

USE OF A MOBILE ON-ROAD LABORATORY TO MEASURE HEAVY-DUTY DIESEL “REAL WORLD” EMISSIONS FROM STANDARD AND NON-STANDARD OPERATING CYCLES

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Heavy-duty diesel engines are abundant and will remain the workhorse of the commercial sector for years to come. Thus, it is important to understand emissions from heavy-duty diesel (HDD) engines both as certified and while operating under ‘real world’ conditions. Towards that end, the University of California at Riverside College of Engineering Center for Environmental Research and Technology (CE-CERT) developed a HDD mobile on-road emissions laboratory with the capability of measuring gaseous, semi-volatile, and particulate emissions, while in motion, from heavy-duty tractors operating under actual conditions. The report will detail some of the verification phases that were used to complete the development of the lab and the new secondary dilution tunnel.

Results will be presented to show that the mobile laboratory can achieve similar driving repeatability for a standard cycle while under “real world” conditions as in a stationary laboratory. This driving precision leads to analytical precision for the various emissions. As a result, CE-CERT is able to determine actual operating emissions of HDD emissions over various on-road cycles to compare with existing certification results and emission inventories. In addition, CE-CERT has developed the capability of assessing the performance of emission reduction technologies in actual operating conditions. The presentation will also discuss the HDD emissions from non-standard cycles, such as a four-mode transient cycle or one developed to represent HDD vehicles that are entering or leaving the Los Angeles Basin. Future plans for the HDD mobile laboratory will be discussed.