are 345.44 tpd and 206.72 tpd respectively and that of VOC are 156.34 tpd for 2002 and 104.14 tpd for 2007.

To calculate emissions, emission factors were applied to vehicle activity using the Texas Mobile Source Emission Software. Vehicle activity was generated using the Dallas-Fort Worth Regional Travel Model and collected from Roadway Inventory Functional Class Records data. Adjustments were applied to develop better regional emissions estimates. Inclusion of nonrecurring congestion, calculation of local street vehicle miles of travel, seasonal adjustments, and a transportation model adjustment to better reflect model estimates to actual data collected through the Highway Performance Monitoring System (HPMS) were applied to the modeling. Emissions results were summarized in 24 one-hour periods and for a daily total for all counties identified in the analysis.

TERP is included as an onroad mobile emission reduction control strategy toward the five percent goal. The assumption applied for this analysis includes a 33.1 percent onroad mobile and 66.9 percent nonroad mobile allocation of 22.2 tpd from TERP. TERP is expected to provide approximately 5.40 tpd of onroad mobile NO_x emission reductions for the DFW nonattainment area by June 15, 2007. This control strategy is NO_X-focused and does not account for VOC reductions in the analysis. With the addition of TERP as a regional control strategy by 2007, the 2007 NO_x motor vehicle emission budget (MVEB) is then calculated at 201.32 tpd. The 2007 VOC emissions are not impacted due to this emission reduction strategy, and therefore not adjusted. The 2007 VOC motor vehicle emission budget is calculated at 104.14 tpd.

In March 2005, it was discovered that incorrect diesel fraction inputs were used in the development of both the 2002 and 2007 onroad mobile inventories that were included in the 5 Percent IOP SIP proposal. The TCEQ and NCTCOG worked together to correct the problem and this SIP adoption includes the updated onroad mobile estimates of NO_x and VOC emissions for both the 2002 base year and the 2007 future year. Appendices B and C were included with the 5 percent IOP SIP proposal and contain summaries of the 2000 and 2007 onroad mobile inventories developed by NCTCOG in 2004. Appendix K contains a summary of the problems identified with these onroad mobile inventories and the MOBILE6.2 input file revisions performed to correct the problems. Appendices L and M contain the electronic input and output summary files from NCTCOG used to develop the “incorrect” onroad emission inventories for 2002 and 2007, respectively. Appendices N and O contain the electronic input and output summary files from NCTCOG that were used to develop the “corrected” onroad emission inventories for 2002 and 2007, respectively.

2.5 MOTOR VEHICLE EMISSIONS BUDGETS (MVEB)

EPA requires that the 5 Percent IOP SIP establish MVEBs for transportation conformity purposes. A MVEB is the onroad mobile source allocation of the total allowable emissions for each applicable criteria pollutant or precursor, as defined in the SIP. Transportation conformity determinations must be performed using the budget test, once EPA determines the budget(s) adequate for transportation conformity purposes. To pass the budget test, areas must demonstrate that the estimated emissions from transportation plans, programs and projects do not cause the motor vehicle emissions budget(s) to be exceeded.

The MVEBs were calculated by subtracting creditable onroad strategies from the unadjusted onroad mobile source inventory. The 5.4 tpd NO_x from TERP reductions, discussed in Section 2.4 above, is the onroad strategy applied toward the 5 Percent IOP plan. Subtraction results in the MVEB budget for NO_x. No specific onroad strategies for VOC were identified for the 5 Percent IOP plan. Please refer to Table 2-

1.

Table 2-1: 2007 DFW Motor Vehicle Emissions Budgets

	VOC (tpd)	NO_x (tpd)
2007 onroad mobile source inventory, unadjusted	104.14	206.72
TERP credits	0	–5.4
2007 MVEB	**104.14**	**201.32**

2.6 NONROAD MOBILE SOURCES

Nonroad mobile categories include aircraft, railroad locomotives, recreational vehicles and boats, and a very broad range of equipment from 600-horsepower engines in the construction equipment class to one-horsepower string trimmers in the lawn and garden class. For all nonroad mobile categories except aircraft, locomotives, and commercial marine vessels the EPA NONROAD model is used to calculate emissions. This model generates emissions for over 200 individual types of equipment for the following classes:

- Agricultural
- Commercial
- Construction
- Industrial/Oilfield
- Lawn and Garden
- Logging
- Railway Maintenance
- Recreational
- Recreational Marine

See Table 2-2 for a summary of emissions in the nine county DFW nonattainment area from the 2002 nonroad mobile inventory and the projected 2007 inventory.

Table 2-2: DFW Nonroad Mobile Emissions Summary for 2002 and 2007 by Nonroad Model Equipment Class

	2002		2007	
CLASS	NO_x (tpd)	VOC (tpd)	NO_x (tpd)	VOC (tpd)
Agricultural	4.23	0.60	3.90	0.47
Commercial	7.71	9.57	7.43	7.70
Construction	56.26	9.34	49.77	6.66
Industrial/Oilfield	19.17	4.58	15.35	3.38
Lawn and Garden	3.23	25.36	3.57	15.31
Logging	0.08	0.05	0.06	0.03
Railway Maintenance	0.15	0.04	0.14	0.03
Recreational	0.28	6.19	0.32	8.97
Recreational Marine	0.45	8.06	0.59	5.69

Activity data in the NONROAD model used to calculate emissions include the equipment count, horsepower ranges, and fuel types. The model will produce emissions for every county in the state, using default activity data prorated from national data to the state and county levels using appropriate surrogates. Operating the model with all the default surrogates in place is acceptable, however, EPA encourages states to update the model with local, county-level data based on surveys and other relevant information. As local, county-level data becomes available to the TCEQ, it is incorporated into the NONROAD model.

The latest NONROAD model, version 2004, was used to develop the DFW 2002 nonroad EI. Recent surveys and local data have improved Texas' use of the model. Improvements to the following classes include the major VOC and NO_x nonroad mobile categories: construction, lawn and garden, oilfield, and recreational marine.

Emissions from commercial and military aircraft are calculated using the Emissions and Dispersion Modeling System (EDMS) model which uses actual recorded landing/takeoff (LTO) data and aircraft types to generate emissions. Smaller aircraft emissions are calculated using EPA emission factors and applicable LTO data. Emissions from ground support equipment at commercial airports were based on a recent survey of equipment in the DFW area.

Emissions from locomotives are based on fuel use and track mileage. Individual railroad lines were surveyed for actual data to use in emissions calculation. These surveys and discussions with the railroad lines are ongoing with the intent to continue to improve the locomotive EI.

The future year 2007 EI for nonroad mobile sources was also developed by the NONROAD model. The model produces future year EIs routinely, and the most recent version contains future estimated activities

and rules that will have an effect on the emissions. Projected LTO data was used to develop the 2007 aircraft and ground support EIs, and railroad activity was projected to 2007 using previous year surveys and data collected from the railroad lines.

Quality assurance procedures for nonroad mobile source emissions rely mainly upon the quality of data used for each separate category. Data such as local equipment population figures and fuel usage routinely change annually. Sources of this information were contacted during the inventory development for updates. Using the current EPA NONROAD and EDMS models ensures that updates to equipment types, horsepower ranges, and results from applicable rules are applied to the emissions. Other routine efforts such as checking calculations for errors and conducting reasonableness and completeness checks were implemented.

Complete documentation of the nonroad mobile inventories is available in Appendix A. Additional data files are available from the commission upon request.

2.7 BIOGENIC SOURCES

Biogenic sources include pine and oak forests, crops, and lawn grass which produce VOC emissions such as isoprene, monoterpene, and alpha-pinene. In addition, nitric oxide emissions are produced by soils. EPA, using the latest Biogenic Emissions Inventory System (BEIS) model, provided the 2002 biogenic EI for the states. Data used in the model includes vegetation types and land use from satellite imaging, field biomass surveys, and emission factors for plant species.

EPA guidance on the 5 Percent IOP plan excludes biogenic emissions from the baseline and future inventories, and thus this submittal does not consider biogenics. However, biogenic emissions are important in determining the overall emissions profile of an area and therefore are required for regional air quality modeling, and will be discussed further in future SIPs.

2.8 EMISSIONS SUMMARY

The 2002 base year emissions inventory summary for the DFW ozone nonattainment area is shown in Figures 2-1 for VOC and 2-2 for NO_x. The largest man-made contribution of VOCs is from area sources and the largest man-made contribution of NO_x is from onroad mobile sources. The contributions from VOC sources in the 2002 base year inventory are as follows: point sources 6 percent; nonroad mobile sources 15 percent; onroad mobile sources 34 percent; and area sources 45 percent. The contributions from NO_x sources in the 2002 base year inventory are as follows: area sources 6 percent; point sources 13 percent; nonroad mobile sources 23 percent; and onroad mobile sources 58 percent. Table 2-4 shows VOC and NO_x emissions for 2002 by county and major source category.

The 2007 future year emissions inventory for the DFW area is summarized in Figures 2-3 for VOC and 2-4 for NO_x. The 2007 future year emissions inventory is an estimation that is projected forward from the 2002 base year inventory, using specific procedures approved by the EPA. The contributions from VOC sources in the 2007 future year inventory are as follows: point sources 8 percent; nonroad mobile sources 13 percent; onroad mobile sources 26 percent; and area sources 53 percent. The contributions from NO_x sources in the 2007 future year inventory are: area sources 9 percent; point sources 19 percent; nonroad mobile sources 27 percent; and onroad mobile sources 45 percent. Table 2-5 shows VOC and NO_x emissions for 2007 by county and major category.

EPA's guidance states that in all likelihood, emissions growth in an area will be more than offset by the expected emission reductions because of onroad and nonroad fleet turnover. However, in a very rapidly growing area a net emission reduction might not be achieved from the 2002 inventory. According to the

guidance, states should ensure that the projected future inventory is at least 5 percent less than the 2002 inventory or the appropriate percentage of NO_x and VOC if a combination of pollutants is used. That is, the 2007 projected inventory must be no greater than 95 percent of the 2002 inventory.

This SIP revision demonstrates that Texas has met this requirement. The percentage reductions in the VOC and NO_x inventory from 2002 (adjusted to include VOC emissions from portable fuel containers and NO_x emissions from Alcoa outside the 9-county DFW nonattainment area) to 2007 (adjusted for 5 percent control strategies) are summarized below:

Table 2-3: DFW Reductions from 2002 to 2007

Pollutant	Adjusted 2002 inventory (tpd)	Adjusted 2007 inventory (tpd)	Percentage reduction from 2002 to 2007
VOC	465.75	403.19	13.4%
NO_x	622.22	422.02	32.2%

Table 2-3 shows that the 2007 inventories for both VOC and NO_x in comparison to the 2002 inventories have each decreased by much more than 5 percent.

Figure 2-1 2002 VOC Emissions in DFW

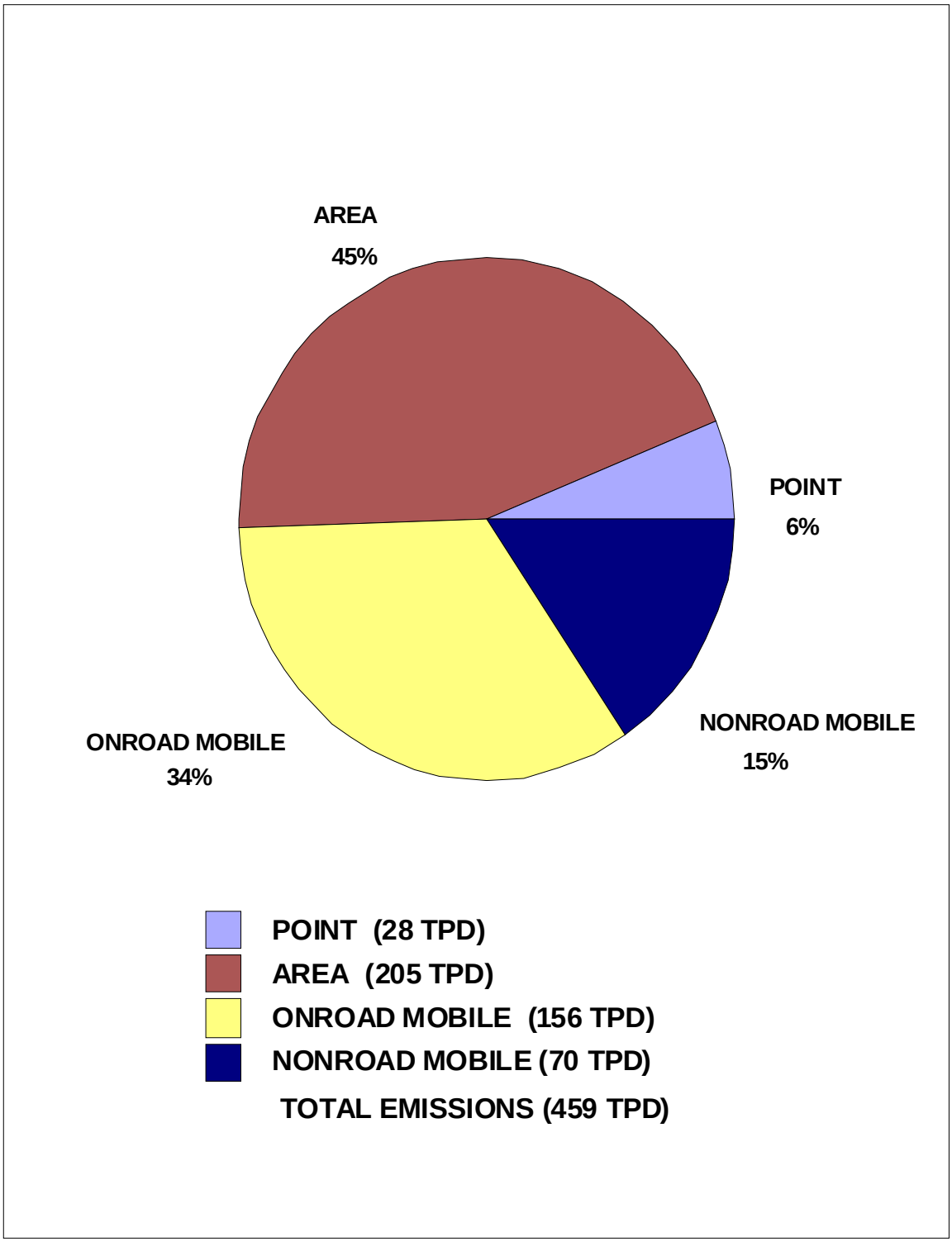


Figure 2-2 2002 NO_x Emissions in DFW

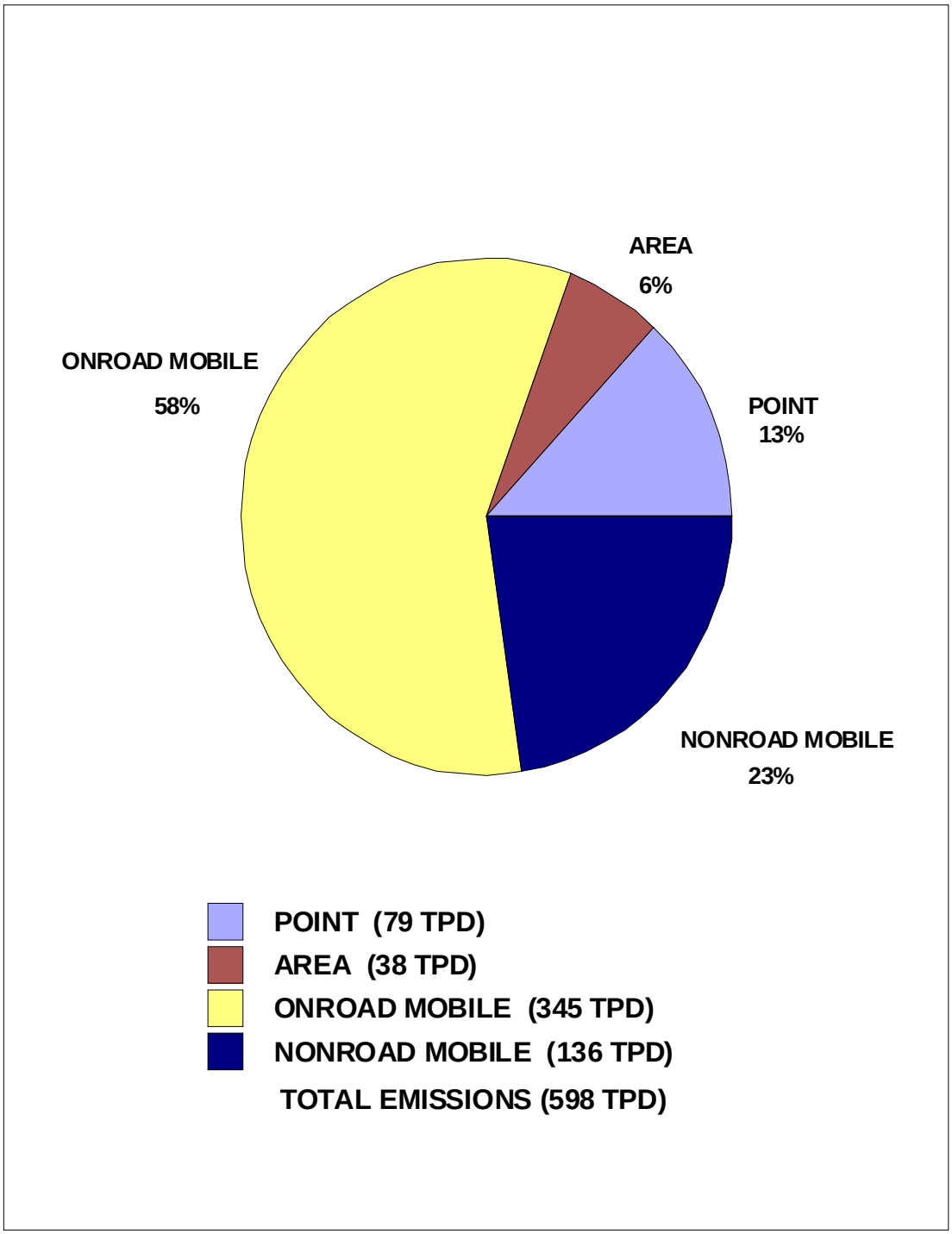


Table 2-4: Unadjusted 2002 VOC and NO_x Emissions by County and Major Category (in tpd)

2002 VOC Emissions

County	Point	Area	Onroad Mobile	Nonroad Mobile	County Totals
Collin	1.13	15.07	13.36	7.59	37.15
Dallas	9.26	80.87	69.65	29.33	189.11
Denton	1.00	19.07	12.45	6.63	39.15
Ellis	5.72	6.40	4.41	2.33	18.86
Johnson	0.77	6.94	4.26	1.31	13.28
Kaufman	0.75	7.42	4.28	1.64	14.09
Parker	0.70	7.40	3.70	1.16	12.96
Rockwall	0.00	1.87	1.70	1.36	4.93
Tarrant	8.98	59.38	42.53	18.73	129.62
Total	28.31	204.42	156.34	70.08	459.15

2002 NO_x Emissions

County	Point	Area	Onroad Mobile	Nonroad Mobile	County Totals
Collin	2.56	1.49	27.30	13.11	44.46
Dallas	15.93	14.44	140.77	46.78	217.92
Denton	0.58	11.16	27.71	10.39	49.84
Ellis	37.83	0.18	18.21	7.79	64.01
Johnson	4.01	0.23	10.64	6.41	21.29
Kaufman	0.35	0.16	12.36	2.53	15.40
Parker	2.62	1.32	11.74	1.78	17.46
Rockwall	0.00	0.10	7.40	1.14	8.64
Tarrant	15.43	8.95	89.31	46.31	160.00
Total	79.31	38.03	345.44	136.24	599.02

Figure 2-3 2007 VOC Emissions in DFW

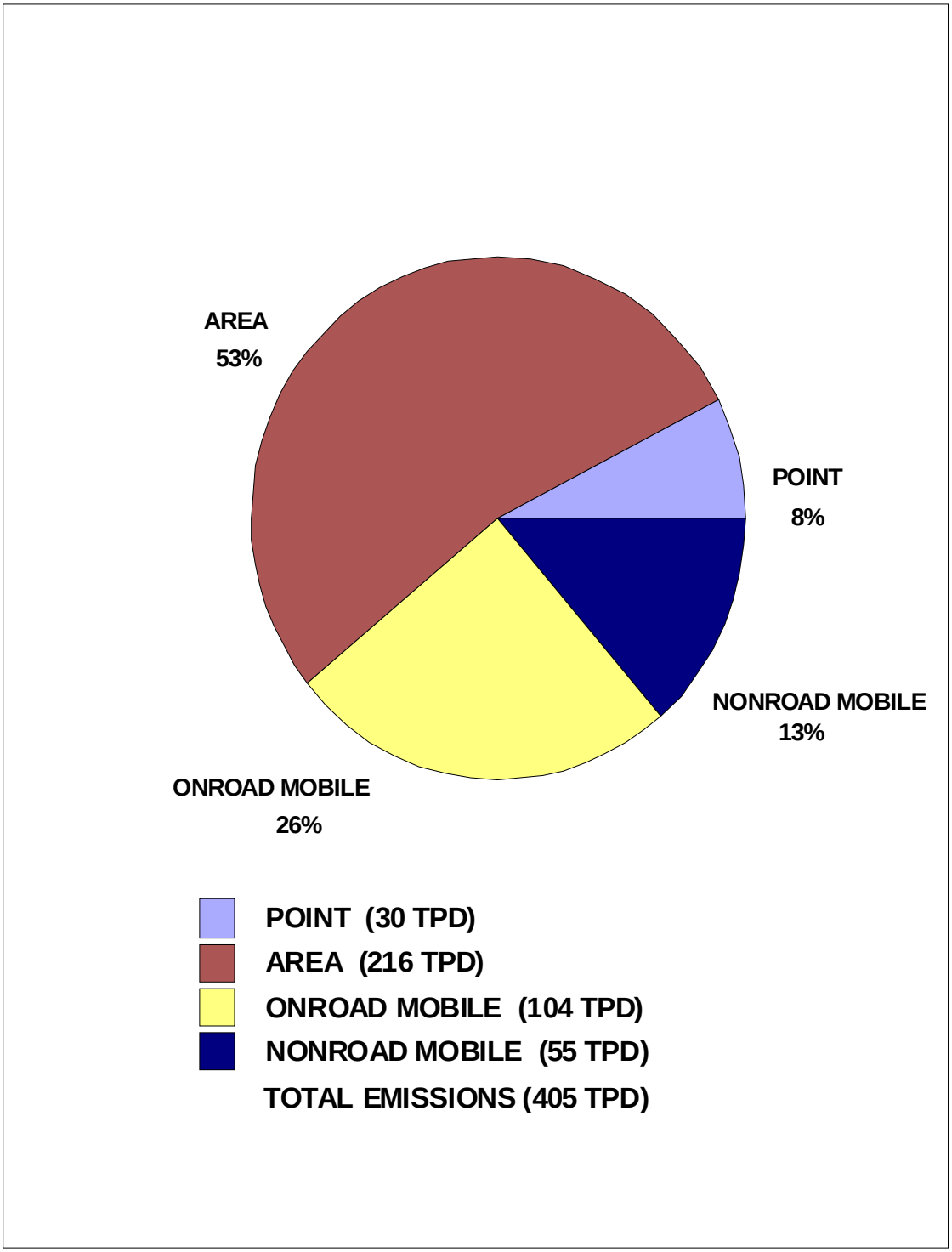


Figure 2-4 2007 NO_x Emissions in DFW

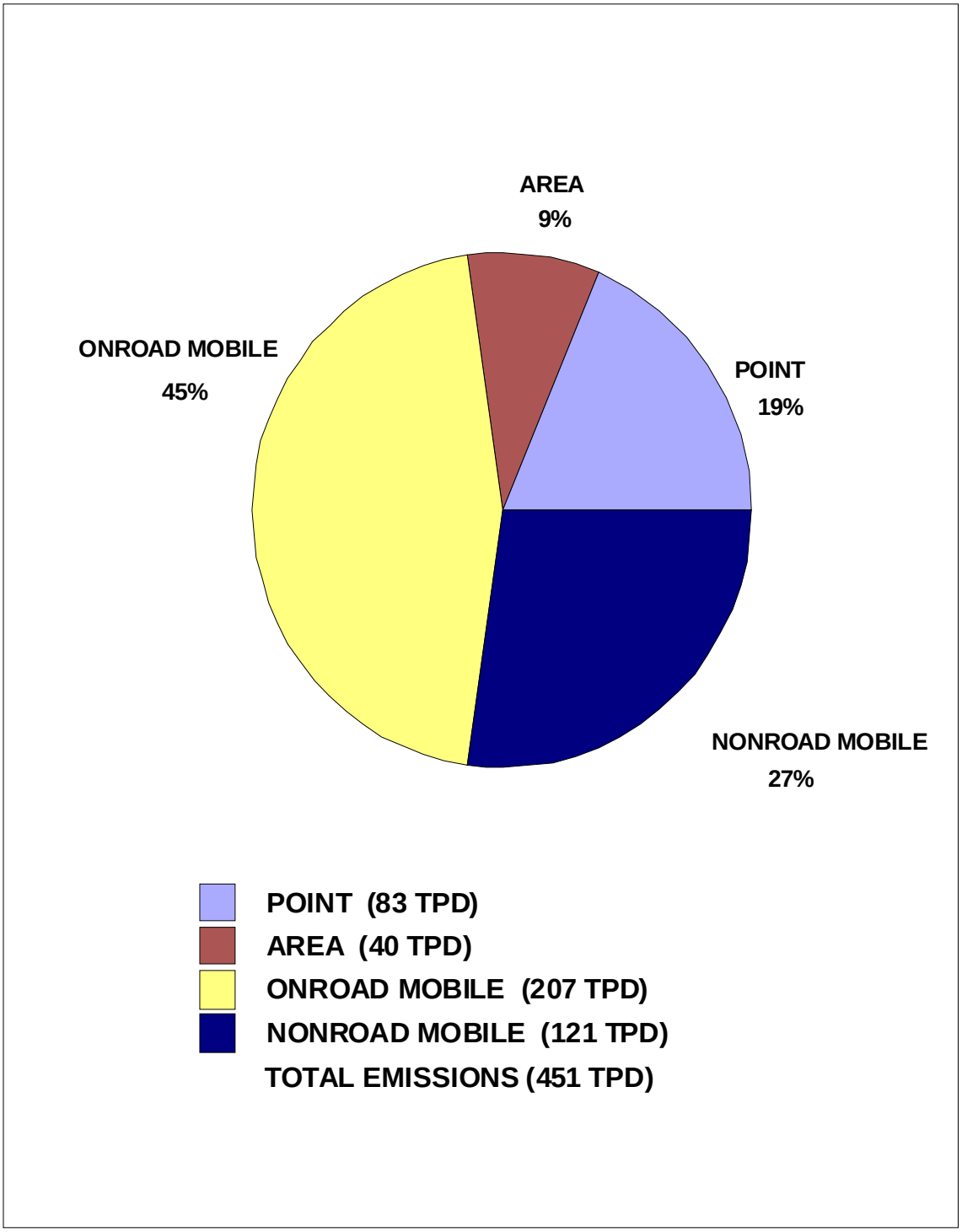


Table 2-5: Unadjusted 2007 VOC and NO_x Emissions by County and Major Category (in tpd)

2007 VOC Emissions

County	Point	Area	Onroad Mobile	Nonroad Mobile	County Totals
Collin	1.18	15.69	8.96	6.80	32.63
Dallas	9.30	84.96	47.40	21.90	163.56
Denton	1.04	20.13	8.16	5.21	34.54
Ellis	6.08	6.75	2.67	1.77	17.27
Johnson	0.79	7.31	2.35	1.02	11.47
Kaufman	2.11	8.03	2.57	1.24	13.95
Parker	0.84	7.76	2.01	0.90	11.51
Rockwall	0.05	1.95	0.99	1.97	4.96
Tarrant	9.03	63.33	29.03	13.77	115.16
Total	30.42	215.91	104.14	54.58	405.05

2007 NO_x Emissions

County	Point	Area	Onroad Mobile	Nonroad Mobile	County Totals
Collin	3.60	1.54	17.86	11.82	34.82
Dallas	7.87	14.97	85.71	42.17	150.72
Denton	2.67	11.75	16.82	10.76	42.00
Ellis	39.43	0.18	9.80	7.07	56.48
Johnson	6.00	0.23	5.75	6.93	18.91
Kaufman	8.22	0.16	6.82	2.50	17.70
Parker	6.35	1.39	6.11	1.92	15.77
Rockwall	2.12	0.10	3.64	1.04	6.90
Tarrant	7.26	9.32	54.21	36.62	107.41
Total	83.52	39.64	206.72	120.83	450.71

CHAPTER 3: PHOTOCHEMICAL MODELING

(No change)

CHAPTER 4: DATA ANALYSIS

4.1 INTRODUCTION

In its guidance for the 5 Percent IOP plan, EPA states that reductions from outside the nonattainment area that are not already in the approved SIP are creditable if consistent with previous EPA guidance, provided they occur within 100 km of the nonattainment area for VOCs or within 200 kilometers for NO_x. A demonstration must be made that, in addition to the 100km/200km criteria, the reductions have been shown to impact the nonattainment area. The guidance states that this demonstration may be met by analyzing wind rose data, available modeling, or similar technical documentation.

The guidance also states that the emissions from the source or sources where the reductions are occurring must be added to the baseline inventory. Furthermore, all measures for inclusion should meet the general criteria for SIP approval of being permanent, quantifiable and enforceable.

4.2 ANALYSIS OF AIR QUALITY SAMPLING FLIGHT NEAR Alcoa and TXU POWER PLANT

Air quality sampling near the Alcoa and TXU Power Plant shows that NO_x emissions from the Alcoa facility significantly contribute to ozone concentrations downwind. On August 25, 1997, the Baylor University King Air Aircraft (contracted by TCEQ) conducted an air quality sampling mission around the Alcoa and TXU power plant (formerly known as TUGCO) near Rockdale in Milam county. The aircraft circled the power plant and then completed a series of downwind traverses approaching Georgetown and Round Rock to follow the emissions plume. Light east to southeast winds were observed to push the plume to the west-northwest. Figure 4-1 shows the ozone concentrations detected during the flight. As the aircraft flew west higher ozone concentrations were observed, peaking above 100 ppb on the furthest downwind traverse approximately 25-30 miles from Alcoa. NO_Y concentrations during the flight are displayed in Figure 4-2. Very close to the source NO_Y was measured above 200 ppb and a NO_Y plume, 5-10 ppb above background levels, appeared to extend many traverses to the west. As expected, ozone levels close to the Alcoa plant drop because of the presence of high levels of NO_y.

4.3 WIND ROSE ANALYSES

Figure 4-3 shows the wind roses for high ozone days superimposed on a map centered on the DFW area, with the location of the Alcoa and TXU power plants highlighted. The windrose analysis provides a visual representation of the frequency of the direction of winds in the DFW on high ozone days. Winds from the south and south-southeast are the most common directions. This leads to the conclusion that reductions in sources from areas south and south-southeast of DFW may have a positive impact on air quality in the DFW area. As such, emission reductions from Alcoa are being included in the 5 percent IOP SIP.

4.4 UPWIND -DOWNWIND ANALYSIS

Figure 4-4 shows that high ozone days in the DFW area can have air parcels move into the area from any direction. Both the upwind-downwind and wind rose analyses show that sources in any direction can have an impact on ozone levels in the nine county DFW area. Therefore, reductions of VOCs through the statewide portable fuel container rule will improve air quality in the DFW area. The magnitude of those reductions are discussed further in Chapter 5.

Figure 4-1: Alcoa and TXU Ozone Plume Analysis

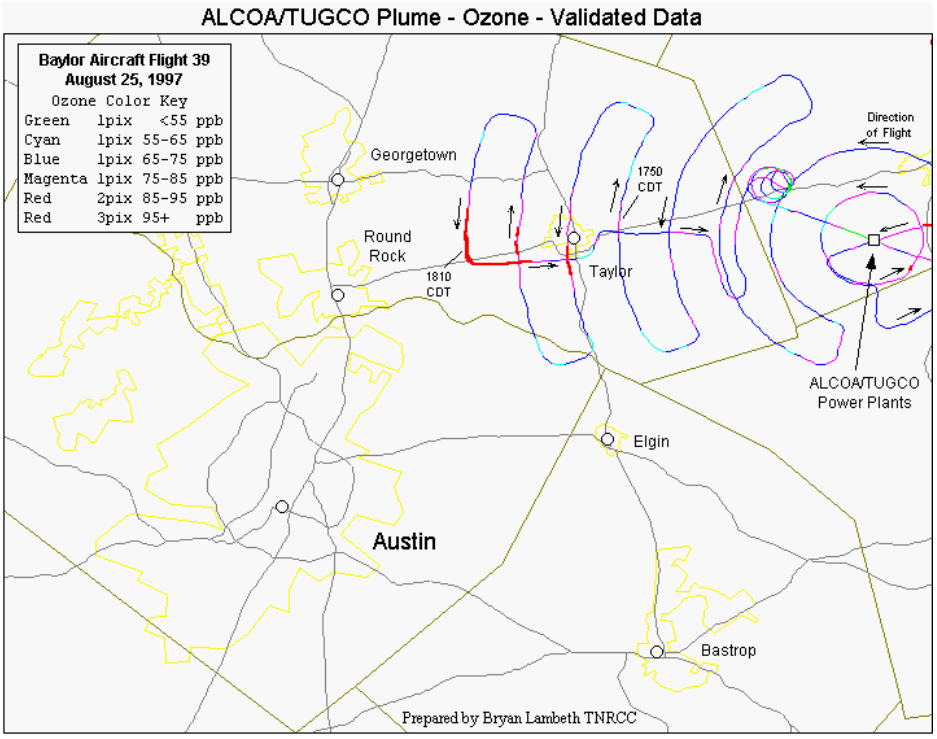


Figure 4-2: Alcoa and TXU NO_y Plume Analysis

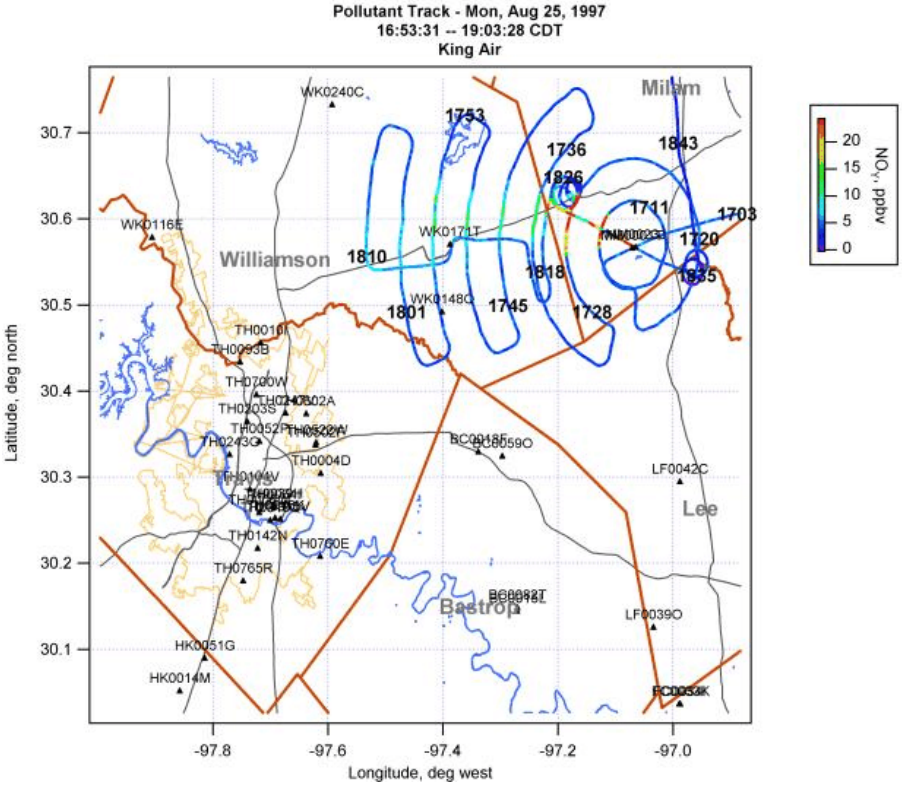
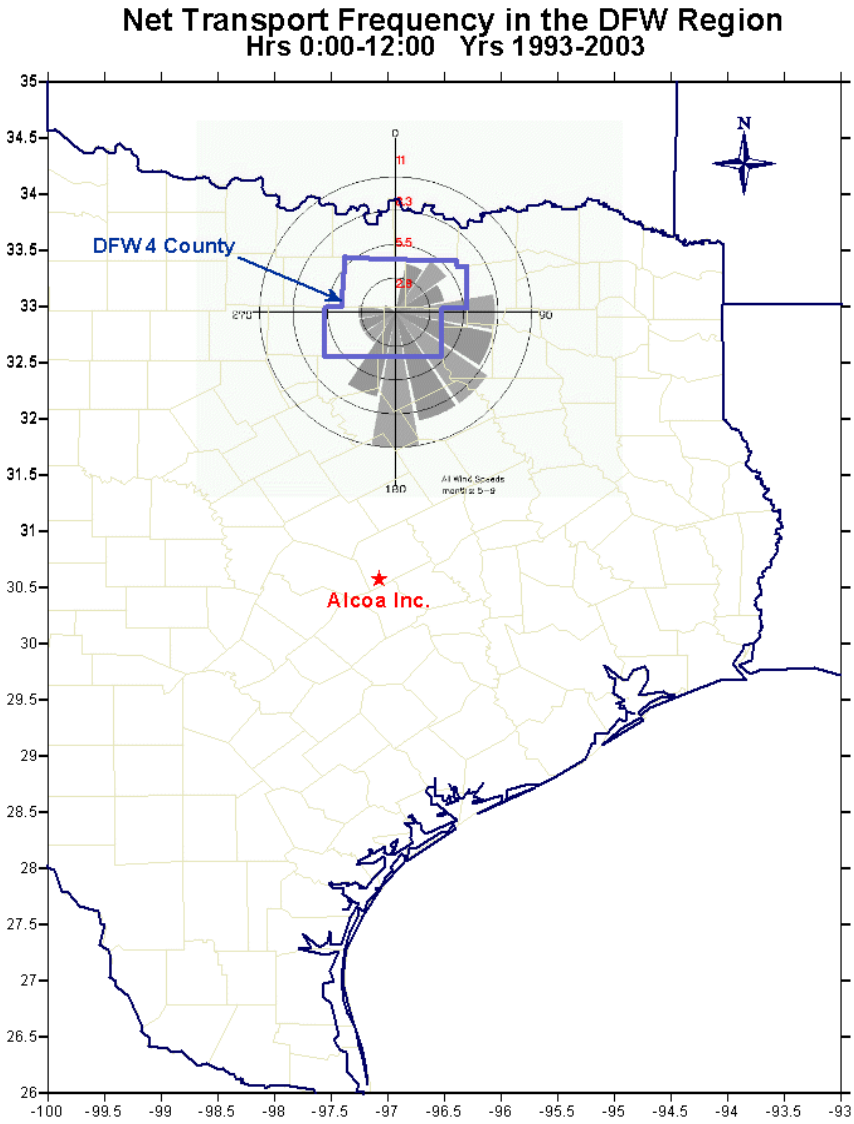


Figure 4-3: DFW Wind Rose Diagram in Relation to Alcoa, Milam County

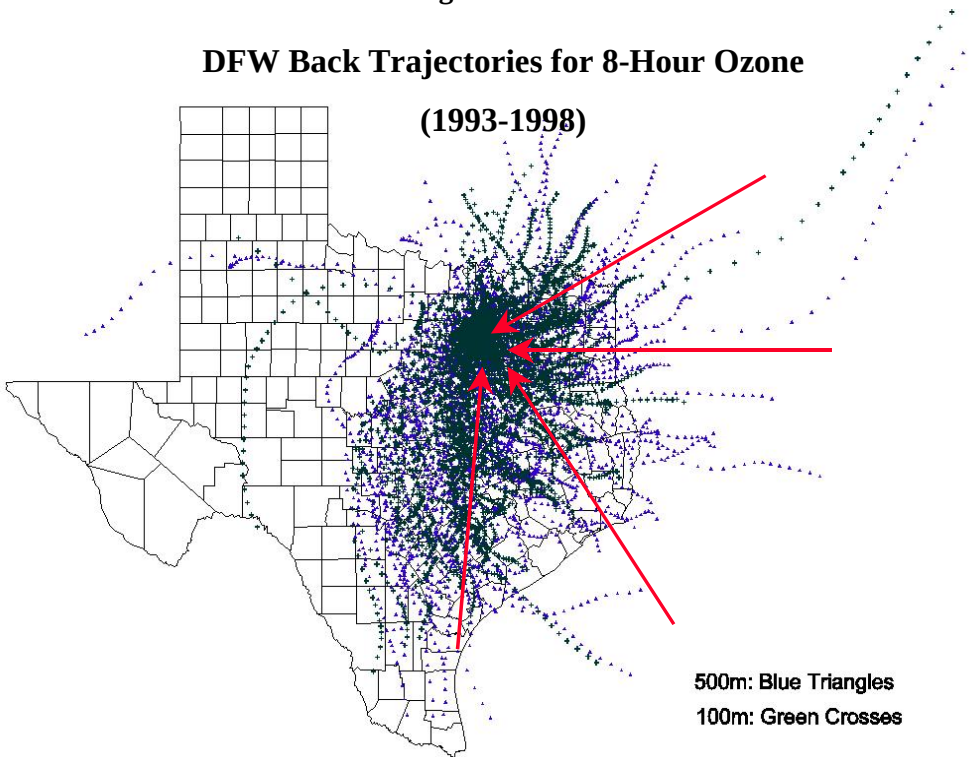


The Wind Rose depicts the frequency of Net-Transport daily winds for 1-hour ozone greater then 125 ppb. The Wind Rose is centered over the DFW region and includes all sites for the calculation.

Figure 4-4:

DFW Back Trajectories for 8-Hour Ozone

(1993-1998)



CHAPTER 5: REQUIRED CONTROL STRATEGY ELEMENTS

5.1 INTRODUCTION

EPA's "Guidance on 5 Percent Increment of Progress, 40 CFR.905(a)(1)(ii)(B)" issued August 2004 contains guidance for states to use in preparing 5 Percent IOP plans. According to the guidance, an approvable 5 Percent IOP plan must contain the following elements:

1. Reductions must be made from the 2002 emission baseline. Specifically, the source of the emission reductions is anthropogenic or man-made emissions only, for the entire 8-hour ozone nonattainment area and the surrounding 100 km for VOC and 200 km for NO_x.
2. The 2002 anthropogenic inventory multiplied by 0.05 represents the amount of reductions that must be achieved by the 5 Percent IOP plan. Both NO_x and VOC reductions may be used to meet the five percent reduction requirement. In this case, the selected percentage reductions are calculated for both the VOC and NO_x 2002 inventories. The respective VOC and NO_x percentages applied must equal five percent.
3. A 2007 inventory including growth, fleet turnover, and measures in the EPA-approved SIP which are already approved and/or which have been implemented by 2002.
4. The result from item 2 above subtracted from the result from item 3 establishes the target level of emissions to be achieved by June 15, 2007. The onroad mobile source portion of the 2007 adjusted inventory represents the MVEB.
5. The plan must have sufficient control measures to ensure that the area's emissions in 2007 will be less than or equal to the target level of emissions.

5.2 EXISTING CREDITABLE MEASURES

5.2.1 NO_x Control Measures

5.2.1.1 Texas Emission Reduction Plan

In 2001, the 77th Texas Legislature passed SB 5 which established the Texas Emission Reduction Plan (TERP). The bill provided funding mechanisms for the program and the state anticipated that about $130 million in new fees would be collected to fund the emission reductions contemplated. The major funding source, a fee on out-of-state vehicle registrations, was found to be in violation of the commerce clause of the Fourteenth Amendment of the United States Constitution and Article I. Section 3 of the Texas Constitution, see *H.M. Dodd Motor Co. Inc. and Autoplex Automotive, LP. v. Texas Department of Public Safety, et al.*, Cause No GNID2585(200th Judicial District Court, Travis County, February 21, 2002). The 78th Texas Legislature enacted HB 1365 which restored funding to the TERP and provided a dedicated revenue mechanism for TERP through an increase in the vehicle title fee and changes to existing surcharges on the sale, lease or use of onroad heavy-duty diesel vehicles and nonroad equipment. TERP was also enhanced through the enactment of House Bill 1365 by the authorization of funding for projects that include stationary engines and equipment that use fuels other than diesel. Out of the $140 million per fiscal year in projected revenue through FY 2008, the Emissions Reduction Incentive Grants Program is allocated 87.5 percent of that total, or about $120.5 million per fiscal year. As a result, projected revenue for the program is expected to average about $130 million per fiscal year through FY 2008. This funding was authorized to pay for at least 16.3 tpd in NO_x emission reductions in the DFW area to replace statutorily restricted rules and, based on an allocation approach established by the commission for future grant funding, may be enough to achieve over 22.2 tpd of reductions by 2007. The legislature also allocated funds to this program for other affected areas of the state.

The first emissions reduction incentive grant projects funded under TERP were for fiscal years 2002 - 2003 (September 1, 2001, through August 31, 2003). The funds available for award under the grants program were substantially less than the $130 million originally expected due to the loss of funding from

the primary funding mechanism. Revenue generated for TERP was only $20.5 million per fiscal year, with approximately $14 million per fiscal year available for emission reduction incentive grants. As a result, applications were only accepted for projects in the HGB and DFW nonattainment areas. There were 68 projects funded for onroad and offroad diesel vehicles and equipment. The projects included the purchase of heavy-duty diesel equipment that met engine emission standards earlier than required, repower of older vehicles and equipment, installation of retrofit devices, and use of qualifying fuels. The TCEQ awarded a total of $26.5 million, with an average projected cost per ton of NO_x reduced of $5,800 for both the DFW and HGB areas.

During the first part of FY 2004, a total of 43 projects in the eligible 41 counties were awarded funding for $15.3 million. The projected NO_x reductions are 3,047 tons, at an average cost per ton of $5,008. In March 2004, 479 applications requesting over $350 million were received and reviewed. The 171 projects funded are anticipated to result in over 10,000 tons of NO_x reductions, at an average cost per ton of $5,980. Overall, as of mid-January, there were contracts in place for 282 projects, totaling over $120 million for projected reductions in NO_x emissions of over 21,100 tons, at an average cost per ton of NO_x reduced of $5,714. Please refer to Appendix J for more detail. For the DFW area, this means approximately 5.2 tpd of NO_x are projected to be reduced in 2007 from the over 100 TERP projects in place in the DFW area. Accounting for these projects already funded and, based on the approach established for allocating future TERP funds, TERP funding will be sufficient to achieve over 22.2 tpd of reductions in the DFW area by 2007.

For information on recent TERP activities, please visit the following web site: http://www.terpgrants.org For further information on obtaining a TERP grant, contact the TERP help line at 1-800-919-TERP.

5.2.1.2 Energy Efficiency

Energy efficiency measures are a critical part of the commission's plan for clean air. Not only do they decrease NO_x emissions, they also produce reductions in other criteria pollutants such as PM, SO_2, VOC, and CO. The primary benefit of energy efficiency is its ability to decrease the demand for electrical generation, which provides for greater reliability, with the secondary benefit being emission reductions. When combined, various efficiency measures have the potential to add up to significant energy savings as well as emission reductions, thereby contributing to the overall goal of clean air in Texas.

The Texas Legislature anticipated the need for the energy efficiency programs in Texas and passed legislation to initiate such programs. The 76th Texas Legislature enacted SB 7, which included among other things, a commitment to improving air quality through an energy efficiency mandate to offset future growth in the demand of energy production. The details of this plan are set out in Chapter 25 of the Public Utility Commission of Texas' rules, which require at least a 10 percent reduction of electric utility's growth in demand by January 1, 2004, and each year thereafter. These reductions can be achieved through energy efficiency measures or by utilizing renewable energy, such as wind power. The 77th Texas Legislature enacted SB 5 which requires each political subdivision to establish a goal to reduce electricity consumption by five percent each year for five years, beginning January 1, 2002, with an annual report submitted to the State Energy Conservation Office demonstrating these reductions. To meet the goals set forth by the Texas Legislature, political subdivisions may develop municipal planning requirements, energy efficiency performance standards, home energy rating programs, and Energy Star programs. The bill also provided for a grant program to be administered through the PUC to provide financial incentives for energy efficiency measures. Furthermore, SB 5 establishes new building code requirements for all new construction statewide.
With EPA support, the TCEQ has managed a contract for the development of the Texas Energy and

Emissions Reduction Calculator (Ecalc). The goal is to provide Texans with an accurate, easy-to-use tool for calculating the emission reduction credits attributable to energy efficiency and renewable energy projects in residential and commercial buildings. In 2004, the Energy Systems Laboratory (ESL) developed the user-friendly web-based interface for Ecalc, and enhancing the features of the single-family and multifamily residences, including new models for office buildings, retail stores, models for solar thermal installations, models for solar photovoltaic installations, as well as the capability for calculating savings from retrofit to municipal buildings, water and wastewater facilities, street lights, traffic lights and wind energy projects. The 2004 enhancement also included the compilation and use of 1999 ozone modeling episode weather data for 9 sites and newly compiled 1999 emissions values, that allow Ecalc to calculate annual NO_x emission reductions for 1999, and peak day NO_x reductions for 1999 and 2007 ozone episode days.

The database and applications developed and used by the Ecalc system were used to calculate NO_x reductions in the DFW nonattainment area. These reductions are enforceable and permanent because SB 5 mandates the statewide adoption of the International Residential Code (IRC) and the International Energy Conservation Code (IECC) for residential, commercial, and industrial buildings. The NO_x reductions were calculated based on electricity and natural gas savings from implementation of the 2000 construction code to single and multi-family residences in 2003. The resulting annual NO_x reductions for 2007 was calculated to be 0.72 tpd. Please refer to Appendix I for more detail.

The TCEQ plans to continue developing a system with tools that will help assess the impact of energy efficiency and renewable energy projects on air quality in Texas.

5.2.2 VOC Control Measures

5.2.2.1 Statewide Portable Fuel Container Rule

The portable fuel container rule establishes new requirements relating to the design criteria for portable fuel containers and portable fuel container spouts. The new rules will establish design criteria for "no-spill" portable fuel containers based in large part on the CARB standards. By December 31, 2005, these new rules will limit the type of portable fuel containers and portable fuel container spouts sold, offered for sale, manufactured, and/or distributed in the State of Texas. Fuel released into the environment leads to the contamination of both the state's air and water. These rules will ensure that portable fuel containers manufactured under these standards will release fewer amounts of fuel as the result of spillage and evaporation.

The source of emissions data was the 2002 emissions inventory, which was based on information on residential and commercial portable fuel containers obtained in surveys conducted in 2002 (Emissions from Portable Gasoline Containers in Texas Survey, Nustats, Inc. [June 10, 2002, Residential Gas Can Survey and August 30, 2004, Business Gas Can Survey]). The life expectancy of a portable fuel container was assumed to be 7 years, based on the 2002 Gas Can Inventory (Appendix H). This information, combined with surveyed replacement schedules, results in an estimated 28 percent of the containers being replaced by 2007. Table 5-1 below shows the 2002 emissions and estimated reductions from portable fuel containers in the 9-county DFW nonattainment area. The 2002 emissions from portable fuel containers in the 9 counties are 20.06 tpd of VOC. Therefore, the estimated VOC reduction by 2007 is 20.06 tpd VOC emissions x 0.80 Rule Effectiveness x 0.28 Rule Penetration x 0.62 Control Efficiency = 2.79 tpd VOC.

EPA's guidance for the 5 Percent IOP plan allows credit to be taken for VOC reductions occurring within 100 km of the ozone nonattainment area. The 100 km perimeter around the DFW ozone nonattainment

area includes all or a predominant part of 34 counties, as shown in Table 5-2 below. (Also see the DFW 100/200 km radius map in Figure 5-1.) The 2002 emissions from portable fuel containers in the referenced 34 counties are 4.52 tpd VOC. Therefore, the estimated VOC reduction by 2007 is 4.52 tpd VOC emissions x 0.80 Rule Effectiveness x 0.28 Rule Penetration x 0.62 Control Efficiency = 0.63 tpd VOC.

Table 5-1: Portable Fuel Container Emissions in the 9-county DFW Area

COUNTY	TPD VOC
Collin	2.01
Dallas	9.65
Denton	1.68
Ellis	0.31
Johnson	0.43
Kaufman	0.2
Parker	0.27
Rockwall	0.15
Tarrant	5.36
TOTAL	20.06
Estimated Reductions	2.79

Table 5-2: Portable Fuel Container Emissions in 100 km Radius Around the DFW Nonattainment Area

COUNTY	TPD VOC
Anderson	0.13
Archer	0.03
Bosque	0.06
Clay	0.03
Comanche	0.04
Cooke	0.11
Delta	0.02
Eastland	0.06
Erath	0.1

COUNTY	TPD VOC
Fannin	0.09
Franklin	0.03
Freestone	0.05
Grayson	0.4
Hamilton	0.03
Henderson	0.26
Hill	0.1
Hood	0.14
Hopkins	0.1
Hunt	0.23
Jack	0.02
Lamar	0.15
Limestone	0.06
McLennan	0.82
Montague	0.06
Navarro	0.15
Palo Pinto	0.08
Rains	0.03
Smith	0.63
Somervell	0.02
Stephens	0.03
Van Zandt	0.15
Wise	0.14
Wood	0.11
Young	0.06
TOTAL	4.52

COUNTY	TPD VOC
Estimated Reductions	0.63

5.3 MEASURES REQUIRING RULEMAKING

5.3.1 NO_x CONTROL MEASURES

5.3.1.1 Lean-Burn and Rich-Burn Engines

The reductions relied upon in the 5 percent IOP plan include the implementation of new NO_x emission specifications and other compliance demonstration requirements for certain industrial, commercial, and institutional gas-fired stationary, reciprocating internal combustion engines. The rule associated with the adopted requirements are in Chapter 117, Subchapter B, Division 3 and apply to sites located in Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties. The adopted rule requires each gas-fired rich-burn engine placed into service before January 1, 2000 and gas-fired lean-burn engine to achieve a 2.0 grams NO_x per horsepower hour (g/hp-hr) emission limit. The adopted rule also requires gas-fired rich-burn engines placed into service on or after January 1, 2000 to achieve 0.5 g/hp-hr. A CO limit of 3.0 g/hp-hr limit applies to all gas-fired lean-burn and rich-burn engines as well as certain demonstration of compliance requirements. The NO_x emission reductions resulting from the implementation of this rule are 1.87 tpd.

5.3.1.2 Alcoa, Milam County

EPA's guidance for the 5 Percent IOP plan allows credit to be taken for NO_x reductions occurring within 200 km of the ozone nonattainment area. The Alcoa plant in Rockdale, Milam County is within 200 km of the boundary of the DFW ozone nonattainment area. As the result of enforcement actions, Alcoa is required to make reductions from its three lignite-fired boilers (Sandow Units 1, 2, and 3).

In other commitments entered into on April 19, 2000, Alcoa made an enforceable commitment to achieve 30 percent NO_x reductions from these three boilers in a phased schedule, with a final compliance date of December 31, 2002. Since these reductions are reflected in the 2002 inventory, they are included in the baseline for the 5 percent increment of progress demonstration.

On April 9, 2003, a federal consent decree was signed with Alcoa which requires the company to elect by September 25, 2004 whether the three Sandow units will be controlled, replaced, or shut down. This consent decree is contained in Appendix D. The company is not considering the option to control the boilers. If Alcoa opts to shut down the boilers, this must occur by December 31, 2006. If the company chooses to replace the boilers with two lignite-fired circulating fluidized bed (CFB) boilers, it must replace the first boiler by May 25, 2007, and the second boiler by December 31, 2007. The allowables are specified in TCEQ Air Quality Permit No. 48437.

EPA's 5 Percent IOP guidance also requires that emissions from the source contributing the emissions credits be added to the 2002 baseline inventory. The 2002 NO_x and VOC emissions inventories for Alcoa, 23.17 tpd and 2.13 tpd, respectively, have been added to the 2002 CERR inventory.

The reported NO_x emissions in the 2002 emissions inventory and the reductions associated with shutdown or replacement of the boilers are supported by Appendices E, F, and G and are summarized in Table 5-3 below:

Table 5-3: Alcoa Emissions Summary

NO_x Emissions for the entire Alcoa site added to 2002 Baseline Inventory: 23.17 tpd					
2002 Emissions Inventory	**NO_x Emissions (tpd)**		**Permit Allowable for New Boilers (Permit No. 48437)**	**NO_x (tpd) Allowable**	**Replacement Deadline**
Boiler 1	6.88		CFB Boiler 1	3.55	04/25/07
Boiler 2	7.26		CFB Boiler 2	3.55	12/31/07
Boiler 3	8.05				
Average	**7.4**		**Eligible NO_x Reductions by June 15, 2007: 3.9 tpd**		

All control measures that are a part of the 5 Percent IOP plan must be implemented by June 15, 2007. Alcoa has chosen to replace the existing boilers. Only one boiler will be replaced by June 15, 2007, and therefore only reductions for one boiler will be claimed for credit in this SIP. Since Alcoa has not indicated which boilers will be replaced and in what order the old ones will be shut down, the emissions from each of the three existing boilers were averaged for the purposes of calculating the eligible reductions for the purposes of this SIP. The average NO_x emissions from the three boilers are 7.4 tpd. The permit allowable identified in permit number 48437 for NO_x is 3.55 tpd for each new boiler. The permit allowable (3.55 tpd) was subtracted from the average NO_x emissions from the boilers (7.4 tpd) to calculate a NO_x reduction of 3.9 tpd.

5.3.2 VOC CONTROL MEASURES

5.3.2.1 Surface Coating

Various rules for surface coating operations have been in effect for the four core DFW counties in order to meet RACT and Control Technique Guideline (CTG) requirements. In rulemaking concurrent to this SIP, the commission is adopting a rule to extend the requirements for surface coating to the five newly designated DFW nonattainment counties. This control measure will result in 0.3 tpd VOC reductions.

5.3.2.2 Stage I Gasoline Unloading

Rules have already been in effect for Stage I gasoline unloading operations in the four core DFW counties, with an exemption for operations with a throughput equal to or less than 10,000 gallons per month. In rulemaking concurrent to this SIP, the commission is adopting a rule revision to extend these Stage I requirements, with the 10,000 gallons per month exemption, to the five newly designated DFW nonattainment counties. This control measure will result in 1.49 tpd VOC reductions.

5.4 SUMMARY

The control measures identified in the 5 Percent IOP plan have not been approved by EPA in previous SIPs and are listed in Table 5-4 below:

Table 5-4: Control Measures for Achieving DFW 5 Percent Increment of Progress

Source of reductions	TPD NO_x	TPD VOC
Eligible existing measures		
Alcoa (within 200 km radius)	3.9	
TERP	22.2	
Energy efficiency	0.72	
Portable fuel containers (9-county area)		2.79
Portable fuel containers (within 100 km radius)		0.63
Subtotal	26.82	3.42
Control measures requiring rulemaking		
Nine county lean-burn and rich-burn engine rule	1.87	
Expand surface coating rule to 5 counties		0.3
Lower Stage I exemption throughput to 10,000 gal/mo. in 5 counties (same as in 4 core counties)		1.49
Subtotal	1.87	1.79
TOTAL IDENTIFIED REDUCTIONS	**28.69**	**5.21**
Minimum reductions required to meet 5%	28.69	1.86
SURPLUS REDUCTIONS	**0**	**3.35**

The 2002 baseline inventory was adjusted by adding the VOC and NO_x emissions from Alcoa. The adjusted baseline inventory is the basis for performing the 5 percent reduction calculations. As shown in Table 5-5, the adjusted baseline inventory for VOC is 470.8 465.75 tpd, and for NO_x it is 622.22 tpd.

Next, 5 percent of the adjusted baseline NO_x inventory was calculated: 622.22 tpd x 0.05 = 31.11 tpd. Since the identified NO_x reductions of 28.69 tpd are less than this amount, a combined NO_x and VOC emissions are being used to meet the 5 percent emission reduction requirement. The allocation of the 5 percent controls and the minimum reductions required between VOC and NO_x are summarized in Table 5-5. The total of the VOC (0.4 percent) and NO_x (4.6 percent) percentage allocations equals 5 percent. These VOC and NO_x reductions achieved by control measures were then subtracted from the respective unadjusted 2007 inventories in Table 5-6. The results, 403.19 tpd VOC and 422.02 tpd NO_x, represent the 2007 target levels. The onroad portion of these target levels represents the VOC and NO_x MVEBs, which are summarized in Table 2-2.

The control measures developed as part of this SIP will achieve the required 5 percent reductions from the 2002 baseline, and therefore satisfy the conditions of the 5 Percent IOP plan.

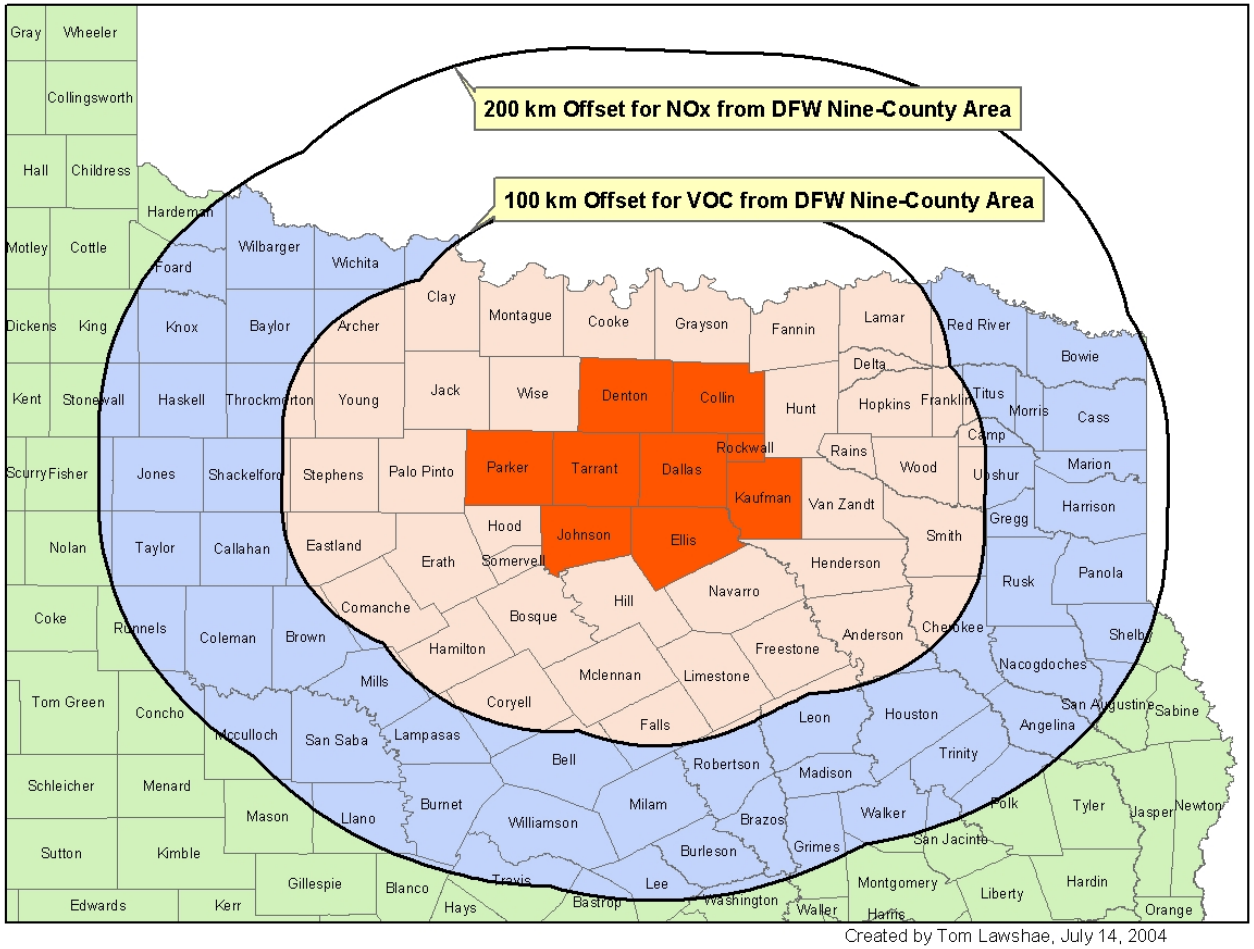
Table 5-5: Calculation of 5 Percent NO_x and VOC Reductions

	VOC (tpd)	NO_x (tpd)
2002 baseline inventory	459.15	599.02
Alcoa (outside DFW nonattainment area, within 200 km)	+2.10	+23.20
Portable fuel containers (outside DFW nonattainment area, within 100 km)	+4.50	
Adjusted 2002 baseline inventory	465.75	622.22
Minimum reductions required to meet 5%	1.86	28.69
	(0.4% of 465.75 tpd adjusted 2002 baseline)	(4.6% of 622.22 tpd adjusted 2002 baseline)

Table 5-6: Calculation of 2007 Target Levels

	VOC (tpd)	NO_x (tpd)
2007 inventory (unadjusted)	405.05	450.71
Minimum reductions required to meet 5%	1.86	28.69
2007 target level	403.19	422.02

Figure 5-1: 100-km and 200-km perimeters around the DFW area



Created by Tom Lawshae, July 14, 2004

CHAPTER 6: FUTURE ATTAINMENT PLANS

The TCEQ's planning for future attainment demonstrations has been difficult due to the uncertainty regarding the transition from the 1-hour ozone standard to the 8-hour ozone standard. On June 2, 2003, the Federal Register published EPA's proposed 8-Hour Ozone Implementation Rule, which outlined a number of options for implementing the 8-hour ozone standard and managing the existing 1-hour ozone standard. In April 2004, EPA finalized Phase I of the 8-Hour Ozone Implementation Rule. However, Phase II of the 8-Hour Ozone Implementation is not expected until later this year.

6.1. PATH FORWARD FOR THE 8-HOUR ATTAINMENT DEMONSTRATION

This revision is a 5 Percent Increment of Progress SIP and not an attainment demonstration SIP. The TCEQ is required to submit an 8-hour ozone attainment demonstration to EPA by June 15, 2007. The TCEQ continues to evaluate existing modeling episodes for application in developing an 8-hour ozone attainment demonstration. The TCEQ will be working towards an 8-hour ozone attainment demonstration which may include an evaluation of potential control measures, an assessment of the need for additional regional control strategies, and an analysis of the contribution to ozone formation from areas other than Texas. Several ongoing activities will provide the TCEQ with additional information in preparing an 8-hour ozone attainment demonstration which may include future control strategies or other actions that may be necessary to achieve the 8 hour ozone standard.

As part of the ongoing analytical, research, and photochemical modeling that will support all future DFW attainment modeling , the TCEQ plans to assess the range of reductions that will be required within the nonattainment area, from other areas in Texas, and other areas in the US. In addition, the TCEQ continues to work with TERC on projects to improve the inventory and gain a better understanding of the modeling in the DFW area.

Input from the North Texas Clean Air Steering Committee on the potential control strategies to reduce emissions within the nonattainment area is important. Local measures (those measures applicable in part or all of the nonattainment area) should be identified in 2005.

The TCEQ recognizes the desire of the North Texas community to develop and submit an early 8-hour ozone attainment demonstration and the TCEQ appreciates working with the North Texas Clean Air Steering Committee, the DFW Photochemical Modeling Technical Committee, and other stakeholders to complete a scientifically sound SIP as soon as practicable.

6.2 FUTURE INITIATIVES

The TCEQ continues to move forward with technology research and developments, building the science for ozone modeling and analysis, and addressing industrial, onroad and nonroad mobile, and area sources of emissions. These initiatives will be beneficial to improve air quality in Texas.

6.2.1 New Technology Research and Development (NTRD) Program

The TCEQ's NTRD Program provides incentives to encourage and support research, development and commercialization of technologies that reduce pollution in Texas. The NTRD Program was formed because of legislative requirements that the TCEQ take over the functions of the Texas Council on Environmental Technology (TCET). The primary objective of the NTRD Program is to promote commercialization technologies that will support projects that are eligible for funding under the TERP Emissions Reduction Incentive Grants Program. The NTRD Program will also work to streamline and expedite the process through which the TCEQ and the EPA provide recognition and SIP credit for new,

innovative and creative technological advancement. This program will help spur the entrepreneurial and inventive spirit of Texans to help develop new technologies to assist in solving Texas' air quality problems. For further information on this program please see the following web site:
http://www.tnrcc.state.tx.us/oprd/sips/research.html

6.2.2 Texas Air Quality Study Phase II (TexAQS II)

The Texas 2000 Air Quality Study, the most comprehensive and successful air quality study conducted to date in the U.S., with over 40 research organizations and over 250 scientists, has provided and will continue to provide a large part of the scientific basis for reassessing the ozone problem in eastern Texas. The second phase of this study, TexAQS II, is scheduled for 2005 and 2006 and will cover the area of Texas east of, and including the, I-35/37 corridor. The pre-study work has already begun. The meteorological, pollutant concentration, and transport data will be collected from May 2005 through October 2006 with the intensive field study period lasting from August to September 2006. The TCEQ will be involved in this research in order to improve regulatory analysis and prediction tools used for developing ozone SIPs. The study will assess formation and accumulation of ozone, year-round air pollution meteorology, and inventories of ozone. Research will also be conducted on ozone transport into, within and out of Texas. For documentation of TexAQS II, please see the following web site:
http://www.tceq.state.tx.us/policy/ta/am/TexAQS_II.html

6.2.3 ONGOING RELATED DFW AIR QUALITY TECHNICAL/SCIENTIFIC ACTIVITIES

The commission has a long history of supporting enhancements of air quality models and associated applications and input data. These endeavors are critical to supporting SIP development for Texas areas and will continue to be a top priority. The commission is committed to working in cooperation with the regulated community, academia, research consortiums, and others to ensure that the modeling used to develop effective control strategies will use the most current scientific methodologies and information to replicate high ozone episodes in a given area.

Because the level of scientific knowledge is constantly evolving, a comprehensive description of ongoing or planned research projects is not provided at this time. However, the TCEQ does maintain documentation of analytical and modeling projects relating to the DFW area which can be found at the following web site:
http://www.tnrcc.state.tx.us/air/aqp/sipmod/dfwaq_techcom.html

The TCEQ has also been active in the Science Coordinating Committee to support air quality planning activities. This committee is the agency's advisory group for air quality research to improve the understanding of air quality in Texas and insure an effective SIP. The Science Coordinating Committee is composed of over 200 researchers from universities, governmental agencies, industry, and environmental organizations from throughout the country.

Information on the committee is located at:
http://www.tceq.state.tx.us/policy/ta/am/scc.html

Appendices Available Upon Request

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