

# Ultra-Low Sulfur Diesel Fuel Program

*November, 2006*

*U.S. EPA- New England*



# Diesel Exhaust and Your Health- What is the Risk?

- Diesel exhaust contains significant levels of small particles, known as fine particulate matter. Fine particles are so small that several thousand of them could fit on the period at the end of this sentence.
- Fine particles pose a significant health risk because they can pass through the nose and throat and lodge themselves in the lungs. These fine particles can cause lung damage and premature death. They can also aggravate conditions such as asthma and bronchitis.
- EPA has determined that diesel exhaust is a likely human carcinogen. Diesel exhaust can also contribute to other acute and chronic health effects (see EPA's Health Assessment Document for Diesel Exhaust).

# Health Risks-

## Who and what is at Risk?

- People with existing heart or lung disease, asthma or other respiratory problems are most sensitive to the health effects of fine particles. The elderly and children are also at risk.
- Children are more susceptible to air pollution than healthy adults because their respiratory systems are still developing and they have a faster breathing rate.
- Diesel exhaust also contains pollutants that contribute to ozone formation (or smog), acid rain, and global climate change.
- Fine particles from diesel engines contribute to haze which restricts our ability to see long distances.

# What is ULSD and how will it Reduce the Risk?

- Ultra low sulfur diesel (ULSD) is diesel fuel that has sulfur containing no more than 15 ppm S
- Low sulfur diesel (LSD) for highway vehicles was limited to 500 ppm S
- Off-road diesel applications use about 3000 ppm
- By lowering sulfur level in diesel fuel, direct PM and sulfur are reduced. In addition, this ULSD allows new engines to be equipped with advanced pollution controls- reducing NOx and PM even further

# Status of Engine and Vehicle Program Implementation

- Engine, vehicle, catalyst, and supplier companies have invested billions for Clean Diesel
- Hundreds of test vehicles in customer hands, millions of miles have been accumulated
- EPA has already issued Certificates of Conformity to manufacturers for Clean Diesel technology engines/vehicles
- Some companies have already started production of new technology engines/vehicles
- New engines/vehicles are being introduced into the market now

# Rule Definitions- §80.2 & §80.502- Who does this effect?

- Definitions are located in §80.2 (general definitions that apply to all fuel programs) and §80.502 (diesel fuel-related definitions)
- **Retailer (§ 80.2(k))**
  - any person/company who “owns, leases, operates, controls, or supervises a retail outlet”
  - *Retail outlet (§ 80.2(j))* is “any establishment at which gasoline, diesel fuel, methanol, natural gas or liquefied petroleum gas is sold or offered for sale for use in motor vehicles or nonroad engines, including locomotive engines or marine engines”
- **Wholesale purchaser-consumer (§ 80.2(o))**
  - “any...ultimate consumer of gasoline, diesel fuel...which purchases or obtains gasoline, diesel fuel,...from a supplier for use in motor vehicles or nonroad engines, including locomotive engines or marine engines and, in the case of gasoline, diesel fuel...receives delivery of that product into a storage tank of at least 550-gallon capacity substantially under the control of that person”

# ULSD

- Although ULSD fuel will be the dominant highway diesel fuel produced, EPA does not require service stations and truck stops to sell ULSD fuel.
- Therefore, it is possible that ULSD fuel might not be available initially at every service station or truck stop and that a diesel retailer may choose to sell Low Sulfur Diesel fuel instead of ULSD fuel.
- The industries involved in the transition are doing all they can to minimize potential inconveniences during the conversion to the new diesel fuel.

# Schedule for the new EPA ULSD standards:

- Refiners and importers nationwide must ensure that at least 80 percent of the volume of the highway diesel fuel they produce or import is ULSD-compliant by June 1, 2006.
- -Diesel fuel classified as ULSD must reach distribution and marketing points downstream from refineries (i.e., pipelines, distributors, terminals and transporters) by September 1, 2006 (July 15, 2006 in California).
- -ULSD fuel requirements took effect at retail locations on October 15, 2006 (September 1, 2006 in California).
- -Diesel fuel classified as Low Sulfur Diesel fuel may still be sold at retail locations outside of California between October 15, 2006 and December 1, 2010.

# ULSD Distribution

## Effective Dates for ULSD Fuel

(Test tolerance of 2 ppm per 80.580(d).

<b>Distribution Point/User</b>	<b>U.S. 80% 15 ppm</b>	<b>U.S. 100% 15 ppm</b>	<b>California 100% 15 ppm required</b>
Refiners & Importers	6/01/06	6/01/10	6/01/06
Downstream from Refineries through Fuel Terminals	9/01/06	10/01/10	7/15/06
At Retail	10/15/06	12/01/10	9/01/06

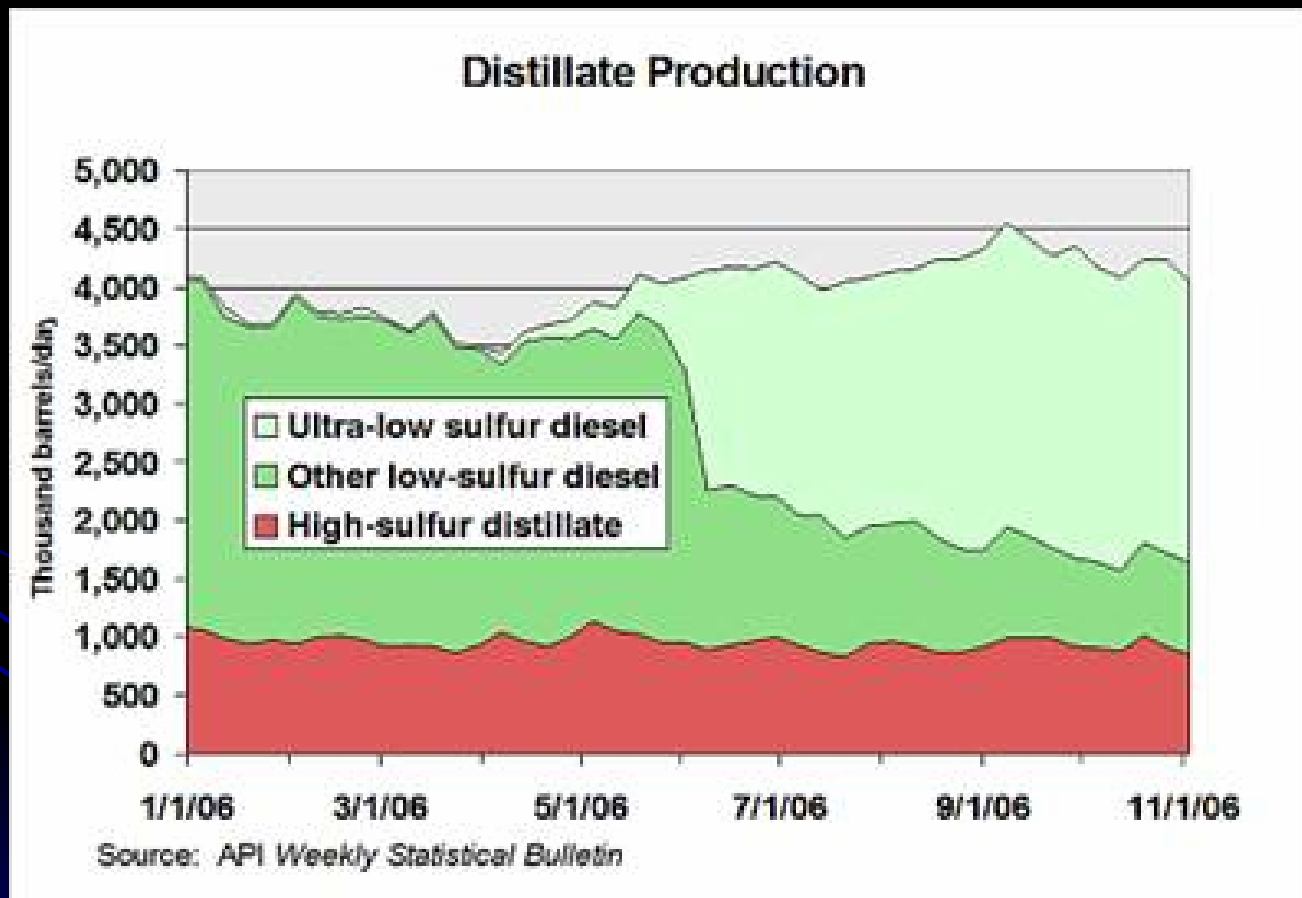
# Status of Ultra-low Sulfur Diesel Fuel Implementation

- ULSD transition is well underway
  - Approximately 2 million barrels per day (bpd) have been produced since June 2006
  - Production has been in the range of 2.4 to 2.6 million bpd
    - Equivalent to ~90% or more of the estimated average daily consumption of highway diesel fuel
- ULSD program start-up transition occurred over 4½ months (June 1, 2006 – October 15, 2006)
  - ✓ June 1: Refineries and importers must produce ULSD
  - ✓ September 1: ULSD distributed by Pipelines and Terminals must meet 15ppm
  - ✓ October 15: ULSD distributed by Retail Stations must meet 15ppm
- Transition period provides time for each party in the distribution chain to implement the new practices necessary to protect ULSD from contamination

# Status of Ultra-low Sulfur Diesel Fuel Implementation

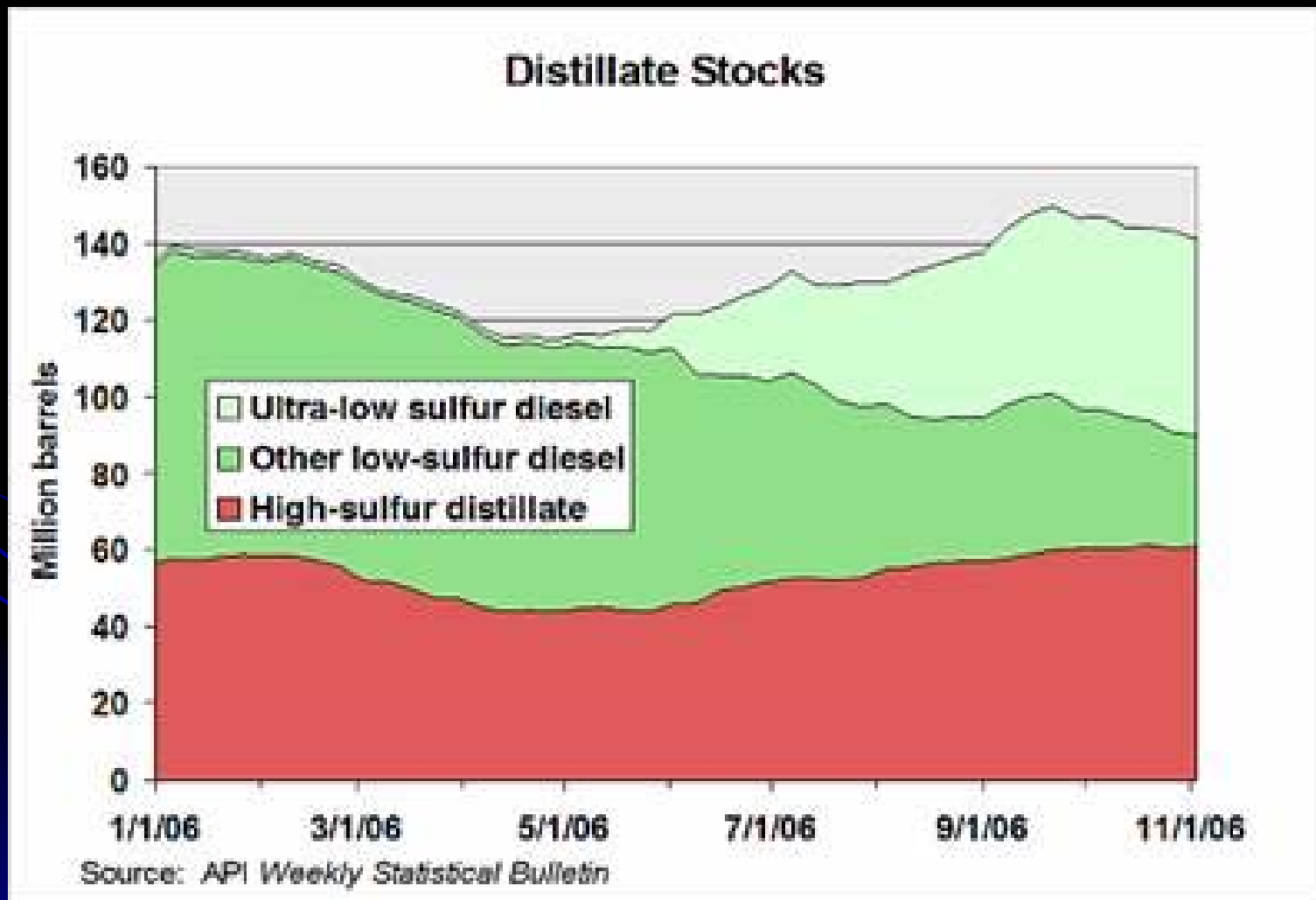
- Refineries
  - ULSD transition is basically finished
  - Refiners pre-compliance reports predicted ~ 90 percent of the highway fuel will be ULSD in the first year
  - By the end of June, majority of highway diesel production was ULSD, most recent data indicates ~90% or more
- Pipelines & Terminals
  - ULSD transition for the vast majority of terminals and pipelines was completed by Sept. 1
  - > 50% of the U.S. inventory of highway-grade diesel fuel is ULSD

# Diesel fuel production for 2006



ULSD production ranges between 2.4 to 2.6 million bpd

# Diesel fuel inventories at terminals for 2006



# Status of Ultra-low Sulfur Diesel Fuel Implementation

- **Marketers/Retailers**
  - Many retail stations across the country are already selling ULSD
  - In reality, for many WPCs and retailers, the transition has already occurred as the sulfur level of the fuel declines in the pipelines and terminals

# How does this rule affect you?

- WPCs and retailers must label their tanks regarding the type of diesel fuel dispensed
- WPCs and retailers must comply with anti-downgrading requirements

# ULSD labeling

- Federal regulations require the **labeling of all diesel fuel pumps** to specify the type of fuel dispensed by each pump (except in California where all diesel fuel must be ULSD by June 1, 2006).
- Similar instrument panel and fuel inlet/fill cap labeling is being mandated for 2007 and later model year highway engines and vehicles that require ULSD fuel.
- Consumers are advised to check the pump and vehicle labels to ensure they are refueling with the proper diesel fuel consistent with their vehicle warranties.

# Key Elements of Designate and Track (D & T)

- Key elements of D&T: Registration, Reporting, Recordkeeping, Management
- D&T “ends” at the point that fuel is taxed or dyed/marked
  - Mostly, at the terminal level and above
  - Parties that handle fuel that is already taxed or has dye added are not necessarily subject to the D&T requirements
- *Most retailers & WPCs will not handle untaxed/undyed fuel...*
- *These parties will not need to register or report*
- *However, they will still be subject to:*
  - *Recordkeeping*
    - *Including downgrading and info on the handling of non-compliant fuel*
    - *Records must be kept for 5 years*
  - *Managing (anti-downgrade, etc.)*

# Anti-Downgrading (§ 80.527)

- A “downgrade” is 15 ppm HW diesel fuel to 500 ppm HW diesel fuel ONLY
  - All other movements are just regrades/redesignations (with unlimited regrading to NRLM)
- No more than 20% of a facility’s 15 ppm HW diesel can be downgraded to 500 ppm HW diesel fuel in a given compliance period
- Begins **October 15, 2006** to allow for the transition (first compliance period ends May 31, 2007; basically annually thereafter)
- Provided special provisions for retailers & wholesale purchaser-consumers (§ 80.527(e))
  - Parties that sell or dispense both 15 ppm and 500 ppm, are exempt from the downgrading limitations (assuming they sell/ dispense both products!)
  - Parties that sell or dispense only 15 ppm are exempt from the downgrading limitations
    - If any fuel is sold as 500 ppm, that fuel is subject to the 20% downgrading limitation
  - Parties that sell or dispense only 500 ppm are subject to the downgrading limitations
    - 20% of the 500 ppm that they sell can be fuel that was downgraded from 15 ppm HW diesel fuel

# Product Transfer Documents (§80.590-591)

- PTDs must state basic information about the fuel and parties transferring the fuel (§80.590):
  - Names and addresses of the transferor and transferee
  - Volume of diesel fuel or distillate being transferred
  - Location of the fuel or distillate at time of the transfer
  - Date
  - Sulfur standard the fuel meets
  - Accurate and clear statement of the applicable designation and/or classification under §80.598 (e.g., 500 ppm sulfur NRLM diesel fuel) and whether the fuel is dyed or undyed, and marked or unmarked
  - Applicable statements required in §80.590(a)(7)
    - Alternate statements may be used with EPA approval
    - The PTD requirements also apply to mobile refuelers (per §80.590(g))
- §80.591 states PTD requirements for additives
  - Additive information does not need to be included on fuel PTD

# Penalties for failing to comply

- The new standards provide strong incentives for suppliers to provide the proper ULSD fuel formulation.
- Civil penalties of up to \$32,500 per violation per day can be assessed for non-compliance with EPA's ULSD fuel standards, or for misrepresentation of the sulfur level of diesel fuel.

# Key reg sections

- This is not an exhaustive list- you should view the titles of the various regulatory sections in the Electronic Code of Federal Regulations (link provided at the end of this presentation) for other provisions that may apply to you:
  - §80.2, §80.502- Definitions
  - §80.500- Implementation dates
  - §80.510- Standards/requirements for NRLM (general)
  - §80.511- Standards/requirements for NRLM and heating oil downstream of the refiner or importer
  - §80.520- Standards/requirements for highway (HW) diesel fuel
  - §80.521- Standards and ID requirements for diesel fuel additives
  - §80.524- Standards for HW diesel fuel downstream of the refinery or importer
  - §80.527- Downgrading
  - §80.570-574- Labeling (for retailers AND WPCs)
  - §80.590- PTDs (additive PTDs- 80.591)
  - §80.592 & 80.602- Recordkeeping
  - §80.610- Prohibited acts
  - §80.611- What evidence may be used to determine compliance with the prohibitions and requirements of this subpart and liability for violations of this subpart?
  - §80.612- Liability
  - §80.613- Defenses
  - §80.615- Applicable penalties

# Cold weather issues?

- **Ultra-low Sulfur Kerosene (ULSK) in the Northeast**

- Kerosene is often blended with diesel fuel in the wintertime to improve the fuels cold flow characteristics
  - Any kerosene blended with ULSD must be ULSK (kerosene with sulfur  $\leq 15$  ppm sulfur)
- Cold flow improver additives are an alternative to using kerosene in some instances

# Nonroad, Locomotive, and Marine (NRLM) LSD

- In 2007, fuel sulfur levels in nonroad diesel fuel will be limited to a maximum of 500 ppm, the same as previously for highway diesel fuel.

-June 1 for refiners and importers, August 1 downstream from refineries through fuel terminals, October 1 for retail outlets, and December 1 for in-use.

**(This limit also covers fuels used in locomotive and marine applications - but not to the marine fuel used by very large engines on large ships)**

# Nonroad ULSD

- In 2010, fuel sulfur levels in most nonroad diesel fuel will be reduced to 15 ppm.

**(In the case of locomotive and marine diesel fuel (LM), this second step will occur in 2012.)**

# For More Information...

Q&As and other guidance documents:

[www.epa.gov/cleandiesel/comphelp.htm](http://www.epa.gov/cleandiesel/comphelp.htm)

Direct Q&A link: <http://www.epa.gov/cleandiesel/documents/420b05010.pdf>

Electronic Code of Federal Regulations (e-CFR):

<http://ecfr.gpoaccess.gov>

- Title 40: Protection of Environment
- PART 80—REGULATION OF FUELS AND FUEL ADDITIVES

Clean Diesel Fuel Alliance website:

[www.clean-diesel.org](http://www.clean-diesel.org)

Bob Judge (617) 918-1045

[judge.robert@epa.gov](mailto:judge.robert@epa.gov)

# Website

Government - Industry  
**Clean Diesel Fuel Alliance**  
INFORMATION CENTER

> About ULSD > EPA Standards > Energy Information Administration > Media Room > Contact Us

- > Highway ULSD Fuel
- > Non-Road ULSD Fuel
- > Vehicle Performance
- > Environment & Health
- > Frequently Asked Questions

Quicklinks to related sites

**Ultra Low Sulfur Diesel (ULSD) fuel technology and engines with advanced emissions control systems offer significant air quality improvement.**

**Stringent Standards.**  
New EPA standards require a major reduction in the sulfur content of diesel fuels beginning June 1, 2006.  
[Read more.](#)

**Cleaner Technology.**  
Ultra Low Sulfur Diesel (ULSD) is a cleaner-burning diesel fuel containing a maximum 15 parts-per-million (ppm) sulfur.  
[Read more.](#)

**A Systems Approach.**  
Cleaner-burning diesel engines with new emissions control devices are being introduced along with ULSD fuel.  
[Read more.](#)

**Breathe Easier.**  
ULSD fuel and new engine technologies will have an important role in improving air quality and providing human health benefits by significantly reducing current emissions.  
[Read more.](#)