

## Draft Deliberative Policy Process Do Not Quote or Cite

### Nonroad Potential Control Strategies for DFW Attainment Demonstration

Control Strategy Description	Base Year 1999 Emission (TPD)	Future Year 2010 Emission Projection (TPD)	Reduction in Tons Per Day (TPD)	Estimated Percent Reduction	Comments
<p><b>1) Electric lawn and garden equipment-</b> This measure would require that only electric-powered lawn and garden equipment be sold in the Houston-Galveston-Brazoria non-attainment area. Depending on the application, some internal combustion equipment would still be sold. Another version of the measure might provide local tax incentives to promote the purchase of electric equipment. CARB is investigating strategies to increase electrification of this source category. See this link for info:  <a href="http://www.arb.ca.gov/msprog/offroad/sore/sore.htm">http://www.arb.ca.gov/msprog/offroad/sore/sore.htm</a>                      US Senate approved a measure on Nov 11, 2003 to preempt California's special authority under the CAA to set tougher pollution regulations than federal standards. This amendment gives EPA sole authority to set standards on &lt;50 hp engines and would direct EPA to propose new regulations for the engines by the end of next year.</p>					<p>There will be a slight increase in VOC emissions from electric power generation due to the increased demand of the new equipment. The relative efficiency of the generating station makes this increase an insignificant number. There will also be a slight increase in NOx emissions from the power plants of 0.0005 tons per day or 0.1945 tons per year. Manufacturers who already produce a large selection of electric powered equipment may be placed in a competitive advantage by this type of regulation. By providing ample lead-time before implementation, other manufacturers will have time to expand their product line. The VOC reduction is primarily gasoline vapor, which has a health effect screening level of 3500 ppb for a one-hour average. Mean incremental reactivity for the substances in gasoline is 2.</p>
<p><b>2) Expand HGB stationary diesel engine rule (EH)-</b>Expand HGB rule to the whole State. Current rule prohibits testing and maintenance between 6am-</p>					<p>Expand HGB rule to state or 110 east Texas counties. Public Citizen bases this idea on a petition for rulemaking.</p>

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noon and establishes standards for new/modified engines.					
<b>3) Alternative reductions from nonroad vehicles (mitigation fees) (Environmental Defense)-</b> Construction companies could pay NOx mitigation fees that could be used to pay for other strategies.					
<b>4) Alternative reductions from nonroad vehicles (scheduling) (Environmental Defense)-</b> “Much nonroad vehicle emissions result from road building and maintenance and public works for state and local governments. These public contracts should provide schedules, to the maximum extent possible, requiring the work to be performed outside of ozone season.”					
<b>5) Controls on existing portable diesel-fueled engines-</b> Unlike stationary engines, portable engines may be moved readily from one location to another. The engines are used to power a variety of equipment, including pumps (e.g., agricultural irrigation pumps and other water pumps), ground support equipment at airports, cranes, oil-well drilling and work over rigs, power generators, dredging equipment, rock crushing and screening equipment, welding equipment, wood chippers, and compressors. These engines are widely distributed and largely uncontrolled.			Portable fuel containers (DFW)- 2 tpd VOC  Portable fuel containers (100 km radius) - 0.5tpd		The first step could be to develop a registration requirement, similar to CARB’s PERP program.  Although CARB’s rule focuses on PM, it also has NOx benefits (because EPA engine “Tier” standards contain both NOx and PM limits). Therefore, although CARB’s focus is on PM, TCEQ could adopt by reference part of this measure as a NOx measure.

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New portable engines are subject to EPA nonroad engine standards (40 CFR, Part 89). There are currently three tiers of standards; Tier 1, 2, and 3. The U.S. EPA proposed Tier 4 emission standards in April 2003, which will, if adopted, require most engines to meet more stringent emission limits in the 2011-2014 timeframe.			VOC		
<b>6) LOCOMOTIVES AND RAILYARDS</b>  <b>6.1) Locomotive idling restriction (EH)-</b> Prohibiting the idling of switchyard locomotive engines while not in use.					An Auxiliary Power Unit (APU) has been developed by EcoTrans Technologies. "Approximately 40 to 50 percent of the time a locomotive is alive, it is idling,..." <a href="http://www.proheat.com/PDF/Less_Idle.PDF">http://www.proheat.com/PDF/Less_Idle.PDF</a> In Jan 2004, EPA issued "Guidance for Quantifying and Using Long Duration Switch Yard Locomotive Idling Emission Reductions in State Implementation Plans" (EPA420-B-04-002, January 2004) <a href="http://www.epa.gov/otaq/smartway/documents/420b04002.pdf">http://www.epa.gov/otaq/smartway/documents/420b04002.pdf</a>  Jurisdictional issues: EPA Guidance indicates that they do not believe that states are precluded under Section 209 of the CAA from regulating the use and operation of locomotives.
<b>6.2) Railroad diesel equipment - emissions from switching engines-</b> Reduce NOx emissions by upgrading switching engines to a minimum of Tier 0 standards. Upgrading to an engine that meets Tier 1 or Tier 2 standards (for newly manufactured locomotives) could result in even further reductions.					

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<b>6.3) Switcher locomotives</b> -The proposed control measure requires switchyard locomotives to reduce emissions by an established target (e.g. 50%).					Choice of technology (i.e. propane, rebuild, hybrid etc) would be left up to the user.
<b>6.4) Hybrid locomotive<sup>1</sup></b> -Locomotive as a switch engine to move cars at slow speeds around the yard. The new engine put into service combines electric and diesel power and runs almost noiselessly because it's using electricity from the batteries.					Union Pacific Railroad unveiled one of the country's first hybrid locomotives at its City of Commerce rail yard near Los Angeles In 1998, the U.S. EPA ordered locomotive manufacturers to reduce emissions of particulate matter and to cut NOx emissions nearly in half between 2001 and 2005. Preliminary data from the new hybrid locomotive shows the engine emits 80 percent to 90 percent less NOx and uses between 40 percent and 70 percent less diesel fuel. New hybrid switchyard locomotives should be introduced to DFW area.
<b>6.5) Reducing train operating speeds</b>					AAR has estimated that a train pulled by a four unit 12,000 horsepower locomotive would reduce fuel use by 2 gallons per mile operating at 50 mph instead of 55 mph. From EPA's "Industry Options for Improving Ground Freight Fuel Efficiency," Draft Report for Review Dec. 14, 2001
<b>6.6) Reducing track resistance</b>					To reduce friction, lubricants can be applied to the sides of the rails. However, if these lubricants are washed away or applied unevenly, train derailment may occur. From EPA's

<sup>1</sup>Thermos/Schoch, Los Angeles Times. March 16, 2005

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					“Industry Options for Improving Ground Freight Fuel Efficiency,” Draft Report for Review Dec. 14, 2001
<b>6.7) Reducing railcar tare weight</b>					Tare weight has the highest impact on energy efficiency for heavy commodities. Aluminum cars are coming into increased use in coal service. On a per car basis, 10% fuel savings results from the use of lightweight coal cars. Cars are becoming more specialized according to what they carry and for some freight, more expensive but lighter cars can save fuel. From EPA’s “Industry Options for Improving Ground Freight Fuel Efficiency,” Draft Report for Review Dec. 14, 2001.
<b>7) RECREATIONAL MARINE</b>					
<b>7.1) Recreational marine vessels (EH)</b> -Usage restrictions on ozone action days.					Aim is to reduce VOCs. Assuming most rec. marine vessels are used on weekends and holidays, and most ozone action days are during the week, there may not be very high reductions.
<b>7.2) CARB recreational marine spark-ignition standards</b> - Adopt the California standards for Recreation Marine. Beginning with the 2003 model year, inboard and stern drive marine engines must comply with the 16.0g/kw-hr HC+NOx standard. Additionally, crankcase emissions will no longer be vented into the ambient atmosphere. With the 2007 model year, manufacturers must comply with the catalyst-based 5 g/kw-hr HC+NOx standard. These standards are expected to require three-way catalyst, closed-loop technology to comply with the more stringent HC+NOx standards. Specifically, for each engine manufacturer’s California production, at least 45 percent of the engines in 2007, 75 percent in 2008, and 100 percent in 2009 and beyond must comply with the 5 grams per kilowatt-hour					The CARB regulation differs from the federal rule primarily with respect to timing and stringency. EPA has proposed a standard for SI Marine, but this proposal only covers evaporative emissions.

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HC+NOx standard.					
<b>8) COMMERCIAL MARINE</b>  <b>8.1) Commercial marine</b> - Commercial marine docking surcharge on ozone action days (can be waived if using clean technology).					Interstate/Intercontinental Commerce law conflicts.
<b>8.2) Barge Transport</b> -The proposed control measure requires a certain portion of a semi-truck trailer fleet to be transported via barge.					There are current operations in the gulf coast area that provide both coastal and inland feeder services to companies for transporting cargo. This strategy has been endorsed by TXDOT and will lead to less congestion and pollution by eliminating VMT from semi trucks.
<b>9) AIRCRAFT AND AIRPORTS</b>  <b>9.1) Landing fees (RC)</b> -Airports can establish a revenue-neutral set of differential landing fees to encourage airlines to use their least-polluting planes.					Variable aircraft landing fees have been implemented at Zurich and Geneva Airports in Switzerland, and at nineteen airports in Sweden. The fees are emissions-based and result in a greater charge being levied on higher polluting aircraft entering those airports.
<b>9.2) More efficient planes (RC)</b> -Financial incentives to airlines to accelerate acquisition of newer, more efficient aircraft and provide greater disincentives for airlines to retain older, less efficient aircraft. Create incentives for conserving fuel.					
<b>9.3) Fuels (RC)</b> - - Non-Fossil Regenerated Fuel - Fuel surcharges					

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<b>9.4) Consumer awareness (RC)</b> -Ads in airports commercials, pamphlets, etc.					
<b>9.5) Regulations on aircraft APUs (EH)</b> - Place standards, usage restrictions, or fleet emission standards on aircraft auxiliary power units.					These auxiliary engines are used on aircraft to provide power while stopped at the gate. These engines are currently entirely unregulated and a source of pollution. They can be replaced by the use of shore power (electricity provided at the gates) where available.
<b>9.6) Airport gate electrification (EH)</b> - Provide grants to pay for, or mandate the need to provide gate shore power to encourage aircraft to shutdown APUs.					Possible under TITLE 30, PART 1, CHAPTER 14.2  "Austin Bergstrom Airport has adopted this powering arrangement as operational requirements from which the city has obtained quantifiable NOx reductions." -Env. Def
<b>9.7) Advertisement placards</b> - This control measure requires all advertisement placards on airport shuttles and taxicabs to be relocated from the top of vehicles to the interior. The fuel efficiency of these vehicles would increase due to decreasing wind drag.					Potential MOU
<b>9.8) Airport operations (Environmental Defense)</b> - Reduce idling on runways.					Priority for takeoff should not be based on the order that planes leave their respective gates. This practice results in dozens of planes routinely idling on runways and the tarmac.
<b>9.9) Congestion pricing at rush hours at airports. (Environmental Defense)</b> - Flights are scheduled at					

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rush hours. Impose a fee on takeoffs at congested hours and use the proceeds to subsidize flights at other hours.					
<b>9.10) “Cap-and-trade,” or airport “bubble” approaches (RC)</b> -These strategies have the potential to limit airport-related emissions, provide flexibility in achieving reductions, and encourage the use and development of cleaner technologies. The operators of Logan Airport (Massport) have established a cap on airport emissions; any emissions increases that result from airport activity must be offset by on-airport emission reductions, reductions near the airport, or by purchasing emission credits.					
<b>9.11) GSE fleet standards/ requirements (RC)</b> -Regulatory approaches such as; 1) promoting or requiring the purchase of cleaner alternatives when fleet vehicles or equipment are replaced or added; and 2) developing a declining fleet emissions standard (target).					
<b>9.12) Aircraft operations-</b> Single engine taxi (RC)-Cost little or nothing to implement and provides fuel-use savings and emissions reductions.					
<b>9.13) Aircraft operations-</b> Reduced use of reverse thrust (RC)-Cost little or nothing to implement and provides fuel-use savings and emissions reductions. To be used at the pilot’s discretion.					

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<b>9.14) Federal Aviation Administration's inherently low-emission airport vehicle (ILEAV) pilot program (RC)</b> - A federal program called ILEAV provides financial incentives for airports to reduce emissions by introducing clean alternative fuel ground service and ground access vehicles into fleets. A total of ten airports have been selected to receive funding.					
<b>9.15) Automobile operations (RC)</b> - All air pollutants would be significantly reduced if motor vehicles were restricted from idling and access to terminal areas were controlled.					
<b>10. FUELS</b>					
<b>10.1) Postal vehicles (kkh)</b> -This control measure requires all postal vehicles to operate on bio-diesel.					
<b>10.2) Diesel fuel catalyst (kkh)</b> -This control measure requires fleets to have a diesel catalyst installed in the engine compartment to reduce NOx and PM emissions.					
<b>10.3) Fossil fuel equipment surcharge (EH)</b> -					

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Surcharge on fossil fueled equipment where electric is viable alternative (i.e. lawn & garden, GSE).					
<b>10.4) Gas tax increase (EH)</b> -Increase state tax on gasoline/diesel. Spend fees on transit to make it a better alternative.					There may be some restrictions on how gas taxes may be spent.
<b>10.5) Reformulated gas III (EH)</b> - Expanding the use of Reformulated Gasoline (RFG) and Stage II Vapor Recovery into Ellis, Johnson, Kaufman, Parker, and Rockwall Counties. Currently, the sale of RFG is required in the “core” Collin, Dallas, Denton, and Tarrant Counties, while Conventional Gasoline with a maximum Reid Vapor Pressure (RVP) of 7.8 pounds per square inch (psi) is required in the five “perimeter” counties. In addition, Stage II “at the pump” Vapor Recovery is required in the four core counties, but not in the five perimeter counties.				<b>On road &amp; Refueling Benefits</b> NOx - .0078 VOC - .6477	
<b>10.6) “Super cetane” paraffinic biodiesel</b> <sup>2</sup> – North Texas Bio-Energy (NTBE) was awarded TCEQ grants for testing of its pure normal-paraffins biodiesel (“HTBio-Fuel B100) as well as separate tests for blends of regular diesel fuel plus bio-paraffins (HT Bio-Fuel B20). Also being tested are various blends of ordinary esterified biodiesel, plus BTBE’s “bio-Cetane Plus” bioparaffin (Bio-Paraffins are produced from relatively cheap feed					

<sup>2</sup> Bioparaffins Might Solve Biodiesel NOx Problem, World Fuels TODAY June 28, 2005.

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stocks including palm oil, in contrast to expensive soybeans). The latter tests aim to show that ordinary biodiesel can be blended with NTBE's bioparaffin fuel to overcome the typical NOx penalties of biodiesel, hence opening the door to biodiesel sales in air quality non-attainment areas.					
<b>11) OTHER</b>  <b>11.1) Tax or license fee credit to scrap old vehicles, replace or retrofit engines-</b> Provide property or income tax credit or credit on next license fee for accelerated retirement of qualifying vehicle according to state or other definition.					Monetary benefit needs to offset a significant portion of vehicle replacement cost; or, alternate travel modes must be adequate and affordable.
<b>Scrappage/transit credit (TTI)-</b> Transit passes/credit in exchange for old vehicle scrappage.					
<b>More enforcement of smoking vehicles (TTI)-</b> Increase enforcement of smoking vehicles, speeding, etc.; Institute a separate law-enforcement staff to monitor smoking or high-emitting vehicles.					
<b>Area-wide "Steer it/ Clear it" programs (TTI)-</b> Expand the "steer it/clear it" program (immediate removal of vehicles from roadway in event of stall or non-serious accident).					
<b>Improved incident management (TTI)-</b> Improved incident detection, response, and management to minimize traffic delays.					Houston TranStar (early stages of coordinated incident management)

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<b>Increase tolls during peak traffic periods (TTI)</b> - Raise tolls when traffic is heaviest and congestion and/or on-road mobile source emissions are highest.					This measure may reduce some trips, combine others through ridesharing, and divert some to less costly periods
<b>Telecommuting and/or increased vacation time for HOV users (TTI)</b> -Provide telecommuting opportunities and/or extra vacation time for rideshare or transit users.					For non-retail, non-customer-service jobs (for telecommuting)
<b>Open HOV facilities for special events (mg)</b> - Before and after special events, open existing HOV lanes/facilities to all peak direction traffic to facilitate flow.				<0.1% reduction in NOx	Potential TCM - applicable to non-attainment and near non-attainment areas.
<b>11.2) Provide home computers/work stations/other incentives for HOV users/telecommuters (mg)</b> -Employers provide home computer/work stations, flextime, transit tokens, and other incentives/rewards for telecommuting, ridesharing, or other travel behavior modification.					Potential TCM - applicable to non-attainment and near non-attainment areas.
<b>11.3) Lottery for purchasers /owners of qualifying LEVs (mg)</b> -Use \$5-\$10 from each vehicle registration fee for lottery type award program. Monthly drawings with buyers of qualifying (lowest) LEVs during past year or registrants of qualifying (lowest emissions rates) LEVs eligible for prizes. Incentive program.				0.1% to 1% reduction in NOx	Potential TCM - applicable to non-attainment and near non-attainment areas

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<b>11.4) Late retail hours (mg)</b> -Change retail business hours to open from noon until 9 p.m. (or later) to shift trips out of peak ozone formation time. "Retail" for this purpose is defined as hard goods (appliances, clothing, etc.) and other similar retailing; essentials such as grocery and drug/convenience stores would not be affected by this measure.				0.1% to 1% reduction in NOx	Potential TCM - applicable to non-attainment and near non-attainment areas.
<b>11.5) Internet ride matching (mg)</b> -Real-time ride matching offered via website by a transportation-related agency or other private entity. Offers immediate matching with employees of a company or people working in similar proximity.				0.1% to 1% reduction in VMT	Potential TCM - applicable to non-attainment and near non-attainment areas.
<b>11.6) Provide transportation conditions Internet site (TTI)</b> -Provide hot link to local transportation conditions website or provide internal web page with transit, traffic, other conditions, schedules, directions to encourage use of modes other than driving alone.					Cities with established traffic/transportation conditions website or with available real-time data that can be accessed by employer computer networks or dial up
<b>11.7) Development bonuses for pedestrian, bicycle, or transit accommodations (mg)</b> -Density, height, FAR or other bonuses for developments providing linkages, amenities, and/or priorities that encourage bicycle, pedestrian, or transit usage for access and internal circulation. Examples include on-site transit station or stop convenient to building entrances, on-site transit route accommodations, compact development with quick/easy inter-building				<0.1% reduction in NOx	Potential TCM - applicable to non-attainment and near non-attainment areas.

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links, comprehensive pedestrian and/or bicycle system, pedestrian/bike priority at street crossings, etc.					
<b>11.8) Traffic ticketing (mg)</b> -Handle traffic citation process in nonroad locations or on local streets rather than in right lane or highway shoulders. This will eliminate temporary loss of a traffic lane and “rubbernecking,” reducing congestion and safety hazards.				<0.1% reduction in NOx	Potential TCM - applicable to non-attainment and near non-attainment areas.
<b>11.9) Employer-managed, travel reduction program (Environmental Defense)</b> - “A program by South Coast AQMD’s Rule 2202– On-road Motor Vehicle Mitigation Options requires individual employers to meet an emissions reduction target while allowing them significant flexibility in how to achieve the reduction and incentives for exceeding their target.” Program that offers commuters choices and incentives not to drive to work.					Employer Options: LEV vehicle purchase, incentives for ridesharing, telecommuting, compressed work week, parking cash-out, purchase of emissions allowances from stationary sources, scrapping gross-polluting vehicles, or contributing to an air quality improvement fund.”
<b>11.10) LEV fleets (Environmental Defense)</b> - “Require public and private sector owners of fleets to phase in vehicles that meet the low-emissions vehicle standard (such as CAL LEV2) on an expedited, phased-in schedule.					
<b>11.11) Pricing measures (Environmental Defense)</b> - Freeway Congestion Pricing. - Car insurance premiums based on when, where,					Pay-at-the-pump liability insurance involves instituting “a surcharge on gasoline as a way to pay for the minimum, state-required liability insurance coverage. The total cost of driving

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<p>and how long one drives,</p> <ul style="list-style-type: none"> <li>- Pay-at-the-pump liability insurance,</li> <li>- “Feebates” as part of the annual vehicle registration process.</li> </ul>					<p>(fuel plus liability insurance) for the average driver is unchanged.</p> <p>“Feebates” involve charging owners of low mileage, low emission vehicles a rebate in their yearly registration fees while charging owners of high mileage, high emission vehicles a fee or surcharge.</p>
<p><b>11.12) Mobile and stationary source emission reduction credit trading (Environmental Defense)</b>-“If stationary sources were allowed to attain a portion of [stationary source reductions] by purchasing NOx emission reduction credits from owners of a retrofitted non-road vehicle fleet (or other mobile sources), then the overall abatement costs could potentially be reduced. The stationary source would have the option of financing vehicle retrofits or accelerated vehicle retirement if the per-ton cost were lower than on-site reductions.”</p>					<p><b>Example:</b> “PG&amp;E Corp. and Waste Mgmt. (WM)., announced the first ever agreement to apply NOx emissions reduction credits from a mobile fleet to offset construction of a new stationary source. In exchange for funding WM’s purchase of 120 new, natural gas powered garbage trucks, PG&amp;E will receive NOx credits that will be applied towards the construction of a new power plant in San Diego County.</p>
<p><b>11.13) Government contracts with aggressive environmental standards (ED)</b>-“Incorporate an environmental standard into contract specifications for construction projects managed by state agencies.”</p>					<p>“More than half of all construction projects in Texas are completed to provide public infrastructure, ... [and] most of these federally and state-funded projects are managed by state agencies.”</p> <p>“This would encourage construction companies to invest in emission reduction technology in order to have a competitive advantage when bidding for projects.”</p>
<p><b>11.14) Location efficient mortgages (ED)</b>-“TCEQ should commit in the SIP to encourage lending institutions to offer “Location-Efficient Mortgages”</p>					

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that reward homebuyers for locating in areas that minimize travel.”					
<b>11.15) Tax incentives (ED)</b> -Give them to businesses that locate near mass transit.					
<b>11.16) Refueling ban</b> - Ban vehicle refueling between the hours of 6am - 12pm.					
<b>11.17) Use targeting to ID high emitters (TTI)</b> - Develop and implement targeting strategies (based on vehicle model, production year, or similar criteria) to identify likely high emitters for emissions testing and repair.					
<b>11.18) Statewide emissions testing (TTI)</b> - Require emissions testing on all vehicles in all areas of the state, not just in selected non-attainment areas. See California and Connecticut examples.					Could include emissions testing in annual vehicle safety inspections.
<b>12) Prohibit use of gas lawn mowers in DFW 9-county area during ozone season-</b>					
<b>13) Golf cart use restrictions-</b> Usage restrictions on ozone action days.					Aim is to reduce VOC's in the 9 county DFW area. Estimate 25 tons VOC reduction over 3 years for every 100 golf carts not in use. (source: Roanoke, VA Early Action Compact 3 <sup>rd</sup> Semi-Annual Status Report, June 30, 2004.)

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<p><b>14) Replace conventional petroleum diesel with biodiesel</b></p> <p>*(tax breaks for people who use biodiesel in place of petroleum diesel, tax diesel to off-set tax breaks, call it an impact fee)</p>					Could increase oxides of nitrogen
<p><b>15) Mitigation fee program for federal sources</b> – charge an air quality impact fee to source pre-empted from State and local air district under the Federal Clean Air Act. Use the impact fees to fund and/or implement cost-effective emission reduction projects.</p>					
<p><b>16) Surcharge for fuels sold on Ozone Action Days.</b></p>					
<p><b>17) New EPA rule - New Source Performance Standards</b> for new stationary compression ignition internal combustion engines. Effective April 2006.</p>					Reduce NOx, PM, SO2, CO, and HC from 2005 & 2015 by 90% or more from baseline levels in some instances.
<p><b>18) Incorporate an EPP program – Environmental Preferable Purchasing</b> - give preference to contractors, companies that purchase, use, offer services that a lesser or reduced impact on the environment and human health.</p> <p>Examples of programs/services – cafeteria ware, new construction, parking lots, paints, glues/adhesives, printing/fleet vehicles that use alternate fuels.</p>					

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