

December 30, 2008

Paul W. Thompson
Authorized Account Representative
LG&E Energy
220 West Main Street
P.O. Box 32010
Louisville, KY 40232

Re: Petition for Alternative Substitute Data for Unit 12 at Louisville Gas and Electric's Paddy's Run Station (Facility ID (ORISPL) 1366) under the NO_x Budget Trading Program

Dear Mr. Thompson:

The United States Environmental Protection Agency (EPA) has reviewed the March 31, 2008 petition, in which Louisville Gas and Electric Company (LG&E) requested to use an alternative method of determining substitute data for nitrogen oxides (NO_x) emissions prior to initial certification for Unit 12 at its Paddy's Run Facility. EPA approves the petition in part, as discussed below.

Background

Louisville Gas and Electric Company (LG&E) owns and operates a natural-gas fired combustion turbine, Unit 12, at its Paddy's Run facility in Louisville, Kentucky. Unit 12 commenced commercial operation in 1968. The unit has a maximum rated heat input capacity of 438 mmBtu/hr and serves a generator with a nameplate rating of 33 MW.

According to LG&E, Unit 12 is subject to the NO_x Budget Trading Program (NBP). The Kentucky NBP regulation (401 KAR 51:160) requires LG&E to monitor and report ozone season¹ NO_x mass emissions and heat input for Unit 12 in accordance with Subpart H of 40 CFR Part 75, beginning on May 1, 2003. The regulation further requires LG&E to hold NO_x allowances equal to the ozone season NO_x mass emissions from Unit 12, starting on May 31, 2004. In addition, according to LG&E, Unit 12 is also subject to the CAIR NO_x Annual Trading Program and is required to report NO_x mass emissions and heat input starting January 1, 2008.

According to the March 31, 2008 petition, LG&E submitted NO_x Budget Program certificates of representation and permit applications for Paddy's Run Unit 12 to EPA on October

¹ The ozone season extends from May 1 through September 30, except for the 2004 ozone season, which began on May 31, by court order.

30, 2001. However, LG&E failed to submit an initial monitoring plan for Unit 12 and did not implement Part 75-compliant monitoring methodologies for NO_x mass emissions and heat input by the compliance date specified in section 3 of 401 KAR 51:160. In addition, LG&E failed to submit electronic data reports (EDRs) and compliance certifications for Unit 12 for the 2003-2007 ozone seasons.

In the March 31, 2008 petition, LG&E requested that the following emissions calculation method be used to determine the emissions to be reported for Unit 12 for the 2004-2007 ozone seasons. According to LG&E, Paddy's Run Unit 12 qualifies to use the low mass emissions (LME) monitoring methodology in 40 CFR 75.19. Therefore, LG&E proposed to determine Unit 12's NO_x mass emissions for the 2004-2007 ozone seasons using the following variation of Equation LM-10 in §75.19:

$$W_{NO_x} = EF_{NO_x} \times HI_t$$

Where:

W_{NO_x} = Ozone season NO_x mass emissions (lb).

EF_{NO_x} = NO_x emission factor from Table LM-2 of §75.19, (lb/mmBtu).

HI_t = Ozone season heat input (mmBtu).

LG&E used the default NO_x emission factor of 0.7 lb/mmBtu for gas turbines from Table LM-2 in the calculations. The actual hourly heat input to the unit was estimated from company operating reports. Using the equation above and applying a conversion factor of 2000 lb/ton, LG&E calculated the following estimates of the 2004-2007 ozone season NO_x mass emissions for Unit 12:

Table 1: 2004-2007 Ozone Season NO_x Mass Emissions for Paddy's Run Unit 12 (LG&E Method)

Ozone Season	Operating Hours	Total Heat Input (mmBtu)	NO _x Emission Factor (lb/mmBtu)	NO _x Emissions (tons)
2004	0	0	N/A	0
2005	32.8	6,106	0.7	2.14
2006	24.8	5,496	0.7	1.92
2007	0	0	N/A	0

As shown in Table 1, Unit 12 did not operate in the 2004 and 2007 ozone seasons, and therefore had no NO_x emissions in those compliance periods.

The Agency notes that, on March 31, 2008, LG&E also submitted a monitoring certification application for the unit, in which LG&E requested to use the LME methodology for reporting emissions as required under Part 75, starting on January 1, 2008. In the March 31, 2008 petition, LG&E requested that EPA waive the requirement in §75.19(a)(2) for the monitoring certification application to be submitted at least 45 days before the date on which the LME methodology is to be first used and that the Agency allow the methodology to be used starting on January 1, 2008. LG&E has submitted EDR reports for Unit 12, covering the first, second, and third quarters of 2008, and reflecting use of the LME methodology.

EPA's Determination

EPA approves LG&E's petition, in part. The Agency grants a waiver of the requirement in §75.19(a)(2) to submit the LME certification application for Paddy's Run Unit 12 at least 45 days before the LME method is first used for reporting emissions in 2008. However, the Agency denies the request to use the LME methodology to quantify emissions starting from January 1, 2008. Rather, EPA believes the appropriate date to begin using the LME method is April 1, 2008.

The waiver of the certification application submittal deadline is granted for the following reasons. LG&E contacted EPA in early March 2008 and explained that Unit 12 had operated very little since 2004, and so would qualify to use the LME methodology. LG&E subsequently provided a draft of its certification application to use the methodology. Since that application showed that Unit 12 had operated for less than 60 hours in the three year period from 2005 through 2007, it was evident that Unit 12 would qualify to use the LME methodology in 2008². Thus, EPA had sufficient time to evaluate LG&E's certification application even though the application was submitted after the date specified in §75.19(a)(2). However, EPA does not believe that it is appropriate to grant the use of the LME methodology retrospectively, prior to the receipt of the certification application. Rather, EPA believes that LG&E should use substitute data for the 2005-2007 ozone seasons and for the first quarter of 2008. Finally, this approach of waiving the application deadline and allowing use of the LME methodology starting in April 2008 results in LG&E using a consistent emissions reporting methodology throughout each individual quarter. In view of these considerations, EPA approves the waiver and such use of the LME methodology for Unit 12.

However, EPA disapproves the alternative substitute data requested by LG&E to account for Unit 12's NO_x mass emissions in the 2004-2007 ozone seasons. LG&E essentially requested to use, as alternative substitute data, the same data that would have been reported if LG&E had been in compliance starting in 2004 and had used the LME methodology to report Unit 12's emissions. EPA maintains that, because Unit 12 was actually out of compliance with the

² Using the most conservative LME calculation method (i.e., maximum rated unit heat input and the default NO_x emission rate from Table LM-2 in §75.19) for 60 hours of unit operation results in total NO_x mass emissions of only 9 tons over the entire 3-year period. This is well within the NO_x emission threshold values that must be met to qualify for LME status (i.e., ≤ 50 tons per ozone season and < 100 tons per year).

monitoring and reporting requirements until 2008, the unit's NO_x emissions for 2004-2007 must be determined in a manner that is more consistent with the purposes of missing data substitution, which are to provide source owners and operators with a strong incentive for meeting monitoring and reporting requirements in a timely manner and to ensure that emissions are not underreported.

While §75.19 does not address initial missing data procedures for LME units as clearly as §75.4(j) addresses initial missing data procedures for units that use continuous emission monitoring systems (CEMS)³, §75.19(b)(2)(iii) does specify the substitute data values that are to be reported when a unit loses its LME status and the required continuous monitoring systems are not installed and certified by the regulatory deadline. EPA interprets this approach to be the initial missing data procedure for LME units that do not use a continuous monitoring system.

Section 75.19(b)(2)(iii) requires estimation of NO_x mass emissions using the unit's maximum potential hourly heat input and maximum potential NO_x emission rate, both of which are defined in §72.2. According to LG&E, the maximum potential hourly heat input for Unit 12 is 438 mmBtu/hr. The maximum potential NO_x emission rate (MER) is calculated using Equation F-5 from Part 75, Appendix F, section 3.1:

$$E = K \times C \times F \left(\frac{20.9}{20.9 - \%O_2} \right)$$

Where:

E = Maximum potential emission rate (MER), lb/mmBtu

K = 1.194×10^{-7} (lb/dscf)/ppm NO_x

C = Maximum potential concentration (MPC), ppm

F = 8,710 dscf/mmBtu for natural gas (from Table 1 in Part 75, Appendix F, section 3.3.5)

%O₂ = Maximum oxygen concentration in the stack gas during normal operation (excluding unit startup, shutdown and malfunction) or, for combustion turbines, the diluent cap value of 19.0 percent O₂

The equation above requires either knowledge of the maximum O₂ concentration during normal unit operation or use of the diluent cap value of 19.0% O₂. However, LG&E has no information on the maximum O₂ concentration, because Unit 12 has no emissions monitors, and use of the diluent cap value of 19.0% O₂ yields an unreasonably high MER value of 2.29 lb/mmBtu⁴. A

³ EPA notes that §75.4(j) applies when required certification tests of continuous monitoring systems are not completed by the applicable deadline. However, LME units do not use continuous monitoring systems, except in cases where the owner or operator elects to use a certified fuel flow meter to quantify heat input. Consequently, §75.4(j) does not generally apply to units that qualify for and elect to use the LME methodology.

⁴ Coal-fired cyclone boilers are among the highest emitters of NO_x. A review of the NO_x emissions data for the 93 cyclone units in the Acid Rain Program and the NBP revealed that the NO_x emission rates during normal operation

review of data for the older combustion turbines (CTs) in the Acid Rain Program and the NBP showed that the maximum O₂ percentage measured during normal operation is 16% O₂. Using a value of 16% O₂ in the equation above, together with a MPC of 200 ppm for existing CTs (from Part 75, Appendix A, section 2.1.2.1, Table 2-2), yields a NO_x MER value of 0.89 lb/mmBtu. Therefore, EPA concludes that a NO_x MER of 0.89 lb/mmBtu should be used in the calculations.

Table 2: 2004-2007 Ozone Season NO_x Mass Emissions for Paddy's Run Unit 12 (EPA-Approved Method)

Ozone Season	Operating Hours	Total Heat Input* (mmBtu)	NO _x Emission Factor (lb/mmBtu)	NO _x Emissions (tons)
2004	0	0	N/A	0
2005	32.8	14,366	0.89	6.39
2006	24.8	10,862	0.89	4.83
2007	0	0	N/A	0

*Based on a maximum hourly heat input rate of 438 mmBtu/hr

As shown in Table 2, the approved calculation methodology for Unit 12 yields NO_x mass emissions estimates of zero tons for the 2004 and 2007 ozone seasons, six tons for the 2005 ozone season and five tons for the 2006 ozone season.⁵ For the reasons discussed above, EPA approves: the use of these NO_x ozone season emission values as the alternative substitute data that Unit 12 must report for 2004-2007; and the use of the same underlying methodology to develop alternative substitute data for first quarter 2008 that must be added to the LME-based data for the rest of 2008.

The conditions of this approval are as follows:

- 1) LG&E shall contact Kenon Smith of my staff, at (202) 343-9164, or at smith.kenon@epa.gov, to resolve the NO_x allowance accounting issues associated with the Paddy's Run Unit 12 for the 2004-2007 ozone seasons;
- 2) LG&E shall resubmit the 1st, 2nd, and 3rd quarter electronic data reports (EDRs) for 2008 for Paddy's Run Unit 12, no later than January 30, 2009;

seldom exceed 2.0 lb/mmBtu. Furthermore, a review of data for 10 older combustion turbines in the Acid Rain Program and the NBP that commenced operation prior to January 1, 1990 indicated that the highest NO_x emission rate during normal combustion of natural gas is about 0.4 lb/mmBtu. Therefore, using a 2.29 lb/mmBtu NO_x emission rate for all operating hours would grossly overstate emissions for Unit 12, which burns only natural gas, a much cleaner-burning fuel than coal.

⁵ Under the NO_x Budget Trading Program, fractions of a ton of 0.50 and greater are rounded up to one and fractions of a ton less than 0.50 are rounded down to zero.

- 3) In the 1st quarter 2008 EDR, LG&E shall report a 531 record⁶, coded as follows: Report “NOXU” in column 10; “0.89” in column 14; “LBMMBTU” in column 27; “LM” in column 34; “PNG” in column 37; “A” in column 40; “DATA” in column 41; “20080101” in column 45; “00” in column 53; “20080331” in column 55; and “23” in column 63;
- 4) In the 2nd and 3rd quarter EDRs, LG&E shall report a 531 record, coded as follows: Report “NOXG” in column 10; “0.7” in column 14; “LBMMBTU” in column 27; “LM” in column 34; “PNG” in column 37; “A” in column 40; “LME” in column 41; “20080401” in column 45; “00” in column 53; and leave columns 55 and 63 blank;
- 5) Please contact Kevin Tran of my staff, at (202) 343-9074, or at tran.kevin@epa.gov, for assistance with the resubmittals.

EPA’s determination relies on the accuracy and completeness of the information provided by LG&E in the March 31, 2008 petition and is appealable under Part 78. If you have any questions or concerns about this determination, please contact Venu G. Ghanta, at (202) 343-9009, or at ghanta.venu@epa.gov. Thank you for your continued cooperation.

Sincerely,

/s/

Sam Napolitano, Director
Clean Air Markets Division

cc: David McNeal, EPA Region IV
Martin Luther, Kentucky Division of Air Quality
Eva Addison, Louisville Metro Air Pollution Control District
Venu Ghanta, CAMD
Kevin Tran, CAMD
Kenon Smith, CAMD
Robert Miller, CAMD

⁶ Note that 531 is the number of an EDR record type (RT) in the unit’s monitoring plan. For a LME unit, RT 531 specifies, among other things, each default NO_x emission rate used for Part 75 reporting and the effective date of the emission rate.