Air Resources Board

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Linda S. Adams
Acting Secretary for Environmental Protection

Edmund G. Brown Jr.
Governor

February 22, 2011

Mr. William P. Allen, Manager
Global Emissions Certification
and Compliance
Large Power Systems Division (MOS 11)
Caterpillar Inc.
P.O. Box 600
Mossville, Illinois 61552-600

Dear Mr. Allen:

This letter is in reply to your request dated February 3, 2011, for an Air Resources Board (ARB) verification of the oxides of nitrogen (NOx) and particulate matter (PM) emission levels for Caterpillar's PR30C. The PR30C is an EMD SD40 – CAT 3516 - 2650 horsepower - Tier 2 Engine Repower – with Selective Catalytic Reduction (SCR) and Diesel Oxidation Catalyst (DOC) retrofits to achieve Tier 4 NOx and PM emission levels.

As you know, in 1998, the BNSF Railway Company (BNSF) and Union Pacific Railroad (UP) Company, along with ARB entered into a Memorandum of Mutual Understandings and Agreements[1] (1998 MOU) to reduce locomotive emissions in the South Coast Air Basin. Under the 1998 MOU, beginning no later than 2010, each Participating Railroad must calculate the fleet average for NOx emissions from its locomotive fleet operating in the South Coast Air Basin. The fleet average is calculated using the emission level, as determined pursuant to 40 Code of Federal Regulations (CFR) 92 and 1033 for the line-haul duty cycle, for each locomotive in operation in the South Coast Nonattainment Area. Pursuant to the 1998 MOU, and as verified by ARB, UP and BNSF can receive ultra-low-emitting locomotive credit for advanced technology line-haul locomotives with NOx emissions levels at or below 3.0 grams per brake horsepower hour (g/bhphr) through 2014.

Southwest Research Institute (SwRI) performed line-haul duty cycle locomotive emission tests pursuant to 40 CFR Part 92 and 1033, for Caterpillar's PR30C, 2650 hp, locomotive equipped with SCR and DOC retrofits. Based on the SwRI test data, staff recognizes the PR30C, 2650 hp, locomotive has line-haul NOx and PM emission levels

[1] MEMORANDUM OF MUTUAL UNDERSTANDINGS AND AGREEMENTS, South Coast Locomotive Fleet Average Emissions Program, July 2, 1998

at or below 0.99 and 0.03 g/bhp-hr, respectively. The 0.99 g/bhp-hr NOx emission level for can be used in calculating the average NOx emissions for a locomotive fleet operating in the South Coast Air Basin. These verified emissions levels also comply with U.S. Environmental Protection Agency (U. S. EPA) Tier 4 limits.

Alternative technology switcher locomotives funded by the Carl Moyer Program, such as genset locomotives, typically include an existing locomotive frame significantly refurbished with a new engine or engines, electronics, controls, and other equipment. For Carl Moyer Program funding, an alternative technology switcher must achieve a NOx emission rate of 3.5 g/bhp-hr and a PM emission rate of 0.14 g/bhp-hr, based on U.S. EPA locomotive emission testing requirements specified in Title 40 CFR Part 92.

SwRI also performed switch-duty-cycle locomotive emission tests pursuant to 40 CFR Part 92 and 1033 for Caterpillar's PR30C, 2650 hp, locomotive equipped with SCR and DOC retrofits. Based on the SwRI test data, staff recognizes the PR30C, 2650 hp, locomotive has switcher NOx and PM emission levels at or below 2.34 and 0.04 g/bhp-hr, respectively, both of which meet the switch-duty-cycle NOx and PM emission levels specified for ARB incentive funding programs.

It should be noted that this verification supersedes the one issued on December 13, 2010, for the 2650 hp rating.

If you have any questions please contact Mr. Harold Holmes, Manager, Engineering Evaluation Section at (916) 322-8029, or hholmes@arb.ca.gov.

Sincerely,

Michael S. Waugh, Chief
Criteria Pollutants Branch

cc: See next page

cc: Mr. Glenn Passavant, Director
Nonroad Center
U.S. Environmental Protection Agency
2000 Plymouth Road
Ann Arbor, Michigan 48105

Mr. Lawrence P. Oeler
U.S. EPA Headquarters
Ariel Rios Building
1200 Pennsylvania Avenue, N. W.
Mail Code: 6403J
Washington, D.C. 20460

Mr. Douglas Biagini
Caterpillar Inc.
P.O. Box 610-AC6140
Mossville, Illinois 61552

Mr. Glenn Luksik
Caterpillar Inc.
495 Metro Place South, Suite 250
Dublin, Ohio 43017

Mr. Harold Holmes, Manager
Engineering Evaluation Section