

REVISIONS TO THE STATE IMPLEMENTATION PLAN (SIP)
FOR THE SUBSTITUTION OF THE FEDERAL
CLEAN FUEL FLEET PROGRAM

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION
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VI: Ozone Control Strategy

A. INTRODUCTION (No change.)

B. OZONE CONTROL STRATEGY

1. - 7. (No change.)

8. SIP REVISIONS FOR MOBILE SOURCES (Revised.)

a. - c. (No change.)

d. Clean Fuel Vehicle Program. (Revised July 29, 1998.)

The Texas Natural Resource Conservation Commission (commission) is required under federal and state mandates to develop a clean-fuel vehicle program by incorporating low emission vehicles (LEVs), which will reduce on-road mobile source emissions. Section 182 (c)(4) of the Federal Clean Air Act (FCAA) Amendments of 1990 required states to either adopt the Federal Clean Fuel Fleet (FCFF) Program outlined in Section 246 of the FCAA Amendments of 1990, or implement a program which demonstrates long-term reductions in ozone-producing and toxic air emissions equal to those achieved under the FCFF Program.

The FCFF Program requires federal, state, local governments, and private fleets to purchase LEVs in areas classified by the United States Environmental Protection Agency (EPA) as being in serious,

severe, or extreme nonattainment of the National Ambient Air Quality Standards (NAAQS) for ozone and carbon monoxide (CO). The federal program mandates increasing percentages of LEV purchases by the affected fleets in the covered nonattainment areas in vehicle model years 1999, 2000, and 2001.

The State of Texas, in a committal State Implementation Plan (SIP) revision submitted to the EPA on November 15, 1992, opted out of the FCFF Program in order to implement a fleet emission control program designed by the state.

In 1994, the commission submitted the state's opt-out program in a SIP revision to the EPA and adopted rules to implement the Texas Alternative Fuel Fleet program as a substitute to the FCFF program in the areas of Texas classified by EPA as being in serious, severe, or extreme nonattainment of the NAAQS for ozone or CO.

In 1995, the 74th Texas Legislature modified the state's alternative fuels program (Health and Safety Code, Chapter 382) through the passage of Senate Bill (SB) 200. The Legislature facilitated fuel neutrality through the incorporation of the federal LEV standards for certain affected fleets regardless of fuel type. The legislation required the commission to adopt regulations to implement the program in all ozone nonattainment areas.

In response, the commission adopted regulations to implement the modified program and developed a revision to the SIP outlining the state's substitute program to the FCFF program. However, the 75th Texas Legislature met and removed the commission's authority to require the program in moderate nonattainment areas through passage of SB 681. This new legislation limits the commission's authority to the serious and above ozone nonattainment areas. In addition, SB 681 modified the state's

alternative fuels program (Health and Safety Code, Chapter 382). The Legislature retained the basic requirement of LEV purchases, but modified the implementation schedule, added an additional exception from the program, and altered the grandfathering provisions of the statute. This new legislation requires the commission to adopt regulations to implement the program.

On December 16, 1997, EPA finalized federal regulations for the National Low Emission Vehicle (NLEV) program. The NLEV program is designed to allow manufacturers to commit to meet tailpipe standards for cars and light-duty trucks that are more stringent than EPA can mandate prior to 2004. EPA made a final determination on implementation of NLEV on March 2, 1998, subject to appeal. If NLEV is successfully implemented nationally, the commission will use emission reductions achieved through the NLEV program to offset any shortfall in emission reductions resulting from the state's substitute for the FCFF program.

However, in the event that the NLEV program cannot be used, the commission will use the emission reductions achieved through the state requirements codified in 30 TAC §§115.352 - 115.359, concerning Fugitive Emission Control in Petroleum Refining, Natural Gas/Gasoline Processing, and Petrochemical Processes in Ozone Nonattainment Areas. The state requirements codified in 30 TAC §115.211(a)(1), concerning Volatile Organic Compound Transfer Operations at Gasoline Terminals, will also be used to offset any shortfall in emission reductions resulting from the state's substitute Texas Clean Fleet program as compared to the FCFF. Both of these programs are identified in the state's 15% Rate of Progress Plan and go above and beyond the requirements of Reasonably Available Control Technology (RACT). If needed, only those emission reductions necessary to cover any shortfall in the state's substitute program will be used.

The commission is submitting this revised SIP to EPA as substitution for the FCFF program. The commission is withdrawing the SIP submitted to EPA in July, 1996.

The state's substitute program is focused on the reduction of mobile source emissions through the acquisition of clean-fuel vehicles, which are defined as vehicles certified by EPA to meet or exceed the LEV standards. The state's substitute program will reduce harmful tailpipe emissions from on-road mobile sources through the use of LEVs in the affected areas.

The state's substitute program covers transit, local government and private fleets operated primarily within the serious, severe, or extreme nonattainment areas of Texas. The state's substitute program requires transit fleets to ensure that at least 50% of their fleet vehicles are certified to meet or exceed the LEV standards. In addition, local government and private fleets after September 1, 1998, must ensure that certain percentages of their vehicle purchases be certified by EPA as LEVs. Fleets affected by the requirements of the state's substitute program may use any vehicle/fuel combination which has been certified by EPA to meet or exceed the federal LEV standards. Table d-1 provides a brief comparison of the requirements and issues between the state's substitute program and the FCFF program.

Statutory authority for the state's substitute program is found in the Texas Health and Safety Code, Section 382.131 through 382.143. Under the Texas Health and Safety Code, Sections 382.002 and 382.011, the commission is given "the powers necessary or convenient to carry out its responsibilities" to establish and maintain air quality standards. The commission also has broad authority to adopt rules pursuant to the Texas Health and Safety Code, Section 382.017. The state's substitute program is codified in the 30 TAC §§114.1, 114.3, 114.150-114.151, 114.153-114.157, and 114.201-114.202.

Table d-1. Comparison of Fleet Programs

Items	Federal Clean Fuel Fleet Program (FCAAA 1990)	The State's Substitute Program
Fuel type	Any fuel or power source which allows the vehicle to meet LEV standards	Any fuel or power source which allows the vehicle to meet LEV standards.
Emission standards	LEV required. ULEV, ILEV & ZEV earn credit.	LEV required. ULEV, ILEV & ZEV earn credit.
Covered fleets	Federal, state, local government, transits, school districts, and private fleets of 10 or more fleet vehicles which are centrally fueled or capable of being centrally fueled.	Local government fleets: > 15 vehicles; Private persons: > 25 fleet vehicles; Transit: all vehicles ≤ 26,000 lbs. GVWR
Vehicle class	LDV, LDT ≤ 8,500 lbs GVWR., HDT 8,500- 26,000 lbs	LDV, LDT ≤ 8,500 lbs GVWR., HDT 8,500- 26,000 lbs GVWR
Exempted vehicles	Emergency, law enforcement, non-road, rental, dealer, test, national security, garaged at residence, and vehicles > 26,000 lbs. GVWR.	Emergency, law enforcement, non-road, garaged at residence, vehicles > 26,000 lbs. GVWR and tunnel vehicles according to §502.006.
Covered Areas	Serious, severe, and extreme ozone and/or carbon monoxide nonattainment areas of 250,000 or more	Any serious, severe, or extreme NAA with a metropolitan statistical area of 350,000 or more.
Phase-in Schedule	<p>LDVs, LDTs: 30% of purchases in MY 1999 50% of purchases in MY 2000 70% of purchases in MY 2001+</p> <p>HDVs: 50% in MY 1999 thru 2000+</p>	<p>Local government & private: 10% of total fleet by 9/1/98 or 30% of fleet vehicle purchases after 9/1/98, 50% of fleet vehicle purchases after 9/1/00, and 70% of light-duty fleet vehicle purchases after 9/1/02 and 50% of heavy-duty fleet vehicles purchased after 9/1/02</p> <p>Transits: 50% of fleet vehicles.</p>
Exceptions	No. However, EPA is currently considering exceptions for vehicle cost differential that would include a threshold percentage and cap. Also under consideration, are exemptions for fuel availability.	Yes - Contractual harm, lack of refueling facilities, insufficient financing, not cost-effective over the life of the vehicle, or no original manufacturers equipment available.
Credit trading	Yes - Mobile Source Emission Reduction Credits (MERCs)	Yes - Mobile Source Emission Reduction Credits (MERCs) and Program Compliance Credits (PCCs)
Program incentives	TCM exemptions and MERCs	MERCs & PCCs

Under the state's substitute program, harmful tailpipe emissions from on-road mobile sources will be reduced through the use of LEVs. The FCAA Amendments of 1990 clearly indicate that it is beneficial for certain vehicles to be LEVs as one strategy to assist in bringing areas into attainment with the NAAQS.

1) PROGRAM IMPLEMENTATION

a) Affected Entities

The following entities are subject to all of the requirements and provisions of the state's substitute program:

- Mass transit authorities, as defined in TAC, Title 30, §114.1, and §101.1, that primarily operate in an affected area, must ensure that at least 50% of their fleet vehicles are certified to meet or exceed the LEV standards .

- All local governments that operate a fleet of more than 15 vehicles, excluding law enforcement and emergency vehicles, and all private entities that operate a fleet of more than 25 fleet vehicles, excluding law enforcement and emergency vehicles, when operated primarily in a serious, severe, or extreme nonattainment area.

A fleet operates primarily in an affected area if the total annual vehicle miles traveled or operating time in the nonattainment area is greater than 50%.

Unlike the FCFE program, the determination of whether a fleet is affected by the requirements and provisions of the state's substitute program is not based on the location of its refueling facilities. Fleets affected by the state's substitute program may be centrally fueled, capable of being centrally fueled, or fueled at facilities serving both business customers and the general public (i.e. public retail fueling facilities or "service stations"), as defined in the Texas Health and Safety Code, Section 382.131.

b) Vehicle and Fuel Requirements

(1) Fleet Vehicle Requirements

A fleet vehicle is defined under the state's substitute program as a vehicle required to be registered for use on the public highways of Texas under the Texas Transportation Code, Section 502.002. The Texas Health and Safety Code, Section 382.131, excludes certain vehicle types from its definition of a fleet vehicle and does not subject these vehicle types to the requirements and provisions of the state's substitute program.

For the purposes of the state's substitute program, a fleet vehicle does not include the following vehicle types:

- A vehicle that, when not in use, is normally parked at the residence of the individual who normally operates it;
- A vehicle that has a gross vehicle weight rating (GVWR) greater than 26,000 pounds;

- A vehicle used in the maintenance or repair of underground mass transit facilities which is required by federal law or regulation to operate on diesel fuel; or

- Emergency or law enforcement vehicles.

(2) Fleet Aggregation

The determination of whether a fleet is affected by the requirements of the state's substitute program is based on the sum of the vehicles operated primarily within the same nonattainment area which are operated by the same entity.

The following methods of calculating the sum of affected vehicles should be applied to the following affected entities:

- Mass transit authorities as defined in TAC, Title 30, §114.1 should count all fleet vehicles within their fleet to determine vehicles that are affected by the LEV requirements.

- Local governments should count all vehicles within their fleet to determine fleet size, which will determine if the fleet is subject to the program. However, only those vehicles meeting the definition of a fleet vehicle are affected by the LEV requirements.

- Private entities should count only the vehicles within their fleet that meet the definition of a fleet vehicle to determine fleet size.

- Lessors are not responsible for vehicles they lease or rent to other entities. However, entities leasing these vehicles should count them as part of their fleet.

(3) Technology Requirements

All vehicles used to comply with the fleet implementation schedule requirements of the state's substitute program must be certified by EPA as LEVs, except for those vehicles which have been grandfathered into the state's substitute program. In addition, all vehicles used for compliance with any of the requirements and provisions of the state's substitute program must conform with all applicable federal and state safety requirements.

There are no specific fuel requirements imposed on affected fleets, except for those entities who wish to comply with the requirements of the state's substitute program by using grandfathered vehicles. The commission will allow all affected entities the choice of using any available vehicle/fuel configuration certified by EPA as an LEV. This provision will provide flexibility for affected fleets in purchasing vehicles to comply with the state's substitute program.

(4) EPA Certification

The commission will rely on the two EPA emission certification procedures for the identification of all LEV systems. A description of these two procedures, EPA's full certification program and the small volume manufacturers certification program, may be found in 40 Code of Federal Regulations (CFR), Part 86. In general terms, EPA certification is attained when a vehicle engine family/fuel configuration is recognized by EPA as meeting all applicable emission standard requirements through the issuance by

the EPA of a certificate of conformity verifying the applicable emission standard for that particular vehicle configuration and engine family.

(5) Dual-Fuel System Guidelines

To be counted toward compliance with the fleet implementation schedule requirements of the state's substitute program, dual-fueled vehicles will be required to be certified by EPA to meet or exceed the dual-fuel LEV standards pursuant to the United States Code (USC), Title 42, Section 7583 and 40 CFR, Part 88. In general terms, these standards require dual-fuel vehicles in the light-duty vehicle classes to meet or exceed the LEV emission standards while operating on the clean fuel portion of the dual-fuel system and meet or exceed the transitional low emission vehicle standards while operating on conventional fuel. However, these standards require dual-fuel vehicles in all other vehicle classes (light-duty trucks and heavy-duty vehicles) to meet or exceed the LEV emission standards when operating on either fuel.

In addition to the EPA guidelines on fuel system conversions, the following policies will apply:

- Fuel system changes to vehicles that have been EPA certified as meeting an applicable emission standard are subject to the tampering prohibitions of the FCAA, Section 203(a). In order to allow vehicle fuel system changes, EPA and the commission established policies for the enforcement of the tampering prohibitions and for the conversion of vehicles. The EPA requirements are contained in the documents 40 CFR, Part 88 "Clean Fuel Fleet Emission Standards, Conversions, and General Provisions and Amended Heavy-Duty Averaging, Banking, and Trading Credit Accounting Regulation," and 40 CFR, Parts 80, 85, 86, 88, and 600 "Standards for Emissions From Natural Gas-

Fueled, and Liquefied Petroleum Gas-Fueled Motor Vehicles and Motor Vehicle Engines, and Certification Procedures for Aftermarket Conversions." The commission rules regarding fuel system changes are contained in 30 TAC §114.20, concerning "Maintenance and Operation of Air Pollution Control Systems or Devices Used to Control Emissions from Motor Vehicles." The commission will rely on EPA certification procedures for all vehicles. Dual-fuel systems should follow all applicable EPA guidelines.

- Manufacturers of conversion systems must obtain certificates of conformity from the EPA for all conversion systems used to satisfy LEV requirements of the state's substitute program. Manufacturers of conversion systems must follow all certification guidelines found in EPA's full certification procedure or EPA's small volume manufacturers certification program.

- Upon receipt of a certificate of conformity, the manufacturer of the conversion system and the system installer will be considered as one entity for the purposes of warranty responsibilities under the FCAA Amendments of 1990, Section 206(a), and under related enforcement provisions of the FCAA Amendments of 1990, and USC, Title 40, Section 7525(a).

- The manufacturer/installer of the conversion system will be responsible for any emissions-related failure caused by a problem in the design, manufacture, or installation of the system over the useful life of the vehicle.

- Any installation of an uncertified conversion system on a vehicle intended to be used to comply with the LEV requirements of the state's substitute program could be considered in violation of

state and federal anti-tampering regulations and will not be recognized by the commission for fleet compliance purposes, except for grandfathered vehicles under §114.150 and §114.151.

c) Fleet Implementation Schedule for Local Government and Private Fleets

(1) Requirements

Beginning September 1, 1998, all affected entities are required by the state's substitute program to ensure that their fleet vehicles are certified by EPA to meet or exceed the federal LEV standards, in accordance with the following implementation schedule:

- 30% of fleet vehicle purchases after September 1, 1998, or at least 10% of the total fleet vehicles as of September 1, 1998;

- 50% of fleet vehicle purchases after September 1, 2000; and

- 70% of light-duty fleet vehicle purchases after September 1, 2002 and 50% of heavy-duty fleet vehicle purchases after September 1, 2002.

The fleet compliance requirements of the state's substitute program requiring the acquisition of LEVs does not apply to an affected entity which maintains a proportion of 70% or more LEVs within its total fleet.

(2) Alternative Methods of Compliance

(A) Credits

Program Compliance Credits (PCCs) or Mobile Emission Reduction Credits (MERCs) may be used to meet the fleet implementation schedule requirements of the state's substitute program.

(B) Dual-fuel Vehicles

In addition, the fleet implementation schedule requirements of the state's substitute program may be met by dual-fuel conversion or the capability of conventional gasoline-powered or diesel-powered vehicles to operate as LEVs, pursuant to the dual-fuel standards found in 40 CFR, Part 88.

(C) Grandfathering of Vehicles

Affected local government and private entities may comply with the fleet implementation schedule requirements by using vehicles converted, purchased, leased, or otherwise acquired before September 1, 1995 which are not certified to LEV standards, but which are capable of operating on a fuel or power source recognized by any State of Texas fleet or mass transit fuel program prior to September 1, 1995. Mass transit authorities may comply by using vehicles converted, purchased, leased, or otherwise acquired before September 1, 1999 which are not certified to LEV standards, but which are capable of operating on a fuel or power source recognized by any State of Texas fleet or mass transit fuel program prior to September 1, 1995. These fuels are: electricity, ethanol or ethanol/gasoline blends of 85% or

greater ethanol, Liquefied Petroleum Gas (propane), methanol or methanol/gasoline blends of 85% or greater methanol, or natural gas.

Local government and private fleet grandfathered vehicles can be counted towards compliance with the implementation schedule if applied toward the 10% of total fleet LEV requirement in 1998. In addition, mass transit authorities will be able to count grandfathered vehicles toward their 50% of total fleet LEV requirement. The purpose of this provision is to provide affected entities the flexibility of using vehicles for compliance with the fleet implementation schedule requirements of the state's substitute program which the entities, voluntarily or in anticipation of being covered by future state regulations, have already acquired or converted to operate on one of the five specified fuels.

Affected entities using grandfathered vehicles which are equipped with dual-fuel systems should be aware of the tampering provisions of the FCAA. EPA Mobile Source Enforcement Memorandum No. 1A, dated September 4, 1997, as revised on June 1, 1998, provides an exemption to the tampering provisions of the FCAA, Section 203(a), for vehicle conversions which can demonstrate that the conversion does not increase the emissions of the vehicle. The FCAA Amendments of 1990, under Section 246(d), also exempt the fuel system conversions of conventional vehicles to that of LEVs from tampering liability if the converted vehicle complies with LEV standards.

d) Fleet Registration, Reporting, and Recordkeeping Requirements

(1) Fleet Registration

Within 90 days of meeting the minimum fleet size, all affected local governments and private fleets are required to register their fleets with the executive director for identification and compliance tracking.

Registration includes the submission of the following information:

- The entity's name, mailing address, telephone and FAX numbers;

- The name, title, mailing address and telephone number of the specific person responsible for the fleet;

- The total number of vehicles required to be registered for use on public highways which are operated primarily in each nonattainment area by the affected entity. This number should include all vehicles operated by the affected entity including law enforcement vehicles, emergency vehicles, and those vehicles that are excluded by the definition of a fleet vehicle. This does not include vehicles that are not registered for use on a public road or vehicles registered under §502.006(c); and

- The affected area counties of operation of all fleet vehicles.

Upon registration, the executive director will assign each affected entity's fleet a unique fleet identification number that will be used for data submission and compliance tracking purposes.

(2) Fleet Reporting Requirements

All affected local government and private entities must submit biennial fleet reports to the executive director by September 1, of each even numbered year, starting in 1998. These biennial fleet reports

should provide the following information:

- The fleet identification number (when assigned by the executive director);
- The total number of vehicles operated by the affected entity, including those vehicles not covered by the definition of a fleet vehicle;
- The total number of vehicles used for compliance operated by the affected entity;
- The nonattainment area counties in which the affected fleet vehicles primarily operate;
- The total number of purchases since the last report, starting with the second biennial report (in the year 2000);
- The vehicle make, model, model year, license number, vehicle identification number, GVWR, fuel type(s) and certified emission standard of each vehicle used for compliance;
- An estimate of the annual vehicle miles traveled (VMT) for each LEV . Two consecutive years averaged will be used for the biennial fleet report;
- If the affected vehicle used for compliance is a dual-fueled vehicle, an estimation of the percentages of the vehicle's VMT or time while operated on each fuel as reported from January 1 through December 31 of each year. Two consecutive years averaged will be used for the biennial fleet report; and
- A demonstration of compliance with the applicable fleet implementation schedule.

Affected local government and private entities may submit the information required in the biennial fleet report on all the vehicles in their fleet, including those vehicles not affected by this program, if this method of reporting is more convenient for the entity. The vehicles being used for compliance must be so indicated.

All affected government and private entities may submit their biennial fleet reports to the executive director using the official Fleet Reporting Forms, or on a copy or similar reproduction. Affected government and private entities may also submit these fleet reports on 3.5 inch DOS formatted computer diskettes in a format as agreed by the executive director, or by other electronic media, as agreed by the executive director.

All affected mass transit authorities must submit annual fleet reports to the executive director by September 1 of each year. These annual fleet reports should provide the following information:

- The total number of vehicles registered according to TTC §502.002, excluding vehicles registered under TTC §502.006(c);
- The total number of LEVs;
- The vehicle make, model, model year, license number, vehicle identification number, GVWR, fuel type(s) and certified emission standard of each vehicle;
- vehicles offered for lease to the public;
- an estimate of the annual VMT for each vehicle;
- If the vehicle is a dual-fueled vehicle, a percentage estimate of the vehicle's annual operation on each fuel, measured in VMT or time; and
- A demonstration of compliance with the transit's 50% LEV requirement.

(3) Recordkeeping

All affected local government and private entities must maintain copies of their submitted biennial fleet reports on site at the reported fleet address for a minimum of three years and should make these available to the executive director upon request. Affected local government and private entities should

start keeping these copies beginning September 1, 1998. They should include the information as supplied in the fleet registration and biennial fleet reports. All affected mass transit authorities must maintain copies of their submitted annual reports on site at the reported fleet address for a minimum of three years and should make these available to the executive director upon request.

e) Emission Standard Requirements

All affected entities shall be required to ensure that the fleet vehicles used for compliance with the fleet implementation requirements of the state's substitute program meet or exceed the following emission standards:

- The LEV standards applicable under the FCAA Amendments of 1990, Subchapter II, Part C, as amended (USC, Title 40, Section 7581 et seq.); and emission limits as stringent as the applicable LEV standards for the FCFF program under 40 CFR Parts 88.104-94 and 88.105-94, as published in the *Federal Register*, September 30, 1994. Other applicable emission standards within these regulations include the following:

- the Ultra Low Emission Vehicle Standards (ULEV); and
- the Zero Emission Vehicle Standards (ZEV).

- The inherently low emission vehicle (ILEV) standards under the 40 CFR, Part 88.311-93, as published in the *Federal Register*, March 1, 1993.

(1) Low Emission Vehicle (LEV)

The LEV standards provide greater emission reduction benefits than the current standards for tailpipe emissions of non-methane hydrocarbon (NMHC) and NO_x. The state's substitute program will require light-duty vehicles and light-duty trucks to comply with the LEV standards, as contained in 40 CFR, Part 88. Heavy-duty vehicles will be required to comply with the EPA combined NMHC+NO_x g/Bhp-hr LEV emission standard, also found in 40 CFR, Part 88. These LEVs will also be required to meet all other applicable emission standards and requirements for CO, particulate matter, smoke, and evaporative emissions for the model year during which they are certified and produced, as specified by the FCAA Amendments of 1990, Section 242(b).

(2) Additional Emission Standards

The ULEV, ILEV, and ZEV standards will further reduce emissions beyond the current Tier I or LEV emission standards. These emission standards may be used for compliance purposes and for the generation of MERCs and PCCs.

The ULEV emission standards for light-duty vehicles are more stringent than the LEV standards. The reduction in emissions over the LEV standard is attributed to reduced non-methane organic gas (NMOG), and CO emissions through improved emission control devices. The combined NMHC+NO_x ULEV standard for heavy-duty vehicles is found in 40 CFR, Part 88.

Light-duty vehicles certified to the ILEV standard further reduce the ozone precursor emissions through adherence to more stringent evaporative emission standards. Therefore, ILEV certified vehicles must pass more stringent emission control measures than a LEV. The standard established by EPA for evaporative emissions applicable to the ILEV standard is 5.0 grams per test with the evaporative

control system disconnected. In most cases, light-duty vehicles certified to the ILEV standard must meet the LEV exhaust standards for NMOG and CO, and the ULEV exhaust standard for NO_x. Heavy-duty ILEV vehicle emission standards are found in 40 CFR, Part 88. These heavy-duty vehicles will also be required to pass more stringent emission control measures.

Light-duty ZEVs are defined as vehicles that have no measurable exhaust or evaporative emissions of any regulated pollutant. At present, only battery-powered or hydrogen fuel cell powered electric vehicles are expected to be able to qualify as ZEVs. Heavy-duty ZEVs must also have no measurable exhaust or evaporative emissions of any regulated pollutant. The use of heavy-duty ZEVs is voluntary and these vehicles may be used for compliance with the state's substitute program and will be able to generate MERCs and PCCs. The heavy-duty ZEV standards are found in 40 CFR, Part 88.

(3) Emission Standards for light-duty vehicles (LDVs) and

Trucks

Tables C-1 and C-2 in Appendix C display the emission standards for the LDV and light-duty truck categories.

f) Exceptions

Exceptions to the requirements of the state's substitute program are established in the Texas Health and Safety Code, Section 382.136, and may be granted for a period of up to two years. Exceptions to the fleet implementation schedule requirements of the state's substitute program are intended to prevent economic harm to affected entities through the implementation of the state's substitute program.

All affected entities may apply to the executive director for an exception to these requirements through the submission of an exception application. Forms and instructions for preparing an exception application will be furnished without charge. Applicants may submit the required information either on the exception application forms or on similarly formatted documents. Applicants will be notified if additional information is needed to process an application. The applicant should confer with the reviewing staff on any questions concerning preparation of the application.

Affected entities may request exception applications and a guidelines manual from the Air Quality Planning and Assessment Division at the following address: Texas Natural Resource Conservation Commission, MC-164, P.O. Box 13087, Austin, Texas, 78711-3087. The exception application and guidelines manual supplied by the commission contains all the data submission forms and instructions for completion. Forms are arranged according to the type of exemption being requested. The exception application must be accompanied by current fleet registration and biennial fleet report information when submitted for processing.

Affected entities will not be considered in violation of the fleet implementation schedule requirement of the state's substitute program while an exception application is under review by the executive director if the exception application has been received by the executive director before the applicable compliance date.

(1) Fixed Price Contract Exception

The executive director may grant exceptions from the fleet implementation schedule requirements of the state's substitute program if a firm engaged in fixed price contracts with public works agencies can

demonstrate that compliance with the fleet implementation schedule requirements of the state's substitute program would result in substantial economic harm to the firm under a contract entered into before September 1, 1997.

The firm applying for this exception must submit to the executive director supporting documentation and correspondence relevant to the nature of the exception including, but not limited to, copies of the relevant contracts and a demonstration of how and by what means the firm would be harmed by complying with these requirements and provisions of the state's substitute program.

(2) Inadequate Refueling Facilities Exception

The executive director may grant exceptions from the fleet implementation schedule requirements of the state's substitute program if the executive director determines that fuels required for LEV operation, that meet the normal requirements of the principal business of the affected entity, are not available in the affected area in which the vehicles are to be operated. The affected area where the entity's fleet operates must be indicated .

Entities applying for this exception must submit supporting documentation and correspondence relevant to the nature of the exception.

(3) Unavailability of Financing for Refueling Exception

The executive director may grant exceptions from the fleet implementation schedule requirements of the state's substitute program if the affected entity is unable to secure financing provided by or arranged through the proposed supplier or suppliers of the fuel or power source required for the operation of LEVs sufficient to cover the additional costs of such fueling or powering.

Entities applying for this exception must submit supporting documentation and correspondence relevant to the nature of the exception including, but not limited to:

- A description of the financing required by the affected entity;
- A description of the financing offered by the proposed supplier, or suppliers, of the fuels necessary for the operation of LEVs; and
- A demonstration of why the affected entity applying for the exception is unable to secure financing to cover the additional cost of fueling the LEVs required by the state's substitute program.

(4) Cost Comparison Exception

The executive director may grant exceptions from the fleet implementation schedule requirements of the state's substitute program if the total projected net costs attributed to the fueling or powering, conversion or replacement, and operation of LEVs is reasonably expected to exceed the comparable costs of conventional vehicles measured over the expected useful life of such vehicles after including consideration of any available state or federal funding or incentives for the use of LEVs.

Entities applying for this exception must submit supporting documentation and correspondence relevant to the nature of the exception including, but not limited to:

- the types of vehicles needed; and
- a demonstration of how the projected net costs of fueling LEVs, after the identification of state and federal funding or incentives for the use of fuels required to fuel LEVs , if any, exceeds the comparable costs of conventional vehicles over the useful life of such vehicles.

(5) Unavailability of Original Equipment Manufacturer's

Vehicles Exception

The executive director may grant exceptions from the fleet implementation schedule requirements of the state's substitute program if original equipment manufacturers vehicles, or converted vehicles, that meet the normal requirements and practices of the principal business and have been certified by the EPA as LEVs are not available.

Entities applying for this exception must submit supporting documentation and correspondence relevant to the nature of the exception including, but not limited to:

- the types of vehicles needed and proof of nonavailability; and
- a justification of why the normal requirements and practices of the principal business cannot be met by the use of currently available LEVs.

(6) Exception Application Policy

All entities affected by the state's substitute program may apply for an exception to the fleet implementation schedule requirements of this program by providing sufficient documentation as needed to verify the necessity for an exception when submitting an exception application to the executive director. The exception applicant shall have the sole responsibility for providing the executive director with current and accurate documentation to substantiate the exception application. The executive director will grant exceptions from the fleet implementation schedule requirements of the state's substitute program if it is determined that the applicant has provided sufficient documentation to verify the necessity for such an exception. The executive director will deny any exception requests that are deemed to contain insufficient proof of the need for such an exception. Entities applying for an exception must evaluate all LEV/fuel configurations currently available for the types of vehicles used in the fleet when submitting an exception application. Exception requests will be reviewed on a case-by-case basis dependant upon individual circumstances.

(7) Application Review Process

Exception applications will be reviewed by the executive director in accordance with the following process and subject to the following provisions:

- The executive director may request additional information in order to evaluate an exception application;

- Exceptions applications will be accepted at any point within the twelve months preceding a fleet compliance deadline; and
- Applicants may apply for a renewal of the exception by submitting a new exception application.

(8) Issuance of an Exception Notice

Upon the approval of an application for an exception to the fleet implementation schedule requirements of the state's substitute program, the executive director will issue the applicant a written notice of exception. The notice of exception shall include the following information:

- the assigned fleet registration number;
- the type of exception granted;
- the name and address of the applicant;
- the compliance date for which the exception may be applied; and
- the time duration of the exception, not to exceed two years.

The entity receiving a notice of exception should maintain a copy of the notice on site at the reported fleet address for the duration of the exception period and should make such copies available to the executive director or local air pollution control agencies having jurisdiction in the area upon request.

(9) The Effect of an Exception

An exception issued to an entity will be used to defer the issuance of a Notice of Violation due to the affected entity's inability to comply with the fleet implementation schedule requirements of the state's substitute program. A copy of the notice of exception will be kept on file by the Air Quality Planning and Assessment Division until the date of the affected entity's next fleet compliance period. Entities wishing to renew an exception must submit a new application.

(10) Enforcement Due to Exception Denial

If an affected entity applies for an exception before the applicable fleet implementation schedule deadline, and that exception request is subsequently denied by the executive director after the deadline has passed, then the affected entity could be deemed in violation. A Notice of Violation may be issued at that time to the affected entity for not complying with the fleet implementation schedule requirements of the state's substitute program. The executive director will coordinate with the agency's regional managers, as well as the Compliance and Enforcement, and Litigation Support Divisions, to ensure the expeditious and effective resolution of any violations of these requirements.

2) MONITORING

The commission will require the submission of biennial reports, containing fleet data as described in the Fleet Reporting Requirements section of this document, from the affected entities in order to determine air quality benefits from the use of LEVs or any other reduced emission vehicles designated for compliance with the state's substitute program. The fleet data as collected will be used to monitor fleet compliance, to calculate emission reductions, and to determine the program's feasibility and effectiveness.

3) PROGRAM ENFORCEMENT

a) Enforcement Authority

The Texas Health and Safety Code, Chapter 382, also known as the Texas Clean Air Act (TCAA), provides the commission with broad enforcement powers in Section 382.011. The executive director is charged with the duty to enforce the TCAA, the rules promulgated under the TCAA, and orders of the commission.

The Enforcement Rules of the commission provide for enforcement through administrative proceedings, civil lawsuits, and criminal proceedings. Through administrative proceedings, the commission can impose orders to achieve compliance accompanied by penalties of up to \$10,000 per day per violation. The commission may also pursue civil legal proceedings through the Office of the Attorney General. Fines of up to \$25,000 per day per violation, injunctions, court orders, and cost of litigation can be assessed in a civil action under the TCAA. Criminal enforcement may also be initiated through the Attorney General, with fines of up to \$300,000 and imprisonment of up to 5 years as possible penalties.

In addition to the general penalty provisions, the rules of the commission require the denial of marketable credits in certain situations. Violation of the state's substitute program rules may also result in denial of credits.

b) Specific Enforcement Items

Enforcement of the emission standards and fleet implementation schedule requirements of the state's substitute program will be done through financial penalties and/or credit denial. The entities affected by the state's substitute program will be required to provide information regarding their fleet operation.

Penalties will be imposed on affected entities for tampering with the engine configuration and emission control systems, including exhaust components. In the case of converted vehicles, the vehicle manufacturer, the clean fuel conversion system manufacturer, and the installer will be required to provide a warranty to the entity owning the vehicle which, in a proven tampering situation, will be subject to being declared void.

Vehicles may undergo random periodic inspection to detect any tampering. In addition to potential voiding of the warranty, financial penalty and credit denial are enforcement options.

Compliance with the fleet implementation schedule's purchase or percentage requirements will be monitored through reporting. Entities affected by the state's substitute program must report to the executive director compliance with these requirements. Inadequate reporting, fraud, abuse, or other findings that jeopardize the integrity of the state's substitute program will be liable for the full range of enforcement actions and penalties discussed previously.

4) CREDIT TRADING PROGRAM

a) General Methodology and Uses

The state's substitute program includes a provision for the calculation of MERCs and PCCs for affected entities which exceed the program's percentage and emission requirements. MERCs and PCCs may be redeemed, sold, traded or transferred within the same NAA to satisfy the state's substitute program requirements. This section provides detailed information on the generation and use of MERCs and PCCs.

(1) MERCs

MERCs are a part of an economic incentive program to help reduce vehicle emissions of VOC and NO_x. This program is intended to provide additional flexibility for business, to develop innovative strategies to control mobile source emissions, and to reduce the total cost of compliance with the Clean Air Act.

MERCs are defined as any enforceable, permanent, and quantifiable emission reduction (exhaust and/or evaporative) generated by a mobile source through the state's substitute program, which has been banked in accordance with the rules of the commission Emissions Bank. These emission reductions are voluntary, and must be in addition to compliance with requirements of state and federal regulations. MERCs can be purchased, traded or sold to meet clean air mandates.

Only LEV certified vehicles are required to be purchased under the state's substitute program. Affected entities purchasing ULEV, ILEV, and ZEV certified vehicles in lieu of LEV certified vehicles will receive credits for exceeding the LEV requirements. The purpose of the credit program is to provide flexibility for the affected entities. It recognizes that some affected entities may, at times, find it attractive to buy more LEVs or to buy lower emitting vehicles than required, if in so doing they can get credit against future purchase requirements, or can sell the credits to someone else who is not able to make the required LEV purchases. Affected mass transit authorities are eligible for MERCs for the operation of light rail cars which have been demonstrated by the mass transit authority to have no direct emissions.

These credits can be used to meet a fleet's own compliance, for fleet-to-fleet trades, or for fleet-to-stationary source trades. Fleet-to-fleet MERCs are assigned to individual vehicles, where applicable. Fleet-to-fleet MERCs will be based on the difference between a combination of the NMOG and NO_x standards. Fleet-to-stationary source MERCs must be expressed in terms of the total amount of emissions reduced in a year, on a pollutant by pollutant basis.

Although an entity can generate both MERCs and PCCs for the same vehicle, only one type of credit associated with the generating vehicle may be used for compliance, trading, buying, or selling. This will allow maximum program flexibility for the affected entities while benefitting air quality.

(2) PCCs

PCCs are for use by affected entities in complying with the state's substitute program. The Texas Health and Safety Code, Section 382.142, defined the number of PCCs for vehicles certified to specific emissions standards as follows:

- 1 LEV = 1 PCC;
- 1 ULEV = 2 PCCs; and
- 1 ILEV or ZEV = 3 PCCs.

Only entities that are subject to the requirements of the state's substitute program may generate PCCs. PCCs will be granted to the affected entities for every LEV that exceeds the requirements of the fleet implementation schedule of the state's substitute program. The additional PCCs generated by clean-fuel vehicles certified by EPA to the ULEV, ILEV, or ZEV emission standards may be used in achieving the entity's own compliance with the fleet implementation schedule of the state's substitute program. If an entity generates more PCCs than needed for compliance, then the entity may trade or sell the PCCs to other fleets for use in achieving their compliance.

b) MERC/PCC Generation Criteria

The MERC program is an option for any entity with a fleet operating primarily in a nonattainment area. Entities and individual private persons in these areas may generate MERCs, regardless of their inclusion in the state's substitute program.

Entities outside of nonattainment areas may purchase LEVs. However, because these areas do not have specific requirements for reducing air pollution at this time, there is no market for credits generated outside of the nonattainment areas. Therefore, these credits cannot be banked.

(1) Generation of MERCs and PCCs

In order to obtain MERCs and PCCs, entities must exceed the requirements of the state's substitute program. Entities may exceed the requirements through any of the following actions:

- The acquisition of vehicles that meet more stringent emissions standards than the LEV standards. This includes vehicles certified to the ULEV, ILEV, ZEV standards.
- The use of more LEVs than otherwise required by the state's substitute program.
- The use of LEV certified vehicles in a category or class not covered by the requirements of the state's substitute program. This includes, but is not limited to, law enforcement vehicles, emergency vehicles, and vehicles heavier than 26,000 lbs. GVWR.
- The use of LEV certified vehicles earlier than required by the state's substitute program (prior to 1998).

(2) Requirements for Credit Generation

The generation of credits by entities in Texas is guided by the regulations included in 30 TAC, §114.157 and §114.201. In addition to the rule, the following information will be considered in relation to the credit programs:

- Only one application is required for an entity in a specific area, regardless of the type of credit requested and the basis of the application. An entity may request both MERCs and PCCs using the same application.
- Although entities may estimate the amount of credit they anticipate, this is by no means required, and all credit estimations are subject to executive director review.
- The Air Quality Planning and Assessment Division will act as a clearinghouse for the trading and selling of credits. The details of the trade or sale are at the discretion of the entities involved. Any credits traded to stationary sources will be processed through the commission's Emissions Credit Bank.
- Entities wishing to generate credits for vehicles that are not covered by the program should include these vehicles with their fleet report. However information on non-covered vehicles should be submitted in a separate section from covered fleet vehicles. This will ensure that non-covered vehicles are not inadvertently treated as covered vehicles.

- Entities which have obtained and are operating under an exception from the requirements of state's substitute program may not trade or sell credits. Entities operating under an exception, although considered in compliance with the program, are not exceeding the fleet implementation percentage requirements. The use of cleaner vehicles than required by these entities will be counted toward their own compliance, regardless of the terms of the exception.

c) Credit Trading Restrictions

The following restrictions on credit trading should be considered prior to the negotiation of trades:

- *Nonattainment Area Specific:* PCCs and MERCs generated in a nonattainment area may be used only in that nonattainment area.
- *Separation of Light & Heavy-Duty Weight Classes:* MERCs may not be traded between the light-duty and heavy-duty weight classes for compliance purposes. Provisions in the FCAA (Section 246 (f)(2)(B)) preclude the trading of MERCs between the heavy-duty and light-duty weight classes. This is because of differences in the operation and use of the two types of vehicles. However, entities may trade MERCs freely among the light-duty subclasses. For example, an entity could trade a light-duty vehicle MERC for light-duty truck 2's compliance, but could not trade a heavy-duty vehicle MERC for a light-duty vehicle's compliance.
- *Credit Trading Within the Heavy-Duty Weight Class:* MERCs generated by the purchase of a heavy-duty vehicle in a particular weight subclass may be used to

demonstrate compliance with the required heavy-duty vehicle purchases for the same or lighter weight subclasses. These MERCs may not be used to demonstrated compliance with the required heavy-duty vehicle purchases for vehicles of heavier weight subclasses than the weight subclass of the vehicle which generated the credits. For example, an entity with heavy heavy-duty vehicles could generate credits and sell them to an entity needing credits for a medium heavy-duty vehicle; however, a credit from a medium heavy-duty vehicle could not be sold and used in place of a heavy heavy-duty LEV. Trading from a lighter to a heavier subclass could increase emissions where the credit using vehicle had a longer useful life, increased fuel consumption or greater emission than the credit generating vehicle.

- *The Emissions Credit Bank is only for VOCs and NO_x:* The Emissions Credit Bank was created to provide flexibility with the growing number of requirements on ozone nonattainment areas and sources of VOC and NO_x. Although some vehicles do provide a reduction in carbon monoxide and/or particulate matter, there is currently no market or emissions credit bank for these emissions.
- *Trading to Stationary Sources:* Stationary source regulations require the reduction of emissions by a specified number of tons each year. Therefore, entities wishing to trade credits tradable to stationary sources must reduce at least one ton of VOC or NO_x emissions per year. Entities may aggregate the emission reductions from their total fleet in order to generate the amount of reductions from each pollutant needed for trades to stationary sources. Increments of less than one ton will not be certified by the bank. Because of the various factors which must be considered by stationary sources

that purchase the credits, it is highly unlikely that credits in increments of less than one ton would be purchased.

d) Uses of Credits

The dollar value of a MERC or PCC depends entirely upon the demand for credits. MERCs may be used by other fleets and by stationary sources. PCCs may be used only by other fleets, subject to the state's substitute program.

Although a fleet may generate both a MERC and a PCC for any qualified vehicle, only one type of credit may actually be used. For example, if Fleet Owner A purchases 3 extra LEVs, he may apply for and receive 3 PCCs and 3 fleet-to-fleet MERCs. If he sells 3 PCCs to Fleet Owner B for her fleet's compliance, Fleet A's fleet-to-fleet MERCs would no longer be available for use. If Fleet Owner A instead sells 3 fleet-to-fleet MERCs to Fleet Owner B, the 3 PCCs would no longer be available for use. This will prevent using the same reductions to account for two fleets' compliance.

(1) Fleet Compliance

Entities may use credits banked as fleet-to-fleet MERCs or PCCs to show compliance with the requirements of the state's substitute program. In any fleet-to-fleet trade the purchaser of credit should base the amount of credit purchased on the number of LEVs needed to demonstrate compliance. Some entities may choose to purchase a few ILEVs, ULEVs or ZEVs and use the additional emissions benefit toward their own compliance. Other entities may choose to forego buying any low emitting vehicles

and purchase enough fleet-to-fleet MERCs or PCCs from other fleets to meet the applicable percentages. Thus, the compliance demonstration will be unique for each entity.

(2) Stationary Source Compliance

Stationary source credit use focuses on the mass of emission reductions generated in a given year. In this type of trade the stationary source will determine the emissions per year that must be offset. Trades involving stationary sources must comply with the offset ratios established by the FCAA Amendments of 1990. Stationary sources are responsible for determining the amount of credit they need for compliance with specific regulations.

(3) Credit Lifetime

During the initial years of the state's substitute program, from 1998 through 2002, all credits generated through the credit program will have a lifetime of two years. This lifetime factor has been determined because of the increasing percentage requirements through 2002 and because entities may need these vehicles for their own compliance with the state's substitute program after the first two years.

This policy will allow entities some flexibility in the use of MERCs without jeopardizing air quality. If the vehicles are still in surplus of the new requirements, the entity may request that new MERCs or PCCs be granted. This will allow entities to sell their MERCs, without making it more difficult for the credit generating entity to meet the increasing percentage requirements of the state's substitute program. After 2002, the requirements stabilize and credits may last for the expected useful life of the vehicle, normally five years.

e) Administrative Requirements

(1) Fleet Registration and Reporting for Credits:

In order to award credits, the executive director must have a current fleet report, showing information on each fleet vehicle in the fleet used for compliance and credit generation. This may be submitted using an official reporting form, either in printed or electronic formats, or on a copy or a similar reproduction chosen by the entity. All fleet reports must contain the information listed in the Fleet Reporting section of this document and as required in the Texas Administrative Code, Title 30, §114.36. Although not required, it is anticipated that entities will choose to apply for credits at the time of their annual/biennial report.

(2) Credit Application and Certification

Credits may be requested as part of the reporting requirements. The executive director will determine if the information given in the compliance report and credit application is adequate to evaluate the credit application. If additional information is needed, the executive director will issue a letter requesting the information necessary to continue the review. The applicant should respond as promptly as possible to ensure that credits are granted in a timely manner. Once any requested information is received, the credit review process will continue. Approval of credits will result in certification of MERCs or PCCs.

Upon certification by the executive director, each credit owner will be issued an account number and a credit certificate indicating the standard to which the vehicle is certified; the weight class of the

vehicle; the amount of emissions reduced per year in tons for the vehicle and the fleet; the number of years the emission reductions will be credited; and the number of light-duty or heavy-duty fleet-to-fleet MERCs. The applicable number of PCCs will also be included on the certificate.

(3) Emissions Banking

Owners of credits will be issued account numbers and will be listed by the commission on its Internet world wide web page: '<http://www.tnrcc.state.tx.us/air/>'. Potential purchasers, both stationary sources and fleets, can view the list of owners and the associated amounts of credit. Those without access to the Internet may contact the Air Quality Planning and Assessment Division directly for assistance in locating owners of credit. Purchasers for all types of credits will contact the owners directly.

The two uses of credits warrant different methods of banking the credits. MERCs used for stationary sources will depreciate in the bank on the anniversary date of their certification. For example, after the first year, a vehicle projected to reduce emissions for five years will only have four years left.

Banking of credits for affected local government and private fleet compliance will be different.

Because compliance is based on 2-year increments, each credit generated during the period of 1998-2002 will be banked as a 2-year fleet-to-fleet MERC or a PCC, thus expiring in two years. After 2002, MERCs are awarded according to expected useful life of the vehicle. For transits, MERCs are awarded according to the expected useful life of the vehicle.

Once a trade has been negotiated, the owner of the credit must notify the executive director of the trade and mail the credit certificate to the executive director. The executive director will then reissue the

credits to the new owner. An account number and credit certificate will also be issued to the new owner. A new certificate will be issued to the credit generator for any unsold credits. For each MERC sold, the following information will be recorded in the Emissions Credit Bank: the name and location of the seller; the name and location of the buyer; and the creation and expiration dates of the MERC.

Once a MERC is sold, any corresponding PCCs will no longer be available for future use. This will prevent duplicate use of credits. Likewise, if PCCs are sold, any corresponding MERCs will no longer be available for use. The commission will use a database to track trading of MERCs and PCCs in order to ensure that two credits are not used for one emission reduction.

Under the state's substitute program, the executive director may revoke approval of a PCC or a MERC if it is determined that the requirements are not being met. Credits may also be canceled if the credit generating vehicle is removed from fleet service either voluntarily or accidentally. If the removed vehicle is not replaced by at least an equally clean vehicle, then the credit for that vehicle will be adjusted or revoked.

(4) Binding Contracts

MERCs also may be generated through binding contracts with the commission to produce credits in the future. Each contract must specify the period in which the MERCs will be generated and the specific number of credits to be generated. In addition, these contracts must name the EPA as a third-party beneficiary of the contract. Credits generated through binding contracts will be banked in the Mobile Emission Reduction Credit Fund. The commission may revoke a MERC generated under the binding contract provisions if it is found that the requirements of the contract have not been met. Binding

contracts to generate MERCs may be enforced in the courts of the State of Texas by order of specific performance. Provisions for binding contracts are in the Texas Health and Safety Code, Section 382.143 and in the 30 TAC, §114.202. Any person found to be in violation of the Mobile Emission Reduction Credit Fund will be subject to a civil penalty of up to \$25,000 per violation.

5) EQUIVALENCY DETERMINATION METHODS

a) Equivalency Calculations

Equivalency to the FCFF program will be determined using methods agreed upon by the commission and the EPA. A complete demonstration of these methods will be made available for comment upon request.

b) Contingency Measures

The commission will use anticipated emission reductions from the national low emission vehicle program to make up any shortfalls in the equivalency determination. However, in the event that it is EPA's final determination that the NLEV program cannot be used, the commission will use the emission reductions achieved through the state requirements codified in 30 TAC §§115.352 - 115.359, concerning Fugitive Emission Control in Petroleum Refining, Natural Gas/Gasoline Processing, and Petrochemical Processes in Ozone Nonattainment Areas. The state requirements codified in 30 TAC §115.211(a)(1), concerning Volatile Organic Compound Transfer Operations at Gasoline Terminals, will also be used to offset any shortfall in emission reductions resulting from the state's substitute Texas Clean Fleet program as compared to the FCFF. Both of these programs are identified in the

state's 15% Rate of Progress Plan and go above and beyond the requirements of RACT. If needed, only those emission reductions necessary to cover any shortfall in the state's substitute program will be used.

6) RESOURCES

The Air Quality Planning and Assessment Division has gained substantial experience working with the regulated community and the providers of clean-fuel vehicle technology and fuels under the auspices of the state's substitute program. Currently, for the Fiscal Year of 1998, six staff members will be dedicated to the state's substitute program. The commission has collected data and established a fleet database necessary for the successful implementation of the state's substitute program.

Appendix A: ACRONYMS

CFR	- Code of Federal Regulations	NMOG	- Non-methane organic gases
CFV	- Clean Fuel Vehicle	NO _x	- Oxides of nitrogen
CO	- Carbon monoxide	PCC	- Program Compliance Credit
EPA	- U.S. Environmental Protection Agency	PM	- Particulate matter
FCAAA	- Federal Clean Air Act Amendments of 1990	SIP	- State Implementation Plan
FCFF	- Federal Clean Fuel Fleet Program	TAC	- Texas Administrative Code
GVWR	- Gross vehicle weight rating	TAFF	- Texas Alternative Fuel Fleet
HCHO	- Formaldehyde	TCAA	- Texas Clean Air Act
HDT	- Heavy-duty truck	TNRCC	- Texas Natural Resource Conservation Commission
HDV	- Heavy-duty vehicle	TW	- Total weight of vehicle
ILEV	- Inherently low emission vehicle	ULEV	- Ultra-low emission vehicle
LDT	- Light-duty truck	USC	- United State Code
LDV	- Light-duty vehicle	VMT	- Vehicle miles traveled
LEV	- Low emission vehicle	VOC	- Volatile organic compounds
LPG	- Liquefied petroleum gas, "propane"	ZEV	- Zero-emission vehicle
MERC	- Mobile Emission Reduction Credit		
NAA	- Nonattainment Area		
NAAQS	- National Ambient Air Quality Standards		
NLEV	- National Low Emission Vehicle		
NMHC	- Non-methane hydrocarbon		

Appendix B: TECHNICAL EVALUATION

Equivalency Determination Through Vehicle Population and Emission Reduction Calculations

B.1. Technical Approach

The State of Texas opted out of the Federal Clean Fuel Fleet (FCFF) program in order to implement a fleet emission control program that closely matched the existing state alternative fuel program. The state's substitute program will be implemented in all serious, severe, and extreme nonattainment areas of the state. Currently in Texas, the Houston-Galveston, Dallas-Fort Worth, and El Paso metropolitan statistical areas are classified as serious nonattainment areas and are subject to the requirements of the state's substitute program.

Modeling of the FCFF program and the state's substitute program was performed using a spreadsheet model developed by the Texas Natural Resource Conservation Commission's Mobile Source Section. The spreadsheet model estimates the number of low emission vehicles (LEVs) and conventional vehicles in each program and extrapolates the amount of emission reductions generated by each program through the number of LEVs purchased.

Estimates of the number of LEVs purchased each year for both fleet programs were calculated by modeling the different fleet parameters of each program. For the state's substitute program, fleet size, total number of vehicles, growth rate, turnover rate, waiver rate, grandfathering rate, and program effectiveness were modeled. Fleet size, total number of vehicles, growth rate, turnover rate, centralized refueling rate, waiver rate, and program effectiveness were modeled in the FCFF program.

Using the modeling parameters attributed to each fleet program, the spreadsheet model estimated the affected vehicle population for each year. The estimated LEV population for each year was obtained by multiplying the affected vehicle population by each program's required new purchase percentages. A detailed analysis of the calculation methods are presented in Section B.2.b.

The spreadsheet model was designed to begin calculating the number of LEVs purchased per year for both programs beginning at the official starting date of each program; Model Year 1999 (September 1, 1998) for the FCFF program and September 1, 1998 for the state's substitute program. Since both programs start in the month of September but vehicle and emission reduction numbers were needed for each complete year, the spreadsheet model was designed to model each program based on a complete calendar year (January 1 to December 31) instead of model years. Modeling on a calendar year basis examines the percentage of LEV purchases for each year in two parts: purchases before and purchases after September 1 of each year.

Comparing purchase requirements, both the state's substitute program and the FCFF program require the purchase of vehicles certified by the U.S. Environmental Protection Agency (EPA) to the low emission vehicle (LEV) standards. However, the first compliance date requirement of the state's substitute program allows affected entities the choice of either having LEVs as a certain percentage of the fleet vehicles in their total fleets by the first compliance date or to purchase LEVs as a certain percentage of their new vehicle purchases after that date. The FCFF program only requires LEVs as certain percentages of new purchases. The first compliance date requirement of the state's substitute program that allowed affected entities a choice was modeled as only a percentage of new purchases since very few LEVs are expected to be available before September 1, 1998.

The estimated emission reductions attributed to each program were determined by multiplying the estimated number of LEVs purchased each year by an emission reduction factor. These emission reductions factors were generated by the EPA MOBILE 5a emissions model.

The Mobile Source Section determined through the use of the spreadsheet model that equivalency with the FCFF program can be demonstrated by the state's substitute program when the National Low Emission Vehicle (NLEV) program or the state controls on fugitive emissions and VOC transfer operations are used to address emission shortfalls. This program combination reduces emissions in far greater amounts than the FCFF program for the years 1998 to 2007.

B.2. Vehicle Projection Calculations

B.2.a. Assumptions for Modeling Inputs

The modeling inputs used in the spreadsheet model for the vehicle population projection and emission reduction calculations are listed in Tables A1, A2, and A3. The assumptions used to determine the modeling inputs are provided in the following paragraphs.

Table A 1. Population Projection

Population Projection Parameters	State's Substitute Program Inputs	FCFF Inputs
Fleet Size	Private fleets of more than 25 vehicles, Local Government fleets of more than 15 vehicles, and Transit fleets	All fleets of 10 or more vehicles
Base Vehicle Population (total for all areas)	72,691 vehicles	105,197 vehicles
Growth Rate	2.2% per year	2.2% per year
Turnover Rate	33% per year (3 year turnover)	33% per year (3 year turnover)
Waiver Rate	30% average	10% average
Grandfathering Rate	Not applicable when using 3 year turnover rate	None
Centrally Refueled Rate	100%	69%
Effectiveness Rate	80%	80%

Table A 2. Emission Reduction

Emission Reduction Parameters	State's Substitute Program Inputs	FCFF Inputs
Emission Reduction Factor (for VOCs)	0.14 g/mile for light-duty vehicles 0.98 g/mile for heavy-duty vehicles	0.14 g/mile for light-duty vehicles 0.98 g/mile for heavy-duty vehicles
Vehicle Miles Traveled (VMT)	100 miles per day	100 miles per day
Days per Ozone Year	250 days	250 days

Table A 3. Implementation Schedule

Implementation Schedule Parameters	State's Substitute Program Inputs	FCFF Inputs
1998	LDV & HDV - 30% of new purchases after 9-1-98 to 12-31-98	LDV - 30% of new purchases in MY 1999 HDV - 50% of new purchases in MY 1999 and thereafter
1999	LDV & HDV - 30% of new purchases from 1-1-99 to 12-31-99	LDV - 50% of new purchases in MY 2000
2000	LDV & HDV - 30% of new purchases from 1-1-00 to 9-1-00, 50% of new purchases after 9-1-00 to 12-31-00	LDV - 70% of new purchases in MY 2001 and thereafter
2001	LDV & HDV - 50% of new purchases from 1-1-99 to 12-31-99	
2002	LDV & HDV - 50% of new purchases from 1-1-02 to 9-1-02 LDV - 70% of new purchases after 9-1-02 and thereafter HDV - 50% of new purchases after 9-1-02 and thereafter	

- **Fleet Size:**

No assumptions were made. FCFF fleets included all fleets of 10 or more vehicles and the state's substitute program included private fleets of more than 25 vehicles, local government fleets of more than 15 vehicles, and transit fleet vehicles with a gross vehicle weight rating of less than 26,000 pounds.

- **Base Vehicle Population:**

The base vehicle population for both programs was determined by the Mobile Source Section from Texas Department of Transportation (TxDOT) vehicle registration records supplied by the Texas Railroad Commission concerning privately owned fleets and the Mobile Source Section's inspection/maintenance (I/M) exempt title database for fleet data concerning federal, state, local government and school district fleets. The TxDOT data included only vehicles registered in the covered nonattainment areas for vehicle model years 1988 to 1993. The Mobile Source Section's I/M data included fleet information through 1994. All fleets of 10 or more vehicles were used to represent the FCFF program and local government fleets of more than 15 vehicles and privately owned fleets of more than 25 vehicles were used to represent the state's substitute program. The estimated number of vehicles used as the base vehicle population in the spreadsheet model for each affected area in the FCFF program and the state's substitute program are listed in Table B.

Table B. Base Vehicle Population

Affected area	Base Vehicle Population	
	State's Substitute Program	FCFF Program
Houston-Galveston	38,811	55,078
El Paso	2,584	4,981
Dallas-Fort Worth	31,296	45,138

- **Growth rate:**

The growth rate of 2.2% per year was obtained from a Radian Corporation study entitled, "Emission Reduction from Using Alternative Transportation Fuels." This rate was applied to both the state's substitute program and the FCFF program.

- **Turnover Rate:**

The vehicle turnover (retirement) rate of 3 years (or 33% per year) applied to the light-duty vehicle calculations was obtained from an EPA technical report entitled, "Lifetime Emissions for Clean-Fuel Fleet Vehicles" (EPA-AA-SRPB-93-01). This turnover rate was applied equally to both the state's substitute program and the FCFF program. The turnover rate of 10.5 years applied to the heavy-duty vehicle calculations was determined as the average of the 15 years given in EPA's urban bus regulatory impact analysis (RIA) and the 6 years given in the Regulatory Support Document, Emission Standards for Heavy-Duty Clean Fuel Fleets.

- **Waiver rate:**

Light-duty vehicles: The state's substitute program is estimated to have an average waiver rate of 30% over the 10 years modeled (1998-2007). This average assumes a 95% waiver rate for the first two years of the state's substitute program. The assumption for the 95% waiver rate in the first two years is based on the following rationale:

- Fleets have the choice of either having 10% of the fleet vehicles in their total fleet as LEVs by September 1, 1998 or having LEVs as 30% of their new purchases between September 1, 1998 and September 1, 2000. It is assumed for the purposes of the model that most fleets will chose the new purchase option, therefore the number of LEV vehicles in the program for 1998 will be very few, i.e. 5%.
- It is estimated that the number of certified LEVs available to meet the varied need of fleets in 1999 will still be relatively small. As the date to demonstrate compliance with the 30% purchase option is September 1, 2000, it is again assumed that only 5% of the vehicles in the program will be LEVs.

The spreadsheet model actually uses the waiver rate listed in Table C in calculating the number of LEVs projected to be in the program for each year. The waiver rate is assumed to be drastically reduced following the implementation of the NLEV program in Texas starting in 2001 and is expected to be reduced to zero percent as the cost differential between conventional and NLEV program vehicles equalize.

Heavy-duty vehicles: Information on heavy-duty vehicles is being provided as additional information to the State Implementation Plan (SIP) submission in order to provide a complete representation of equivalency. The state's substitute program, unlike the FCFF program, allows fleets the flexibility of meeting the purchase and percent of total fleet requirements with only light-duty vehicles until 2002 when 50% of heavy-duty vehicle purchase must be LEVs. Additionally, since it is assumed that heavy-duty vehicles are to be kept longer than light-duty vehicles, it will be more difficult for fleets to demonstrate a need for an economic waiver (the most likely waiver to be requested) over the lifetime of the heavy-duty vehicle.

Therefore, the waiver rate is lowered for heavy-duty vehicles throughout the program's evaluation period starting with a 50% waiver rate the first year and dropping to zero percent in 2004. The waiver rate for heavy-duty vehicles is assumed to be zero percent in 2004 in anticipation that the new heavy-duty emission standard are fully implemented by this time. It is our understanding that the new MY 2004 heavy-duty standards are to be more stringent than the LEV standards (combined NMHC+NO_x at 2.5 g/bhp-hr for the 2004 standards, and NMHC 3.8 g/bhp-hr for the LEV standards).

Table C. Waiver Rate

Year	Waiver Rate (%)	
	Light-duty	Heavy-duty
1998	95	50
1999	95	20
2000	55	15
2001	25	5
2002	20	5
2003	10	5
2004 - 2007	0	0
Average Waiver Rate =	30	10

These waiver rate percentages were assumed as a "worst case scenario" for modeling purposes and may not reflect the actual percentages of waivers to be granted under the state's substitute program. The actual waiver rate will be adjusted to reflect actual fleet data when the state's substitute program is fully operational.

- **Grandfathering:**

The state's substitute program allows affected local governments and private entities to count vehicles acquired before September 1, 1995, that were converted to operate on electricity, ethanol, liquefied petroleum gas, methanol, or natural gas, toward compliance with the 1998-only requirement option of having 10% of their fleet vehicles in their total fleet as LEVs by September 1, 1998. However, with an assumed turnover rate of 33% per year, and a program start date of September 1, 1998, these grandfathered vehicles would be completely (100%) discounted from the state's substitute program fleet by September 1, 1998. Therefore, grandfathered vehicles do not have an effect on equivalency in this modeling scenario.

- **Centralized refueling rate:**

The Mobile Source Section conducted a telephone survey of registered affected fleets to determine the centralized refueling rate. The data collected from the survey showed that 69% of the registered fleets were centrally refueled or capable of being centrally refueled. Therefore, a centralized refueling rate of 69% was applied to the FCFF program in the spreadsheet model since only fleets that are centrally refueled or capable of being centrally refueled are affected by the FCFF program. The centralized refueling rate of 100% was applied to the state's substitute program due to this program's coverage of all fleets that meet its fleet size criteria regardless of how or where they are fueled.

- **Effectiveness rate:**

The effectiveness of each program was assumed to be 80%. This assumes that 80% of the fleets captured by the program will fully comply with the requirements of each program. Based on this assumption, the number of LEV purchases for both the state's substitute program and the FCFF program was discounted by 20%. Rule effectiveness is based on the type of rule, the reliability of rule implementation, and the

ability of the regulating authority to measure and enforce the rule. Without documentation to support the determination of rule effectiveness, EPA requires a default rule effectiveness rate of 80%.

- **Emission Reduction Parameters:**

The emission reduction factors used to calculate the estimated emission reductions attributed to each program were generated using the EPA Mobile 5a emissions model. Factors were generated for each light-duty and heavy-duty weight class of vehicles in each category of emission standards for nonmethane organic compounds (NMOG) and oxides of nitrogen (NOx). The factor used to calculate the volatile organic compound (VOC) reductions from light-duty vehicles, 0.14 grams per mile, was derived by subtracting the average of all the light-duty LEV NMOG factors from the average of all the light-duty Tier I NMOG factors. The factor for the heavy-duty classes, 0.98 grams per mile, was derived using the same method as the light-duty factor.

Vehicle miles traveled (VMT) accrual rates were assumed to be an average of 100 miles per day for all vehicle weight classes. The ozone year was assumed to be 250 days in length.

B.2.b. Vehicle Projection Calculation Processes

This section explains the calculation processes the spreadsheet model uses to estimate the affected vehicle population, LEV purchases, and corresponding emission reductions for each year of the period 1998 to 2007. Calculations for both the state's substitute program and the FCFF program were performed by the spreadsheet model according to the following methods:

- **Affected vehicle population & previous year's vehicle population:**

The affected vehicle population for each year was obtained by multiplying the previous year's vehicle population against the growth rate plus one. The data input for the Base Vehicle Population was the initial "previous year's population."

Calculate the affected vehicle population for each year using:

$$Avp = Pyp \times (1 + (Gr \div 100))$$

Where,

Avp = affected vehicle population for each year,
Pyp = previous year's vehicle population,
Gr = vehicle population growth rate per year.

- **Centralized refueling rate:**

In order to account for only the vehicles that were assumed to be centrally refueled or capable of being centrally refueled in the FCFF program, the data input for the FCFF program's Base Vehicle Population was multiplied by the centralized refueling rate at the beginning of the modeling period. The product of this equation was the number used as the initial "previous year's population" in modeling the FCFF program.

For the FCFF program use the following equation below to determine the initial affected vehicle population:

$$Bmp = Rbvp \times Cfr$$

Where,

Bmp = base modeling population,
Rbvp = reported base vehicle population,
Cfr = centralized refueling rate.

● **Growth amount:**

This is the number by which the vehicle population grows for each year. It is derived by multiplying the previous year's vehicle population against the growth rate.

Calculate the growth amount using:

$$Ga = Pyp \times Gr$$

Where,

Ga = the amount by which vehicle population is increased per year,
Pyp = previous year's vehicle population,
Gr = vehicle population growth rate per year.

● **Turnover amount:**

This is the number of vehicles that will be retired from the fleet each year. It is derived by multiplying the affected vehicle population against the turnover rate.

Calculate the turnover amount using:

$$Ta = Pyp \times (1 \div Tr)$$

Where,

Ta = the amount by which vehicle population is reduced per year due to turnover,
Pyp = previous year's vehicle population,
Tr = turnover rate per year.

● **Total purchase:**

This is the total number of vehicles predicted to be purchased each year. The number includes conventional and LEVs. It is the sum of the growth amount and the turnover amount.

Calculate the total number of vehicles purchased for each year using:

$$Tp = Ga + Ta$$

Where,

Tp = predicted number of vehicles purchased per year (conventional & LEVs),
 Ga = the amount by which vehicle population is increased per year due to growth,
 Ta = the amount by which the vehicle population is replaced per year due to turnover.

● **Percentage of new LEVs purchased & fractions of the calendar year:**

The state's substitute program in effect has two different new purchase percentages for certain years. Within the year in which a compliance date occurs, the percentage required before September 1 and the percentage required after September 1 are different. For instance, after September 1, 1998, 30% of new purchases are required to be LEVs and then after September 1, 2000, 50% of new purchases are required to be LEVs. This means that at the end of the year 2000, purchases before September 1 will be weighted by 30% and purchases after September 1 by 50%. The above example also shows that at the end of the year 2000, 25% of the total population representing one fourth of the year, will be weighted against new LEV purchases after September 1, and 75% of the total population will be weighted against purchases before September 1. At the end of the year 2000, the number of new LEVs purchased before September 1 was derived by multiplying the total purchases (conventional and LEVs) against the percentage required before September 1, the fraction representing the period of year before September 1, and the effectiveness rate.

Calculate the number of LEVs purchased *before* September 1 of each year using:

$$Lb1 = Tp \times Pb1 \times Fb1 \times Er$$

Where,

Lb1 = number of LEVs purchased *before* September 1 of each year,
 Tp = predicted number of vehicles purchased per year (conventional & LEVs),
 Pb1 = required percentage of new LEVs purchased before September 1,
 Fb1 = applicable fraction of year before September 1,
 Er = effectiveness rate.

Calculate the number of LEVs purchased *after* September 1 of each using:

$$Lal = Tp \times Pal \times Fal \times Er$$

Where,

Lal = number of LEVs purchased *after* September 1 of each year,
 Tp = predicted number of vehicles purchased per year (conventional & LEVs),
 Pal = required percentage of new LEVs purchased after September 1,
 Fal = applicable fraction of year after September 1,
 Er = effectiveness rate.

For example, this means that if total vehicle purchases equaled 1200 vehicles, then LEVs purchased before September 1, 2000 would be determined by calculating " $1200 \times 30\% \times 75\% \times 80\% = 216$." LEV purchases after September 1, 2000 would be determined by calculating " $1200 \times 50\% \times 25\% \times 80\% = 120$." The total LEV purchased for the year 2000 would be the sum of the two equations, " $216+120 = 336$."

- **Total LEVs purchased and the Waiver amount:**

This is the total number of LEVs predicted to be purchased during the calendar year. The total number of LEV purchased per year is determined by calculating the sum of the LEVs purchased before September 1 and those purchased after September 1 of each year discounted by the waiver (exception) rate to obtain the final number attributed to each program for the year.

Calculate the total number of LEVs purchased for each year using:

$$TLEV = (Lb1 + La1) - Wa$$

Where,

TLEV = total predicted number of LEVs purchased per year,
Lb1 = predicted number of LEVs purchased before September 1,
La1 = predicted number of LEVs purchased after September 1,
Wa = the amount by which the number of LEVs is reduced due to exceptions.

- **LEV population:**

This is the total number of LEVs estimated to be in the program for each year. This number contains the total number of LEVs purchased plus the accumulation of LEVs from previous years minus the LEVs being retired according to the turnover rate. The amount of retired LEVs is determined by looking backward the number of years specified by the turnover rate and subtracting the total LEVs purchased that year from the number of accumulated LEVs.

Calculate the total LEV population for each year using:

$$LEVP = (TLEV + AL) - RL$$

Where,

LEVP = LEV population per year,
TLEV = total predicted number of LEVs purchased per year,
AL = Accumulated number of LEVs in program,
RL = the number of LEVs retired from program.

- **Emission Reductions:**

The emission reductions attributed to both the state's substitute program and the FCFE program were determined using the same method. The emission reductions are determined in grams per day using an equation multiplying the total LEV population for each year, the emission reduction factor, VMT, and a grams per ton factor.

Calculate the emission reductions in grams per day using:

$$ER = LEVP \times Ef \times VMT \times 0.002205/2000$$

Where,

ER = emission reductions in grams per day,
 LEVP = LEV population per year,
 Ef = emission reduction factor,
 VMT = vehicle miles traveled per day,
 0.002205/2000 = grams per ton factor.

B.3. Results: Projected LEV Populations and Emission Reductions

The estimated results from this equivalency determination are presented in this section. The estimated number of light-duty and heavy-duty LEVs under each program per year for all the nonattainment areas combined are shown in Table D. The estimated emission reductions per year from the use of light-duty and heavy-duty Vs under the state's substitute program and under the FCFF program for all the nonattainment areas combined are shown in Table E. The estimated emission reductions from the NLEV program for all the nonattainment areas combined are shown in Table F.

Table D. Comparison Between Estimated LEVs under the State's Substitute Program and FCFF Program in the Houston-Galveston, Dallas-Fort Worth, and El Paso Areas.

Years	State's Substitute Program		FCFF Program	
	LDV	HDV	LDV	HDV
	LEVs/Year	LEVs/Year	LEVs/Year	LEVs/Year
1998	65	2	712	34
1999	365	10	5,126	215
2000	3,512	93	14,729	465
2001	11,097	296	27,492	742
2002	19,986	517	37,575	1,039
2003	30,276	771	42,787	1,342
2004	37,876	1,059	44,454	1,653
2005	44,288	1,354	45,432	1,970
2006	46,788	1,655	46,431	2,294
2007	47,817	1,963	47,453	2,625
Accumulated Totals =	242,070	7,719	312,190	12,378
Total Program LEVs From 1998 - 2007 =	249,790		324,569	

Table E. Comparison Between Estimated Emission Reductions Under the State's Substitute Program and the FCFF Program in the Houston-Galveston, Dallas-Fort Worth, and El Paso Areas.

Years	State's Substitute Program		FCFF Program	
	LDV	HDV	LDV	
	VOC Tons/day		VOC Tons/day	VOC Tons/day
1998	0.001	0.000	0.011	0.005
1999	0.006	0.002	0.079	0.033
2000	0.054	0.014	0.227	0.072
2001	0.171	0.046	0.424	0.115
2002	0.308	0.080	0.580	0.162
2003	0.467	0.120	0.660	0.209
2004	0.585	0.165	0.686	0.257
2005	0.684	0.211	0.701	0.306
2006	0.722	0.258	0.717	0.357
2007	0.738	0.305	0.732	0.408
Accumulated Totals =	3.736	1.201	4.819	1.926
Total Combined Reduction (TCR) in Tons per Day =	4.937		6.745	
Total Program Tons of VOCs Reduced from 1998 - 2007 = <i>(TCR x 250 day Ozone Year)</i>	1234.347		1686.131	

Table F. Estimated Emission Reductions Under the NLEV Program in the Houston-Galveston, Dallas-Fort Worth, and El Paso Areas.

National Low Emission Vehicle Program						
Estimated Emission Reductions (Tons per Day)						
Year	Houston-Galveston		El Paso		Dallas-Fort Worth	
	VOC	NO _x	VOC	NO _x	VOC	NO _x
2001	0.594	1.490	0.033	0.050	0.718	1.149
2002	1.444	3.463	0.441	0.356	1.453	2.906
2003	2.179	5.446	0.469	0.660	2.255	4.359
2004	2.878	7.291	0.640	0.994	2.867	5.884
2005	3.630	9.093	0.836	2.944	3.612	7.538
2006	4.183	10.632	1.189	1.579	4.338	8.997
2007	4.662	12.151	1.157	1.879	4.765	10.187
Total Accumulated Reductions = (Tons per Day)	19.570	49.566	4.765	8.462	20.008	41.020

Table G. Estimated VOC Emission Reductions from Controls on Fugitive Emission and VOC Transfer Operations in the Houston-Galveston, Dallas-Fort Worth, and El Paso Areas.

Year	Houston-Galveston		El Paso		Dallas-Fort Worth	
	Fugitive Tons/Day	Bulk Gas Tons/Day	Fugitive Tons/Day	Bulk Gas Tons/Day	Fugitive Tons/Day	Bulk Gas Tons/Day
1998	46.03	3.36	1.13	0.77	0.07	2.17
1999	46.03	3.36	1.13	0.77	0.07	2.17
2000	46.03	3.36	1.13	0.77	0.07	2.17
2001	46.03	3.36	1.13	0.77	0.07	2.17
2002	46.03	3.36	1.13	0.77	0.07	2.17
2003	46.03	3.36	1.13	0.77	0.07	2.17
2004	46.03	3.36	1.13	0.77	0.07	2.17
2005	46.03	3.36	1.13	0.77	0.07	2.17
2006	46.03	3.36	1.13	0.77	0.07	2.17
2007	46.03	3.36	1.13	0.77	0.07	2.17
Accumulated Totals	460.3	33.6	11.3	7.7	0.7	21.7
Total Combined Reduction (TCR) in Tons per Day	493.9		19		22.4	
Total Program Tons VOC Reduced from 1998 - 2007 <i>(TCR x 250 day Ozone Year)</i>	123,475.00		4,750.00		5,600.00	

B.4. Interpretation of Results

The fleet analysis presented in the Results section clearly indicates that the state's substitute program, when combined with the reductions attributed to the NLEV program as shown in Table F, or with the reductions attributed to the state controls on fugitive emissions and VOC transfer operations as shown in Table G, will result in significant more emission reductions than the FCFE program in all affected nonattainment areas in Texas when examined over the long term (10 years).

Appendix C: EMISSION STANDARD TABLES

Table C-1 Emission Standards for LDVs and Trucks, in Grams per Mile.

VEHICLE WEIGHT CLASS		EXHAUST EMISSION STANDARDS in grams/mile									
		NMOG		CO		NO _x		PM		HCHO	
		LEV	ULEV	LEV	ULEV	LEV	ULEV	LEV	ULEV	LEV	ULEV
5 0 , 0 0 m i l e s	Light-duty vehicles and trucks ≤3,750 lbs. TW (≤6,000 lbs. GVWR)	0.075	0.040	3.4	1.7	0.2	0.20	0.08	0.08	0.015	0.008
	Light-duty trucks >3,750 lbs. and ≤5,750 lbs. TW (≤6,000 lbs. GVWR)	0.100	0.050	4.4	2.2	0.4	0.40	0.08	0.08	0.018	0.009
	Light-duty trucks ≤3,750 lbs. TW (>6,000 lbs. GVWR)	0.125	0.075	3.4	1.7	0.4	0.20	n/a	n/a	0.015	0.008
	Light-duty trucks >3,750 lbs. and ≤5,750 lbs. TW (>6,000 lbs. GVWR)	0.160	0.100	4.4	2.2	0.7	0.40	n/a	n/a	0.018	0.009
	Light-duty trucks >5,750 lbs. and ≤8500 lbs. TW (>6,000 lbs. GVWR)	0.195	0.117	5.0	2.5	1.1	0.60	n/a	n/a	0.022	0.011
1 0 , 0 0 m i l e s	Light duty vehicles and trucks ≤3,750 lbs. TW (≤ 6,000 lbs. GVWR)	0.090	0.055	4.2	2.1	0.3	0.30	0.08	0.04	0.018	0.011
	Light-Duty trucks >3,750 lbs. and ≤ 5,750 lbs. TW (≤ 6,000 lbs. GVWR)	0.130	0.070	5.5	2.8	0.5	0.50	0.08	0.04	0.023	0.013
	Light-duty trucks ≤3,750 lbs. TW (>6,000 lbs. GVWR)	0.180	0.107	5.0	2.5	0.6	0.30	0.08	0.04	0.022	0.012
	Light-duty trucks >3,750 lbs. and ≤5,750 lbs. TW (>6,000 lbs. GVWR)	0.230	0.143	6.4	3.2	1.0	0.50	0.10	0.05	0.027	0.013
	Light-duty trucks >5,750 lbs. and ≤8500 lbs. TW (>6,000 lbs. GVWR)	0.280	0.167	7.3	3.7	1.5	0.80	0.12	0.06	0.032	0.016

● ILEV standards equal LEV standards for NMOG and CO; and ULEV standards for NO_x. In addition, ILEV standards require evaporative emissions of no more than 5 grams per test with the vapor recovery system disconnected.

CO - carbon monoxide
 GVWR - gross vehicle weight rating (GVWR)
 HCHO - formaldehyde
 NMOG - non-methane organic gas

NO_x - oxides of nitrogen
 PM - particulate matter
 TW - total weight
 ULEV - ultra-low emission vehicle

TABLE C-2 Exhaust Emission Standards for Dual-Fueled and Flexible-Fueled Vehicles

VEHICLE WEIGHT CLASS		NMOG Exhaust Emission Standards for Flexible and Dual-Fueled (grams/mile)	
		When Operating on Clean Alternative Fuel	When Operating on Conventional Fuel
5 0 0 0 m i l e s	Light-duty vehicles and trucks ≤3,750 lbs. TW (≤6,000 lbs. GVWR)	0.075	0.125
	Light-duty trucks >3,750 lbs. and ≤5,750 lbs. TW (≤6,000 lbs. GVWR)	0.100	0.160
	Light-duty trucks ≤3,750 lbs. TW (>6,000 lbs. GVWR)	0.125	0.25
	Light-duty trucks >3,750 lbs. and ≤5,750 lbs. TW (>6,000 lbs. GVWR)	0.160	0.32
	Light-duty trucks >5,750 lbs. and ≤8500 lbs. TW (>6,000 lbs. GVWR)	0.195	0.39
1 0 0 0 m i l e s	Light-duty vehicles and trucks ≤3,750 lbs. TW (≤6,000 lbs. GVWR)	0.090	0.156
	Light-duty trucks >3,750 lbs. and ≤5,750 lbs. TW (≤6,000 lbs. GVWR)	0.130	0.200
	Light-duty trucks ≤3,750 lbs. TW (>6,000 lbs. GVWR)	0.180	0.36
	Light-duty trucks >3,750 lbs. and ≤5,750 lbs. TW (>6,000 lbs. GVWR)	0.230	0.46
	Light-duty trucks >5,750 lbs. and ≤8500 lbs. TW (>6,000 lbs. GVWR)	0.280	0.56