

## BACKGROUND

### History of U.S. Air Quality Regulations

- 2000** U.S. EPA signed emission standards for model year 2007 and later on-highway HD diesel engines. The rule includes two components: (1) emissions standards and (2) diesel fuel sulfur regulation.
- 2002** Diesel engine manufacturers implement 50% NO<sub>x</sub> reduction starting in October. Most OEMs use cooled EGR as their primary NO<sub>x</sub> reduction technology, but Caterpillar chooses its own proprietary emission control system known as ACERT (R-TM). Caterpillar cannot meet full compliance timing on October 1, 2002 and chooses to pay fines until its engines reach full compliance.
- 2006** U.S. EPA requires diesel fuel suppliers to make 15 ppm maximum sulfur diesel (ULSD) available for on-highway applications starting in June. However, ULSD availability is a phased-in requirement for 80% ULSD minimum and 20% 500 ppm sulfur fuel maximum for the years 2007-2009. Current EPA surveys indicate that actual ULSD availability will be on the order of 95%.
- 2007** Both NO<sub>x</sub> and Diesel Particulate Emissions (PM) are reduced by an order of magnitude from 2002/2004 levels. Like the ULSD availability, the reduction in NO<sub>x</sub> is phased-in between 2007-2009, with a requirement for a production average reduction of 50%. Rather than targeting half of production at 2 g/bhp-hr and half of production at 0.2 g/bhp-hr, most OEMs are targeting their overall production average to meet 1.1 g/bhp-hr. The full PM reduction from 0.1 g/bhp-hr to 0.01 g/bhp-hr takes effect in 2007. Meeting this level of PM reduction will require the use of diesel particulate traps on all engines.
- 2010** All on-highway diesel fuel must meet ULSD limit of 15 ppm maximum sulfur. All on-highway diesel engines must meet limits of 0.01 g/bhp-hr maximum PM emissions and 0.2 g/bhp-hr maximum NO<sub>x</sub> emissions.