

Proposed Amendments to the Stationary Diesel Engine Control Measure

**Public Hearing
San Francisco
November 16, 2006**

California Environmental Protection Agency



Air Resources Board

Overview

- Background
- Proposed Amendments
 - ▶ Stationary Diesel In-Use Ag Engines
 - ▶ Stationary Diesel Non-Ag Engines
- Comments
- Proposed 15-Day Modifications
- Staff Recommendation

Background – Diesel PM

- Diesel PM is a toxic air contaminant
- Diesel Risk Reduction Plan identifies goal of 85% reduction by 2020
- Board adopted stationary diesel engine ATCM in 2004
- Board directed staff to evaluate reducing in-use ag engine diesel PM emissions via electrification and other means

Background – Ag Engines

- Primarily ag irrigation pump engines
- 8,600 >50 hp ag pump engines Statewide
- About one-half are in the San Joaquin Valley
- 42% of engines are pre-1996 (uncontrolled)
- 480 tons/yr (TPY) diesel PM
- 10,400 TPY NO_x



Background – Electrification Feasibility and Voluntary Programs

- Feasibility of electrification must be determined on a site-by-site basis
- Two voluntary electrification incentive programs now in place
 - ▶ 1,400 applications
 - ▶ 300 installations
- Controls required to reduce diesel PM when electrification is not feasible

Background - Carl Moyer Incentive Funds

- \$25 million distributed
- 2,200 ag pump engines replaced (thru June 2003)
- Emission reductions
 - ▶ 92 TPY PM
 - ▶ 1,900 TPY NO_x
- Continues to be an important source of funding for ag engine replacement

Background - District NOx Rules for In-Use Ag Engines

- San Joaquin Valley Rule 4702
 - ▶ Relies on engine replacement
 - ▶ Requires engines to be permitted or registered
- South Coast Rule 1110.2
 - ▶ Very few engines affected
 - ▶ Relies on engine replacement
 - ▶ Engines to be permitted

Proposed Requirements for In-Use Stationary Diesel Agricultural Engines



Approach

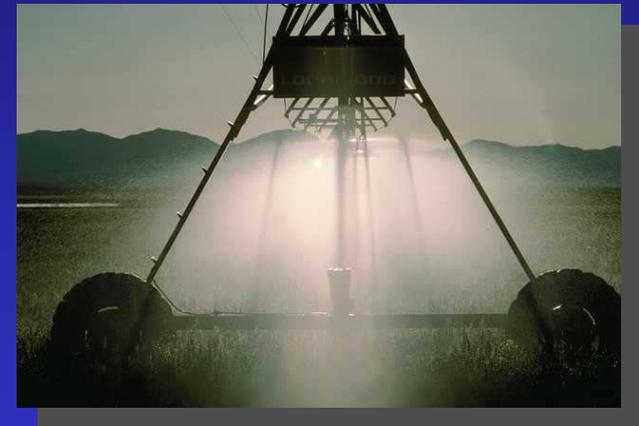
- Replacement of older engines
 - ▶ Achieves significant emission reductions for PM and NOx
- Emission limits based on ARB off-road engine standards for new engines
- Phase-in compliance schedule beginning December 31, 2010

Approach (cont.)

- Will result in most ag engines meeting Tier 3 or Tier 4 engine standards
- Consistent with San Joaquin Valley and South Coast rules

Applicability – Emission Limits

- Tier 0, Tier 1, and Tier 2 stationary diesel ag engines
- Exemptions:
 - ▶ ≤ 50 hp
 - ▶ Ag wind machines
- Conditional Exemptions:
 - ▶ Ag emergency standby engines
 - ▶ Remotely-located ag engines



Emission Limits – Basic Requirements

- Replace Tier 0 engines with electric motors or Tier 3 engines
- Replace Tier 1 and Tier 2 engines with electric motors or Tier 4 engines
- Equivalent alternatives include:
 - ▶ Use of spark-ignited and alternative fuel engines (CNG, LPG, biodiesel); and
 - ▶ Retrofit with an add-on control device (e.g., diesel particulate filter).

Emission Limits - Tier 0 Engines

Requirements for Tier 0 Engines

Engine Horsepower	Emission Limit	Compliance Date
>50 - 99	Tier 3 or Interim Tier 4	Dec. 31, 2011
100 -174	Tier 3	Dec. 31, 2010
175 - 750	Tier 3	Dec. 31, 2010
>750	Tier 4	Dec. 31, 2014

Emission Limits - Tier 0 Engines

PM Emission Reduction – From Tier 0 to Tier 3

Engine Horsepower	Percent Reduction	Percent Engines Affected
>50-99	60	4
100-174	60	20
175-750	70	18
>750	85*	<1

* Tier 0 to Tier 4

Emission Limits - Tier 1 and Tier 2

Requirements for Tier 1 and Tier 2 Engines

Engine Horsepower	Emission Limit	Compliance Date
>50 - 174	Tier 4	Dec. 31, 2015*
≥175	Tier 4	Dec. 31, 2014*

* Or 12 years after installation.

Emission Limits - Tier 1 and Tier 2

PM Emission Reduction – From Tiers 1 & 2 to Tier 4

Engine Horsepower	Percent Reduction	Percent Engines Affected
>50-74	95	2
75-99	98	2
100-174	96	28
175-750	95	26
>750	85	<1

Emission Limits – Other Pollutants

- Comply with ARB off-road standards for model year engine meeting diesel PM emission limits
- Ensures corresponding reductions in pollutants which are:
 - ▶ Precursors to ozone and secondary PM; and
 - ▶ Associated with non-cancer health effects.

Conditional Exemptions – Emergency Standby Engines

- Engines used solely to provide power during emergencies (e.g., power failures, fires, floods)
- Register and apply for exemption
- Record annual operating hours
- Upon loss of exemption have 18 months to comply



Conditional Exemptions – Remotely-Located Engines

- No receptors within one-half mile
- Located in federal attainment area for PM and ozone
- Register and apply for exemption
- Upon loss of exemption have 18 months to comply



Engine Registration Requirements

- Applies to all >50 hp stationary diesel ag engines
- Must provide registration information to local air districts



Engine Registration Requirements (cont.)

- Registration information includes:
 - ▶ Contact information;
 - ▶ Engine make, model, serial number, size, location;
 - ▶ Annual operating hours; and
 - ▶ Location of residential area, school, or hospital if within one-quarter mile (1,320 feet) of engine.

Engine Registration Requirements (cont.)

- Information submittal to local air districts
 - ▶ In-Use – By March 1, 2008
 - ▶ New – Within 90 days of initial installation
- District cost recovery through fees
- Alternative programs allowed



Health Impacts

- Some Tier 3 engines may still pose an elevated risk if located very close to receptors
- Registration information will help local air districts identify engines close to receptors
 - ▶ Local air districts will address these engines under the AB 2588 Hot Spots Program
- Residual risk not an issue for Tier 4 engines or electric motors

Health Impacts

- Reduces diesel PM emissions by 91% (440 TPY)
- Reduces NOx emissions by 90% (9,400 TPY)
- Achieves overall 85% cancer risk reduction (per engine basis)
- In conjunction with the AB 2588 Hot Spots Program, reduces near source risk to less than 10 chances per million

Economic Impacts

- Cost: \$34 million to \$42 million
- Costs to growers (per engine)
 - ▶ Engine replacement cost: \$7,000 to \$33,000
 - ▶ Registration fees
 - Initial: \$145 to \$190
 - Annual: \$26 to \$242
 - Some districts may need to assess higher fees
- Cost effectiveness: \$13 per pound of diesel PM

Other Proposed Amendments



Other Amendments

- Allow use of biodiesel blends meeting CARB diesel standards
- Simplify requirements for using alternative diesel fuels
- Amend the definition of alternative diesel fuel

Other Amendments (cont.)

- Amend definitions
 - ▶ Rolling Blackout Reduction Program
 - ▶ Maintenance and Testing
- Modify fuel recordkeeping requirements
- Clarify compliance options:
 - ▶ Tier 3 engines with 85% PM control devices
 - ▶ Launch-tracking engines
 - ▶ Allow test engine exemption
- Add sell-through provisions

Other Amendments – Sell-Through Provision

- Dealers may sell engines after compliance date if:
 - ▶ Engine was delivered to California before compliance date; and
 - ▶ Engine sold no later than 6 months after compliance date.
- Owner may install last year's engine if permit application is deemed complete no later than 12 months after the compliance date

Comments

- Remotely-located ag engines in federal PM and ozone non-attainment areas
- Availability of Carl Moyer funding
- Early Outreach
 - ▶ ARB Staff currently working with districts
 - ▶ Future efforts to include:
 - Fact sheets and articles in ag publications (early 2007); and
 - Assistance to local air districts.

Proposed 15-Day Modifications

- Remotely-located Ag Engine Exemption
 - ▶ Remove limits on annual hours of operation
- Non-ag engines
 - ▶ Clarify compliance option for Tier 3 engines with 85 percent PM control
 - ▶ Clarify relationship between purchase year and compliance standards for other pollutants (e.g., NO_x, HC, etc.)
- Minor changes to clarify regulatory language

Staff Recommendation



- Approve the proposed amendments with 15-day changes
- Direct ARB staff to assist local air districts to:
 - ▶ Address ag. engines posing a significant risk consistent with the AB 2588 Hot Spots Program;
 - ▶ Ensure that Carl Moyer incentive funding priority is given to in-use ag engine replacement; and
 - ▶ Develop and implement registration programs.