May 12, 2008

Ms. Heather Chelpaty
Designated Representative
Valero Delaware City Refinery
4550 Wrangle Hill Road
Delaware City, Delaware 19706-7000

Re: Petition for Approval to Use an Alternative F_d-factor to Calculate NO_x Mass Emissions
        on Units MECCU1 and MECCU2 at the Valero Delaware City Refinery (Facility ID
        (ORISPL) 52193)

Dear Ms. Chelpaty:

        The United States Environmental Protection Agency (EPA) has reviewed the September
14, 2007 petition submitted under §75.66 by the Premcor Refining Group Inc. ("Premcor"). In
the petition Premcor requested to use an alternative method to determine the dry-basis F-factor
that is used to calculate nitrogen oxides (NO_x) mass emissions when Units MECCU1 and
MECCU2 at the Valero Delaware City Refinery combust syngas, a by-product of the petroleum
refining process. EPA approves the petition, with conditions, as discussed below.

Background

        Premcor owns and operates two 878 mmBtu/hr combined-cycle combustion turbines,
Units MECCU1 and MECCU2, at the Valero Refinery in Delaware City, Delaware. The
combustion turbines' primary fuel is syngas, which is produced by a petroleum coke gasification
plant at the refinery. Low-sulfur diesel fuel is used as a secondary fuel for both combustion
turbines. Each unit is equipped with a 215 mmBtu/hr natural gas-fired duct burner, a heat
recovery steam generator (HRSG), and a generator. Units MECCU1 and MECCU2 are subject to
the NO_x Budget Trading Program. Therefore, Premcor is required to continuously monitor and
report NO_x mass emissions and heat input for these units, in accordance with Subpart H of 40
CFR Part 75.

        During the combustion of syngas, nitrogen (N_2) is injected into each combustion turbine
to control NO_x emissions. The added N_2 lowers the flame temperature, which reduces the
formation of thermal NO_x. Currently, Premcor quantifies the hourly heat input to each unit using
measured fuel flow rates in conjunction with the heating value(s) of the fuel(s) combusted. The
hourly NO_x emission rates for each unit (in lb/mmBtu) are determined from measurements of

NO_x and oxygen (O_2) concentration made with continuous emission monitors. The hourly NO_x mass emissions are then calculated by multiplying together the unit heat input rate and the NO_x emission rate.

Equation F-5 in Appendix F of Part 75 is used to calculate the hourly lb/mmBtu NO_x emission rates for Units MECCU1 and MECCU2. This equation includes a fuel-specific dry-basis F-factor. The F-factor (i.e., F_d) represents the ratio of the volume of dry flue gases generated to the gross caloric value (GCV) of the fuel combusted. F_d is calculated by substituting the elemental composition of the fuel and the GCV into Equation F-7a in Appendix F of Part 75. Ever since Units MECCU1 and MECCU2 began reporting emissions data under the NO_x Budget Trading Program, Premcor has based the value of F_d solely on the volume of dry flue gas generated by the combustion process at zero percent excess O_2 (i.e., at "stoichiometric" conditions) and has not taken into account the added N_2 that is injected into the turbines for NO_x emissions control.

During normal operation, the flow rate of the injected N_2 is approximately 1.3 times the syngas flow rate. Since the added N_2 passes through the turbine and out the stack, it increases the flue gas volume and consequently increases the value of F_d. By failing to take into consideration the added N_2, the F_d-factors derived from Equation F-7a that Premcor has been using to calculate the NO_x emission rates have been biased low. As a result, the NO_x mass emissions from Units MECCU1 and MECCU2 have been consistently underreported.

In the September 14, 2007 petition, Premcor proposed a calculation method by which to adjust the value of F_d to account for the injected N_2. Premcor proposed to continuously measure the N_2 volumetric flow rate, to add this extra gas volume to the stoichiometric volume of the combustion products, and then to calculate the F-factor based on the total gas volume. The value of F_d increases by about 50 percent when calculated this way, with a corresponding increase in the NO_x mass emissions.

In order to confirm that the proposed calculation methodology accurately predicts the total dry flue gas volume, Premcor conducted a series of comparison tests against EPA Method 2 while combusting syngas in Unit MECCU2. The results of these tests show that Premcor's proposed method of estimating the dry stack gas volumetric flow rate agrees well with Method 2. The volumetric flow rates estimated by Premcor's method were, on average, about 3.2 percent higher than those measured by Method 2.

EPA's Determination

EPA approves Premcor's petition to use an alternative method to calculate the F_d-factor for Units MECCU1 and MECCU2 during the combustion of syngas. The Agency approves, with conditions, the calculation methodology proposed by Premcor in the September 14, 2007 petition. The approved methodology has been shown to be both acceptably accurate and sufficiently conservative to ensure that NO_x mass emissions from Units MECCU1 and MECCU2 will not be underreported. The conditions of this approval are as follows:

(1)   Premcor shall resubmit to EPA all of the quarterly electronic data reports (EDRs) for units MECCU1 and MECCU2, from the first quarter of 2003 through the fourth quarter of 2007. These reports shall be submitted no later than June 30, 2008. Contact Ujjval Shukla of my staff, at (202) 343-9196 for assistance with the resubmittals;

(2)   Premcor shall apply the approved methodology for calculating the F_d-factor to each unit operation hour in which syngas was combusted in Units MECCU1 and MECCU2, from the first quarter of 2003 through the fourth quarter of 2007;

(3)   Premcor shall operate, maintain, and calibrate the flow meter used to measure the N_2 injection rates according to the manufacturer's instructions;

(4)   Premcor shall continuously measure and record the N_2 injection rates during syngas combustion in Units MECCU1 and MECCU2, and shall maintain records of these flow rates along with the supporting documentation for calculating the F_d factor. These records shall be kept on-site for a period of five years and shall be made available to EPA or to the Delaware Department of Natural Resources and Environmental Control (DNREC) upon request; and

(5)   Premcor shall contact Kenon Smith of my staff, at (202) 343-9164, to resolve the 2003-2007 ozone season NO_x allowance accounting issues that result from applying the approved F_d calculation methodology to Units MECCU1 and MECCU2.

EPA's determination relies on the accuracy and completeness of the information provided in Premcor's September 14, 2007 petition and is appealable under Part 78. If you have any questions regarding this determination, please contact Charles Frushour at (202) 343-9847. Thank you for your continued cooperation.

Sincerely,

/s/
Sam Napolitano, Director
Clean Air Markets Division

cc: Charles Perritt, USEPA Region III
Ravi Rangan, DNREC
Charles Frushour, CAMD
Kenon Smith, CAMD
Ujjval Shukla, CAMD