**Start NOx Emissions from late model heavy-duty truck engines**

Bo Yang, Wayne Sobieralski, Victor Sales, Christian Fehrenbacker, Robert Ianni, Don Chernich, Shaohua Hu, Tao Huai

Monitoring and Laboratory Division, California Air Resources Board

NOx emission rates following varying soak times were studied through Portable Emission Measurement System (PEMS) testing for several late model (MY2014 and newer) heavy-duty, on-road diesel vehicles as part of California Air Resources Board’s (CARB’s) Truck and Bus Surveillance Program (TBSP).   Start emissions occur during the first 10 minutes following engine start are influenced by the soak time since the last engine operation.   Soak times studied are: 20 min, 2 hrs, 4 hrs, 8 hrs, and > 12 hrs.  Cumulative NOx emissions, mass based NOx/CO2 ratio, and possible effects from temperatures are compared and discussed on these vehicles.

