TCEQ REGULATORY GUIDANCE

Air Quality Planning and Implementation Division
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Questions & Answers regarding the Texas Low Emission Diesel Fuel (TxLED) Regulations

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I. Compliance with TxLED fuel standards

A. **How does a producer or importer achieve compliance with the TxLED fuel standards?** Producers and importers can satisfy the TxLED fuel standards using any of the following five methods:

1. Produce or import diesel fuel that has a maximum aromatic hydrocarbon content of 10 percent by volume and has a minimum cetane number of 48.

2. Produce or import diesel fuel that complies with the specifications of a California Air Resources Board (CARB) certified alternative diesel formulation that was approved by CARB before January 18, 2005, to meet California diesel regulations in effect as of October 1, 2003. CARB certified alternative diesel formulations that were approved for compliance with California's small refinery specifications for diesel fuel are not acceptable.

3. Produce or import diesel fuel that complies with California diesel fuel regulations in effect as of January 18, 2005, except for those regulations established for small refineries. Diesel fuel produced to comply with the "designated equivalent limits" specified in the California diesel regulations would also be considered compliant with the TxLED fuel standards.

4. Produce or import diesel fuel that complies with an alternative diesel fuel formulation that has been approved by TCEQ as achieving comparable or better emission reductions.

5. Produce diesel fuel under an alternative emission reduction plan that has been approved by TCEQ and the U.S. Environmental Protection Agency (EPA) which contains a substitute fuel strategy that will achieve equivalent emission reductions.

B. **Do the TxLED fuel standards apply to diesel fuel used for nonroad equipment, locomotives, and marine engines?** Yes. All diesel fuel that is commonly or commercially known or represented as Grade No.1D or No.2D diesel fuel in accordance with the ASTM D-975 standards that is sold in or supplied into the 110 Texas counties affected by the TxLED regulations that may ultimately be used to power a diesel-fueled compression-ignition engine within those affected counties is required to meet the TxLED fuel standards. There is no distinction in the TxLED regulations between the Grade No. 1D or No. 2D diesel fuel used in on-highway motor vehicles and that used in nonroad equipment, locomotives, and marine engines.

High sulfur Grade No. 1D or No. 2D diesel fuel (i.e. S5000) that is currently allowed by federal law for use in nonroad equipment, locomotives, and marine engines will be required to comply with the TxLED fuel standards when sold or supplied into the 110 affected Texas counties after October 1, 2005.

The TxLED regulations do not apply to marine distillate fuels, i.e. DMX, DMA, DMB, and DMC as specified by the International Standard ISO 8217.

C. **I own a site located in the 110-county region that is subject to the Title V permitting program and I have diesel fuel storage tanks on site. Are the TxLED regulations in Chapter 114 an applicable requirement for Title V purposes?** No. Chapter 114 relates to air pollution control from mobile sources, rather than stationary

sources. Therefore, Chapter 114 is not an applicable requirement under TCEQ's Title V program rules.

II. Affected Parties

A. **Who is affected by this rule?** Primarily, the TxLED regulations apply to the producers and importers of diesel fuel that intend to sell, offer for sale, supply, or offer for supply diesel fuel in the110 counties covered by the rules. However, in some fashion all parties involved in the production, distribution, and use of diesel fuel in the 110 counties in the Eastern half of Texas are affected since §114.312(a) states that no person shall sell, offer for sale, supply, or offer for supply, dispense, transfer, allow the transfer, place, store, or hold any diesel fuel in any stationary tank, reservoir, or other container in the affected 110 counties that may ultimately be used to power a diesel fueled compression-ignition engine in the affected counties unless the diesel fuel is compliant with the TxLED regulations.

B. **Are consumers required to purchase and use TxLED when operating diesel engines in the affected counties?** The ultimate consumer of diesel fuel in the affected 110 counties is not required to purchase or use TxLED, however all diesel fuel suppliers in the affected counties are prohibited from selling diesel fuel that is not compliant with the TxLED regulations.

C. **Who does TCEQ consider to be a producer or importer?** A producer is any person or company that manufacturers diesel fuel either through the refining of petroleum or the combining of blend stocks to create the finished product that is represented as diesel fuel. This definition also applies to any person or company that blends an additive with non-compliant diesel fuel to create a finished product that may be represented as TxLED compliant diesel fuel. An importer is any person or company that is responsible for the transport of diesel fuel into the affected 110 counties from outside the state or from outside the control area.

D. **Who would be considered a Wholesale Bulk Purchaser?** A company or organization that purchases large volumes of diesel fuel for its own use and stores it at its own storage facility (e.g., purchasing in quantities of 50,000+ gallons at a time).

III. Additives

A. **Is biodiesel an approved additive for use in TxLED?** The executive director of the TCEQ has determined that blending biodiesel into Texas Low Emission Diesel (TxLED) is not acceptable unless the blend has been approved by TCEQ as being equivalent to TxLED in reducing NOx emissions.

Pure biodiesel (B100) and other biodiesel blends such as B20 are known to be effective in reducing emissions of carbon monoxide, total hydrocarbons, and particulate. The U.S. Environmental Protection Agency (EPA) has verified the use of biodiesel as a retrofit technology to reduce these specific emissions. However, the use of B100 in compression-ignition engines is also known to increase NOx emissions by at least 10 percent and by 2 percent or more with B20 blends.

This increase in NOx emissions is acknowledged by industry groups, the EPA, the California Air Resources Board (CARB), and the National Biodiesel Board. In fact, because of the known increase in NOx emissions, the Engine Manufacturers

Association (EMA) does not recommend the use of B100 or biodiesel blends as a means to improve air quality in ozone non-attainment areas.

The TCEQ will accept the use of biodiesel in TxLED if a specific biodiesel/diesel fuel blend (i.e., B20) or a specific biodiesel/fuel additive/diesel fuel blend can demonstrate that:

(A) it has been verified by EPA or CARB to reduce NOx emissions by a percentage that is equivalent to or greater than the NOx reduction of at least 5.7 percent attributed to TxLED when blended with regular EPA diesel; or

(B) it has been tested in accordance with procedures specified in §114.315 and has been approved by the executive director as an TxLED alternative diesel formulation.

B. **Do all additives have to be approved by TCEQ before they can be added to diesel fuel in the affected counties?** No. The only additives that must be approved by TCEQ are those that are used to reduce emissions from diesel fuel used to comply with the TxLED regulations. Additives such as those used to increase lubricity or enhance cold flow characteristics are not required to be approved unless there is a known emissions impact from their use (i.e., the increase in NOx emissions from diesel fuel when biodiesel is added to the fuel).

IV. Alternative Diesel Fuel Formulations

A. **What is an alternative diesel fuel formulation?** An alternative diesel fuel formulation is a diesel fuel that has been produced to achieve emission reductions that are equivalent to those that would be achieved by TxLED, but without meeting the fuel content specifications for aromatic hydrocarbons and cetane as specified in §114.312(b) and (c). An alternative diesel fuel formulation could be produced through changes in the characteristics of the fuel or through the blending of fungible EPA diesel with an additive.

The process to obtain TCEQ approval for the use of an alternative diesel formulation to produce TxLED has two tracks, one is specified in §114.315(c) and the other is specified in §114.315(d), and both require emission testing to demonstrate the equivalency of the formulation to TxLED in reducing emissions. A TCEQ approved alternative diesel fuel formulation is considered to be TxLED and producers using it are not required to submit alternative emission reduction plans.

The process to obtain TCEQ approval under §114.315(c) is explained in the topic below on “How do I receive approval for my alternative diesel fuel formulation?”.

Diesel fuel additives and formulations that have been approved by EPA through EPA’s Voluntary Diesel Retrofit Program or EPA’s Environmental Technology Verification (ETV) Program to achieve emission reductions that are equivalent to those that would be achieved by TxLED may be approved by TCEQ in accordance with §114.315(d) as an alternative diesel fuel formulation for TxLED without the need for further testing. The manufacturers of these EPA approved formulations will be required to submit a letter of application requesting TCEQ approval of their formulation and must provide all of the information required under §114.315(d) as appropriate when applying.

Alternative diesel fuel formulations that have been approved by the California Air Resources Board (CARB), except those approved to meet California diesel fuel

specifications applicable to small refineries, are considered approved by TCEQ without the need for further process and may be used to produce TxLED.

B. **How is this different from an alternative emission reduction plan?** An alternative emission reduction plan is used by producers that want to use some other fuel strategy to achieve the same amount of emission reductions that would have been achieved if they were producing TxLED. Prior to the amendments to the TXLED regulations, the TCEQ allowed a producer to use, as part of an alternative emissions reduction plan, a strategy of additive blended fuels or other alternative diesel fuel formulations that did not demonstrate, through the approved test methods in §114.315, an "equivalent" or better level of NOx reduction as otherwise achievable through compliance with §114.312. However, these plans are also required to be approved by the U.S. EPA, unlike alternative diesel fuel formulations. The recently revised TxLED regulations (specifically 114.315(b), (c), and (d)) provide more flexibility for the TCEQ to approve alternative formulations and therefore, using the alternative emission reduction plan option in the future should not be necessary. [**Note:** *For a more complete explanation see the topic on Alternative Emission Reduction Plans below*.]

C. **How do I receive approval for my alternative diesel fuel formulation?** Persons seeking approval for an alternative diesel fuel formulation under §114.315(c) must first submit a letter of application to the TCEQ requesting approval of their testing protocol prior to conducting testing. The application should be submitted in the following format:

1. A cover letter requesting the TCEQ to approve the proposed test protocol which can also include any pertinent information about the proposed formulation, including data relating to the additive, if an additive blend is proposed, such as the EPA registration number of the additive;

2. Information regarding the identity of emissions testing facility that the applicant plans to use to conduct the testing;

3. A test plan outlining the specific test procedures to be used to conduct the testing that are consistent with §114.315(c)(4);

4. Information regarding the diesel engine the applicant plans to use for the emissions testing that demonstrates the proposed engine is consistent with §114.315(c)(4)(A). This information should include data such as engine make, model number, model year, displacement, and horsepower rating;

5. Fuel analysis data that demonstrates that the candidate fuel to be used in the testing conforms to the diesel fuel standards listed in ASTM D-975, except for lubricity, and that the reference fuel to be used in the testing complies with the fuel characteristic specifications listed in §114.315(c)(3);

6. Information that indicates that the emissions testing facility to be used to conduct the testing has reasonable quality assurance and quality control procedures in place to ensure the accuracy of the test results; and

7. A notification of any outlier identification and exclusion procedures the applicant is proposing to use during testing.

Upon TCEQ review and acceptance of the proposed test protocol, the applicant would then conduct emissions testing in accordance with the approved test protocol and

provide the test results to TCEQ for determination of equivalency. If the emissions produced when using the alternative diesel fuel formulation are determined to be comparable or better than the emissions produced when using the reference fuel, the TCEQ will be able to approve the alternative diesel fuel formulation for use as TxLED.

Note: If the average emissions produced with the reference fuel exceed the test engine's applicable federal exhaust emission standards by more than 110%, the TCEQ may not accept the emission test results unless the applicant provides further documentation justifying the acceptance of this data.

If approved, the TCEQ will issue an approval notification certifying that the alternative diesel fuel formulation may be used to satisfy the TxLED requirements under §114.312. As part of the approval notification, an identification number will also be assigned to the approved alternative diesel fuel formulation that would be used for reporting as required under §114.316.

D. **If I plan to use the Alternative 4 test sequence to conduct the emissions testing needed for the approval of an alternative diesel fuel formulation, how many hot start exhaust emission tests must be performed on each fuel?** To be consistent with the requirements under §114.315(c)(4)(C)(i) that specify each test must consist of at least one cold start and two hot start cycles, the exhaust emission tests for each "R" and each "C" listed under the hot start only test sequences (alternatives 1 through 5) must consist of at least three hot start cycles.

Therefore, when the Alternative 4 test sequence is used, the testing should proceed in the following chronological order:

1. A minimum of six hot start exhaust emission tests must be performed on the Reference fuel to establish the reference baseline emissions for the comparative analysis;

2. The test engine may then be operated on the Candidate fuel for a period of up to 72 hours of engine operation as a conditioning cycle;

3. A minimum of nine hot start exhaust emission tests must be performed on the Candidate fuel to establish the average emissions from the use of the Candidate fuel that will be used for the comparative analysis;

4. A minimum of six hot start exhaust emission tests must be performed on the Reference fuel to determine any carry-over effect that may occur from the use of the Candidate fuel. Only the emissions from the first set of hot start exhaust emission tests on the Reference fuel will be used for the comparative analysis to determine whether the Candidate fuel can be approved as an alternative diesel fuel formulation for TxLED.

Note: If the average emissions produced with the reference fuel exceed the test engine's applicable federal exhaust emission standards by more than 110%, the TCEQ may not accept the emission test results unless the applicant provides further documentation justifying the acceptance of this data.

E. **Who do I contact at TCEQ about my questions regarding alternative diesel fuel formulations?** For questions regarding alternative diesel fuel formulations and the approval processes, please contact the following TCEQ staff:

Morris Brown, Air Quality Planning and Implementation Division
(512) 239-1438
mbrown@tceq.state.tx.us

F. **How long does it take to go through the TCEQ alternative diesel fuel formulation approval process?** The TCEQ estimates that the entire process could take at least two to three months to complete. The time line for this process is dependent upon the following stages:

1. The applicant submits the application for approval of the test protocol to TCEQ.
2. TCEQ staff reviews the application and test plan and makes a recommendation for approval.
3. The TCEQ approves the test plan and notifies the applicant that emissions testing in accordance with the approved test plan may begin.
4. The applicant conducts the emissions testing at the approved testing facility.
5. The approved emission testing facility compiles the test data into a comprehensive test report and submits the report to the TCEQ.
6. TCEQ staff reviews the report and makes a recommendation for approval based on the results of the testing as indicated in the report.
7. TCEQ approves the alternative diesel fuel formulation and issues an approval notification to the applicant.

G. **If my TCEQ approved alternative diesel fuel formulation has a sulfur content greater than 15 parts per million (ppm), will the approval be valid after June 2006 when the federal ULSD standards become effective?** Yes. Since the reference fuel used to determine the equivalency of an alternative diesel fuel formulation is required to have a sulfur content of less than 15 ppm, it is logical to assume that any alternative diesel fuel formulation with a greater sulfur content that is able to achieve comparable or better NOx emission reductions would continue to do so when produced with ULSD.

H. **If my CARB approved alternative diesel fuel formulation (which is produced through the use of an additive) has a specification for sulfur that is less than 500 ppm, will TCEQ accept it as TxLED when it is blended into high sulfur diesel fuel used for nonroad applications?** Yes. The sulfur content of an alternative diesel fuel formulation would have no impact the ability of the formulation to achieve NOx reductions. Therefore, if the additive is approved by California or TCEQ when blended with low sulfur diesel fuel (<500 ppm), the TCEQ will continue to accept it when it is blended with high sulfur diesel fuel (>500 ppm).

I. **If the untreated diesel fuel that was used in a TCEQ or CARB approved additive-based alternative diesel fuel formulation had an aromatic hydrocarbon content of 29 % by volume when the formulation was tested for approval, is the additive allowed to be mixed with a diesel fuel that has an aromatic hydrocarbon content of 32 % by volume?** Yes. Data from a statewide diesel fuel survey conducted in August/September 2004 has provided information that allowed TCEQ to estimate the average properties of diesel fuel currently being sold in Texas. Using this information and criteria based on EPA and CARB diesel regulations, it has been determined that TCEQ or CARB approved additive-based alternative diesel fuel formulations that used a candidate fuel with fuel properties within the following ranges as applicable would continue to be acceptable when mixed with any Grade No. 1-D or No. 2-D diesel fuel in compliance with ASTM D975-04c (Standard Specification for Diesel Fuel Oils) or the current active version of ASTM D975, except for lubricity.

				Distillation (°F)				
Range	**API Gravity**	**Aromatic Hydrocarbons (%vol.)**	**Cetane Number**	**IBP**	**10% Rec**	**50% Rec**	**90% Rec**	**EP**
Min	32	28	43	340	400	470	560	610
Max	39	36	49	400	460	540	630	690

V. Alternative Emission Reduction Plans

A. **What is an alternative emission reduction plan and when is it necessary?** An alternative emission reduction plan is the documentation by which a diesel fuel producer demonstrates how a substitute fuel strategy (or strategies) will meet the "equivalent" level of NOx reduction otherwise achievable through compliance with §114.312.

An alternative emission reduction plan may be submitted by diesel fuel producers who, beginning October 1, 2005, intend to sell, offer for sale, supply, or offer for supply diesel fuel in the110 counties covered under the Texas low emission diesel (LED) rules and who do not intend to produce diesel fuel that would comply with the LED requirements under §114.312(b) and (c), (e), or (f).

B. **When do alternative emission reduction plans need to be submitted to the TCEQ?** An alternative emission reduction plan must be submitted and approved by the executive director and the EPA prior to the use of that plan for compliance with the TxLED regulations. TCEQ recommends that producers who intend to comply with the TxLED rules with a substitute fuel strategy submit their alternative emission reduction plans as soon as possible to allow time for the TCEQ and the EPA to approve the plans before the implementation of the TxLED rules on October 1, 2005.

C. **Does my alternative emission reduction plan need approval from both TCEQ and EPA?** Yes. After the alternative emission reduction plan has been approved by the TCEQ, it will be submitted to the EPA for their approval as well.

D. **If my alternative emission reduction plan is approved by TCEQ, do I have to wait for EPA's approval before I can begin to sell or supply diesel fuel under this plan?** Yes. The TxLED rules in §114.318 specify that alternative emission reduction plans must be approved by both TCEQ and EPA to be considered in compliance with

the TxLED fuel content requirements specified in §114.312(a). For this reason, TCEQ encourages producers to submit their alternative emission reduction plans as soon as possible to allow time for the EPA to approve the plans before the implementation of the TxLED rules on October 1, 2005.

E. **What years are used to calculate "equivalency"?** The TxLED rules requires compliance beginning October 1, 2005. "Equivalent" reductions of NOx emissions must be demonstrated for years 2006, and 2007 (attainment year), and thereafter. See topics below for discussions on crediting reductions achieved prior to 2006.

F. **Is "equivalency" determined on a volumetric basis?** Yes. TCEQ requires producers to demonstrate equivalent reductions based on the volume of diesel supplied to a specific geographic region. Producers are required to provide TCEQ information regarding their market share, which is based on the volume of diesel they supply to the effective area. See topic below for geographic boundaries used to determine equivalency in alternative emission reduction plans.

G. **What geographic boundaries are used in determining "equivalency"? For example, do I show equivalency by county or by nonattainment area?** Since reductions from LED have been calculated by area (rather than individual counties), the TCEQ will require alternative emission reduction plans to show equivalency for the follow areas:

1. Houston/Galveston 8-county area: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller counties.

2. Dallas/Fort Worth 9-county area: Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant counties.

3. The affected 93-county regional area: Anderson, Angelina, Aransas, Atascosa, Austin, Bastrop, Bee, Bell, Bexar, Bosque, Bowie, Brazos, Burleson, Caldwell, Calhoun, Camp, Cass, Cherokee, Colorado, Comal, Cooke, Coryell, De Witt, Delta, Falls, Fannin, Fayette, Franklin, Freestone, Goliad, Gonzales, Grayson, Gregg, Grimes, Guadalupe, Hardin, Harrison, Hays, Henderson, Hill, Hood, Hopkins, Houston, Hunt, Jackson, Jasper, Jefferson, Karnes, Lamar, Lavaca, Lee, Leon, Limestone, Live Oak, Madison, Marion, Matagorda, McLennan, Milam, Morris, Nacogdoches, Navarro, Newton, Nueces, Orange, Panola, Polk, Rains, Red River, Refugio, Robertson, Rusk, Sabine, San Jacinto, San Patricio, San Augustine, Shelby, Smith, Somervell, Titus, Travis, Trinity, Tyler, Upshur, Van Zandt, Victoria, Walker, Washington, Wharton, Williamson, Wilson, Wise, and Wood counties.

These boundaries are set to maintain the integrity of the Houston-Galveston-Brazoria (HGB) and Dallas-Fort Worth (DFW) State Implementation Plans (SIPs) which rely on NOx emission reductions from Texas LED to show attainment.

H. **If I have excess emissions reductions in one geographic area and a shortage in another, can I trade those reductions within my plan to show equivalency?** No. Excess NOx emission reductions that may occur as a result of an alternative emission reduction plan in one geographic area may not be credited to another geographic area (e.g., excess Nox emission reductions occurring in the HGB or DFW nonattainment areas may not be applied towards shortages in the affected 93-county region or vice versa.)

I. **If I have excess emissions reductions in one geographic area, can I offer/sell those reductions to other producers for use in their alternative emission reduction plans?** No. Excess emissions reductions that may occur as a result of a producer's alternative emission reduction plan may not be credited for use with another producer's alternative emission reduction plan.

J. **If my plan involves a cleaner diesel or gasoline, may I determine those reductions on an annually averaged basis?** No. Emissions reductions must be demonstrable on a per-gallon basis.

K. **What information is required to demonstrate "market share"?** Market share is determined by the estimated daily volume of diesel sold to affected counties (broken down by on-road product and off-road product). If an alternative emission reduction plan involves other fuels, the daily sales by barrel or gallon of that fuel in the affected counties should also be provided.

To determine your percentage of the market share in the HGB ozone nonattainment area, the DFW ozone nonattainment area, and the affected 93-county region, divide your volume of sales for each area by the total market size shown in Table 1.

Table 1: Estimate of Diesel/Gasoline Market Size by Area, 2001

	Estimated sales (in barrels/day) of	
	Diesel	**Gasoline**
DFW (9 counties)	88,826	178,375
HGB (8 counties)	82,313	165,297
Affected 93-county region	120,007	240,992

A description of how this market size information was derived is included in Appendix A - Estimation of Diesel & Gasoline Market Sizes.

L. **How do I determine my NOx reduction target?** The original NOx reduction levels at the time of adoption of the Texas LED rule were estimated to be 6.7 tpd in HGB (3 tpd on-road; 3.7 tpd nonroad), 3.48 tpd for DFW (on-road only), and 16.32 tpd for the 110 county region (including HGB and DFW). These numbers were based on studies that estimated a 5.7% NOx reduction from using Texas LED in on-highway equipment and a 7% NOx reduction from using Texas LED in nonroad equipment.

Since these estimates were calculated in 2000 and 2001, several changes to the modeling have occurred. In February 2003, the TCEQ completed a re-analysis of the NOx emissions reductions benefits from using Texas LED to reflect improvements in modeling. Table 2 shows the updated emissions reductions in each region. Consult Appendix B - Estimation of NOx Reduction Levels from Texas LED for more details on how the numbers in Table 2 were derived.

Table 2: Emissions Reductions from Texas LED for on-highway and off-highway, 2006-2007. (Updated February 2003)

	HGB (tpd)			**DFW (tpd)**			**93-County Region (tpd)**		
Year	On	Off	Total	On	Off	Total	On	Off	Total

2006	3.43	3.32	6.75	3.60	3.53	7.13	10.07	4.67	14.74
2007	3.34	3.22	6.56	3.25	3.42	6.67	9.77	4.51	14.28

A tool has been provided by the TCEQ to help calculate each producer's NOx reduction target, based on the information in Tables 1 and 2. This tool is available on our website: http://www.tnrcc.state.tx.us/oprd/sips/cleandiesel.html#Alt. The most recent version is Texas_LED_calculator_v3.xls.

M. **Can a combination fuel-equipment strategy be acceptable?** Yes, in situations where specific type of equipment is required before a fuel strategy can show emissions reductions (i.e., an ultra low-sulfur diesel (ULSD) strategy, which can only achieve NOx reductions when combined with an equipment technology such as a retrofit device that requires ULSD to operate effectively). The reductions resulting from equipment usage of the fuel may be used to demonstrate equivalency in the alternative emission reduction plan.

The producer will be required to demonstrate that fuel-sensitive equipment will be implemented in accordance with the alternative emission reduction plan (e.g., the producer can show that agreement has been made to provide ULSD to a fleet that has agreed to retrofit vehicles with sulfur-sensitive technologies). With the use of this option, it is key to ensure that reductions from the retrofits have not already been included in the relevant SIP, to avoid double-counting.

NOTE: This option will not apply after June 1, 2006, because ULSD is required by federal regulations after this date.

N. **If my plan starts getting NOx reductions prior to 2006, can I use those early reductions to offset reductions in later years?** To reach attainment of the national ambient air quality standards, the HGB and DFW State Implementation Plans need to have quantifiable, demonstrable reductions in the 2007 attainment year. Additionally, these two areas need to ensure no more than three exceedances for the period from 2005 to 2007. As a result, early reductions (such as reductions in 2003 and 2004) cannot contribute to attainment in 2007 in HGB and DFW and therefore cannot be credited towards achieving equivalency in producers' alternative emission reduction plans. The affected 93-county region is not bound by these same constraints, therefore the TCEQ is willing to consider crediting early reductions in that area.

O. **What tools may be used to estimate NOx reduction benefits for demonstrating equivalency from alternative strategies?** The TCEQ requires the use of EPA's MOBILE 6 model for modeling on-highway emissions when feasible. For nonroad emissions, EPA's NONROAD model is preferred.

The following table shows some of the other accepted methods to estimate the emission reduction benefits from alternative fuel strategies. Please note that while it is appropriate to use these models to estimate your emission reductions, ultimately the TCEQ and EPA will need to verify and approve your calculations.

Table 3: Methods of Estimating NOx Emission Reductions from Alternative Emission Reduction Plans

Strategy	Calculation Method

Adjustments in gasoline parameters	Use EPA's Complex Model to determine the percentage reduction and then apply the percentage reduction to the proportion of regional gasoline emissions based on MOBILE 6 calculations. (e.g., a producer supplies 10% of the gasoline in the HGB area and wants to know what NOx reductions a "cleaner" gasoline will get in 2005. Assuming the total NOx emissions from the gasoline fleet in 2005 is 50 tons per day (tpd), then the producer contributes 10% of this 50 tpd, or 5 tpd. Assuming the Complex Model indicates a 4% reduction of NOx from adjusting a certain specification, the producer would apply this 4% to the 5 tpd to achieve 0.2 tpd reduction from this strategy).
Ultra Low sulfur diesel +equipment (applies only to nonroad equipment after June 06)	Emission reduction equipment must be certified by either CARB or EPA or otherwise approved for use by the commission. Use the calculation method provided by the TERP program to estimate the emission reductions.
Cetane additives/enhancers	The TCEQ has provided a Cetane Effects Calculator based on regression equations from EPA's June 2002 draft technical report, *The Effect of Cetane Number Increases Due to Additives on NOx Emissions from Heavy-Duty Highway Engines* (Report EPA420-S-02-012). Use this calculator to determine the percentage reduction, then apply to your portion of regional emissions (see Adjustments in gasoline parameters for how to do this).
Adjustments in other diesel parameters (such as aromatics)	The TCEQ has provided a Unified Model Calculator based on regression equations from EPA's July 2001 staff discussion document, *Strategies and Issues in Correlating Diesel Fuel Properties with Emissions* (Report EPA420-P-01-001). Use this calculator to determine the percentage reduction, then apply to your portion of regional emissions (see Adjustments in gasoline parameters for how to do this).

P. **Are reductions at stationary sources acceptable as part of the emission reduction plan?** No. The Texas LED rules specifically state that an alternative emission reduction plan must be composed of a substitute fuel strategy.

Q. **Can I purchase Emission Reduction Credits (ERCs) to satisfy my NOx reduction target?** No. The Texas LED rules specifically state that an alternative emission reduction plan must be composed of a substitute fuel strategy.

R. **Can I use the sulfur credits generated under the Averaging, Banking and Trading (ABT) provisions of the federal Tier 2 ultra low sulfur gasoline (ULSG) regulations to satisfy my NOx reduction target?** No. Producers are not allowed to use the sulfur credits they are generating under the federal Tier 2 ULSG gasoline ABT program for meeting their compliance with TxLED regulations after January 1, 2006. Federal Tier 2 regulations will require gasoline producers to meet a 30 ppm average and a 80 ppm per gallon cap gasoline sulfur standard beginning January 1, 2006. The EPA MOBILE 6 emissions model does not provide additional benefit from gasoline with less than 30 ppm sulfur after January 1, 2006, since the emission benefits from the reduction in

gasoline sulfur is already addressed in the modeling. Therefore, after January 1, 2006, the sulfur credits provide no benefit other than to allow producers to meet their compliance with the federal Tier 2 gasoline production requirements.

However, TxLED "credit" could be generated from the sale of gasoline in the affected areas prior to January 2006 if it can be documented that it was actually cleaner than required by federal regulations and if the reductions can be determined by MOBILE 6. After January 1, 2006, this will no longer be the case. The emission reductions generated from the cleaner gasoline would be allowed to offset shortfalls occurring between October 1, 2005, and January 1, 2006, if it can be documented.

S. **Am I allowed to include a force majeure or variance provision in the alternative emission reduction plan that I submit?** Yes. Producers with alternative emission reduction plans may request a variance from their alternative emission reduction plan through a written request to the executive director. That written request should include (1) a description of the unforeseeable event which prompts the request, (2) an estimate of the volume, timing, quality, and destination of noncompliant material that will be distributed as a result, and (3) proposed measures to make-up those emissions reductions. The TCEQ will notify the producer if the variance is approved.

T. **How will TCEQ ensure compliance?** The TCEQ intends to rely on monitoring, record-keeping, and reporting requirements as the primary means of enforcement. Additionally, the TCEQ reserves the right to do random tests on final blends.

U. **What is the monitoring, record-keeping and reporting requirments for a producer with an approved alternative emission reduction plan?** Producers with approved alternative emission reduction plans are required to comply with the product transfer document labeling requirments specified in §114.316(g), and the monitoring (sampling and testing) and quarterly reporting requirements specified in §114.316(k).

V. **How long is an alternative emission reduction plan effective?** An approved alternative emission reduction plan is considered to be effective as long as it continues to achieve equivalent emission reductions.

W. **Am I allowed to revise my plan after it has been submitted?** Yes. The TCEQ recognizes that plans may need to change with market conditions or for other reasons. However, any changes must include the appropriate re-modeling of emissions reductions to ensure that your NOx emission reduction target continues to be met and the revised plan will require TCEQ / EPA approval.

X. **I already submitted a plan; do I need to resubmit now that my NOx reduction target may have changed?** If there is a significant change in the market share that was used to determine the NOx reduction target, the producer must notify TCEQ of the change and indicate how they will continue to ensure equivalency. In the vast majority of cases, the difference between the two estimates are insignificant and subject to a margin of error. In situations where the new figures result in a significant shortfall or surplus, the TCEQ will work with each producer individually to address that issue. Alternately, producers are free to revise their submitted plan based on the revised NOx reduction target if they choose to do so.

Y. **Who do I contact at TCEQ about my questions regarding alternative emission reduction plans?** For questions regarding alternative emission reduction plans, please contact the following TCEQ staff:

Primary Contact:
Margie McAllister, Air Quality Planning and Implementation Division
(512) 239-1967
mmcallister@tceq.state.tx.us

Legal Contact:
John Minter, Legal Division
(512) 239-6366
jminter@tceq.state.tx.us

Technical Contact:
Morris Brown, Air Quality Planning and Implementation Division
(512) 239-1438
mbrown@tceq.state.tx.us

VI. Cetane

A. **Can I use a Cetane Index to determine compliance with the Cetane Number requirements of the TxLED rules?** Yes, when appropriate. Whenever ASTM D 613, *Test Method for Cetane Number of Diesel Fuel Oil*, is not readily available to determine the cetane number as required in the TxLED rules for compliance with the low emission diesel standards in §114.312 and the monitoring, recordkeeping, and reporting requirements in §114.316, the cetane index as determined by ASTM D4737, *Test Method for Calculated Cetane Index by Four Variable Equation*, may be used as an approximation. However, a cetane index is NOT appropriate to use when determining the cetane number as specified in §114.315(c) and (d) for the fuels used in testing the equivalency of alternative diesel fuel formulations.

VII. Commingling

A. **Does the TCEQ allow the commingling of TxLED and TxLED compliant fuels in the distribution system?** Yes. Volumes of diesel fuel identified on their product transfer documents (PTD) as TxLED, TxLED compliant under an alternative emission reduction plan, or diesel fuel that requires further processing, may be commingled in the same storage facility while in the distribution system. The operator of the storage facility will be required to label the PTD of the outgoing diesel fuel according to the volume of the specific fuel received. (e.g., If 10,000 barrels of TxLED entered the storage tank, then 10,000 barrels being transferred out of the storage tank should be labeled as TxLED).

The same volume of diesel fuel that is labeled as non-compliant diesel requiring further processing (i.e., fungible EPA diesel) that is commingled with compliant fuel in the same storage facility must also be labeled the same when transferred out of the storage tank or it must be further processed (i.e., injecting an approved additive into the fuel either as specified in accordance with an TCEQ approved alternative diesel fuel formulation or as specified under a TCEQ approved alternative emission reduction plan) and labeled accordingly as either TxLED or TxLED compliant under an alternative emission reduction plan.

B. **Can non-compliant fungible EPA diesel that is to be blended with an additive (e.g., ORYXE) as part of an alternative emissions reductions plan be commingled**

with TxLED-compliant fuel? What portion of that total blended volume must be additized? Yes, see previous answer above. The volume to be additized is dependent on the volume of non-compliant diesel fuel that is being received and how it is being additized. If the non-compliant diesel fuel is being additized as it is going into the storage tank to be commingled with the TxLED or an amount of the additive is blended into the tank during storage to compensate for the volume of fungible EPA diesel, then no further additization is required. However, if the additive is blended into the fuel as it leaves the tank, then the same volume of the non-compliant diesel fuel that went into the storage tank will be required to be additized at the rate required under the TCEQ approved alternative emission reduction plan.

C. **If I have a storage facility that also supplies areas outside of the affected counties, can I commingle non-compliant fungible EPA diesel that is not destined to be supplied to the affected areas in the same storage tank with volumes of TxLED, TxLED compliant under an alternative emission reduction plan, and non-compliant fungible EPA diesel that requires further processing, that is destined to be supplied to the affected counties?** Yes, but the volume of all diesel fuel being supplied to the affected counties from that commingled storage tank would be considered non-compliant diesel that requires further processing. Therefore, the entire volume of fuel leaving the commingled tank destined for the affected counties must:

1. Include PTD language labeling the fuel as non-compliant diesel requiring further processing and/or;

2. Be further processed under an alternative emission reduction plan (e.g. treated with the ORYXE additive) or with an approved alternative diesel fuel formulation (additive) and labeled with the appropriate PTD language.

VIII. Enforcement

A. **At what point is a stationary tank, reservoir, or other storage container considered compliant with §114.312(a) if that receptacle contains non-compliant diesel but is being refueled only with TxLED or TxLED compliant fuel under an alternative emission reduction plan?** The storage receptacle would be considered compliant with §114.312(a) when the volume as indicated on the PTDs of the TxLED or TxLED compliant fuel being transferred into the storage receptacle exceeds the volume of the storage receptacle.

B. **If TCEQ samples/tests product at some point in the system, how does it know if the fuel is in compliance (i.e. although not LED compliant, it may be acceptable under the producer's alternative emission reduction plan)?** The most likely method TCEQ will use to check compliance will be through the review of product transfer documents and testing/sampling records.

IX. Lubricity

A. **Did the TCEQ adopt the lubricity standard as specified in ASTM D 975, Standard Specification for Diesel Fuel Oils?** No. The TxLED regulations cite ASTM D 975 for appropriate test methods, as a reference for specific definitions, and as the minimum specifications that a candidate fuel must meet when used to demonstrate equivalency as an alternative diesel fuel formulation. The TxLED regulations do not contain a lubricity standard.

X. Permits

A. **Will I need a permit for the diesel additive storage tanks that will be needed for the production of TxLED using a TCEQ approved alternative diesel fuel formulation or under an alternative emission reduction plan?** This document does not attempt to address authorizations you may need to comply with the TXLED rules. Depending upon your strategy for compliance, various types of permits may be needed at the federal, state and local level. Regarding air quality authorizations from TCEQ, information concerning the authorization mechanism for diesel additive storage tanks and the handling of these material at fuel terminals is available from the TCEQ's Air Permits Division at the following TCEQ website: http://www.tnrcc.state.tx.us/permitting/airperm/nsr_permits/memo.pdf.

XI. Registration

A. **Who is required to register?** Only producers and importers that sold or supplied diesel fuel into the 110 Texas counties affected by the TxLED regulations on or before April 1, 2005, are required to register with the TCEQ by May 1, 2005. Producers and importers that did not begin to sell or supply diesel fuel into the affected counties until after April 1, 2005 are required to register with TCEQ at least 30 days before they begin to sell or supply diesel fuel into the affected areas.

XII. Recordkeeping

A. **Who is required to keep records?** All parties in the distribution chain, including producers, importers, bulk terminals, pipeline operators, common carriers, wholesale bulk purchasers, and retail fuel dispensing outlets, that supply diesel fuel into the 110 Texas counties affected by the TxLED regulations are required to maintain copies or records of the product transfer documents for a minimum of two years. These records must be made available to the TCEQ, EPA, or to the local air pollution agency having jurisdiction in the area, upon request.

XIII. Sampling and Testing

A. **Who is required to sample and test diesel fuel for compliance with the TxLED regulations?** Only producers and importers are required to sample and test to ensure that the diesel fuel they are producing or importing is compliant with the TxLED regulations. The other parties in the distribution chain, such as bulk terminals, pipeline operators, common carriers, wholesale bulk purchasers, and retail fuel dispensing outlets, are not required to sample or test. However, if a bulk terminal or other party in the distribution chain further processes a volume of diesel fuel, (i.e., injecting an approved additive into the fuel either as specified in accordance with an TCEQ approved alternative diesel fuel formulation or as specified under a TCEQ approved alternative emission reduction plan), then that party becomes the producer of that fuel and is required to sample and test accordingly. In addition, they would also be required to comply with all of the other requirements in the TxLED regulations that apply to producers, including the registration and reporting requirements.

B. **Why is the frequency of testing so small (i.e., every 250,000 gallons)?** The sampling rate of 1 test per 250,000 gallons is only required for testing diesel fuel that is being blended to produce TxLED as it being loaded to pipelines, tank ships,

railway tank cars, and delivery truck tank trailers and would usually only apply when an additive is being used to produce TxLED. This sampling rate should reduce the occurrence of large volumes of non-compliant diesel fuel being produced as a result of malfunctions in the additive injection systems.

C. **Do I have to pull a physical sample of the final blend when I produce TxLED at the terminal rack using an additive injection system?** It depends upon the alternative diesel fuel formulation or alternative emission reduction plan that the additive was approved under. If the additive was approved for use with fungible EPA diesel, with no other fuel content changes required, then TCEQ would only require the producer to "sample" the operation of the additive injection system at a rate of once per 250,000 gallons of production to record the volume of additive being injected and the volume of diesel being additized, to ensure that the approved treat rate was being maintained.

   However, if the approved additive required the base fuel to have specific fuel content specifications that are different than fungible EPA diesel (e.g., aromatic hydrocarbon content of less than 25 percent per volume), then TCEQ would require the producer to obtain a physical sample to test for the appropriate fuel components of the base fuel and additive as listed in the approval notification issued by TCEQ.

XIV. Appendices

A. Appendix A: Estimation of Diesel & Gasoline Market Sizes

This paper estimates the aggregate market size by the three regions subject to the Texas LED rule: (1) HGB (8-counties) (2) DFW (9-counties) (3) rest of 93-county region. After researching the options, the best data source was determined to be sales volumes collected by the Texas Comptroller of Public Accounts (gasoline), and the Energy Information Administration (diesel). Unfortunately, both data sets are aggregated at the state-level. Therefore, we used population to distribute these statewide volumes to the county level. We believe that this procedure is acceptable common practice. Census data from 2001 provides the following population distribution for Texas.

Table A1: Population Distribution in Texas, 2001

	Population	Population ratio
DFW (9 counties)	5,147,717	24%
HGB (8 counties)	4,770,298	22%
Rest of region (93 counties)	6,954,780	33%
Rest of state	4,398,895	21%
Statewide Total	**21,271,690**	**100%**

Gasoline

The State Comptroller of Public Accounts recorded that in 2001, 737,000 bpd gasoline were sold statewide. The population ratios in the last column of Table A1 are applied to statewide gasoline volumes to derive an estimated volume by region in Table A2.

Table A2: Estimate of Gasoline Distribution in Texas, 2001 (bpd)

	Gasoline (bpd)	Population ratio (%)
DFW (9 counties)	178,375	24%
HGB (8 counties)	165,297	22%
Rest of region (93 counties)	240,992	33%
Rest of state	152,426	21%
Statewide Total	**737,090**	**100%**

Diesel

The Energy Information Administration (EIA) recorded that in 2001, 367,051 bpd diesel[1] were sold statewide. EIA documents also show that nationally, 71% of diesel sold is low sulfur diesel (<500 ppm) and 29% is high sulfur diesel (>500 ppm)[2]. The population ratios in the last column of Table A1 are applied to statewide diesel volumes to derive an estimated volume by region in Table A3.

[1] Source: *EIA Fuel Oil and Kerosene Sales 2001*, Table 16 - Adjusted Sales of Distillate Fuel Oil by Energy Use

[2] This ratio between high sulfur and low sulfur is based on Table 2 of *EIA Petroleum Supply Annual 2001 Vol. 1*. Table 8 shows similar results (70% low sulfur diesel versus 30% high sulfur diesel) for just PAD III.

Table A3: Estimate of Diesel Distribution in Texas, 2001 (bpd)

	Diesel (bpd)	Population ratio (%)
DFW (9 counties)	88,826	24%
HGB (8 counties)	82,313	22%
Rest of region (93 counties)	120,007	33%
Rest of state	75,905	21%
Statewide Total	**367,051**	**100%**

Tables A2 and A3 are summarized in Table A4, and included into the Texas LED Calculator v.3.

Table A4: Estimated Diesel/Gasoline Market Sales Volumes by Area, 2001 (bpd)

	Diesel (bpd)	Gasoline (bpd)
DFW (9 counties)	88,826	178,375
HGB (8 counties)	82,313	165,297
Affected 93-county Region	120,007	240,992

B. Appendix B: Estimation of NOx Reduction Levels from Texas LED

The original NOx reduction levels at the time of adoption of the Texas LED rule in December 200 were estimated to be 6.7 tpd in HGB (4 tpd on-road; 2.7 tpd nonroad), 3.48 tpd for DFW (all on-road), and 16.32 tpd for the 110 county region (including HGB and DFW). These numbers were based on studies which estimated a 5.7% NOx reduction from using Texas LED in on-highway equipment and a 7% NOx reduction from using Texas LED in off-highway equipment.

Since these estimates were calculated in 2000 and 2001, several changes have occurred.
1. New MOBILE 6 modeling and emissions inventory
2. Updates to NONROAD and emissions inventory
3. An EPA report entitled The Effect of Cetane Number Increases Due to Additives on NOx Emissions from Heavy-Duty Highway Engines was released in draft form in June 2002. This report stated that "EGR-equipped engines are expected to exhibit no discernable NOx response to cetane." The EPA estimated that the proportion of the emissions inventory attributable to on-highway fleet with EGR systems are: 23% in 2005, 30% in 2006, and 35% in 2007.

In Spring 2003, the TCEQ revised the NOx reduction estimate from using Texas Low Emission Diesel. These revised estimates are shown in Table B1, and have been incorporated into the Texas LED Calculator v.3.

Table B1: NOx reductions due to use of Texas LED, by region (tons per day).

	HGB (tpd)			**DFW (tpd)**			**Region 93 counties (tpd)**		
Year	On	Off	Total	On	Off	Total	On	Off	Total
2006	3.43	3.32	6.75	3.60	3.53	7.13	10.07	4.67	14.74
2007	3.34	3.22	6.56	3.25	3.42	6.67	9.77	4.51	14.28

Notes:
- Nonroad estimates by TCEQ's Chief Engineers Office. HGB nonroad numbers based on Dec 2002 SIP.
- On-road DFW estimates by TCEQ contractor (ERG). They used latest link-based information from the NCTCOG and scaled down 2005/2006 based on assumption of 3% VMT growth per year. They also scaled these numbers down based on new VMT numbers.
- On-road HGB and 93-county region estimates by TCEQ's Chief Engineers Office. Data for attainment counties from TCEQ contractor (TTI) M6 2007 non-link county-level emissions inventories. Data for near nonattainment and nonattainment areas within the 93-county area from TCEQ contractor (TTI) M6 2007 link-level emissions inventories. 2005/2006 based on assumption of 3% VMT growth per year.