



STOLL · KEENON · OGDEN  
P L L C

2000 PNC PLAZA  
500 WEST JEFFERSON STREET  
LOUISVILLE, KENTUCKY 40202-2828  
502-333-6000  
FAX: 502-333-6099  
WWW.SKOFIRM.COM

W. DUNCAN CROSBY III  
DIRECT DIAL 502-560-4263  
DIRECT FAX 502-627-8754  
duncan.crosby@skofirm.com

December 5, 2006

VIA HAND DELIVERY

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DEC 05 2006

PUBLIC SERVICE  
COMMISSION

Elizabeth O'Donnell  
Executive Director  
Kentucky Public Service Commission  
211 Sower Boulevard  
Frankfort, Kentucky 40601

RE: *The Application of Kentucky Utilities Company for a Certificate of Public Convenience and Necessity to Construct a Selective Catalytic Reduction System and Approval of its 2006 Compliance Plan for Recovery by Environmental Surcharge*  
Case No. 2006-00206

*The Application of Louisville Gas and Electric Company for Approval of its 2006 Compliance Plan for Recovery by Environmental Surcharge*  
Case No. 2006-00208

Dear Ms. O'Donnell:

Enclosed please accept for filing two originals and ten copies of Louisville Gas and Electric Company's and Kentucky Utilities Company's Joint Post-Hearing Brief in the above-referenced matters. Please confirm your receipt of this filing by placing the stamp of your Office with the date received on the enclosed additional copies and return them to me in the enclosed self-addressed stamped envelope.

Should you have any questions or need any additional information, please contact me at your convenience.

Very truly yours,

W. Duncan Crosby III

WDC/ec  
Enclosures  
cc: All parties of record

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DEC 05 2006

PUBLIC SERVICE  
COMMISSION

**COMMONWEALTH OF KENTUCKY**

**BEFORE THE PUBLIC SERVICE COMMISSION**

**In the Matter of:**

**THE APPLICATION OF KENTUCKY UTILITIES )**  
**COMPANY FOR A CERTIFICATE OF PUBLIC )**  
**CONVENIENCE AND NECESSITY TO )**  
**CONSTRUCT A SELECTIVE CATALYTIC )**      **CASE NO. 2006-00206**  
**REDUCTION SYSTEM AND APPROVAL OF )**  
**ITS 2006 COMPLIANCE PLAN FOR RECOVERY )**  
**BY ENVIRONMENTAL SURCHARGE )**

**In the Matter of:**

**THE APPLICATION OF LOUISVILLE GAS AND )**  
**ELECTRIC COMPANY FOR APPROVAL OF ITS )**      **CASE NO. 2006-00208**  
**2006 COMPLIANCE PLAN FOR RECOVERY BY )**  
**ENVIRONMENTAL SURCHARGE )**

**JOINT POST-HEARING BRIEF OF**  
**KENTUCKY UTILITIES COMPANY AND**  
**LOUISVILLE GAS AND ELECTRIC COMPANY**

Kendrick R. Riggs  
 W. Duncan Crosby III  
 Stoll Keenon Ogden PLLC  
 2000 PNC Plaza  
 500 West Jefferson Street  
 Louisville, Kentucky 40202-2828  
 Telephone: (502) 333-6000

Elizabeth L. Cocanougher  
 Robert J. Ehrler  
 Senior Corporate Attorneys  
 E.ON U.S. LLC  
 220 West Main Street  
 Louisville, Kentucky 40202  
 Telephone: (502) 627-4850

Counsel for Kentucky Utilities Company  
 and Louisville Gas and Electric Company

**FILED:      December 5, 2006**

**CERTIFICATE OF SERVICE**

The undersigned hereby certifies that a true and correct copy of the foregoing Joint Post-Hearing Brief was served on the following parties of record this 5th day of December 2006, by mailing a copy thereof, postage prepaid, via U.S. mail to:

David F. Boehm  
Michael L. Kurtz  
Boehm, Kurtz & Lowry  
36 East Seventh Street, Suite 1510  
Cincinnati, Ohio 45202

Elizabeth E. Blackford  
Assistant Attorney General  
Office of the Attorney General  
Office of Rate Intervention  
1024 Capital Center Drive, Suite 200  
Frankfort, Kentucky 40601-8204



\_\_\_\_\_  
Counsel for Kentucky Utilities Company  
and Louisville Gas and Electric Company

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**COMMONWEALTH OF KENTUCKY**  
**BEFORE THE PUBLIC SERVICE COMMISSION**

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<b>THE APPLICATION OF KENTUCKY UTILITIES</b>	)	
<b>COMPANY FOR A CERTIFICATE OF PUBLIC</b>	)	
<b>CONVENIENCE AND NECESSITY TO</b>	)	
<b>CONSTRUCT A SELECTIVE CATALYTIC</b>	)	<b>CASE NO. 2006-00206</b>
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<b>BY ENVIRONMENTAL SURCHARGE</b>	)	

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<b>THE APPLICATION OF LOUISVILLE GAS AND</b>	)	
<b>ELECTRIC COMPANY FOR APPROVAL OF ITS</b>	)	<b>CASE NO. 2006-00208</b>
<b>2006 COMPLIANCE PLAN FOR RECOVERY BY</b>	)	
<b>ENVIRONMENTAL SURCHARGE</b>	)	

**JOINT POST-HEARING BRIEF OF  
KENTUCKY UTILITIES COMPANY AND  
LOUISVILLE GAS AND ELECTRIC COMPANY**

Kentucky Utilities Company (“KU”) and Louisville Gas and Electric Company (“LG&E”) (collectively, the “Companies”), in support of their environmental surcharge applications and for their Joint Post-Hearing Brief, state as follows:

**I. INTRODUCTION**

Environmental compliance is a continuous and ongoing utility activity, requiring investment in new and existing facilities to meet applicable environmental requirements. It is this duty of continuous compliance that requires KU to request a Certificate of Public Convenience and Necessity (CPCN) to build a new Selective Catalytic Reduction (SCR) facility to reduce NO<sub>x</sub> emissions at its Ghent generating station. The same duty also requires LG&E and KU to build the new and additional pollution control facilities included in their 2006 Environmental Compliance Plans (2006 Plans). LG&E’s 2006 Environmental Compliance Plan

includes four new projects to serve its Cane Run, Mill Creek, and Trimble County Generating Stations, all of which projects are necessary for LG&E to continue to comply with the requirements of the Federal Clean Air Act as amended (CAAA), the Clean Air Interstate Rule (CAIR), the Clean Air Mercury Rule (CAMR), the Clean Air Visibility Rule (CAVR, also known as the Regional Haze Rule), and other environmental regulations that apply to LG&E facilities used for the production of energy from coal. Likewise, KU's 2006 Environmental Compliance Plan contains five new projects to serve its Ghent, E.W. Brown, Green River and Tyrone generating stations, as well as KU's ownership of Trimble County Unit 2 that is now under construction, all of which projects enable KU to comply with the requirements of the CAAA, CAIR, CAMR, CAVR, and other environmental regulations that apply to KU facilities used for the production of energy from coal. LG&E's and KU's proposed surcharges, if approved, will recover the cost of these projects in accordance with KRS 278.183 and the Commission's previous surcharge orders. The estimated initial impact of the Companies' 2006 Plans on a residential customer using 1,000-kilowatt hours per month is expected to be an increase of \$0.41 during 2007 with a maximum monthly impact expected to occur in 2011 and estimated to be an increase of \$0.78 without the inclusion of O&M for Project 18 and \$0.86 with the inclusion of O&M for Project 18 for an LG&E customer,<sup>1</sup> and an increase of \$0.82 during 2007 with a maximum monthly impact expected to occur in 2011 and estimated to be an increase of \$2.54 without the inclusion of O&M for Project 23 and \$2.75 with the inclusion of O&M for Project 23 for a KU customer.<sup>2</sup>

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<sup>1</sup> *In the Matter of the Application of Louisville Gas and Electric Company for Approval of its 2006 Compliance Plan for Recovery by Environmental Surcharge*, Case 2006-00208, Direct Testimony of Robert M. Conroy at 8 (June 23, 2006) ("Conroy LG&E"); LG&E's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 13(a).

<sup>2</sup> *In the Matter of the Application of Kentucky Utilities Company for a Certificate of Public Convenience and Necessity to Construct a Selective Catalytic Reduction System and Approval of its 2006 Compliance Plan for Recovery by Environmental Surcharge*, Case 2006-00206, Direct Testimony of Robert M. Conroy at 8 (June 23,

The Office of the Attorney General, Division of Rate Intervention (AG), and the Kentucky Industrial Utility Customers, Inc. (KIUC), intervened in both cases. Neither the AG nor the KIUC submitted any requests for information, filed testimony, or otherwise objected to the Companies' 2006 Plans.

An evidentiary hearing was held on November 8, 2006, at which the Transcript of Evidence (T.E.) was taken.

**II. KU SHOULD BE AWARDED A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO CONSTRUCT THE SELECTIVE CATALYTIC REDUCTION FACILITY AT GHENT UNIT NO. 2**

Because the Selective Catalytic Reduction (SCR) facility at Ghent Unit No. 2 is needed to comply with CAAA, CAIR, and other environmental regulations to allow the Unit to continue operation to supply power and capacity for KU's customers, the Commission should grant KU the Certificate of Public Convenience and Necessity (CPCN) required to construct the proposed SCR. KRS 278.020(1) states:

No person, partnership, public or private corporation, or any combination thereof shall ... begin the construction of any plant, equipment, property or facility for furnishing to the public any of the services enumerated in KRS 278.010 ... until that person has obtained from the Public Service Commission a certificate that public convenience and necessity require the service or construction.

Kentucky's highest court has construed "public convenience and necessity" to mean that (1) there is a need for the proposed facility or service, and (2) the new facility or service will not create wasteful duplication.<sup>3</sup>

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2006) ("Conroy KU"); KU's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 18(a).

<sup>3</sup> Kentucky Utilities Co. v. Pub. Serv. Comm'n, 252 S.W.2d 885, 890 (Ky. 1952).

A finding of “need” is supported where there has been a showing of “a substantial inadequacy of existing service” due to a deficiency of service facilities beyond what could be supplied by normal improvements in the ordinary course of business.<sup>4</sup> In addition, the prevention of “wasteful duplication” has been interpreted to mean not only a physical multiplicity of facilities, but also an avoidance of “excessive investment in relation to productivity or efficiency.”<sup>5</sup>

Concerning the proposed SCR facility for Ghent Unit No. 2, there is no doubt that Ghent Unit No. 2 itself is needed in order to prevent a significant inadequacy of service. In order to continue operating the Unit, KU must keep it in compliance with applicable environmental regulations; indeed, KU and LG&E were previously authorized by the Commission to build as needed seven SCRs in Case No. 2000-112,<sup>6</sup> but the Companies determined that mandated reductions in NO<sub>x</sub> emissions were achievable by constructing six SCRs instead of the seven units originally planned, primarily due to better-achieved operating effectiveness compared to modeled results.<sup>7</sup> However, as shown below, recently enhanced environmental regulations now require constructing the proposed SCR facility as a necessary and cost-effective means of keeping Ghent Unit No. 2 in compliance with relevant environmental regulations, allowing the Unit to continue providing needed service to KU’s customers.

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<sup>4</sup> *Id.*

<sup>5</sup> Kentucky Utilities Co., 252 S.W.2d at 890.

<sup>6</sup> In the Matter of: *Application of Kentucky Utilities Company and Louisville Gas and Electric Company for a Certificate of Public Convenience and Necessity to Construct Selective Catalytic Reduction (SCR) NO<sub>x</sub> Control Technologies* (June 22, 2000).

<sup>7</sup> In the Matter of the *Application of Kentucky Utilities Company for a Certificate of Public Convenience and Necessity to Construct a Selective Catalytic Reduction System and Approval of its 2006 Compliance Plan for Recovery by Environmental Surcharge*, Case 2006-00206, Direct Testimony of Kent W. Blake at 3-4 (June 23, 2006) (“Blake KU”).

### **A. Environmental Regulations Have Tightened**

The environmental requirements set forth in the United States Environmental Protection Agency's (USEPA) NO<sub>x</sub> State Implementation Plan (SIP) Call, as expanded and made more restrictive with the adoption of CAIR in March 2005, require certain reductions in NO<sub>x</sub> emissions.<sup>8</sup> CAIR is a multi-pollutant strategy rule requiring significant additional reduction of SO<sub>2</sub> and NO<sub>x</sub> emissions in order to further reduce levels of ozone and fine particulate matter in the atmosphere.<sup>9</sup> The rule applies to the eastern 28 states (including Kentucky) and the District of Columbia.<sup>10</sup>

CAIR will replace the NO<sub>x</sub> SIP Call ozone-season NO<sub>x</sub> reduction requirements with new annual and ozone-season reduction requirements based on the cap-and-trade allowance method.<sup>11</sup> For Kentucky on an annual basis, the CAIR allocations represent a 42% reduction from 2003 NO<sub>x</sub> levels for the first phase (2009-2014) of the program and a 58% reduction from 2003 NO<sub>x</sub> emissions during the second phase (2015 and beyond).<sup>12</sup> During the ozone season (May-September), emissions will be capped at a level identical to the NO<sub>x</sub> SIP Call requirements for 2009-2014 and an approximate 15% reduction is prescribed for 2015 and beyond.<sup>13</sup> The annual and ozone season programs are two separate and distinct allowance programs.<sup>14</sup> CAIR Ozone Season allowances cannot be used for compliance with the CAIR Annual Program and CAIR Annual allowances cannot be used for compliance with the CAIR Ozone Season Program.<sup>15</sup>

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<sup>8</sup> Blake KU at 4.

<sup>9</sup> *In the Matter of the Application of Kentucky Utilities Company for a Certificate of Public Convenience and Necessity to Construct a Selective Catalytic Reduction System and Approval of its 2006 Compliance Plan for Recovery by Environmental Surcharge*, Case 2006-00206, Direct Testimony of Sharon L. Dodson at 5 (June 23, 2006). The Companies' witness, Gary H. Revlett, adopted Ms. Dodson's testimony. Thus, hereinafter, this testimony will be referred to as "Revlett KU."

<sup>10</sup> Revlett KU at 5.

<sup>11</sup> Revlett KU at 6.

<sup>12</sup> Revlett KU at 6.

<sup>13</sup> Revlett KU at 6.

<sup>14</sup> Revlett KU at 6.

<sup>15</sup> Revlett KU at 6.

These NO<sub>x</sub> reduction provisions of the CAAA, the NO<sub>x</sub> SIP Call, and the provisions of the CAIR that further restrict NO<sub>x</sub> emissions are prompting the need to install an SCR on Ghent Unit 2.<sup>16</sup>

**B. KU prudently evaluated the need to install an SCR facility at Ghent Unit No. 2**

KU closely and prudently follows the changes in environmental regulatory requirements for NO<sub>x</sub> emissions, mercury, and fine particulate matter under the CAAA and, more recently, the CAIR.<sup>17</sup> As the USEPA's position concerning CAIR developed, and as the NO<sub>x</sub> emission allowance market responded, KU developed an initial compliance strategy that included construction of four SCRs (three at Ghent Unit Nos. 1, 3, and 4, and one at E.W. Brown Unit 3) on an as-needed basis to ensure full compliance with USEPA's then current NO<sub>x</sub> emission limits.<sup>18</sup> Subsequently, KU determined that construction of an SCR at E.W. Brown Unit 3 was not needed or cost-effective to achieve compliance with allowed NO<sub>x</sub> emission levels, and therefore built only three SCRs at Ghent Unit Nos. 1, 3, and 4.<sup>19</sup>

The most recent evaluation process, presented in detail in KU's *2006 NO<sub>x</sub> Compliance Strategy for E.ON U.S. Subsidiaries Kentucky Utilities and Louisville Gas and Electric* ("2006 NO<sub>x</sub> Compliance Strategy"), shows that, faced with increasing reductions in NO<sub>x</sub> emissions mandated by CAIR, the construction of the fourth SCR facility is now necessary; and the most advantageous location for the SCR is at Ghent Unit No. 2, rather than at E.W. Brown Unit No. 3.<sup>20</sup>

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<sup>16</sup> Revlett KU at 10.

<sup>17</sup> Blake KU at 4.

<sup>18</sup> Blake KU at 4-5.

<sup>19</sup> Blake KU at 5.

<sup>20</sup> Blake KU at 5.

**1. The 2006 NO<sub>x</sub> Compliance Strategy Shows an SCR Facility is Needed and Will Be Most Effective at Ghent Unit No. 2**

The analysis contained in the *2006 NO<sub>x</sub> Compliance Strategy* is a result of the Companies' continual environmental compliance review process.<sup>21</sup> The study identifies the least cost present value revenue requirement approach for complying with CAIR.<sup>22</sup> The study shows that though a combined bank of 6,727 ozone-season NO<sub>x</sub> allowances existed as of December 31, 2005, this bank will begin to decline in 2006 and will become fully depleted in 2013.<sup>23</sup> Additionally, as a result of CAIR, the Companies will have insufficient annual NO<sub>x</sub> allowances beginning in 2009.<sup>24</sup> As identified in the Companies' 2005 Integrated Resource Plan (IRP)<sup>25</sup> in a report titled *2005 NO<sub>x</sub> Compliance Strategy Update for Kentucky Utilities and Louisville Gas and Electric (January 2005)*, the Companies anticipated a declining bank of NO<sub>x</sub> allowances that would soon require the addition of new control technologies, the purchase of NO<sub>x</sub> allowances, or a combination of both.<sup>26</sup>

The *2006 NO<sub>x</sub> Compliance Strategy* study identified the construction of an SCR at Ghent Unit No. 2 as the next step in continued least-cost compliance with CAIR.<sup>27</sup> The analysis included a multi-year evaluation of various strategies utilizing SCR systems at Ghent Unit No. 2 and Brown Unit No. 3 along with purchasing allowances to determine the least cost revenue requirement alternative to mitigate the expected NO<sub>x</sub> allowance shortfall.<sup>28</sup> Ghent Unit No. 2 and Brown Unit No. 3 were selected as they are the only large coal-fired generating units on the

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<sup>21</sup> *In the Matter of the Application of Kentucky Utilities Company for a Certificate of Public Convenience and Necessity to Construct a Selective Catalytic Reduction System and Approval of its 2006 Compliance Plan for Recovery by Environmental Surcharge*, Case 2006-00206, Direct Testimony of John P. Malloy at 3 (June 23, 2006) ("Malloy KU").

<sup>22</sup> Malloy KU at 3.

<sup>23</sup> Malloy KU at 3.

<sup>24</sup> Malloy KU at 3.

<sup>25</sup> Case No. 2005-00162, *In the Matter of: The 2005 Joint Integrated Resource Plan of Louisville Gas and Electric Company and Kentucky Utilities Company*.

<sup>26</sup> Malloy KU at 3-4.

<sup>27</sup> Malloy KU at 4.

<sup>28</sup> Malloy KU at 4.

Companies' generation system operating without SCR systems and together account for 27% of the Companies' annual NO<sub>x</sub> emissions through 2015.<sup>29</sup>

The *2006 NO<sub>x</sub> Compliance Strategy* study demonstrates the least cost alternative to address the 2009 shortfall in NO<sub>x</sub> allowances and to comply with CAIR is to construct an SCR at Ghent Unit No. 2 in 2009.<sup>30</sup> Constructing the SCR will provide the following ratepayer benefits through 2035:

- (1) Decreases the present value revenue requirements associated with NO<sub>x</sub> compliance by more than \$59 million when compared to purchasing allowances;
- (2) Reduces by half the exposure associated with the historically volatile NO<sub>x</sub> allowance market by reducing the anticipated allowance shortfall to approximately 123,000 tons from over 260,000 tons;
- (3) Delays the depletion of the Companies' annual NO<sub>x</sub> allowance bank by six years (from 2009 to 2015) and thereby reduces ratepayers' exposure to the NO<sub>x</sub> allowance market for the same period;
- (4) Delays the depletion of the Companies' ozone season NO<sub>x</sub> allowance bank from 2014 to 2033 and thereby reduces the ratepayer's exposure to the NO<sub>x</sub> allowance market for the same period;
- (5) Allows more time and flexibility to evaluate next steps in future NO<sub>x</sub> compliance technologies; and

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<sup>29</sup> Malloy KU at 4.

<sup>30</sup> Malloy KU at 5.



- (6) Allows observation of how the NO<sub>x</sub> allowance market responds to CAIR.<sup>31</sup>

**2. SCR is a Proven Technology that Has Produced Better-Than-Expected Results for the Companies**

SCR's proven reduction technology is a process in which ammonia reacts with nitrogen oxides to form molecular nitrogen and water.<sup>32</sup> The catalyst enhances the reactions between the NO<sub>x</sub> and ammonia and usually comprises tungsten and vanadium configured in a plate arrangement.<sup>33</sup> Combustion gases pass through the channels of the honeycomb configuration.<sup>34</sup> Usually there are two or three separate catalyst beds in sequence.<sup>35</sup> As part of the SCR project, low conversion catalyst and sorbent injection technology will be installed to mitigate the high sulfur dioxide to sulfur trioxide conversion problems associated with SCR operation.<sup>36</sup>

KU's current SCR facilities have provided excellent availability and have exceeded expectations concerning NO<sub>x</sub> reduction. Reduction of NO<sub>x</sub> on the order of 90% is typical via SCR technology.<sup>37</sup> KU currently has SCR facilities in operation on Ghent Unit Nos. 1, 3, and 4, which, during the 2005 ozone season, maintained a 95% or greater availability and removed 0.008, 0.014 and 0.015 (respectively) more pounds of NO<sub>x</sub> per mmBtu than was targeted over the same period.<sup>38</sup> Moreover, a Babcock Power, Inc. survey of the North American SCRs in operation in the 2005 NO<sub>x</sub> ozone season reflects KU and LG&E's excellent SCR performance.<sup>39</sup> As measured by SCR outlet NO<sub>x</sub>, KU and LG&E collectively had three out of the top four

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<sup>31</sup> Malloy KU at 5-6.

<sup>32</sup> Malloy KU at 6.

<sup>33</sup> Malloy KU at 6.

<sup>34</sup> Malloy KU at 6.

<sup>35</sup> Malloy KU at 6.

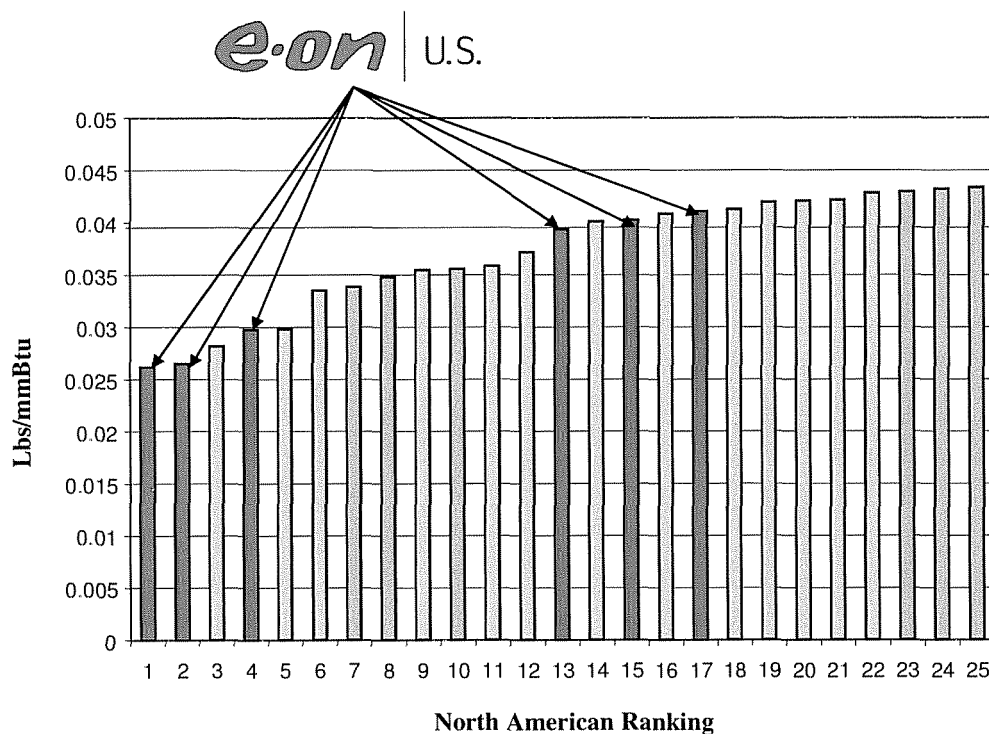
<sup>36</sup> Malloy KU at 6.

<sup>37</sup> Malloy KU at 6.

<sup>38</sup> Malloy KU at 7.

<sup>39</sup> Malloy KU at 11.

performing SCRs; all six of their collective SCRs were in the top seventeen.<sup>40</sup> The following table graphically reflects the performance of the top twenty-five SCRs in North America:<sup>41</sup>



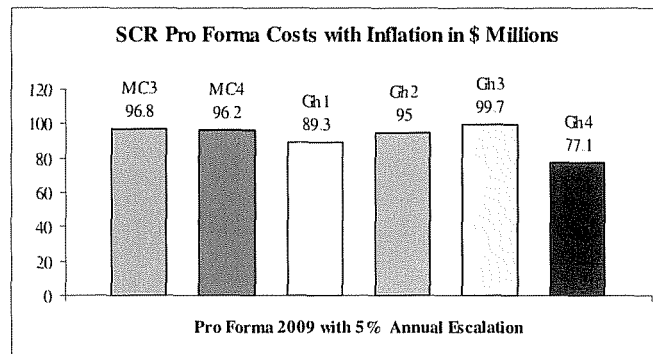
The Companies' excellent results with SCR facilities to date provides firm ground to believe that the proposed Ghent Unit No. 2 SCR facility will indeed be the most prudent, reasonable, and cost-effective means of keeping the Companies' compliant with CAAA, CAIR, and other relevant environmental regulations.

<sup>40</sup> Malloy KU at 11.

<sup>41</sup> Malloy KU at 11 (chart at 12).

**3. The Cost and Financing of the Proposed SCR Facility is Consistent with the Costs and Financing of Other SCR Facilities the Commission Has Approved for KU**

The anticipated cost of the Ghent Unit No. 2 SCR facility is \$95 million with an expected in-service date of 2009, which is consistent with the costs of the SCR facilities the Commission approved and the Companies built for Ghent Unit Nos. 1, 3, and 4.<sup>42</sup> The table below compares the actual cost of the 2000 NO<sub>x</sub> compliance plan (including SCR facilities and supporting systems) constructed from 2000 – 2004 escalated at 5% annually until 2009.<sup>43</sup> The Ghent Unit 2 SCR estimate lies in the range of the escalated costs for the other previously constructed SCRs:<sup>44</sup>



In view of the costs of the other approved Ghent SCR facilities, the cost of KU’s proposed SCR facility for Ghent Unit No. 2 is reasonable.

KU expects to finance the cost of the SCR with a combination of new debt and equity.<sup>45</sup> The mix of debt and equity used to finance the project will be determined so as to allow KU to maintain its strong investment-grade credit rating and is consistent with the targets previously

<sup>42</sup> Malloy KU at 10.

<sup>43</sup> Malloy KU at 10.

<sup>44</sup> Malloy KU at 10. Though KU constructed identical SCRs on Ghent Unit Nos. 3 and 4, the SCR facility for Ghent Unit No. 3 was the first SCR facility constructed and its cost included the common ammonia storage system, initial site mobilization, utility relocations, and conceptual engineering. *Id.* at 11.

<sup>45</sup> Blake KU at 6.

referenced by the Company in proceedings before this Commission.<sup>46</sup> The equity component will take the form of retained earnings.<sup>47</sup> The SCR does not qualify for tax-exempt funding under current law.<sup>48</sup>

KU anticipates that any incremental debt financing will be funded on a temporary basis utilizing proceeds from the money pool.<sup>49</sup> This short-term debt would be replaced with long-term loans from E.ON affiliates when market conditions are attractive and the money pool balance is sufficient to issue long-term securities.<sup>50</sup> KU will seek the Commission's approval of any debt or securities as necessary.<sup>51</sup>

During the course of the construction program, KU will continue to review new financing structures to determine if more cost-effective financing methods are available.<sup>52</sup>

**4. The NO<sub>x</sub> Allowance Market's Historical Volatility Makes Constructing an SCR Facility at Ghent Unit No. 2 the Most Prudent, Reasonable, and Cost-Effective Means of Complying with Applicable Environmental Regulations.**

In 2005, the market price for 2006 vintage NO<sub>x</sub> allowances ranged from a low of \$2,558/ton to a high of \$3,658/ton, which represents an increase of 43%.<sup>53</sup> The graph below displays the historical volatility associated with the NO<sub>x</sub> allowance market:<sup>54</sup>

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<sup>46</sup> Blake KU at 6. See also *In the Matter of The Application of Louisville Gas and Electric Company for Approval of its 2004 Compliance Plan for Recovery by Environmental Surcharge*, Case No. 2004-00421, and *In the Matter of The Application of Kentucky Utilities Company for a Certificate of Public Convenience and Necessity to Construct Flue Gas Desulfurization Systems and Approval of its 2004 Compliance Plan for Recovery by Environmental Surcharge*, Case No. 2004-00426, Joint Post-Hearing Brief of Louisville Gas and Electric Company and Kentucky Utilities Company at 30-49 (May 31, 2005).

<sup>47</sup> Blake KU at 6.

<sup>48</sup> Blake KU at 6.

<sup>49</sup> Blake KU at 6.

<sup>50</sup> Blake KU at 6.

<sup>51</sup> Blake KU at 6.

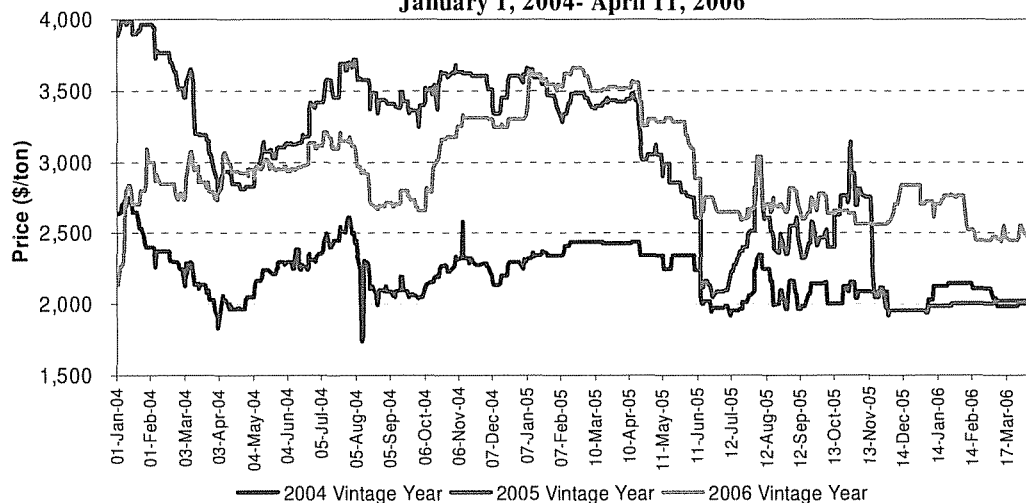
<sup>52</sup> Blake KU at 6.

<sup>53</sup> Malloy KU at 5.

<sup>54</sup> Malloy KU at 9.

## NO<sub>x</sub> Allowance Market Prices

January 1, 2004- April 11, 2006



As the graph above shows, complete reliance on the NO<sub>x</sub> allowance market significantly exposes the Companies and their customers to volatile and uncertain prices.<sup>55</sup> Additionally, the Companies may not be able to purchase allowances from the market.<sup>56</sup> This potentially illiquid and volatile market continues to support the Companies' analysis for construction of an SCR at Ghent Unit No. 2.<sup>57</sup>

### 5. Recent Adjustments to the Companies' NO<sub>x</sub> Allowance Forward Price Forecast Do Not Change the Conclusion of the 2006 NO<sub>x</sub> Compliance Strategy that Construction of an SCR Facility at Ghent Unit No. 2 is the Most Prudent Means of Environmental Compliance

On May 24, 2006, the Companies adopted a new NO<sub>x</sub> forward price curve.<sup>58</sup> A comparison of the 2005 price curve to the newly adopted forward price curve is reflected in the graph below:<sup>59</sup>

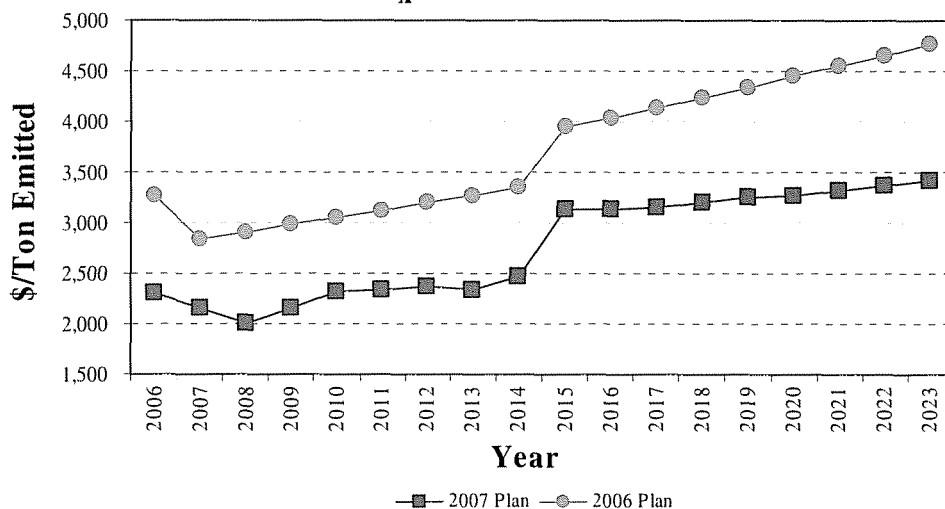
<sup>55</sup> Malloy KU at 5.

<sup>56</sup> Malloy KU at 5.

<sup>57</sup> Malloy KU at 5.

<sup>58</sup> Malloy KU at 8.

## NO<sub>x</sub> Price Forecast



An increase in the efficiency of SCR technology constitutes the major assumption change in this year’s forecast.<sup>60</sup> Last year’s forecast assumed 80-85% SCR operational efficiency rates throughout the forecast where the forecast this year increased this assumption to 85-90%.<sup>61</sup> This increase was based on research by Hill & Associates through inquiries with their clients who have installed SCR equipment.<sup>62</sup>

The new NO<sub>x</sub> forward prices do not, however, impact the least cost recommendation of the 2006 NO<sub>x</sub> Compliance Strategy.<sup>63</sup> A NO<sub>x</sub> allowance price sensitivity analysis was completed and is contained in the study.<sup>64</sup> The new forecasted NO<sub>x</sub> prices remain well above the level required for the “purchase NO<sub>x</sub> allowances only” case to be least cost.<sup>65</sup> Even taking into account the new forward price curve, the proposed SCR facility is the least cost approach to environmental compliance, reducing the present value of revenue requirements by \$59 million

<sup>59</sup> Malloy KU at 8.

<sup>60</sup> Malloy KU at 8.

<sup>61</sup> Malloy KU at 8.

<sup>62</sup> Malloy KU at 8.

<sup>63</sup> Malloy KU at 9.

<sup>64</sup> Malloy KU at 9.

<sup>65</sup> Malloy KU at 9 and Exhibit JPM-2.

when compared to purchasing allowances alone.<sup>66</sup> Additionally, the certainty of self-compliance versus the uncertainty of continued market exposure continues to support the construction of the Ghent Unit No. 2 SCR facility and minimizes the financial impact to the customer.<sup>67</sup>

**C. Due to the Time Required to Construct an SCR Facility and the Need for the Facility to be Operational in 2009, KU Respectfully Requests that the Commission Grant the Requested CPCN by December 22, 2006**

KU expects construction to take eighteen to twenty-four months to complete, with the unit being placed in service in 2009.<sup>68</sup> The anticipated in-service date coincides with the planned 2009 outage necessary to make the Ghent Unit 2 Flue Gas Desulfurization System operational.<sup>69</sup>

Based upon the preliminary engineering design work, KU anticipates the need to commence construction of the SCR facility in early 2007 to meet the proposed 2009 in-service date.<sup>70</sup> For this reason, KU requests that the Commission issue its CPCN by December 22, 2006.<sup>71</sup> To date, KU has not executed any contracts for the acquisition or construction of the proposed facility.<sup>72</sup> Thus, receiving a CPCN by December 22, 2006, is highly important to having the SCR facility completed when needed.

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<sup>66</sup> Malloy KU at 22.

<sup>67</sup> Malloy KU at 9.

<sup>68</sup> Blake KU at 5.

<sup>69</sup> Blake KU at 5. As fully explained in KU's November 16, 2006 Application in Case No. 2006-00493, if approved, the FGD being built nominally for Ghent Unit No. 2 will actually "scrub" the flue gas of Ghent Unit No. 1. In turn, new ductwork will route Ghent Unit No. 2's flue gas to the FGD currently scrubbing Ghent Unit No. 1's flue gas. *See In the Matter of the Application of Kentucky Utilities Company to Modify Certain Certificates of Public Convenience and Necessity to Construct Ductwork for Two Flue Gas Desulfurization Units at the Ghent Power Station*, Case No. 2006-00493, Application (November 16, 2006).

<sup>70</sup> Blake KU at 5-6.

<sup>71</sup> KU's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 1.

<sup>72</sup> Blake KU at 6.

### III. LG&E'S AND KU'S ENVIRONMENTAL COMPLIANCE PLANS SHOULD BE APPROVED

Under KRS 278.183, upon a Commission determination that their compliance plans are reasonable and cost-effective, LG&E and KU are entitled to the current recovery by an environmental surcharge to customers' bills of their costs of complying with applicable environmental regulations. None of the interveners in this proceeding have opposed any of the projects the Companies have proposed in their compliance plans. This fact alone strongly supports the Companies' belief that their 2006 Plans are indeed reasonable and cost-effective.

#### A. Overview

LG&E's and KU's evidence, as shown in the sections that follow, demonstrates that their 2006 Environmental Compliance Plans are reasonable and cost-effective. The total capital cost of the four projects in LG&E's 2006 Plan is estimated to be approximately \$65.8 million. The four projects in LG&E's 2006 Plan and the associated air pollutant or waste to be controlled and resulting cost are summarized as follows:<sup>73</sup>

<b>Project</b>	<b>Air Pollutant or Waste/By-Product To Be Controlled</b>	<b>Control Facility</b>	<b>Generating Station</b>	<b>Actual (A) or Estimated (E) Project Cost</b>
18	Fly Ash, NO <sub>x</sub> , SO <sub>2</sub> , SO <sub>3</sub> , Hg, and Particulate	Air Quality Control System	Trimble Co. Unit 2	\$43.46 M (E)
19	NO <sub>x</sub> , SO <sub>3</sub>	Sorbent Injection Technology	Mill Creek Units 3 & 4, Trimble Co. Unit 1	\$18.66 M (E)
20	Hg	Mercury Monitors	All Plants	\$2.84 M (E)
21	Fly Ash and Particulate	Particulate Monitor	Mill Creek Plant	\$0.84 M (E)

<sup>73</sup> *In the Matter of the Application of Louisville Gas and Electric Company for Approval of its 2006 Compliance Plan for Recovery by Environmental Surcharge*, Case 2006-00208, Direct Testimony of John P. Malloy at Exhibit JPM-1 (June 23, 2006) ("Malloy LG&E").



The total capital cost of the five projects in KU's 2006 Plan is estimated to be approximately \$325.1 million. The five projects in KU's 2006 Plan and the associated air pollutant or waste to be controlled and resulting cost are summarized as follows:<sup>74</sup>

Project	Air Pollutant or Waste/By-Product To Be Controlled	Control Facility	Generating Station	Actual (A) or Estimated (E) Project Cost
23	Fly Ash, NO <sub>x</sub> , SO <sub>2</sub> , SO <sub>3</sub> , Hg, and Particulate	Air Quality Control System	Trimble Co. Unit 2	\$185.29 M (E)
24	NO <sub>x</sub> , SO <sub>3</sub>	Sorbent Injection Technology	Ghent Units 1, 3, & 4	\$39.59 M (E)
25	Hg	Mercury Monitors	All Plants	\$2.97 M (E)
26	NO <sub>x</sub>	Selective Catalytic Reduction	Ghent Unit 2	\$95.00 M (E)
27	Fly Ash and Particulate	Electrostatic Precipitators	Brown Plant	\$2.23 M (E)

The AG and KIUC do not oppose any of the projects in either LG&E's or KU's proposed Compliance Plan. Historically, the Commission has acknowledged interveners' lack of opposition.<sup>75</sup>

**B. The Companies' Pollution Control Facilities for Trimble County Unit No. 2 are Reasonable and Cost-Effective**

The pollution control facilities the Companies will construct for Trimble County Unit No. 2 are reasonable, cost-effective, and necessary to comply with applicable environmental regulations. These facilities, KU Project 23 and LG&E Project 18, comprise the Air Quality

<sup>74</sup> Malloy KU, Exhibit JPM-1.

<sup>75</sup> See, e.g., *In the Matter of the Application of Louisville Gas and Electric Company for Approval of its 2004 Compliance Plan for Recovery by Environmental Surcharge*, Case No. 2004-00421, Order at 7-8 (June 20, 2005); *In the Matter of the Application of Kentucky Utilities Company for a Certificate of Public Convenience and Necessity to Construct Flue Gas Desulfurization Systems and Approval of its 2004 Compliance Plan for Recovery by Environmental Surcharge*, Case No. 2004-00426, Order at 10-11 (June 20, 2005).

Control System (AQCS) equipment necessary to operate Trimble County Unit 2 within the environmental limitations as set forth in the U.S. Environmental Protection Agency Title V Operating Permit for Trimble County Unit No. 2.<sup>76</sup> The proposed AQCS equipment for the unit consists of an SCR facility, a Dry Electrostatic Precipitator (DESP), a pulverized activated carbon (PAC) injection system for mercury control, a hydrated lime injection system, a Pulse Jet Fabric Filter (PJFF), a Limestone Forced Oxidation Wet Flue Gas Desulfurization System (WFGD), and a Wet Electrostatic Precipitator (WESP).<sup>77</sup> The total cost of the AQCS will be approximately \$228.8 million, \$185.3 million of which is KU's allocation and \$43.5 million of which is LG&E's allocation.<sup>78</sup>

The following diagram provides a graphic representation of how flue gas will flow through the AQCS equipment, each component of which is described further below.<sup>79</sup>



<sup>76</sup> Malloy LG&E at 4; Malloy KU at 14. The relevant permit is U.S. USEPA Title V Operating Permit No. V-02-043. This Commission granted a Certificate of Public Convenience and Necessity for TC2's construction by Order dated November 1, 2005, in Case No. 2004-00507, *In the Matter of: Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for a Certificate of Public Convenience and Necessity, and a Site Compatibility Certificate, for the Expansion of the Trimble County Generating Station.*

<sup>77</sup> Malloy LG&E at 4; Malloy KU at 14.

<sup>78</sup> Malloy KU Exh. JPM-3; Malloy LG&E Exh. JPM-2. Please note that the costs of the equipment set out below will not total to \$228.8 million because there are certain smaller costs not explained in great detail here. The remaining categories of items, which are ID fans, stack flue, miscellaneous mechanical/pipe, civil, electrical/controls, and miscellaneous bulks, total \$45.4 million, of which \$36.7 is KU's allocation and \$8.7 million is LG&E's allocation. *Id.*

<sup>79</sup> Malloy LG&E at 4; Malloy KU at 14.

## 1. TC2's Air Quality Control System is Reasonable and Cost-Effective

### (a) Selective Catalytic Reduction (SCR) System

The SCR is necessary to ensure compliance with NO<sub>x</sub> limitations as described in detail above.<sup>80</sup> Situated between the economizer outlet and the air pre-heater inlet, the SCR converts NO<sub>x</sub> and ammonia to water and nitrogen.<sup>81</sup> As part of the SCR project, low conversion catalyst and sorbent injection technology will be installed to mitigate the high sulfur dioxide to sulfur trioxide conversion problems associated with SCR operation.<sup>82</sup> The sorbent injection technology will also help to mitigate sulfuric acid mist emissions that form when sulfur trioxide bonds with water to become sulfuric acid.<sup>83</sup>

The cost of the SCR will be approximately \$18.3 million, \$14.8 million of which is KU's allocation and \$3.5 million of which is LG&E's allocation.<sup>84</sup>

### (b) Dry Electrostatic Precipitator (DESP)

The DESP will remove 90% of the particulate matter in the flue gas stream.<sup>85</sup> The DESP uses electrical current to charge particles contained in the flue gas by passing them over charged electrodes.<sup>86</sup> The charged particles are then placed in an electrostatic field that attracts them to collection plates (or curtains).<sup>87</sup> After an increment of build-up, the collection surface plates are rapped to knock the particles into a hopper below for final byproduct disposal.<sup>88</sup>

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<sup>80</sup> Malloy LG&E at 5; Malloy KU at 14.

<sup>81</sup> Malloy LG&E at 5; Malloy KU at 14.

<sup>82</sup> Malloy LG&E at 5; Malloy KU at 14.

<sup>83</sup> See Transcript of Evidence at 34-35 (November 8, 2006).

<sup>84</sup> Malloy KU Exh. JPM-3; Malloy LG&E Exh. JPM-2.

<sup>85</sup> Malloy LG&E at 5; Malloy KU at 15.

<sup>86</sup> Malloy LG&E at 5; Malloy KU at 15.

<sup>87</sup> Malloy LG&E at 5; Malloy KU at 15.

<sup>88</sup> Malloy LG&E at 5; Malloy KU at 15.

The cost of the DESP will be approximately \$22.6 million, \$18.3 million of which is KU's allocation and \$4.3 million of which is LG&E's allocation.<sup>89</sup>

**(c) Pulverized Activated Carbon (PAC) Injection**

An activated carbon injection system will be installed to ensure Trimble County Unit 2 meets mercury emission permit limitations across a full range of specified fuels.<sup>90</sup> The PAC will be injected between the DESP and the PJFF.<sup>91</sup> The PAC system will remove 90% of the total mercury from the flue gas stream and will meet the permitted mercury emission limitation of  $13 \times 10^{-6}$  Lb/MWh.<sup>92</sup>

The cost of the PAC will be approximately \$1.2 million, \$1.0 million of which is KU's allocation and \$0.2 million of which is LG&E's allocation.<sup>93</sup>

**(d) Hydrated Lime Injection and Pulse Jet Fabric Filter (PJFF)**

Due to the range of fuels and operating parameters specified for Trimble County Unit 2, there are conditions in which condensation of sulfur trioxide into sulfuric acid may occur in the Pulse-Jet Fabric Filter.<sup>94</sup> As discussed in III.B.1(a) above, the operation of Trimble County Unit 2's SCR will result in the creation of significant amounts of sulfur trioxide. Sulfur trioxide (SO<sub>3</sub>) can combine with water vapor (H<sub>2</sub>O) in coal-burning unit emissions to become sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) under certain circumstances.<sup>95</sup> To address the corrosion and operational issues related

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<sup>89</sup> Malloy KU Exh. JPM-3; Malloy LG&E Exh. JPM-2.

<sup>90</sup> Malloy LG&E at 5; Malloy KU at 15.

<sup>91</sup> Malloy LG&E at 5; Malloy KU at 15.

<sup>92</sup> Malloy LG&E at 5; Malloy KU at 15.

<sup>93</sup> Malloy KU Exh. JPM-3; Malloy LG&E Exh. JPM-2.

<sup>94</sup> Malloy LG&E at 5; Malloy KU at 15.

<sup>95</sup> KU's September 5, 2006 Response to Commission Staff's August 21, 2006 Data Request No. 2(a); LG&E's September 5, 2006 Response to Commission Staff's August 21, 2006 Data Request No. 2(a); Transcript of Evidence at 34-35 (November 8, 2006).

to sulfuric acid mist in the PJFF and comply with relevant regulatory obligations, a hydrated lime injection system will be installed.<sup>96</sup> The sorbent will be directly injected in the flue gas stream upstream of the baghouse to chemically react with sulfur trioxide and sulfuric acid to produce filterable compounds which are then efficiently collected in a baghouse.<sup>97</sup>

Trimble County Unit 2 will be supplied with one PJFF system to control particulate matter and mercury emissions.<sup>98</sup> The PJFF comprises two fields each containing six compartments.<sup>99</sup> Each compartment contains 1,140 bags for a total of 13,680 bags in the PJFF.<sup>100</sup> Flue gas with boiler fly ash, PAC and hydrated lime enters an inlet plenum and is distributed to each of the individual compartments.<sup>101</sup> Flue gas enters the compartments and is evenly distributed via a baffle to the filter bag socks.<sup>102</sup> The particle laden flue gas flows through the sides of the filters (where the particles collect and form a filter cake on the outside of the bags) and clean flue gas exits the top of the filter.<sup>103</sup> In order to clean the filters, a pulse of air is directed into the top of the filters, causing a pressure change and dislodging the cake from the filter so that it falls into the collection hopper for disposal.<sup>104</sup> Each filter bag is supported on a wire cage; the bags and cages are independently suspended from the top of each compartment.<sup>105</sup>

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<sup>96</sup> Malloy LG&E at 6; Malloy KU at 15. *See* 401 KAR 59:015; 401 KAR 60:005; 401 KAR 61:015; LMAPCD Regulation 7.06.

<sup>97</sup> Malloy LG&E at 6; Malloy KU at 15.

<sup>98</sup> Malloy LG&E at 6; Malloy KU at 15.

<sup>99</sup> Malloy LG&E at 6; Malloy KU at 16.

<sup>100</sup> Malloy LG&E at 6; Malloy KU at 16.

<sup>101</sup> Malloy LG&E at 6; Malloy KU at 16.

<sup>102</sup> Malloy LG&E at 6; Malloy KU at 16.

<sup>103</sup> Malloy LG&E at 6; Malloy KU at 16.

<sup>104</sup> Malloy LG&E at 6; Malloy KU at 16.

<sup>105</sup> Malloy LG&E at 6; Malloy KU at 16.

There are numerous filter bag material alternatives for a baghouse.<sup>106</sup> However, due to the high sulfur content of the coal to be burned, a degradation resistant fabric filter material will be required for this particular application.<sup>107</sup>

The PJFF is designed and guaranteed for a filterable particulate matter emission rate of 0.015 lbs/mmBtu.<sup>108</sup> This is tested at the outlet of the PJFF.<sup>109</sup>

The total cost of the PJFF and hydrated lime systems will be approximately \$22.6 million, \$18.3 million of which is KU's allocation and \$4.3 million of which is LG&E's allocation.<sup>110</sup>

#### **(e) Wet Flue Gas Desulfurization (WFGD)**

A WFGD system will be installed to ensure permitted sulfur dioxide emission limitations are met.<sup>111</sup> The WFGD is designed to remove 99% of the SO<sub>2</sub> in the flue gas without the added costs of reaction enhancing chemicals.<sup>112</sup> The WFGD is also effective in removing particulate matter, fluorides, and oxidized mercury.<sup>113</sup>

The WFGD consists of one absorber tower with two dual flow trays designed to treat 100% of the flue gas generated from the boiler.<sup>114</sup> The absorber contains six limestone slurry spray levels and is designed to achieve 99% SO<sub>2</sub> removal with five spray levels in service; the

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<sup>106</sup> Malloy LG&E at 6; Malloy KU at 16.

<sup>107</sup> Malloy LG&E at 6; Malloy KU at 16.

<sup>108</sup> Malloy LG&E at 7; Malloy KU at 16.

<sup>109</sup> Malloy LG&E at 7; Malloy KU at 16.

<sup>110</sup> Malloy KU Exh. JPM-3; Malloy LG&E Exh. JPM-2.

<sup>111</sup> Malloy LG&E at 7; Malloy KU at 16.

<sup>112</sup> Malloy LG&E at 7; Malloy KU at 16.

<sup>113</sup> Malloy LG&E at 7; Malloy KU at 16.

<sup>114</sup> Malloy LG&E at 7; Malloy KU at 16.

sixth spray level is a spare.<sup>115</sup> The WFGD system is designed for 5.5 lbs SO<sub>2</sub>/mmBtu loading and 99% SO<sub>2</sub> removal.<sup>116</sup>

The total cost of the WFGD will be approximately \$72.8 million, \$59.0 million of which is KU's allocation and \$13.8 million of which is LG&E's allocation.<sup>117</sup>

#### (f) Wet Electrostatic Precipitator (WESP)

A WESP will be installed to ensure compliance with permitted particulate matter emission limitations.<sup>118</sup> The WESP is designed to meet the permitted level of 0.0036 lbs/mmBtu of sulfuric acid at the stack.<sup>119</sup> The WESP is also effective in removing many types of particulates, including acid mist, oil and tar based condensed aerosols, filterable particulates, and oxidized mercury.<sup>120</sup>

A WESP charges particles in the flue gas by passing the particles over energized electrodes.<sup>121</sup> The electrostatically charged particles then flow through an electrostatic field that drives them to oppositely charged collecting plates.<sup>122</sup> The collection plates are continuously irrigated by an overhead washing system to eliminate concerns relating to contaminant build-up.<sup>123</sup> The particle saturated water flows down the plates to the bottom of the WESP and to the reaction tank of the WFGD system.<sup>124</sup>

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<sup>115</sup> Malloy LG&E at 7; Malloy KU at 17.

<sup>116</sup> Malloy LG&E at 7; Malloy KU at 17.

<sup>117</sup> Malloy KU Exh. JPM-3; Malloy LG&E Exh. JPM-2.

<sup>118</sup> Malloy LG&E at 7; Malloy KU at 17.

<sup>119</sup> Malloy LG&E at 7; Malloy KU at 17. *See* Trimble County Station Title V Operating Permit V-02-043 rev. 2.

<sup>120</sup> Malloy LG&E at 7; Malloy KU at 17.

<sup>121</sup> Malloy LG&E at 7; Malloy KU at 17.

<sup>122</sup> Malloy LG&E at 7; Malloy KU at 17.

<sup>123</sup> Malloy LG&E at 8; Malloy KU at 17.

<sup>124</sup> Malloy LG&E at 8; Malloy KU at 17.

The WESP is anticipated to have a removal impact on all particulate matter, both filterable and condensable.<sup>125</sup> From the WESP, the flue gas flows to the stack and exits into the atmosphere.<sup>126</sup> At the stack, the guaranteed total (filterable and condensable) particulate matter emission rate is 0.015 lbs/mmBtu.<sup>127</sup>

The total cost of the WESP will be approximately \$45.8 million, \$37.1 million of which is KU's allocation and \$8.7 million of which is LG&E's allocation.<sup>128</sup>

**2. The Air Quality Control System is Necessary to Comply with Relevant Environmental Regulations**

Myriad federal, state, and local environmental regulations apply to Trimble County Unit 2. These regulations require the installation of the component systems of the Air Quality Control System (Project 18 for LG&E and Project 23 for KU) described above.

In addition, the Companies have already received an operating permit for this unit that stipulates the operating and emission limitations and regulatory requirements placed on this unit.<sup>129</sup> The pollution control equipment systems contained in the Air Quality Control System are necessary for the Companies to comply with the pollution control requirements placed on this unit by this operating permit.<sup>130</sup>

**(a) The Federal and State Prevention of Significant Deterioration Review Process Requires the AQCS**

Constructing the above-described Air Quality Control System is necessary for Trimble County Unit 2 to comply with relevant environmental regulations. Under Kentucky Regulation

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<sup>125</sup> Malloy LG&E at 8; Malloy KU at 17.

<sup>126</sup> Malloy LG&E at 8; Malloy KU at 17.

<sup>127</sup> Malloy LG&E at 8; Malloy KU at 17.

<sup>128</sup> Malloy KU Exh. JPM-3; Malloy LG&E Exh. JPM-2.

<sup>129</sup> Revlett KU at 8 and Exhibit GHR-1; Revlett LG&E at 8 and Exhibit GHR-1.

<sup>130</sup> Revlett KU at 8; Revlett LG&E at 8.



401 KAR 51:017, 401 KAR 52:020, and Federal Regulation 40 CFR Part 52.21, the construction of a new generating unit is required to undergo a Prevention of Significant Deterioration (PSD) review, which involves Best Available Control Technology (BACT) and air quality impact demonstrations.<sup>131</sup> From the PSD review of Trimble County Unit 2, these Air Quality Control System pollution control technologies were determined to meet the requirements of BACT for particulate matter, sulfuric acid mist, and fluorides (as HF).<sup>132</sup> Based on this review, a Title V Operating Permit<sup>133</sup> was obtained with controls specified to be installed on Trimble County Unit 2.<sup>134</sup>

**(b) Title IV of the Federal Clean Air Act as Amended and the Clean Air Interstate Rule Require the Installation of the Wet Flue Gas Desulfurization System to Mitigate Sulfur Dioxide Emissions.**

The acid rain control requirements under Title IV of the CAAA also play a role in determining the need for these devices.<sup>135</sup> Under that program, each utility unit in the 48 contiguous states must have sufficient SO<sub>2</sub> allowances at the end of each year to account for its emissions.<sup>136</sup> Trimble County Unit 2 will not receive any SO<sub>2</sub> allowances because it is a new unit.<sup>137</sup> KU and LG&E have built a “bank” of SO<sub>2</sub> allowances that could be used to cover these new SO<sub>2</sub> emissions; however, that bank will be depleted within the next few years.<sup>138</sup> The

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<sup>131</sup> Revlett KU at 4; *In the Matter of the Application of Louisville Gas and Electric Company for Approval of its 2006 Compliance Plan for Recovery by Environmental Surcharge*, Case 2006-00208, Direct Testimony of Gary H. Revlett at 4 (June 23, 2006) (“Revlett LG&E”).

<sup>132</sup> Revlett KU at 4; Revlett LG&E at 5.

<sup>133</sup> Exhibit GHR-1.

<sup>134</sup> Revlett KU at 4; Revlett LG&E at 5.

<sup>135</sup> Revlett KU at 5; Revlett LG&E at 5.

<sup>136</sup> Revlett KU at 5; Revlett LG&E at 5.

<sup>137</sup> Revlett KU at 5; Revlett LG&E at 5.

<sup>138</sup> Revlett KU at 5; Revlett LG&E at 5.

WFGD will reduce SO<sub>2</sub> emissions and reduce the burden on the Companies' SO<sub>2</sub> allowance bank.<sup>139</sup>

As more fully described above in the section on the proposed SCR facility at Ghent Unit No. 2, the USEPA promulgated CAIR under its authority provided under Section 110 of the CAAA.<sup>140</sup> CAIR is a multi-pollutant strategy rule requiring significant additional reduction of SO<sub>2</sub> and NO<sub>x</sub> emissions in order to further reduce levels of ozone and fine particulate matter in the atmosphere.<sup>141</sup> The rule applies to the eastern 28 states (including Kentucky) and the District of Columbia.<sup>142</sup> It reduces emissions through cap-and-trade allowance-based programs, similar to SO<sub>2</sub> under the Acid Rain Program and NO<sub>x</sub> under the NO<sub>x</sub> SIP Call.<sup>143</sup> For SO<sub>2</sub>, current Acid Rain Program allocations would be used.<sup>144</sup> The program will reduce emissions over two phases.<sup>145</sup> CAIR targets annual SO<sub>2</sub> reductions of 3.6 million tons during Phase I (from 2010-2014) and an additional 2 million tons during Phase II (from 2015 and beyond).<sup>146</sup> Because the Companies (and all other utilities impacted by CAIR) have already received Acid Rain Program allowances for its existing units for 2010 through 2034, the USEPA provides that utilities surrender those allowances at a greater rate than is currently required: on a 2-for-1 and 2.87-for-1 basis, during Phase I and Phase II respectively.<sup>147</sup> However, pre-2010 Acid Rain Program SO<sub>2</sub> allowances (i.e., banked allowances) would retain their full value.<sup>148</sup> As stated earlier, Trimble County Unit 2 will not be given any allowances when it starts operation in 2010.<sup>149</sup> Therefore,

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<sup>139</sup> Revlett KU at 5; Revlett LG&E at 5.

<sup>140</sup> Revlett KU at 5; Revlett LG&E at 5.

<sup>141</sup> Revlett KU at 5; Revlett LG&E at 5.

<sup>142</sup> Revlett KU at 5; Revlett LG&E at 5.

<sup>143</sup> Revlett KU at 5; Revlett LG&E at 6.

<sup>144</sup> Revlett KU at 5; Revlett LG&E at 6.

<sup>145</sup> Revlett KU at 5; Revlett LG&E at 6.

<sup>146</sup> Revlett KU at 5; Revlett LG&E at 6.

<sup>147</sup> Revlett KU at 6; Revlett LG&E at 6.

<sup>148</sup> Revlett KU at 6; Revlett LG&E at 6.

<sup>149</sup> Revlett KU at 6; Revlett LG&E at 6.

the installation of this WFGD and associated equipment is necessary to ensure the Companies' continued compliance with all current regulations requiring the reduction of SO<sub>2</sub> emissions.<sup>150</sup>

**(c) The Clean Air Interstate Rule Also Requires the Installation of a Selective Catalytic Reduction System to Meet CAIR Limits on Nitrogen Oxide Emissions.**

Additionally, for NO<sub>x</sub>, CAIR will replace the NO<sub>x</sub> SIP Call ozone-season NO<sub>x</sub> reduction requirements with new annual and ozone-season reduction requirements based on the cap-and-trade allowance method.<sup>151</sup> For Kentucky on an annual basis, CAIR allocations represent a 42% reduction from 2003 NO<sub>x</sub> levels for the first phase (2009-2014) of the program and a 58% reduction from 2003 NO<sub>x</sub> emissions during the second phase (2015 and beyond).<sup>152</sup> During the ozone season (May-September), emissions will be capped at a level identical to the NO<sub>x</sub> SIP Call requirements for 2009-2014 and an approximate 15% reduction is prescribed for 2015 and beyond.<sup>153</sup> The annual and ozone season programs are two separate and distinct allowance programs.<sup>154</sup> CAIR Ozone Season allowances cannot be used for compliance with the CAIR Annual Program and CAIR Annual allowances cannot be used for compliance with the CAIR Ozone Season Program.<sup>155</sup> To aid the Companies in meeting the requirements of the NO<sub>x</sub> portion of the CAIR, an SCR and associated equipment is needed on Trimble County Unit 2.<sup>156</sup>

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<sup>150</sup> Revlett KU at 6; Revlett LG&E at 6.

<sup>151</sup> Revlett KU at 6; Revlett LG&E at 6.

<sup>152</sup> Revlett KU at 6; Revlett LG&E at 6.

<sup>153</sup> Revlett KU at 6; Revlett LG&E at 6.

<sup>154</sup> Revlett KU at 6; Revlett LG&E at 7.

<sup>155</sup> Revlett KU at 6; Revlett LG&E at 7.

<sup>156</sup> Revlett KU at 6; Revlett LG&E at 7.

**(d) State and Local Opacity Regulations and State General Duty Provisions (KRS Chapter 224) Require that a Hydrated Lime Sorbent Injection System Be Installed.**

With the installation of an SCR facility, sulfur trioxide levels within the flue gas stream will increase due to the SCR catalyst's reaction with sulfur dioxide.<sup>157</sup> Additionally, various conditions could cause condensation of sulfur trioxide in the PJFF resulting in sulfuric acid deposition.<sup>158</sup> To address the corrosion and operational issues that could occur from the formation of sulfuric acid, and to comply with applicable regulatory obligations, a hydrated lime injection system upstream of the PJFF must be installed.<sup>159</sup> According to the Kentucky Division for Air Quality (KYDAQ), sulfuric acid mist could potentially impact human health and the environment and subsequently result in non-compliance with the general duty provisions of KRS Chapter 224.<sup>160</sup> Also, to ensure continuous compliance with state and local opacity limits on emissions, it is necessary to undertake sulfuric acid mitigation because sulfuric acid is a particulate that increases the opacity of power plant plumes.<sup>161</sup> Though the WESP is the best available control technology for removal of sulfuric acid mist (generally applicable to new units) and ensures compliance with permitted particulate matter emission limitations, the hydrated lime injection equipment is a cost-effective option for controlling acid mist on existing units while protecting operating equipment.<sup>162</sup>

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<sup>157</sup> Revlett KU at 6; Revlett LG&E at 7.

<sup>158</sup> Revlett KU at 7; Revlett LG&E at 7.

<sup>159</sup> Revlett KU at 7; Revlett LG&E at 7.

<sup>160</sup> Revlett KU at 7; Revlett LG&E at 7.

<sup>161</sup> See 401 KAR 59:015; 401 KAR 60:005; 401 KAR 61:015; LMAPCD Regulation 7.06.

<sup>162</sup> Revlett KU at 7; Revlett LG&E at 7.

**(e) The Federal Clean Air Mercury Rule’s Limits on Mercury Emissions Require Installation of a Pulverized Activated Carbon Injection System and a Pulse-Jet Fabric Filter.**

On March 15, 2005, the Clean Air Mercury Rule (CAMR) was promulgated requiring the reduction of mercury emissions from all coal-fired generating facilities.<sup>163</sup> The CAMR is based on “cap-and-trade” methodologies.<sup>164</sup> It is to be implemented in two phases.<sup>165</sup> In Phase I (2010-2017), mercury emissions are to be capped at 38 tons nationwide.<sup>166</sup> In Phase II (2018 and beyond), mercury emissions are to be reduced to 15 tons nationwide (a 69% reduction).<sup>167</sup> Allowances must be surrendered to cover equal amounts of emissions.<sup>168</sup> New sources such as Trimble County Unit 2 are also stipulated to have an emission limit.<sup>169</sup> Trimble County Unit 2 has a limit of  $13 \times 10^{-6}$  lb/MWh as stipulated in its operating permit.<sup>170</sup> To meet that limit, the PAC injection system coupled with the PJFF is needed to reduce mercury emissions.<sup>171</sup>

**(f) The Federal Clean Air Visibility Rule, Which Limits Particulate Emissions, Necessitates Installation of a Dry Electrostatic Precipitator, a Pulse-Jet Fabric Filter, and a Wet Electrostatic Precipitator.**

In April 1999, the final Clean Air Visibility Rule (CAVR) was issued.<sup>172</sup> The final rule gives states flexibility in determining reasonable progress goals for the areas of concern, taking into account the statutory requirements of the CAAA.<sup>173</sup> The final regulation requires all 50 states to cut emissions of fine particulate matter and other air pollutants, including SO<sub>2</sub> and

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<sup>163</sup> Revlett KU at 7; Revlett LG&E at 7.

<sup>164</sup> Revlett KU at 7; Revlett LG&E at 7.

<sup>165</sup> Revlett KU at 7; Revlett LG&E at 7.

<sup>166</sup> Revlett KU at 7; Revlett LG&E at 7.

<sup>167</sup> Revlett KU at 7; Revlett LG&E at 7.

<sup>168</sup> Revlett KU at 7; Revlett LG&E at 8.

<sup>169</sup> Revlett KU at 7; Revlett LG&E at 8.

<sup>170</sup> Revlett KU at 7 and Exhibit GHR-1; Revlett LG&E at 8 and Exhibit GHR-1.

<sup>171</sup> Revlett KU at 7; Revlett LG&E at 8.

<sup>172</sup> Revlett KU at 7; Revlett LG&E at 8.

<sup>173</sup> Revlett KU at 7; Revlett LG&E at 8.

NO<sub>x</sub>.<sup>174</sup> Under the rule, the target year is 2064 for restoring clear visibility to 156 areas classified as Class I under the CAAA, although incremental improvements in air quality are required to begin early in the next decade.<sup>175</sup> A DESP, PJFF and WESP are being installed to reduce particulate matter emissions from this unit.<sup>176</sup> The WESP will also be integral in reducing the fine particulate and sulfuric acid mist emissions from this unit.<sup>177</sup>

### **3. The Air Quality Control System is a Cost-Effective and Reasonable Means of Meeting Applicable Environmental Requirements**

As demonstrated in Case No. 2004-00507,<sup>178</sup> the cost associated with Trimble County Unit 2, inclusive of cost associated with the above listed AQCS, is cost-effective.<sup>179</sup> In approving the Companies' application for a CPCN to build TC2, the Commission stated, "[T]he Commission finds that there is a need on the Companies' system for 75 percent of the proposed 750 MW TC2. The proposed construction is reasonable and will not result in wasteful duplication of utility facilities."<sup>180</sup>

Each prospective bidder on the TC2 project was required to construct a unit to meet the environmental requirements mandated by the United States Environmental Protection Agency (USEPA).<sup>181</sup> The Title V operating permit requirements cannot be met by purchasing allowances since the permit sets a maximum emission rate on the unit.<sup>182</sup> In addition, the

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<sup>174</sup> Revlett KU at 8; Revlett LG&E at 8.

<sup>175</sup> Revlett KU at 8; Revlett LG&E at 8.

<sup>176</sup> Revlett KU at 8; Revlett LG&E at 8.

<sup>177</sup> Revlett KU at 8; Revlett LG&E at 8.

<sup>178</sup> *In the Matter of: Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for a Certificate of Public Convenience and Necessity, and a Site Compatibility Certificate, for the Expansion of the Trimble County Generating Station.*

<sup>179</sup> Malloy KU at 18; Malloy LG&E at 9.

<sup>180</sup> *In the Matter of: Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for a Certificate of Public Convenience and Necessity, and a Site Compatibility Certificate, for the Expansion of the Trimble County Generating Station*, Case No. 2004-00507, Order at 7 (Nov. 1, 2005).

<sup>181</sup> Malloy KU at 18; Malloy LG&E at 9.

<sup>182</sup> Malloy KU at 18; Malloy LG&E at 9.

requirements are such that there is no fuel switch option other than Gas or Oil which would allow the unit to meet the SO<sub>2</sub> limitations in the permit.<sup>183</sup> Therefore the required back-end environmental technologies were selected by each bidder on the TC2 project to most cost effectively comply with the permitting restrictions.<sup>184</sup>

**C. The Companies' Sorbent Injection Facilities are Reasonable and Cost-Effective Means of Mitigating Sulfur Trioxide and Sulfuric Acid Emissions to Comply with Opacity Limitations and General Duty Provisions of Kentucky Law.**

KU Project 24 and LG&E Project 19 pertain to the mitigation of sulfur trioxide and sulfuric acid on generating units where high sulfur coal is burned and NO<sub>x</sub> emissions are controlled using an SCR during the ozone season: Ghent Units Nos. 1, 3, and 4; Mill Creek Units Nos. 3 and 4; and Trimble County Unit No. 1.<sup>185</sup> As the Companies' witness Gary Revlett explained in his live testimony before the Commission, sulfur trioxide, which results from burning coal and "scrubbing" NO<sub>x</sub> from exhaust gases in an SCR, converts readily and naturally to sulfuric acid as it exits a generating unit's stack. (This process is graphically depicted in the attached slide, "Illustration of How Sulfuric Acid Mist Emissions Form in LG&E/KU Units," attached hereto as Appendix 1.) As explained in detail below, sulfuric acid mist in a stack's plume can result in opacity limit violations and, under certain environmental conditions, public health concerns. Because the Companies must ensure that they remain in continuous compliance with the relevant environmental regulations, the Companies will install the proposed sorbent injection facilities even if the Commission denies them environmental surcharge recovery of the

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<sup>183</sup> Malloy KU at 18; Malloy LG&E at 9.

<sup>184</sup> Malloy KU at 19; Malloy LG&E at 9.

<sup>185</sup> Malloy KU at 19; Malloy LG&E at 9.

costs thereof;<sup>186</sup> however, as shown below, the Companies are indeed entitled to surcharge recovery of these costs.

As a result of NO<sub>x</sub> mitigation using SCRs, sulfur trioxide emissions (and, hence, sulfuric acid emissions) have increased.<sup>187</sup> With the addition of a third layer of SCR catalyst to maintain NO<sub>x</sub> emission compliance, sulfur trioxide emission levels further increased.<sup>188</sup> This consequence of NO<sub>x</sub> control can cause:

- 1) Increased air heater fouling and pluggage;
- 2) Sulfuric acid accelerated corrosion in the duct work and balance of pollution control equipment post-SCR and increased levels of sulfuric acid in plant emissions; and
- 3) Highly visible “blue plume” from the chimney discharge under certain conditions, which, in the absence of mitigation, may result in opacity limit violations.<sup>189</sup>

To meet both NO<sub>x</sub> compliance requirements as set forth in Title V permits<sup>190</sup> and the general duty provisions of KRS Chapter 224 that require the Companies to mitigate emissions that could potentially impact human health or the environment, the Companies have three alternatives:

- 1) Remove the SCR from service and purchase NO<sub>x</sub> allowances;
- 2) Remove the generating unit from service and purchase energy from the market to meet native load obligation; or

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<sup>186</sup> Transcript of Evidence at 26-27 (November 8, 2006).

<sup>187</sup> Malloy KU at 19; Malloy LG&E at 10.

<sup>188</sup> Malloy KU at 19; Malloy LG&E at 10.

<sup>189</sup> Malloy KU at 19; Malloy LG&E at 10.

<sup>190</sup> KYDAQ Permit Nos. V-02-043 and V-05-043; LMAPCD Permit No. 145-97-TV.



- 3) Install low sulfur dioxide to sulfur trioxide conversion catalyst and sorbent injection technology.<sup>191</sup>

The installation of low sulfur dioxide to sulfur trioxide conversion catalyst and sorbent injection technology provides the lowest-cost and least-risk operational alternative for effective NO<sub>x</sub> compliance.<sup>192</sup>

As discussed in the *Sargent & Lundy SO<sub>3</sub> Mitigation Study*<sup>193</sup> (“Sargent and Lundy Study”) and *2006 SO<sub>3</sub> Mitigation Strategy for Kentucky Utilities and Louisville Gas and Electric*,<sup>194</sup> sorbent injection is required at Ghent Unit No. 1, Ghent Unit No. 3, and Ghent Unit No. 4 in 2007, 2007, and 2008, respectively.<sup>195</sup> The dates associated with Ghent Unit Nos. 3 and 4 correspond with when those units would be switched from the low sulfur fuel currently being burned to a lower cost high sulfur fuel and placing an FGD in-service.<sup>196</sup> The same studies also show that sorbent injection is required at Trimble County Unit No. 1 and Mill Creek Unit Nos. 3 and 4.<sup>197</sup>

- 1. To Ensure Continuous Compliance With Current State, Local, and Federal Environmental Laws and Regulations, It Is Necessary To Install Sorbent Injection Technology on Ghent Units 1, 3, and 4, Trimble County Unit 1, and Mill Creek Units 3 and 4.**

To ensure continuous compliance with current state, local, and federal environmental laws and regulations, it is necessary to install sorbent injection technology at Ghent Unit Nos. 1, 3, and 4, Trimble County Unit No. 1, and Mill Creek Units 3 and 4.<sup>198</sup> The Companies

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<sup>191</sup> Malloy KU at 19-20; Malloy LG&E at 10.

<sup>192</sup> Malloy KU at 20; Malloy LG&E at 10.

<sup>193</sup> Malloy KU Exhibit JPM-4; Malloy LG&E Exhibit JPM-3.

<sup>194</sup> Malloy KU Exhibit JPM-5; Malloy LG&E Exhibit JPM-4.

<sup>195</sup> Malloy KU at 20.

<sup>196</sup> Malloy KU at 20.

<sup>197</sup> Malloy LG&E at 10.

<sup>198</sup> Revlett KU at 8; Revlett LG&E at 9.

contacted the KYDAQ to confirm the agency's interpretation of the relevant laws and regulations.<sup>199</sup> It is the position of the KYDAQ that the "General Duty" provisions of the Kentucky Revised Statutes (KRS) Chapter 224 require necessary and appropriate action on a case by case basis to mitigate sulfur trioxide and sulfuric acid emissions that could potentially impact human health and the environment.<sup>200</sup> If a permittee fails to address sulfur trioxide and sulfuric acid emissions that may potentially impact human health or the environment, the KYDAQ reserves the right to take appropriate action under KRS Chapter 224 to compel compliance with this requirement.<sup>201</sup> KYDAQ stated unequivocally that it is "necessary and appropriate that such emission be controlled."<sup>202</sup> KYDAQ's position is consistent with that taken by other agencies which have undertaken enforcement action to compel sulfur trioxide and sulfuric acid mitigation where a company has failed to undertake measures deemed necessary by the agency.<sup>203</sup>

KYDAQ recently demonstrated that controlling sulfur trioxide and sulfuric acid emissions is of high importance when it inspected LG&E's Trimble and KU's Ghent generating stations. In its October 23, 2006 Air Inspection Report -- Partial Compliance Evaluation, which documented KYDAQ's September 19, 2006 inspection of the Trimble generating station, KYDAQ wrote:

Although some amount of SO<sub>3</sub> is created in the boiler, LG&E has noticed a greater amount of SO<sub>3</sub> formation during ozone season due to the use of the SCR. The Florence Regional Office believes that the increased formation of SO<sub>3</sub> could contribute to excess opacity emissions that could violate the permit limit. A COM [Continuous Opacity Monitor] unit measures the opacity of the exhaust stream before it travels through the scrubber. Although the COM was reading an

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<sup>199</sup> See Revlett KU Exhibit GHR-3; Revlett LG&E Exhibit GHR-3.

<sup>200</sup> Revlett KU at 8; Revlett LG&E at 9; KU's September 5, 2006 Response to Commission Staff's August 21, 2006 Data Request No. 2(a); LG&E's September 5, 2006 Response to Commission Staff's August 21, 2006 Data Request No. 2(a).

<sup>201</sup> Revlett KU at 9; Revlett LG&E at 9.

<sup>202</sup> See Revlett KU Exhibit GHR-4; Revlett LG&E Exhibit GHR-4.

<sup>203</sup> See *People ex rel. Madigan v. PSI Energy*, 847 N.E. 2d 514 (Ill. App. 2006).

acceptable opacity, SO<sub>3</sub> condenses in the FGD causing increased opacity as the exhaust gas exits the stack. The inspectors took no official Method 9 readings. However, qualitative observations indicated that LG&E was experiencing higher opacities when not controlling for SO<sub>3</sub>. We noticed that the opacity and appearance of the plume was noticeably better when SO<sub>3</sub> emissions were controlled (injection of lime).<sup>204</sup>

Shortly after its inspection of Trimble, KYDAQ inspected KU's Ghent generating station on September 25, 2006. In its November 2, 2006 Air Inspection Report -- Partial Compliance Evaluation of its inspection, KYDAQ states, "KU-Ghent should realize that the increased formation of SO<sub>3</sub> could contribute to excess opacity emissions that could violate the permit limit."<sup>205</sup> Thus, KYDAQ has made it abundantly clear that the Companies cannot simply ignore sulfur trioxide emissions because there is no specific emission limit: in addition to its concerns regarding potential public health and environmental protection issues associated in the event of plume touchdown, KYDAQ has shown its clear concern that failure to control sulfur trioxide may potentially result in the Companies' violating specific opacity emission limits contained in their generating units' operating permits.

That KYDAQ has taken the position that appropriate sulfur trioxide mitigation is required under the general duty provisions of KRS Chapter 224 makes apposite the Companies' analogy between the sorbent injection technology at issue in this proceeding and the Mill Creek wet stack conversion required by the Air Pollution Control District of Jefferson County (APCDJC, predecessor to LMAPCD), the costs of which conversion were at issue in Case No. 2002-00147.<sup>206</sup> As LG&E witness Caryl M. Pfeiffer described in her testimony in Case No. 2002-00147, APCDJC had cited LG&E's Mill Creek generating station for violating APCDJC

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<sup>204</sup> Emphases added. Companies' November 21, 2006 Joint Response to Post-Hearing Data Request No. 3, Attachment 2 (October 23, 2006 Air Inspection Report -- Partial Compliance Evaluation).

<sup>205</sup> Emphasis added. A copy of the November 2, 2006 Air Inspection Report -- Partial Compliance Evaluation is attached hereto as Appendix 3.

<sup>206</sup> See *In the Matter of the Application of Louisville Gas and Electric Company for Approval of Its 2002 Compliance Plan for Recovery by Environmental Surcharge*, Case No. 2002-00147, Direct Testimony of Caryl M. Pfeiffer (August 12, 2002).

Regulation 1.09, a general prohibition of air pollution, which alleged violations occurred during several instances of unit start-up, shut-down, and malfunction that caused increased particulate emissions.<sup>207</sup> After working with LG&E to determine the best solution to the problem, APCDJC and LG&E entered into an Agreed Order requiring LG&E to convert the Mill Creek stacks to “wet stack” configuration.<sup>208</sup> Even though the APCDJC regulation LG&E allegedly violated was a general prohibition of pollution without any specific emission limitations whatsoever, the Commission approved recovery of LG&E’s Mill Creek “wet stack” conversion costs in its final order in Case No. 2002-00147.<sup>209</sup> Thus, contrary to what was implied at hearing in this proceeding, the Commission’s final order in Case No. 2002-00147 is precedent strongly supporting the Companies’ recovery of the costs of their proposed sorbent injection technology. Indeed, given KYDAQ’s unequivocal statements that it is “necessary and appropriate that such emission [sulfur trioxide] be controlled”<sup>210</sup> and that “increased formation of SO<sub>3</sub> could contribute to excess opacity emissions that could violate the permit limit,”<sup>211</sup> there can be no reasonable argument that the Companies’ efforts to mitigate sulfur trioxide and sulfuric acid emissions are voluntary. Rather, the evidence, particularly KYDAQ’s strong statements, is clear that there are relevant environmental regulations, specifically opacity limits, as well as the KRS Chapter 224 “General Duty” to mitigate as articulated by KYDAQ, which require that the Companies install the above-described sorbent injection technology. Thus, it is irrelevant that, unlike the Companies’ sulfur trioxide/sulfuric acid mitigation projects, the wet stack project at issue in Case No. 2002-00147 was built pursuant to an agreed order. In both cases, the action in question was

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<sup>207</sup> *Id.* at 5.

<sup>208</sup> *Id.* at Exh. CMP-1.

<sup>209</sup> *In the Matter of the Application of Louisville Gas and Electric Company for Approval of Its 2002 Compliance Plan for Recovery by Environmental Surcharge*, Case No. 2002-00147, Order at 11 (February 11, 2003).

<sup>210</sup> *See* Revlett KU Exhibit GHR-4; Revlett LG&E Exhibit GHR-4.

<sup>211</sup> Companies’ November 21, 2006 Joint Response to Post-Hearing Data Request No. 3, Attachment 1 (November 2, 2006 Air Inspection Report -- Partial Compliance Evaluation).

undertaken pursuant to the requirements of a regulation. The agreed order in the wet stack conversion project did not create the substantive regulatory requirements, but was merely the procedural mechanism used by the agency in that instance to enforce compliance with the substantive requirement. Because installing this sulfur trioxide/sulfuric acid mitigation technology is indeed being done pursuant to an environmental requirement, the Companies are entitled to environmental surcharge recovery of the costs thereof.

USEPA also has clarified that sulfur trioxide and sulfuric acid mitigation is mandated by federal regulations under the CAAA.<sup>212</sup> In assessing the compliance measures mandated by CAIR, USEPA has clarified that high sulfur coal burning plants presumptively will implement sulfur trioxide and sulfuric acid mitigation measures.<sup>213</sup> In the supplemental notice of reconsideration for the CAIR rule, USEPA stated, “[W]e assumed that every unit that is projected to install SCR and/or wet FGD will incur increased costs for SO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub> [sulfuric acid] mitigation.”<sup>214</sup>

Furthermore, discoloration of a coal burning plant’s plume by sulfuric acid mist can result in violation of the applicable state and local particulate (opacity) standards.<sup>215</sup> KYDAQ has promulgated several specific opacity limitation regulations that apply to Ghent Unit Nos. 1,

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<sup>212</sup> KU’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(a); LG&E’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(a).

<sup>213</sup> KU’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(a); LG&E’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(a).

<sup>214</sup> KU’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(a); LG&E’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(a) (quoting *Rule To Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule): Supplemental Notice of Reconsideration*, 70 Fed. Reg. 77101, 77106 [December 29, 2005]). See also *New York et al. v. USEPA*, 413 F.3d 3 (D.C. Cir. 2005), which invalidated the Pollution Control Project Exemption formerly exempting sulfur trioxide/sulfuric acid emission increases associated with SCR/wet FGD installations, USEPA noted that “[a]s a result of that decision, either CAIR sources will need to mitigate [sulfur trioxide/sulfuric acid] emissions .... or they may choose to apply for NSR permits.” 70 Fed. Reg. at 77109. Please note that obtaining an NSR permit would involve implementation of pollution control measures far more expensive than sulfur trioxide abatement for which cost recovery is sought here. See Sargent and Lundy Study at 35-36.

<sup>215</sup> KU’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(b); LG&E’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(b).

3, and 4, and Trimble County Unit No. 1, namely 401 KAR 59:015, 401 KAR 60:005, and 401 KAR 61:015. These regulations impose opacity limits for emissions of no greater than 20% (40% for Ghent Unit No. 1<sup>216</sup>), which limits are reflected in the plants' air permits.<sup>217</sup> Sulfuric acid, which is a particulate that increases a plume's opacity, therefore must be mitigated in order to maintain these plants' emissions within Kentucky's opacity regulations and operating permit requirements, which permits are in the record of this proceeding and which Mr. Revlett discussed in his live testimony before the Commission.<sup>218</sup>

LMAPCD likewise has imposed emissions opacity limits on Mill Creek Units 3 and 4, which require sulfur trioxide/sulfuric acid mitigation as well. Section 4 of LMAPCD Regulation 7.06 requires that the emissions from these units not exceed 20% opacity. The units' LMAPCD air permit also references a 20% opacity limit.<sup>219</sup> Because sulfuric acid increases plume opacity, it must be mitigated to remain within these established opacity limits.

Finally, KYDAQ and USEPA have expressed regulatory concerns regarding sulfur trioxide and sulfuric acid emissions based on the potential for impacts on public health and the environment under certain conditions. USEPA has acknowledged that high sulfur coal burning plants that utilize SCR and FGD controls to meet the sulfur dioxide and NO<sub>x</sub> limits under CAIR will experience increased sulfur trioxide, which readily converts to sulfuric acid.<sup>220</sup> Under some scenarios, sulfuric acid in a coal burning plant's plume can pose a potential hazard during plume

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<sup>216</sup> The regulation that limits opacity for Ghent Unit No. 1, 401 KAR 61:015, prescribes a less onerous opacity constraint (i.e., 40%) on units that were under construction no later than August 17, 1971. *See* 401 KAR 61:015 § 4(4).

<sup>217</sup> KYDAQ Permit Nos. V-02-043 and V-05-043.

<sup>218</sup> Transcript of Evidence at 37-38; *see* Revlett KU Exhibits GHR-1 and GHR-2; Revlett LG&E Exhibits GHR-1 and GHR-2. KYDAQ Permit No. V-05-043 is available on the World Wide Web at:

<http://www.air.ky.gov/NR/rdonlyres/F3594ED6-7A1C-411D-90C9-5B2AD775DE4F/0/V05043Draft1705.pdf>

<sup>219</sup> LMAPCD Permit No. 145-97-TV.

<sup>220</sup> KU's September 5, 2006 Response to Commission Staff's August 21, 2006 Data Request No. 2(a); LG&E's September 5, 2006 Response to Commission Staff's August 21, 2006 Data Request No. 2(a); Transcript of Evidence at 34 (November 8, 2006).

“touchdowns,” where plumes invert and reach ground level.<sup>221</sup> Such sulfuric acid mist-laden plume touchdowns have at times resulted in complaints regarding “burning eyes, scratchy throats, and coughing.”<sup>222</sup> These potential human health impacts and other concerns have not escaped the notice of environmental regulators, who have administered their air programs to require mitigation of sulfur trioxide and sulfuric acid emissions, among others.

**2. Because Installing Sorbent Injection Technology Is Necessary To Ensure Continuous Compliance With State and Federal Environmental Laws and Regulations, Environmental Surcharge Recovery of the Costs for the Technology is Appropriate.**

The Commission should allow the Companies recovery of their sorbent injection technology costs because, though state and federal environmental authorities have not promulgated specific sulfur trioxide and sulfuric acid emission limits, the authorities have, as shown above, nonetheless expressed a clear requirement that regulated entities such as the Companies mitigate such emissions. As discussed below, KRS 278.183 does not actually require that an environmental regulation be include a “specific” emission limit in order for a utility to have surcharge recovery of the costs of complying with such a regulation. Thus, because state and federal authorities have expressed requirements that the Companies mitigate sulfur trioxide and sulfuric acid, the Companies should be granted surcharge recovery for the costs of their sorbent injection facilities.

Moreover, the Commission should defer to U.S. Environmental Protection Agency and the Kentucky Division for Air Quality concerning their expressed opinions that the Companies

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<sup>221</sup> KU’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(b); LG&E’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(b).

<sup>222</sup> *People ex rel. Madigan v. PSI Energy*, 847 N.E.2d 514, 516 (Ill. App. 2006).

should mitigate their sulfuric acid and sulfur trioxide emissions.<sup>223</sup> Indeed, a denial that the general duty provisions of KRS Chapter 224 and state and local opacity regulations constitute an “environmental requirement,” pursuant to which the Companies must mitigate such emissions, would directly contradict KYDAQ’s opinion thereon. The Commission should defer to the agencies’ charged with promulgating and administering the air program and possessing expertise in determining appropriate environmental controls. Consequently, the Commission should avoid conflict with the expressed opinion of the Kentucky Division for Air Quality by acknowledging that there are in fact environmental requirements necessitating that the Companies install the proposed sorbent injection facilities, and thus that the Companies are entitled to environmental surcharge recovery of the costs for such facilities.

Finally, even if KRS 278.183 is interpreted to contain a requirement that a project must be performed to comply with specific emission limits, there are unambiguously clear and specific state and local environmental emission limits for opacity.<sup>224</sup> To ensure continuous compliance with these opacity limits, it is necessary to mitigate sulfur trioxide and sulfuric acid, which can potentially increase plume opacity and result in “blue plume,” an actual discoloration of a plume. Thus, regardless of whether KRS 278.183 is understood to allow surcharge recovery only for compliance with “specific” emission limits, the Commission should allow the Companies surcharge recovery for the costs of their sorbent injection facilities to comply with specific state and local emissions opacity limits.

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<sup>223</sup> See, e.g., *Commonwealth v. Family Home Health Care*, 98 S.W.3d 524, 527 (Ky. Ct. App. 2003) (“[A]n administrative agency’s interpretation of its own regulations is entitled to substantial deference.”) (citing *Camera Center, Inc. v. Revenue Cabinet*, 34 S.W.3d 39 (Ky. 2000)).

<sup>224</sup> See 401 KAR 59:015; 401 KAR 60:005; 401 KAR 61:015; LMAPCD Regulation 7.06.



(a) **Kentucky’s Environmental Surcharge Statute, KRS 278.183, Does Not Contain a Requirement For A Specific Emission Limit that Prevents the Companies from Recovering by Surcharge their Costs of Sorbent Injection Facilities to Mitigate Sulfur Trioxide and Sulfuric Acid Emissions.**

Kentucky’s environmental surcharge statute, KRS 278.183, states: “[A] utility shall be entitled to the current recovery of its costs of complying with the Federal Clean Air Act as amended [CAAA] and those federal, state, or local environmental requirements which apply to coal combustion wastes and by-products resulting from the production of energy by the burning of coal.” Nowhere does KRS 278.183 require that a federal, state, or local environmental regulation be include a “specific” emission limit for a utility to receive surcharge recovery of related costs. Thus, because sulfur trioxide and sulfuric acid are wastes resulting from the Companies’ production of energy by burning coal and their control is necessary for compliance with the Clean Air Act and federal, state, and local environmental requirements, KRS 278.183 entitles the Companies to surcharge recovery of their sorbent injection technology costs.<sup>225</sup>

This plain-meaning understanding of KRS 278.183 is consistent with one of the most fundamental tenets of statutory interpretation, one Kentucky’s highest court has repeatedly and unequivocally embraced: When a statute’s language is clear and unambiguous, the plain meaning of the language is the only appropriate interpretation thereof.<sup>226</sup> Thus, as Kentucky’s Supreme Court stated, “We have a duty to accord to words of a statute their literal meaning unless to do so would lead to an absurd or wholly unreasonable conclusion.”<sup>227</sup> Moreover, as the Kentucky Court of Appeals has stated, “Ordinarily, we are bound to construe all statutory words and

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<sup>225</sup> KU’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2; LG&E’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2.

<sup>226</sup> *Hoy v. Kentucky Industrial Revitalization Authority*, 907 S.W.2d 766, 768 (Ky. 1995) (“[U]nder general rules of statutory construction, we may not interpret a statute at variance with its stated language.”); *Regional Jail Authority v. Tackett*, 770 S.W.2d 225, 229 (Ky. 1989) (“Where there is no ambiguity in a statute there is no need to resort to the rules of statutory construction in interpreting it.”); *Gateway Construction Co. v. Wallbaum*, 356 S.W.2d 247, 249 (Ky. 1962) (“Resort must be had first to the words, which are decisive if they are clear.”).

<sup>227</sup> *Bailey v. Reeves*, 662 S.W.2d 832, 834 (Ky. 1984).

phrases according to the common and approved usage of the language.”<sup>228</sup> Finally, “[W]here the legislature has not created exceptions to the terms of a statute, courts must presume that none were intended.”<sup>229</sup> Applying these overarching and complementary principles of statutory interpretation to KRS 278.183, it is clear that the language of the statute allows no room for creating a requirement for a specific emission limit; it simply states that a utility is entitled to recover through surcharge its costs of complying with the Clean Air Act and all federal, state, or local environmental requirements that apply to burning coal to produce energy, and there is no warrant for excepting from surcharge recovery costs of complying with environmental limits that do not happen to contain a specific emission limit. Indeed, the air program and individual air permits in fact impose many requirements on regulated sources that are not expressed in terms of specific emission limits.

Because KRS 278.183 is unambiguous and does not contain a requirement for a specific emission limit, any attempt to construe the statute as containing such a requirement would be contrary to Kentucky courts’ consistently stated prohibition against inserting requirements into statutes. For example, in *Bailey v. Reeves*, the Kentucky Supreme Court held that, because it had to “give the words of the statute written by the legislature their plain meaning,” the court could not “add[] restrictive language to [a statute] where it does not now exist.” The facts of *Bailey* required the court to determine whether to apply the general one-year statute of limitations for personal injuries to an action a truck driver, Bailey, brought against a non-operator of a motor vehicle, or whether to apply the Motor Vehicle Reparations Act (MVRA), which provided a two-year statute of limitations for actions “with respect to accidents occurring in the Commonwealth

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<sup>228</sup> *Revenue Cabinet v. JRS Data Systems, Inc.*, 738 S.W.2d 828, 829 (Ky. App. 1987).

<sup>229</sup> *Lindall v. Kentucky Retirement Systems*, 112 S.W.3d 391, 394 (Ky. App. 2003).

and arising from the ownership, maintenance, or use of a motor vehicle.”<sup>230</sup> The trial court and court of appeals, having read the MVRA to apply only to tort actions against an owner, operator, or occupant of a motor vehicle, held that the one-year statute of limitations applied to Bailey’s action, dismissing it as untimely filed.<sup>231</sup> The Kentucky Supreme Court reversed the court of appeals and trial court, finding impermissible the other courts’ reading into the MVRA restrictive language that simply did not exist in the plain terms of the MVRA, which provided for a two-year statute of limitations “with respect to accidents . . . arising from the ownership, maintenance, or use of a motor vehicle,” without regard for whether the plaintiff or defendant was the owner, operator, or occupant of the vehicle.<sup>232</sup> *Bailey* is only one of many such cases.<sup>233</sup> And just as in *Bailey*, the Commission would be without justification in this case if it read KRS 278.183 to include a requirement for a specific emission limit that would prevent the Companies from recovering sulfur trioxide and sulfuric acid mitigation costs, costs the Companies will incur to meet the stated requirement of Kentucky and federal authorities.

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<sup>230</sup> *Id.* at 833.

<sup>231</sup> *Id.*

<sup>232</sup> *Id.* at 834-35.

<sup>233</sup> *See, e.g., Lindall v. Kentucky Retirement Systems*, 112 S.W.3d 391, 394 (Ky. App. 2003) (“Courts are not at liberty add or subtract from a legislative enactment, nor to discover meaning not reasonably ascertainable from the language used. . . . Courts are also required to give the words of a statute their plain meaning, which prevents a court from adding language to the statute which does not presently exist.”); *McElroy v. Taylor*, 977 S.W.2d 929, 931 (Ky. 1998) (“‘We have a duty to accord to words of a statute their literal meaning unless to do so would lead to an absurd or wholly unreasonable conclusion.’ . . . If the legislature had wanted the phrase ‘except . . . matters of equity’ found in subpart (1) to be an absolute limitation of the district court’s probate jurisdiction, it easily could have placed the phrase in the prefatory language which applies to all three subparts, or it could have repeated the phrase in each subpart. It chose not to do so, and thus, we must conclude that the limitation does not apply to subparts (2) and (3).”); *J. Sutter’s Mill, Inc. v. Revenue Cabinet*, 793 S.W.2d 838, 840 (Ky. App. 1990) (“Furthermore, we are required to construe statutes according to their plain meaning. . . . We are not authorized to impose restrictive language upon a statute which contains none.”); *Berry v. Commonwealth*, 782 S.W.2d 625, 626 (Ky. 1990) (“Where a statute is intelligible on its face, the courts are not at liberty to supply words or insert something or make additions however just or desirable it might be to supply an omitted provision.”); *Division of Driver Licensing v. Bergmann*, 740 S.W.2d 948, 950 (Ky. 1987) (“The legislature chose not to impose a revocation period based on the characterization of the DUI conviction and the courts may not add this language to KRS 189A.070 where none exists now.”); *Reda Pump Co. v. TRW, Inc.*, 713 S.W.2d 818, 819-20 (Ky. 1986) (“We have long adhered to the rule in this jurisdiction that statutes will be construed according to the plain meaning of the words contained in the statute.”).

The Franklin Circuit Court has also shown that it will require the Commission to give effect to the plain words of statutes. In *Commonwealth ex rel. Chandler v. Kentucky Public Service Commission*, the court reversed a Commission order denying Kentucky Power Company's application for environmental surcharge recovery of the costs of installing low NO<sub>x</sub> burners.<sup>234</sup> The Commission had denied Kentucky Power recovery of such costs because Kentucky Power had not conducted a cost-benefit analysis or an evaluation of the available compliance options.<sup>235</sup> The court reversed the Commission's order because the words of KRS 278.183 required only that a compliance cost be "reasonable and cost-effective" to be recoverable, but did not create an evidentiary requirement necessitating a cost-benefit study or options analysis: "By reading an absolute requirement for a cost-benefit study and an options analysis into the statute, the PSC has violated the basic principle that it is unlawful for an agency to interpret a statute so as to add restrictive language when such language does not otherwise exist in the statute."<sup>236</sup> Given this precedent, the Commission should carefully interpret KRS 278.183 to mean what it says on its face, namely that the Companies may recover through the environmental surcharge mechanism costs for complying with the Clean Air Act and federal, state, or local environmental requirements, regardless of whether requirement in question is expressed in terms of an emission limit.

The Commission has often rightly interpreted and applied KRS 278.183 to allow recovery of environmental costs incurred in complying with environmental requirements other than specific emission limits; the Commission should do so in this case.<sup>237</sup> For example, the NO<sub>x</sub> SIP Call, CAIR, and CAMR regulations under the CAAA impose "cap and trade" programs

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<sup>234</sup> Civil Action Nos. 97-CI-01144, 97-CI-01138, 97-CI-01319, Order at 7 (April 30, 1998).

<sup>235</sup> *Id.*

<sup>236</sup> *Id.* (citing *Bailey v. Reeves*, 662 S.W.2d 832 (Ky. 1984)).

<sup>237</sup> KU's September 5, 2006 Response to Commission Staff's August 21, 2006 Data Request No. 2(b); LG&E's September 5, 2006 Response to Commission Staff's August 21, 2006 Data Request No. 2(b).

without any plant-specific emission limits, yet the Commission has allowed recovery of such compliance costs in prior Environmental Cost Recovery (ECR) cases.<sup>238</sup> In Case No. 2004-00421, the Commission allowed recovery of the costs of the Mill Creek wet stack conversion project aimed at controlling “reactive particle” emissions from the plant, even though there was no specific emission limit for reactive particles.<sup>239</sup> The Louisville Metro Area Pollution Control District (LMAPCD) required the measures pursuant to Regulation 1.09 (Prohibition of Air Pollution) and 1.12 (Control of Nuisances), general environmental protection requirements similar to the general duty provisions of KRS Chapter 224 cited by the Kentucky Division for Air Quality as authority for control of sulfur trioxide.<sup>240</sup> Thus, there is established precedent for the environmental surcharge recovery of costs incurred to comply with environmental requirements other than specific emission limits, precedent the Commission should follow by allowing the Companies surcharge recovery of their sorbent injection technology costs in these proceedings.<sup>241</sup>

In sum, KRS 278.183 simply does not contain a requirement for a specific emission limit, but does state that a utility “shall be entitled to the current recovery of its costs of complying with the Federal Clean Air Act and . . . federal, state, or local environmental requirements . . . .” As Kentucky courts, including the Franklin Circuit Court, have made clear, the Commission does not have authority to create such a requirement where none exists in the statute. Thus, because the Companies have established that state and federal agencies *require* the Companies to mitigate their sulfur trioxide and sulfuric acid emissions -- unlike American Electric Power

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<sup>238</sup> KU’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(b); LG&E’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(b).

<sup>239</sup> KU’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(b); LG&E’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(b).

<sup>240</sup> KU’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(b); LG&E’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(b).

<sup>241</sup> KU’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(b); LG&E’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(b).

which failed to provide such a direct link between proposed sulfur trioxide mitigation and regulatory requirements<sup>242</sup> -- the Companies have established that KRS 278.183 entitles the Companies to full environmental surcharge recovery of their costs of sulfur trioxide and sulfuric acid mitigation.

**(b) The Commission Should Defer to KYDAQ’s Opinion that KRS Chapter 224 Creates an Environmental Requirement for the Companies to Mitigate Sulfuric Acid and Sulfur Trioxide Emissions, as Well as USEPA’s Implicit Opinion that Utilities Like the Companies Must Mitigate Such Emissions.**

The federal and state agencies whose obligation it is to interpret and administer the environmental laws -- namely, the U.S. Environmental Protection Agency and the Kentucky Division for Air Quality -- have expressed clear opinions that the Companies must mitigate their sulfuric acid and sulfur trioxide emissions as necessary to comply with general duty and other requirements, opinions to which the Commission should defer by allowing the Companies environmental surcharge recovery of their sorbent injection facility costs. Kentucky’s courts have repeatedly stated that agencies are entitled to deference in their areas of expertise.<sup>243</sup> And the relevant expert agencies have spoken clearly concerning sulfuric acid and sulfur trioxide emission mitigation. In the supplemental notice of reconsideration for the CAIR rule, USEPA stated, “[W]e assumed that every unit that is projected to install SCR and/or wet FGD will incur

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<sup>242</sup> See *In the Matter of Application of Kentucky Power Co. for Approval of an Amended Compliance Plan for Purposes of Recovering Additional Costs of Pollution Control Facilities and to Amend its Environmental Cost Recovery Surcharge Tariff*, Case No. 2005-00068, Order at 9-11 (Sept. 7, 2005) (“Kentucky Power acknowledged ... that the AEP companies were installing the SO<sub>3</sub> mitigation equipment in order to address community concerns arising from an SO<sub>3</sub> plume.” In response to the Commission’s concerns about the lack a regulatory standard compelling sulfur trioxide mitigation, AEP pointed to the opacity regulation. However, the Commission found that AEP had failed to provide the necessary information linking the proposed action to the opacity standard).

<sup>243</sup> See, e.g., *Commonwealth v. Family Home Health Care*, 98 S.W.3d 524, 527 (Ky. Ct. App. 2003) (“[A]n administrative agency’s interpretation of its own regulations is entitled to substantial deference.”) (citing *Camera Center, Inc. v. Revenue Cabinet*, 34 S.W.3d 39 (Ky. 2000)).

increased costs for SO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub> [sulfur trioxide/sulfuric acid] mitigation.”<sup>244</sup> When the Companies contacted KYDAQ to confirm its position that the “General Duty” provisions of KRS Chapter 224 require necessary and appropriate action on a case by case basis to mitigate sulfuric acid and sulfur trioxide emissions that could potentially impact human health and the environment, KYDAQ stated unequivocally that it is “necessary and appropriate that such emission be controlled.”<sup>245</sup> Moreover, as KYDAQ recently expressed concerning the Ghent and Trimble generating facilities, increased sulfur trioxide emissions (and the resultant sulfuric acid mist) increase plume opacity, potentially contributing to violation of established emission limits for opacity.<sup>246</sup> It is therefore clear that both agencies believe the Companies should mitigate such emissions, and it furthermore appears that KYDAQ believes that the general duty provisions of KRS Chapter 224 constitute an “environmental requirement,” pursuant to which the Companies must mitigate such emissions. A denial of surcharge recovery of the costs of the Companies’ proposed sorbent injection facilities would directly contradict KYDAQ’s apparent opinion. The Commission should therefore defer to the agencies’ expertise in environmental requirements and avoid conflict with the expressed opinion of the Kentucky Division for Air Quality by acknowledging that there are in fact environmental requirements necessitating that the Companies install the proposed sorbent injection facilities, and thus that the Companies are entitled to environmental surcharge recovery of the costs for such facilities.

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<sup>244</sup> KU’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(a); LG&E’s September 5, 2006 Response to Commission Staff’s August 21, 2006 Data Request No. 2(a) (quoting *Rule To Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule): Supplemental Notice of Reconsideration*, 70 Fed. Reg. 77101, 77106 [December 29, 2005]). See also *New York et al. v. USEPA*, 413 F.3d 3 (D.C. Cir. 2005), which invalidated the Pollution Control Project Exemption formerly exempting sulfur trioxide/sulfuric acid emission increases associated with SCR/wet FGD installations, USEPA noted that “[a]s a result of that decision, either CAIR sources will need to mitigate [sulfur trioxide/sulfuric acid] emissions .... or they may choose to apply for NSR permits.” 70 Fed. Reg. at 77109. Please note that obtaining an NSR permit would involve implementation of pollution control measures far more expensive than sulfur trioxide abatement for which cost recovery is sought here. See Sargent and Lundy Study at 35-36.

<sup>245</sup> See Revlett KU Exhibit GHR-4; Revlett LG&E Exhibit GHR-4.

<sup>246</sup> See KYDAQ October 23, 2006 Air Inspection Report -- Partial Compliance Evaluation (Appendix 2) and November 2, 2006 Air Inspection Report -- Partial Compliance Evaluation (Appendix 3).

**(c) Even if KRS 278.183 Contains a Requirement for Specific Emission Limits, It Is Necessary for the Companies to Install Sorbent Injection Facilities To Ensure Continuous Compliance With Specific Opacity Limits.**

Though it would be incorrect to read a requirement for a specific emission limit into KRS 278.183, even if such a requirement is read into the statute, the Commission should allow the Companies environmental surcharge recovery of their sorbent injection facility costs. Sulfuric acid mist and sulfur trioxide can potentially discolor and increase the opacity of power plants' plumes, possibly resulting in violation of specific state and local particulate (opacity) standards under certain circumstances.<sup>247</sup> KYDAQ has promulgated several specific opacity limitation regulations that apply to Ghent Unit Nos. 1, 3, and 4, and Trimble County Unit No. 1, namely 401 KAR 59:015, 401 KAR 60:005, and 401 KAR 61:015. These regulations impose specific opacity limits for emissions of no greater than 20% (40% for Ghent Unit No. 1<sup>248</sup>), which limits are also reflected in the plants' emissions permits.<sup>249</sup> Sulfuric acid and sulfur trioxide, particulates that may potentially increase a plume's opacity, therefore must be mitigated in order to ensure continuous compliance with Kentucky's opacity regulations.

As discussed more fully in Section III.C.1 above, KYDAQ personnel have already observed that sulfuric acid emissions resulting from sulfur trioxide formation at the Companies' units may contribute to opacity limit violations under some conditions. These opacity limits are expressed in terms of a specific numerical standard, as shown herein, and mitigating sulfur trioxide and sulfuric acid emissions is necessary to ensure continuous compliance with opacity

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<sup>247</sup> KU's September 5, 2006 Response to Commission Staff's August 21, 2006 Data Request No. 2(b); LG&E's September 5, 2006 Response to Commission Staff's August 21, 2006 Data Request No. 2(b).

<sup>248</sup> The regulation that limits opacity for Ghent Unit No. 1, 401 KAR 61:015, prescribes a less onerous opacity constraint (i.e., 40%) on units that were under construction no later than August 17, 1971. *See* 401 KAR 61:015 § 4(4).

<sup>249</sup> KYDAQ Permit Nos. V-02-043 and V-05-043.



limits, notwithstanding that there are currently no permit limits for sulfuric acid emissions for any of the Companies' units except Trimble County Unit No. 2. As Mr. Revlett testified, the Companies must continue to meet their opacity limits on a day-in, day-out basis, which will require sulfur trioxide and sulfuric acid mitigation.<sup>250</sup>

LMAPCD likewise has imposed opacity limits on Mill Creek Units 3 and 4, which, in order to ensure continuous compliance, require sulfuric acid and sulfur trioxide mitigation as well. Section 4 of LMAPCD Regulation 7.06 requires that the emissions from these units not exceed 20% opacity. The units' LMAPCD emission permit also references a 20% opacity limit.<sup>251</sup> Because sulfuric acid and sulfur trioxide may increase plume opacity under some conditions, they must be mitigated to ensure continuous compliance with these established opacity limits.

### **3. The Companies' Sorbent Injection Facilities are Reasonable and Cost-Effective Means of Meeting the Requirements of Relevant Environmental Regulations**

As shown in the *Sargent & Lundy SO<sub>3</sub> Mitigation Study*<sup>252</sup> and *2006 SO<sub>3</sub> Mitigation Strategy for Kentucky Utilities and Louisville Gas and Electric*,<sup>253</sup> the proposed sorbent injection facilities provide the least cost alternative to mitigate sulfur trioxide and sulfuric acid emissions.<sup>254</sup>

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<sup>250</sup> *Id.* at 36-38.

<sup>251</sup> LMAPCD Permit No. 145-97-TV.

<sup>252</sup> Malloy KU Exhibit JPM-4; Malloy LG&E Exhibit JPM-3.

<sup>253</sup> Malloy KU Exhibit JPM-5; Malloy LG&E Exhibit JPM-4.

<sup>254</sup> Malloy KU at 20; Malloy LG&E at 11.

Also, reliance on market purchases of energy and/or NO<sub>x</sub> allowances to meet Title V operating permit requirements is subject to volatile market conditions and eliminates the Company's ability to be self-compliant to environmental laws and regulations.<sup>255</sup>

**D. The Companies' Mercury Monitor Facilities are Reasonable and Cost-Effective**

In compliance with the CAMR, mercury monitors are required to be installed and certified prior to January 1, 2009 to facilitate full year compliance reporting and mercury allowance tracking on January 1, 2010.<sup>256</sup> In order to add mercury monitors, the data loggers and software must be upgraded.<sup>257</sup> This replacement must take place in 2006 to accommodate new recordkeeping and reporting software in 2007 and to be able to certify monitors for mercury in 2008.<sup>258</sup> The new recordkeeping and reporting software also supports the new format changes that the USEPA has instituted for Electronic Data Reporting (EDR).<sup>259</sup>

**1. The Companies' Mercury Monitor Facilities are Necessary to Comply with Relevant Environmental Regulations**

CAMR requires the monitoring of mercury emissions beginning January 1, 2009.<sup>260</sup> Therefore, mercury monitoring equipment must be purchased, installed and certified before that date.<sup>261</sup> 40 CFR Part 75 continuous emission monitoring installation and certification procedures will be followed to place these monitors in operation.<sup>262</sup>

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<sup>255</sup> Malloy KU at 21; Malloy LG&E at 11.

<sup>256</sup> Malloy KU at 21; Malloy LG&E at 11-12.

<sup>257</sup> Malloy KU at 21; Malloy LG&E at 12.

<sup>258</sup> Malloy KU at 21; Malloy LG&E at 12.

<sup>259</sup> Malloy KU at 21; Malloy LG&E at 12.

<sup>260</sup> Revlett KU at 9; Revlett LG&E at 10.

<sup>261</sup> Revlett KU at 9; Revlett LG&E at 10.

<sup>262</sup> Revlett KU at 9; Revlett LG&E at 10.

No new permits are required for the installation of this equipment.<sup>263</sup> Existing Title V Operating Permits will be revised to reflect the installation and operation of these monitors.<sup>264</sup>

**2. The Companies' Proposed Mercury Monitoring Facilities are Reasonable and Cost-Effective Means of Complying with Applicable Environmental Regulations**

The proposed mercury monitoring facilities provide the only means of compliance with the CAMR which requires monitoring, tracking, and reporting of mercury emissions,<sup>265</sup> and are therefore cost-effective and reasonable per se.

**E. KU's Selective Catalytic Reduction Facility at Ghent Unit No. 2 is Reasonable and Cost-Effective**

As discussed more fully in Section II above, the proposed SCR facility for Ghent Unit No. 2 is required to comply with CAAA and CAIR regulations, as well as Ghent's Title V Operating Permit V-97-025.<sup>266</sup> The proposed SCR facility is the least cost approach to environmental compliance as the option reduces the present value of revenue requirements by \$59 million when compared to purchasing allowances alone.<sup>267</sup>

**F. KU's Electrostatic Precipitators at the Brown Generation Station are Reasonable and Cost-Effective Facilities**

Project 27 in the KU 2006 Environmental Compliance Plan is a collection of projects that are part of a multi-year plan (2006 – 2008) to maintain the structural integrity of the existing flue

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<sup>263</sup> Revlett KU at 9; Revlett LG&E at 10.

<sup>264</sup> Revlett KU at 9; Revlett LG&E at 10.

<sup>265</sup> Malloy KU at 22; Malloy LG&E at 12.

<sup>266</sup> Malloy KU at 22.

<sup>267</sup> Malloy KU at 22.

gas duct work systems and to maintain the functional operation of the existing DESP.<sup>268</sup> Through normal operation of the units, the duct work is subject to thinning from corrosion and erosion.<sup>269</sup> Additionally, the DESPs are subject to the same operational effects as the duct work.<sup>270</sup> Specifically, E.W. Brown Unit No. 1 DESP inlet duct will be replaced in 2007.<sup>271</sup> E.W. Brown Unit No. 2 DESP plates and electrodes will be replaced in 2007.<sup>272</sup> E.W. Brown Unit No. 3 will replace the DESP key interlock system and the induced draft fan inlet duct to the stack.<sup>273</sup>

### **1. KU's Electrostatic Precipitators are Necessary to Comply with Relevant Environmental Regulations**

The Title V Operating Permit for E.W. Brown Station<sup>274</sup> places a particulate matter emission limitation on each of the units at the station.<sup>275</sup> (No new permits will be required to accomplish this work.<sup>276</sup>) Regulation 401 KAR 50:055 also stipulates that emission units and associated pollution control devices must be maintained and operated in a manner consistent with good air pollution control practices for minimizing emissions.<sup>277</sup> The electrostatic precipitators are the particulate matter emission control devices for these units.<sup>278</sup> Proper operation of these devices is needed to ensure compliance with the permit limitation.<sup>279</sup> This project will allow the devices to be operated properly.

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<sup>268</sup> Malloy KU at 22.

<sup>269</sup> Malloy KU at 22-23.

<sup>270</sup> Malloy KU at 23.

<sup>271</sup> Malloy KU at 23.

<sup>272</sup> Malloy KU at 23.

<sup>273</sup> Malloy KU at 23.

<sup>274</sup> Revlett KU Exhibit GHR-5.

<sup>275</sup> Revlett KU at 13.

<sup>276</sup> Revlett KU at 13.

<sup>277</sup> Revlett KU at 13.

<sup>278</sup> Revlett KU at 13.

<sup>279</sup> Revlett KU at 13.

**2. KU's Electrostatic Precipitators are a Cost-effective and Reasonable Means of Complying with Applicable Environmental Regulations**

Maintaining the useful life of existing assets provides a lower cost alternative to complete asset replacement.<sup>280</sup> Therefore, Project 27 provides the least-cost viable approach for the management of flue gas emissions and the collection of fly ash.<sup>281</sup>

**G. LG&E's Particulate Monitors at the Mill Creek Plant are Reasonable and Cost-Effective Facilities**

Mill Creek Station converted all four generating units to "wet stack" operation requiring a change to monitoring methodologies.<sup>282</sup> Particulate matter (PM) monitoring devices were installed consistent with the Title V operating permit and an Agreed Board Order approved by LMAPCD.<sup>283</sup>

The PM monitors were installed in the stacks at the "official" continuous emissions monitoring platform.<sup>284</sup> The PM monitors extract a sample of flue gas and dry the sample before going through a forward light scatter measurement section.<sup>285</sup> The signal is then correlated to PM.<sup>286</sup> The monitors were tested using USEPA required tests and a testing protocol, Performance Specification 11.<sup>287</sup>

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<sup>280</sup> Malloy KU at 23.

<sup>281</sup> Malloy KU at 23.

<sup>282</sup> Malloy LG&E at 12.

<sup>283</sup> Malloy LG&E at 12-13. The Agreed Board Order is included at Revlett LG&E Exhibit GHR-4.

<sup>284</sup> Malloy LG&E at 13.

<sup>285</sup> Malloy LG&E at 13.

<sup>286</sup> Malloy LG&E at 13.

<sup>287</sup> Malloy LG&E at 13.

**1. LG&E's Particulate Monitors are a Necessary Means of Complying with Relevant Environmental Regulations**

Compliance with federal (40 CFR Part 60) and local (Louisville Metro Air Pollution Control District Regulations 6.02, 6.07, 7.01 and 7.06) particulate matter emissions standards is the paramount need for this project.<sup>288</sup> These regulations require the application of emission monitoring equipment to ensure that compliance is met.<sup>289</sup> Specifically, opacity monitoring equipment is stated in the regulation as the method for indicating compliance with the particulate matter standard.<sup>290</sup> However, the saturated flue gas conditions that occur within Mill Creek Station's stacks do not allow accurate opacity measurement at the emission exit point using ordinary opacity monitors.<sup>291</sup>

To deal with this issue, the Title V Operating Permit for Mill Creek Station<sup>292</sup> was written to allow the investigation of an extractive opacity monitor to determine whether this new monitoring technology would allow for the measurement of opacity in a wet flue gas environment.<sup>293</sup> Testing of the device was performed.<sup>294</sup> However, the results were inconclusive within the timeframe of deadlines stipulated within the Title V Operating Permit.<sup>295</sup>

Because of this result and to meet installation deadlines outlined in the Title V Operating Permit, four ordinary opacity monitors along with associated equipment and structures were installed at the exit of the electrostatic precipitator of Mill Creek Unit 1.<sup>296</sup> However, monitoring

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<sup>288</sup> Revlett LG&E at 10.

<sup>289</sup> Revlett LG&E at 10.

<sup>290</sup> Revlett LG&E at 10-11.

<sup>291</sup> Revlett LG&E at 11.

<sup>292</sup> Revlett LG&E Exhibit GHR-2.

<sup>293</sup> Revlett LG&E at 11.

<sup>294</sup> Revlett LG&E at 11.

<sup>295</sup> Revlett LG&E at 11.

<sup>296</sup> Revlett LG&E at 11.

in this location has not accurately depicted what emissions are actually being emitted into the environment (at the stack).<sup>297</sup>

In continuing to strive for an accurate emission monitoring device, LG&E entered into an Agreed Board Order on December 14, 2004, with LMAPCD<sup>298</sup> to investigate particulate matter continuous emission monitoring equipment.<sup>299</sup> The Agreed Order suspended any further installation deadlines as specified within the Title V Operating Permit.<sup>300</sup> The ensuing investigation showed the installed device to be an excellent monitor of particulate matter emissions in a wet flue gas.<sup>301</sup> On November 1, 2005, LMAPCD<sup>302</sup> approved the installation of the device on all four units at Mill Creek Station as an alternate monitoring methodology to continuous opacity measurement.<sup>303</sup>

No new permits were required for the installation of this equipment.<sup>304</sup> The Approval Letter from LMAPCD<sup>305</sup> stipulated a timeframe for the installations of monitoring devices. The PM Continuous Emissions Monitoring Systems (CEMS) were approved and have been installed.<sup>306</sup> Per LMAPCD's approval of the particulate matter monitoring device, the Title V Operating Permit will be amended to indicate that PM CEMS are to be used to demonstrate compliance with applicable PM standards.<sup>307</sup>

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<sup>297</sup> Revlett LG&E at 11.

<sup>298</sup> Revlett LG&E Exhibit GHR-5.

<sup>299</sup> Revlett LG&E at 11.

<sup>300</sup> Revlett LG&E at 11.

<sup>301</sup> Revlett LG&E at 11.

<sup>302</sup> Revlett LG&E Exhibit GHR-6.

<sup>303</sup> Revlett LG&E at 11-12.

<sup>304</sup> Revlett LG&E at 12.

<sup>305</sup> Revlett LG&E Exhibit GHR-6.

<sup>306</sup> Revlett LG&E at 12.

<sup>307</sup> Revlett LG&E at 12.

**2. LG&E's Particulate Monitors are a Cost-Effective and Reasonable Means of Complying with Applicable Environmental Regulations**

LG&E's particulate monitors (Project 21) provided the only accurate measurement of PM approved by the LMAPCD.<sup>308</sup> They are therefore reasonable and cost-effective per se.

**3. Placing Mill Creek's Current Opacity Monitors in Inventory Is a Cost-Effective Means of Continuing Environmental Compliance**

As LG&E explained in its response to the Commission Staff's July 26, 2006 Data Request No. 10, a consequence of installing Project 21's particulate monitors at Mill Creek will be the placing in inventory of Mill Creek's current "dry stack" opacity monitors, the costs of which opacity monitors LG&E will continue to recover through base rates because the monitors will continue to be used and useful. As John Malloy explained in his live testimony before the Commission in this proceeding, because the E.W. Brown, Green River, Tyrone, and Cane Run generating stations continue to use "dry stack" opacity monitors identical to those that LG&E will remove from Mill Creek, the inventoried monitors will serve as full replacements or as sources of spare parts for the monitors that remain in service at the other generating stations. Because replacement "dry stack" monitors and spare parts for them are becoming more difficult to find due to the industry-wide movement toward "wet stack" configurations, it will be most cost effective to keep the Mill Creek "dry stack" monitors in inventory in order to keep the other in-service "dry stack" monitors functioning, and particularly to prevent extended outages that might result from delays in finding spare parts or replacement systems from vendors who stock such replacements and spare parts less and less. Therefore, because the Mill Creek "dry stack" opacity monitors will not be retired and will continue to be used and useful for staying in

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<sup>308</sup> Malloy LG&E at 13. See Revlett LG&E Exhibit GHR-5 (LMAPCD Agreed Order).



compliance with relevant environmental regulations, LG&E should not be required to adjust its environmental surcharge by the cost of the monitors that is being recovered through base rates.

#### **IV. LG&E'S AND KU'S AMENDED ENVIRONMENTAL SURCHARGE TARIFFS ARE REASONABLE**

##### **A. LG&E and KU's Proposed Rate of Return is Reasonable**

The Companies are currently allowed a return on equity (ROE) of 10.50 percent.<sup>309</sup> They are requesting a continuation of the 10.50 percent ROE in this proceeding because this level of ROE is still reasonable and is, in fact, conservative under the economic conditions prevailing currently.<sup>310</sup> An examination of (1) allowed returns on common equity for utilities in general, (2) the recent level and trend in interest rates, and (3) the projected course of interest rates shows this to be the case.<sup>311</sup>

According to Regulatory Research Associates *Regulatory Focus* of April 5, 2006, allowed returns for electric utilities and gas utilities in the first quarter of 2006 averaged 10.4 percent and 10.6 percent, respectively.<sup>312</sup> For calendar year 2005, electric utilities and gas utilities were both allowed an average return on equity of 10.50 percent.<sup>313</sup> Thus, an allowed return of 10.50 percent for the Companies for ECR purposes is within the mainstream of allowed

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<sup>309</sup> Blake KU at 8 (citing the Commission's June 20, 2005 Order in Case No. 2004-00426, *In the Matter of: The Application of Kentucky Utilities Company for a Certificate of Public Convenience and Necessity to Construct Flue Gas Desulfurization Systems and Approval of its 2004 Compliance Plan for Recovery by Environmental Surcharge*); *In the Matter of the Application of Louisville Gas and Electric Company for Approval of its 2006 Compliance Plan for Recovery by Environmental Surcharge*, Case 2006-00208, Direct Testimony of Kent W. Blake at 5 (June 23, 2006) ("Blake LG&E") (citing the Commission's June 20, 2005 Order in Case No. 2004-00421, *In the Matter of: The Application of Louisville Gas and Electric Company for Approval of Its 2004 Compliance Plan for Recovery by Environmental Surcharge*).

<sup>310</sup> Blake KU at 8; Blake LG&E at 5.

<sup>311</sup> Blake KU at 9; Blake LG&E at 5.

<sup>312</sup> Blake KU at 9 (Exhibit KWB-1 contains a complete copy of this publication); Blake LG&E at 5 (Exhibit KWB-1 contains a complete copy of this publication).

<sup>313</sup> Blake KU at 9; Blake LG&E at 5.

return for utilities in general.<sup>314</sup> Though such awards do not necessarily determine what ROE should be awarded in a case, the Commission has found such awards do “indicate a reasonableness measure for a company’s allowed ROE.”<sup>315</sup>

In addition, these allowed ROEs are consistent with those recently authorized by this Commission in cases involving other investor-owned utilities serving Kentucky.<sup>316</sup> Most recently, on March 14, 2006, the Commission approved a settlement agreement<sup>317</sup> that, among other things, authorized the use of a 10.5 percent rate of return on equity for environmental surcharge purposes and for accounting for allowance for funds used during construction.<sup>318</sup>

There has generally been an upward trend in the level of interest rates for 10- and 20-year Treasury bonds, A-rated utility bonds and Aaa-rated corporate bonds for the period January 2005-May 2006, with an acceleration in the increase noticeable over the past several months.<sup>319</sup> On a spot basis -- comparing May 2006 with June 2005 (when the Commission rendered its Order in the last ECR proceeding) -- interest rates are up about one full percentage point.<sup>320</sup> In fact, on a six-month average basis, interest rates are up roughly 30-40 basis points.<sup>321</sup>

Projections of interest rates show that the upward trend in interest rates is forecast to continue.<sup>322</sup> For example, *The Value Line Quarterly Economic Review* of May 26, 2006 shows that 10-year and long-term Treasury securities are projected to rise to the level of 5.3 percent and

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<sup>314</sup> Blake KU at 9; Blake LG&E at 5.

<sup>315</sup> *In the Matter of: The Application of Kentucky Utilities Company For A Certificate Of Public Convenience and Necessity To Construct Flue Gas Desulphurization Systems And Approval Of Its 2004 Compliance Plan For Recovery By Environmental Surcharge*, Case No. 2004-00426, Order, p. 27 (June 20, 2005). See Blake KU at 9; Blake LG&E at 5.

<sup>316</sup> Blake KU at 9; Blake LG&E at 6.

<sup>317</sup> *In the Matter of: General Adjustments of Electric Rates of Kentucky Power Company*, Case No. 2005-00341, Appendix A, Settlement Agreement, Paragraph 7.

<sup>318</sup> Blake KU at 9-10; Blake LG&E at 6.

<sup>319</sup> Blake KU at 10 and Exhibit KWB-2; Blake LG&E at 6 and Exhibit KWB-2.

<sup>320</sup> Blake KU at 10; Blake LG&E at 6.

<sup>321</sup> Blake KU at 10 and Exhibit KWB-2; Blake LG&E at 6 and Exhibit KWB-2.

<sup>322</sup> Blake KU at 10; Blake LG&E at 6.

5.5 percent, respectively, by 2008.<sup>323</sup> AAA-rated Corporate Bonds are projected to increase to 6.4 percent by that time period.<sup>324</sup>

Based on the above data and comparisons, a continuation of the 10.50 percent allowed ROE for ECR purposes is reasonable, and even conservative.<sup>325</sup>

**B. The Costs to be Recovered Through the ECR are Not Already Included in Base Rates**

**1. Capital Expenditures**

None of the Companies' proposed capital expenditures for the new and additional pollution control facilities in this case is already included in existing rates.<sup>326</sup> The current base rates were determined to be fair, just and reasonable by the Commission in its most recent rate case orders for the Companies, issued June 30, 2004.<sup>327</sup> In making that determination, the Commission evaluated the reasonableness of the Companies' regulated return from Kentucky jurisdictional operations using the twelve month period ending September 30, 2003, as the test period, adjusted for known and measurable changes.<sup>328</sup> No capital expenditures for the new and additional pollution control facilities included in this case were incurred by the Companies

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<sup>323</sup> Blake KU at 10 and Exhibit KWB-3; Blake LG&E at 6 and Exhibit KWB-3.

<sup>324</sup> Blake KU at 10; Blake LG&E at 6.

<sup>325</sup> Blake KU at 10; Blake LG&E at 6.

<sup>326</sup> *In the Matter of the Application of Kentucky Utilities Company for a Certificate of Public Convenience and Necessity to Construct a Selective Catalytic Reduction System and Approval of its 2006 Compliance Plan for Recovery by Environmental Surcharge*, Case 2006-00206, Direct Testimony of Shannon L. Charnas at 5 (June 23, 2006) ("Charnas KU"); *In the Matter of the Application of Louisville Gas and Electric Company for Approval of its 2006 Compliance Plan for Recovery by Environmental Surcharge*, Case 2006-00208, Direct Testimony of Shannon L. Charnas at 5 (June 23, 2006) ("Charnas LG&E").

<sup>327</sup> Charnas KU at 5 (citing Case No. 2003-00434, *In the Matter of: An Adjustment of the Electric Rates, Terms and Conditions of Kentucky Utilities Company*); Charnas LG&E at 5 (citing Case No. 2003-00433, *In the Matter of: An Adjustment of the Gas and Electric Rates, Terms and Conditions of Louisville Gas and Electric Company*).

<sup>328</sup> Charnas KU at 5; Charnas LG&E at 5.

during or prior to the twelve-month period ending September 30, 2003, or included as adjustments thereto.<sup>329</sup>

## **2. Operations and Maintenance Expenses**

The Companies are seeking recovery only of operations and maintenance (O&M) expenses associated with new environmental projects, not already existing projects, and the Companies are requesting that the Commission consider O&M recovery for pollution control equipment at Trimble County Unit No. 2.<sup>330</sup> There are no O&M savings related to these new projects.<sup>331</sup>

### **(a) KU**

The projects for which KU is seeking recovery of O&M expense are Project Nos. 23, 24, 25 and 26.<sup>332</sup> Project 23 relates to the O&M expenses associated with the pollution control equipment to be installed at Trimble County Unit 2. The estimated O&M expense for the first full year of operation (2011) is approximately \$4.5 million.<sup>333</sup> Project 24 relates to the installation of sorbent injection equipment on Ghent Unit Nos. 1, 3, and 4.<sup>334</sup> This project includes O&M costs estimated to be \$0.9 million in 2007, \$1.5 million in 2008, and annual O&M costs beginning in 2009 of approximately \$3.8 million.<sup>335</sup> The change in cost is due to the timing of completion of the projects in addition to the requirement to operate the SCRs year-

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<sup>329</sup> Charnas KU at 5; Charnas LG&E at 5.

<sup>330</sup> KU's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 15; LG&E's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 9.

<sup>331</sup> Charnas KU at 6; Charnas LG&E at 6.

<sup>332</sup> Charnas KU at 2; KU's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 15.

<sup>333</sup> KU's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 15.

<sup>334</sup> Charnas KU at 2.

<sup>335</sup> Charnas KU at 2.

round beginning in 2009 rather than just during the ozone season (May – September).<sup>336</sup> Project No. 25 relates to the installation of mercury emission monitors on all generating units and includes annual O&M costs of approximately \$790 thousand.<sup>337</sup> Project 26 relates to the installation of Selective Catalytic Reduction (“SCR”) and Sorbent Injection equipment on Ghent Unit 2, and includes annual O&M costs estimated to be approximately \$1.4 million for each, respectively.<sup>338</sup>

**(b) LG&E**

The projects for which LG&E is seeking recovery of O&M expense are Project Nos. 18, 19, and 20.<sup>339</sup> Project 18 relates to the O&M expenses associated with the pollution control equipment to be installed at Trimble County Unit 2. The estimated O&M expense for the first full year of operation (2011) is approximately \$1.1 million.<sup>340</sup> Project 19 relates to the installation of sorbent injection equipment on Mill Creek Units 3 and 4 and on Trimble County Unit 1.<sup>341</sup> This project includes O&M costs estimated to be \$0.9 million in 2007, \$0.9 million in 2008, and annual O&M costs beginning in 2009 of approximately \$2.2 million.<sup>342</sup> The change in cost is due to the requirement to operate the SCRs year-round beginning in 2009, rather than just during the ozone season (May – September).<sup>343</sup> Project No. 20 relates to the installation of

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<sup>336</sup> Charnas KU at 2-3.

<sup>337</sup> Charnas KU at 3.

<sup>338</sup> Charnas KU at 3.

<sup>339</sup> Charnas LG&E at 2; LG&E’s August 7, 2006 Response to Commission Staff’s July 24, 2006 Data Request No. 9.

<sup>340</sup> LG&E’s August 7, 2006 Response to Commission Staff’s July 24, 2006 Data Request No. 9.

<sup>341</sup> Charnas LG&E at 2.

<sup>342</sup> Charnas LG&E at 2.

<sup>343</sup> Charnas LG&E at 3.

mercury emission monitors on all generating units and includes annual O&M costs estimated to be approximately \$612,000.<sup>344</sup>

### (c) Identifying O&M Expenses

The Companies' accounting systems permit the tracking of costs in accordance with the Federal Energy Regulatory Commission's (FERC) Uniform System of Accounts.<sup>345</sup> The Companies intend to use FERC Account Nos. 502, Steam Expenses – Operation and 512, Maintenance of Boiler Plant, to identify and track O&M expenses associated with the sorbent injection, mercury emission monitors, and SCR projects once they become operational.<sup>346</sup> The Companies will use subaccounts to track specific expenses and location codes to track expenses by unit.<sup>347</sup> Since the Companies' above-discussed sorbent injection, mercury emission monitor, and SCR equipment are new, there is no expense currently in base rates for these units and the Companies will only include in its monthly surcharge filings O&M associated with new equipment.<sup>348</sup>

### 3. Existing Facilities

The installation of the new pollution control facilities proposed in these proceedings will not replace or cause existing facilities currently included in LG&E's environmental compliance rate base to be removed from service for LG&E;<sup>349</sup> the same is not true for KU, however. For

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<sup>344</sup> Charnas LG&E at 3.

<sup>345</sup> Charnas KU at 3; Charnas LG&E at 3.

<sup>346</sup> Charnas KU at 3; Charnas LG&E at 3.

<sup>347</sup> Charnas KU at 3; Charnas LG&E at 3.

<sup>348</sup> Charnas KU at 3; Charnas LG&E at 3.

<sup>349</sup> Charnas LG&E at 5. The particulate monitors installed at LG&E's Mill Creek Unit Nos. 1, 2, 3, and 4 in 2005 and 2006 replaced then-in-service opacity monitors; however, the replaced opacity monitors neither were nor are included in LG&E's environmental compliance rate base. See LG&E's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 9; LG&E's September 7, 2006 Response to Commission Staff's August 21,

KU, Project No. 27 results in the removal from service of existing assets totaling approximately \$57,000.<sup>350</sup> The construction costs of the project have been reduced by this amount.<sup>351</sup> During the construction of the project, as existing equipment is replaced, labor associated with the removal will be charged to Retirement Work in Process (RWIP).<sup>352</sup> Upon completion of the project, the book value of the assets replaced will be removed from the Plant In Service account.<sup>353</sup> Accumulated Depreciation and all associated RWIP charges will be removed from the Reserve for Accumulated Depreciation account and the monthly ECR filings will be adjusted to reflect the retirements.<sup>354</sup> As described above, when appropriate, KU will adjust the monthly ECR filings to reflect asset retirements in conformity with prior Commission Orders and consistent with KU's current practice.<sup>355</sup>

### **C. The Companies' Proposed Tariff Changes are Reasonable**

The Companies' proposed changes to their Environmental Cost Recovery tariff are reasonable and should be approved by the Commission. As shown below, the Companies' proposed changes in the determination of their ECR billing factors will not harm the customer and will more closely align the revenues used to determine the billing factors and the revenues to which the billing factors are applied. If approved, the modifications will result in language

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2006 Second Data Request No. 5. Thus, replacing the monitors does not necessitate an adjustment to the environmental surcharge calculations involved in this application. LG&E's September 7, 2006 Response to Commission Staff's August 21, 2006 Second Data Request No. 5.

<sup>350</sup> Charnas KU at 6.

<sup>351</sup> Charnas KU at 6. *See* Malloy KU at Exhibit JPM-1.

<sup>352</sup> Charnas KU at 6.

<sup>353</sup> Charnas KU at 6.

<sup>354</sup> Charnas KU at 6.

<sup>355</sup> Charnas KU at 6.

revisions to the Companies' ECR tariff sheets, which revised tariffs the Companies have submitted in this proceeding for the Commission's review.<sup>356</sup>

### 1. The Companies' Proposed Change to R(m)

The Companies will use the currently approved methodologies for calculating the environmental surcharge already approved by the Commission in the relevant Cases.<sup>357</sup> The calculation of the monthly Environmental Surcharge billing factor will continue to consolidate the 2001, 2003 and 2005 Environmental Compliance Plans and if approved, the proposed 2006 Plan.<sup>358</sup> However, the Companies are proposing a modification to the determination of R(m).<sup>359</sup>

Under current practice, the Companies determine R(m) by deducting all non-jurisdictional revenues, all Fuel Adjustment Clause (FAC) revenues and all ECR revenues from each month's total revenues according to the financial records.<sup>360</sup> The remaining balance is treated as base revenues, and R(m) is the sum of base revenues and FAC revenues.<sup>361</sup> That remaining balance, however, is actually net of demand side management (DSM), small time-of-day (STOD) program cost recovery factor (PCRF), merger surcredit (MSR) and value delivery

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<sup>356</sup> Conroy KU at 2 (tariff sheets at Exhibits RMC-1 and RMC-2); Conroy LG&E at 2 (tariff sheets at Exhibits RMC-1 and RMC-2).

<sup>357</sup> Conroy KU at 2 (citing Case Nos. 2000-439, *In the Matter of: The Application of Kentucky Utilities Company for Approval of an Amended Compliance Plan for Purposes of Recovering the Costs of New and Additional Pollution Control Facilities and to Amend Its Environmental Cost Recovery Surcharge Tariff*; 2002-00146, *In the Matter of: The Application of Kentucky Utilities Company for Approval of Its 2002 Compliance Plan for Recovery by Environmental Surcharge*; and 2004-00426, *In the Matter of: The Application of Kentucky Utilities Company for a Certificate of Public Convenience and Necessity to Construct Flue Gas Desulfurization Systems and Approval of Its 2004 Compliance Plan for Recovery by Environmental Surcharge*); Conroy LG&E at 2 (citing Case Nos. 2000-386, *In the Matter of: Application of Louisville Gas and Electric Company for Approval of an Amended Compliance Plan for Purposes of Recovering the Costs of New and Additional Pollution Control Facilities and to Amend Its Environmental Cost Recovery Surcharge Tariff*; 2002-00147, *In the Matter of: The Application of Louisville Gas and Electric Company for Approval of Its 2002 Compliance Plan for Recovery by Environmental Surcharge*; and 2004-00421, *In the Matter of: The Application of Louisville Gas and Electric Company for Approval of Its 2004 Compliance Plan for Recovery by Environmental Surcharge*).

<sup>358</sup> Conroy KU at 2; Conroy LG&E at 2.

<sup>359</sup> Conroy KU at 2; Conroy LG&E at 2.

<sup>360</sup> Conroy KU at 2; Conroy LG&E at 2.

<sup>361</sup> Conroy KU at 2; Conroy LG&E at 2.



surcredit (VDT) revenues.<sup>362</sup> The Companies propose that the determination of R(m) be refined by removing the above referenced revenues from total revenue, leaving base revenues as the sum of customer charges, energy charges and demand charges, and R(m) as the sum of base revenues and FAC, DSM, and STOD PCRf revenues.<sup>363</sup> Therefore, if the Commission accepts the Companies' proposal, R(m) as determined in the monthly filings will closely approximate the revenues to which the monthly ECR billing factor is applied (i.e. base revenue plus fuel adjustment clause plus demand-side management plus STOD PCRf).<sup>364</sup>

The Companies are proposing the change to R(m) so that the revenues used to determine the environmental surcharge factor are consistent with the revenues to which the environmental surcharge factor is applied on customer bills.<sup>365</sup> When the ECR was initially established, STOD, MSR, and VDT were not established rate schedules and therefore were not included in the determination of R(m).<sup>366</sup> As these rate schedules were established, the revenue (or surcredit) was included in R(m).<sup>367</sup>

## **2. The Companies' Proposed Change Will Not Impact Customers But Will More Closely Align the Revenues Used to Determine the Billing Factor and the Revenues to Which the Billing Factor is Applied**

There will be a de minimis impact to customers by changing the determination of R(m).<sup>368</sup> Though the proposed change to the determination of R(m) does slightly change the

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<sup>362</sup> Conroy KU at 3; Conroy LG&E at 3.

<sup>363</sup> Conroy KU at 3; Conroy LG&E at 3.

<sup>364</sup> Conroy KU at 3; Conroy LG&E at 3.

<sup>365</sup> Conroy KU at 3; Conroy LG&E at 3.

<sup>366</sup> Conroy KU at 3; Conroy LG&E at 3.

<sup>367</sup> Conroy KU at 3; Conroy LG&E at 3.

<sup>368</sup> KU's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 16; LG&E's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 11. For KU, the "de minimis" impact of the proposed change to R(m) means, using June 2006 data, KU's jurisdictional allocation factor increases slightly, from 80.81 % as filed using current procedures to 81.20%. This increase of 39 basis points in the jurisdictional allocation factor increases Jurisdictional E(m) by \$14,203, or 0.5% for the expense month of June 2006. (KU's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 16.) Likewise for LG&E, using June 2006

environmental costs that the Companies are authorized to collect through the ECR billing factor, this result is the function of eliminating the impacts of the MSR and VDT rate schedules which were approved after the establishment of the ECR rate schedule.<sup>369</sup>

The proposed change will, however, more closely align the revenues used to determine the billing factor and the revenues to which the billing factor is applied.<sup>370</sup> This alignment should somewhat reduce the variability of the monthly true-up adjustment for the over/under recovery of the monthly surcharge due to timing differences (from ES Form 2.00).<sup>371</sup> There will still remain a variance due to the fact that a 12 month average revenue value is used to calculate the monthly factor and this factor is applied to actual monthly revenues.<sup>372</sup>

#### **D. The Companies' Proposed Monthly Reporting Formats are Reasonable**

The Companies propose to change the format of several forms to reflect the recovery of the costs associated with the 2006 Plan and also edit the language used throughout the forms to provide consistency between the LG&E and KU filings.<sup>373</sup> The Companies have submitted for the Commission's review in these proceedings the forms they currently use when filing their monthly environmental surcharge report and the sample monthly environmental surcharge report forms they are proposing in this case.<sup>374</sup>

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data, the proposed change to R(m) slightly increases LG&E's jurisdictional allocation factor from 80.89% as filed using current procedures to 81.47%. This increase of 58 basis points in the jurisdictional allocation factor increases Jurisdictional E(m) by \$16,355, or 0.7% for the expense month of June 2006. (LG&E's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 11.)

<sup>369</sup> KU's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 16; LG&E's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 11.

<sup>370</sup> Conroy KU at 4; Conroy LG&E at 4.

<sup>371</sup> Conroy KU at 4; Conroy LG&E at 4.

<sup>372</sup> Conroy KU at 4; Conroy LG&E at 4.

<sup>373</sup> Conroy KU at 4; Conroy LG&E at 4.

<sup>374</sup> Conroy KU at Exhibits RMC-3 and RMC-4; Conroy LG&E at Exhibits RMC-3 and RMC-4; KU's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request Nos. 15 and 17; LG&E's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request Nos. 9 and 12. Please also see the updated forms distributed at the informal conference held in this proceeding on October 12, 2006.

The calculation of the monthly billing factor for recovery of the cost of the Companies' 2006 Plans will be consistent with the methodology approved by the Commission<sup>375</sup> and used to calculate the recovery of the cost of KU's Post 1994 Environmental Compliance Plans<sup>376</sup> and LG&E's Post 1995 Environmental Compliance Plans.<sup>377</sup> ES Form 1.00 will continue to show the calculation of the Jurisdictional Environmental Surcharge Billing Factor using the same methodology previously approved by the Commission.<sup>378</sup>

The determination of the Environmental Compliance Rate Base is based on combining all ECR approved expenditures and calculating the rate base according to the methodologies ordered in the relevant Commission cases.<sup>379</sup>

The plant, construction work in progress, and depreciation expense for the 2001, 2003, and 2005 Plans previously reported for KU on ES Form 2.11 will be consolidated with the same monthly information for the KU 2006 Plan onto a new and multi-page ES Form 2.10.<sup>380</sup> The plant, construction work in progress, and depreciation expense for the 2001, 2003, and 2005

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<sup>375</sup> Case No. 2004-00426, *In the Matter of: The Application of Kentucky Utilities Company for a Certificate of Public Convenience and Necessity to Construct Flue Gas Desulfurization Systems and Approval of Its 2004 Compliance Plan for Recovery by Environmental Surcharge*; Case No. 2004-00421, *In the Matter of: The Application of Louisville Gas and Electric Company for Approval of Its 2004 Compliance Plan for Recovery by Environmental Surcharge*.

<sup>376</sup> Conroy KU at 4.

<sup>377</sup> Conroy LG&E at 4.

<sup>378</sup> Conroy KU at 4-5; Conroy LG&E at 4-5.

<sup>379</sup> Conroy KU at 5 (citing Case Nos. 2000-439, *In the Matter of: The Application of Kentucky Utilities Company for Approval of an Amended Compliance Plan for Purposes of Recovering the Costs of New and Additional Pollution Control Facilities and to Amend Its Environmental Cost Recovery Surcharge Tariff*; 2002-00146, *In the Matter of: The Application of Kentucky Utilities Company for Approval of Its 2002 Compliance Plan for Recovery by Environmental Surcharge*; and 2004-00426, *In the Matter of: The Application of Kentucky Utilities Company for a Certificate of Public Convenience and Necessity to Construct Flue Gas Desulfurization Systems and Approval of Its 2004 Compliance Plan for Recovery by Environmental Surcharge*); Conroy LG&E at 5 (citing Case Nos. 2000-386, *In the Matter of: Application of Louisville Gas and Electric Company for Approval of an Amended Compliance Plan for Purposes of Recovering the Costs of New and Additional Pollution Control Facilities and to Amend Its Environmental Cost Recovery Surcharge Tariff*; 2002-00147, *In the Matter of: The Application of Louisville Gas and Electric Company for Approval of Its 2002 Compliance Plan for Recovery by Environmental Surcharge*; and 2004-00421, *In the Matter of: The Application of Louisville Gas and Electric Company for Approval of Its 2004 Compliance Plan for Recovery by Environmental Surcharge*).

<sup>380</sup> Conroy KU at 5; KU's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 17.

Plans previously reported for LG&E on ES Forms 2.11 and 2.12, as well as the same monthly information for the 2006 Plan, will be consolidated onto a new and multi-page ES Form 2.10.<sup>381</sup>

The Companies' pollution control equipment operation and maintenance expenses for the 2001 and 2005 Plans are currently reported on ES Form 2.50.<sup>382</sup> This form is being expanded to include the 2006 Plan projects for which the Companies are seeking to recover incremental operation and maintenance expenses.<sup>383</sup> The current month O&M expense for all plans shown on ES Form 2.50 will be utilized as the current month O&M on ES Form 2.40 in the determination of the pollution control cash working capital allowance.<sup>384</sup>

The Companies are further proposing to modify ES Form 3.10 to specifically identify MSR and VDT revenues in the section titled "Reconciling Revenues".<sup>385</sup> Currently, those revenues are included in base revenues reported on ES Forms 3.00 and 3.10 even though the ECR is not applied to those revenues.<sup>386</sup> Separate identification will result in an accurate match of base revenues used for the determination of the ECR billing factor and the method for applying the ECR billing factor on customer bills.<sup>387</sup>

Both ES Forms 3.00 and 3.10 are being further modified to separately identify DSM and STOD PCRf revenues from base revenues leaving base revenue as the sum of customer, energy and demand charges.<sup>388</sup>

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<sup>381</sup> Conroy LG&E at 5; LG&E's August 7, 2006 Response to Commission Staff's July 24, 2006 Data Request No. 12.

<sup>382</sup> Conroy KU at 5; Conroy LG&E at 5.

<sup>383</sup> Conroy KU at 5; Conroy LG&E at 5.

<sup>384</sup> Conroy KU at 5; Conroy LG&E at 5.

<sup>385</sup> Conroy KU at 6; Conroy LG&E at 6.

<sup>386</sup> Conroy KU at 6; Conroy LG&E at 6.

<sup>387</sup> Conroy KU at 6; Conroy LG&E at 6.

<sup>388</sup> Conroy KU at 6; Conroy LG&E at 6.

## **1. The Companies' Proposed Form Changes Will Provide Consistency Between the Two Companies' ECR Filings**

The Companies are proposing to make changes to the forms in order to provide consistency between the two Companies.<sup>389</sup> This consistency will facilitate the review process for both Companies and allow for easier comparison.<sup>390</sup> It will also facilitate the Commission's review of the Companies monthly filings and the operation of the mechanism in the 6-month and 2-year review proceedings.<sup>391</sup> In addition, by having both Companies' forms consistent, administration of the mechanism will be made easier and it will allow for the potential automation of our filing processes in the future.<sup>392</sup> Due to the different projects that each Company has approval to include in the ECR, there will remain slight differences in the content of each form.<sup>393</sup>

## **2. Other Form Changes**

The Companies propose to add new forms ES Form 2.32 and 2.33 to track and report NO<sub>x</sub> emission allowance inventory, usage and purchases consistent with the SO<sub>2</sub> emission allowances reported on ES Form 2.31.<sup>394</sup> NO<sub>x</sub> emission allowance purchases (either from the market or from KU or LG&E) will be required.<sup>395</sup> Currently there are NO<sub>x</sub> allowances in inventory for the Ozone Season (May through September).<sup>396</sup> ES Form 2.32 will be used to track and report the ozone season NO<sub>x</sub> allowance inventory.<sup>397</sup> Upon implementation of CAIR, there will be an allocation of annual NO<sub>x</sub> allowances and a separate inventory from the ozone season

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<sup>389</sup> Conroy KU at 6; Conroy LG&E at 6.

<sup>390</sup> Conroy KU at 6; Conroy LG&E at 6.

<sup>391</sup> Conroy KU at 6; Conroy LG&E at 6.

<sup>392</sup> Conroy KU at 6; Conroy LG&E at 6.

<sup>393</sup> Conroy KU at 6; Conroy LG&E at 6.

<sup>394</sup> Conroy KU at 6-7; Conroy LG&E at 6-7.

<sup>395</sup> Conroy KU at 7; Conroy LG&E at 7.

<sup>396</sup> Conroy KU at 7; Conroy LG&E at 7.

<sup>397</sup> Conroy KU at 7; Conroy LG&E at 7.

NO<sub>x</sub> allowance inventory.<sup>398</sup> As such, ES Form 2.33 will be used to track and report the annual NO<sub>x</sub> allowance inventory.<sup>399</sup>

For KU, consistent with the Commission's Order of June 20, 2005 in Case No. 2004-00426<sup>400</sup> any purchases of allowances from LG&E will be at LG&E's weighted average cost of its emission allowance inventory.<sup>401</sup> Likewise for LG&E, consistent with the Commission's Order of June 20, 2005 in Case No. 2004-00421<sup>402</sup> any purchases of allowances from KU will be at KU's weighted average cost of its emission allowance inventory.<sup>403</sup> Currently there is a zero dollar value associated with the Companies' NO<sub>x</sub> emission allowance inventory because the only NO<sub>x</sub> allowances held in inventory are those allocated by the Environmental Protection Agency at zero dollar value.<sup>404</sup> The proposed new ES Forms 2.32 and 2.33 are consistent with the Commission's approval of KU Project 22 in the June 20, 2005 Order in Case No. 2004-00426,<sup>405</sup> as well as the Commission approval of LG&E Project No. 17 in the June 20, 2005 Order in Case No. 2004-00421.<sup>406</sup>

The Companies are also proposing to modify ES Form 2.30 in order to separately identify SO<sub>2</sub> and NO<sub>x</sub> emission allowance inventory.<sup>407</sup>

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<sup>398</sup> Conroy KU at 7; Conroy LG&E at 7.

<sup>399</sup> Conroy KU at 7; Conroy LG&E at 7.

<sup>400</sup> In the Matter of: *The Application of Kentucky Utilities Company for a Certificate of Public Convenience and Necessity to Construct Flue Gas Desulfurization Systems and Approval of Its 2004 Compliance Plan for Recovery by Environmental Surcharge.*

<sup>401</sup> Conroy KU at 7.

<sup>402</sup> In the Matter of: *The Application of Louisville Gas and Electric Company for Approval of Its 2004 Compliance Plan for Recovery by Environmental Surcharge.*

<sup>403</sup> Conroy LG&E at 7.

<sup>404</sup> Conroy KU at 7; Conroy LG&E at 7.

<sup>405</sup> In the Matter of: *The Application of Kentucky Utilities Company for a Certificate of Public Convenience and Necessity to Construct Flue Gas Desulfurization Systems and Approval of Its 2004 Compliance Plan for Recovery by Environmental Surcharge.*

<sup>406</sup> In the Matter of: *The Application of Louisville Gas and Electric Company for Approval of Its 2004 Compliance Plan for Recovery by Environmental Surcharge.* Conroy KU at 7; Conroy LG&E at 7.

<sup>407</sup> Conroy KU at 7; Conroy LG&E at 7.

## V. CONCLUSION

For the foregoing reasons stated in this brief and in their testimony, Kentucky Utilities Company and Louisville Gas and Electric Company request the Public Service Commission to enter orders that grant the Companies the following relief:

1. Granting KU a Certificate of Public Convenience and Necessity to construct a Selective Catalytic Reduction NO<sub>x</sub> facility for Ghent Unit No. 2;
2. Approving LG&E's 2006 Environmental Compliance Plan (consisting of four additional projects) and KU's 2006 Environmental Compliance Plan (consisting of five additional projects) to meet federal, state and local environmental regulations;
3. Approving LG&E's and KU's proposed Environmental Surcharge Tariffs for bills rendered on and after February 1, 2007;
4. Authorizing LG&E and KU to use an 10.50 percent return on equity in the calculation of the overall rate of return on their 2006 Environmental Compliance Plans;
5. Authorizing LG&E and KU to continue to calculate the rate of return for their environmental surcharges consistent with the manner established in the Commission's previous orders, but also approving the LG&E and KU's proposed change to R(m); and
6. Approving the reporting formats proposed by LG&E and KU for use in the monthly surcharge filings.

Dated: December 5, 2006

Respectfully submitted,



Kendrick R. Riggs  
W. Duncan Crosby III  
Stoll Keenon Ogden PLLC  
2000 PNC Plaza  
500 West Jefferson Street  
Louisville, Kentucky 40202-2828  
Telephone: (502) 333-6000

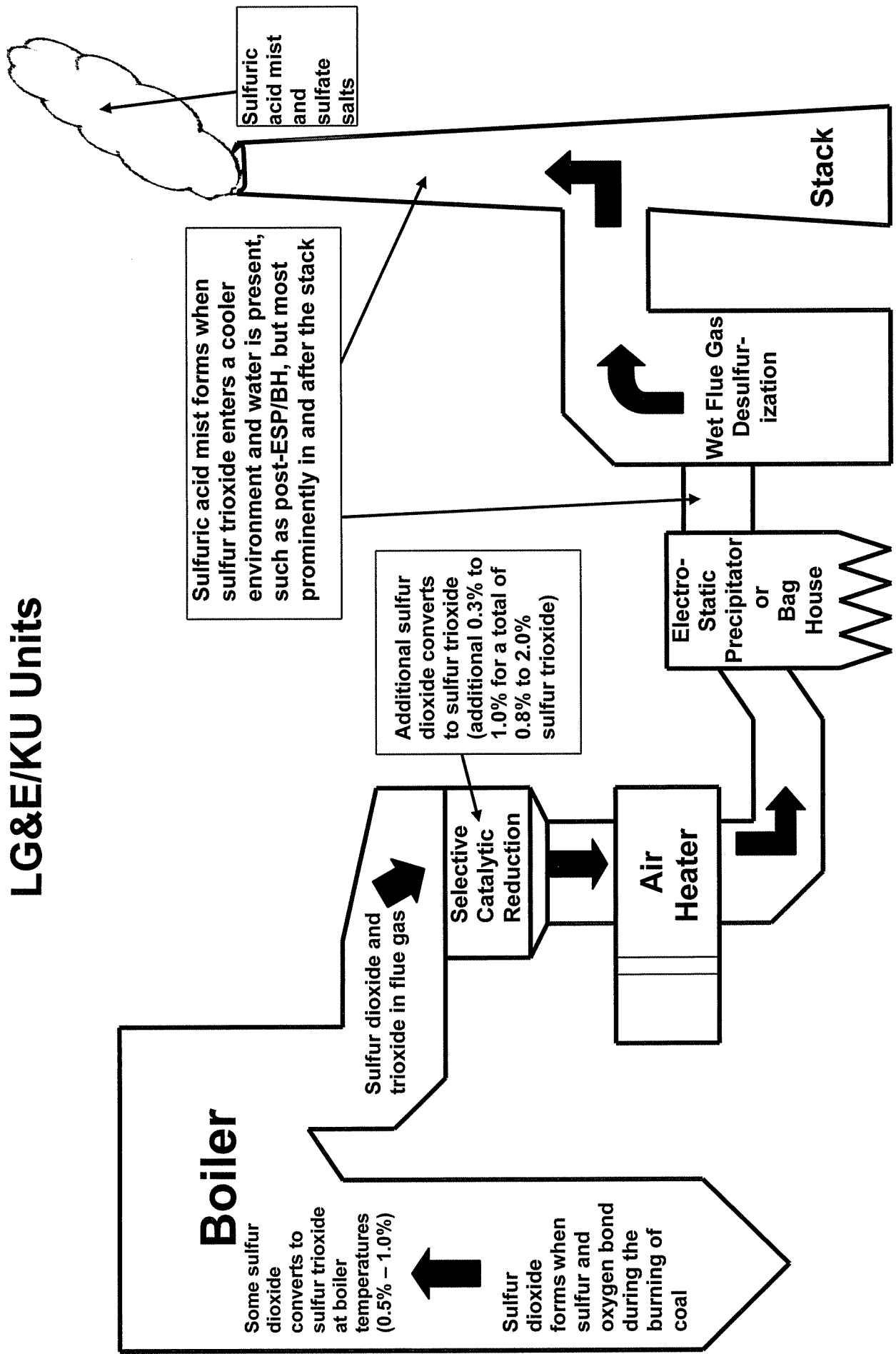
Elizabeth L. Cocanougher  
Robert J. Ehrler  
Senior Corporate Attorneys  
E.ON U.S. LLC  
220 West Main Street  
Louisville, Kentucky 40202  
Telephone: (502) 627-4850

Counsel for Kentucky Utilities Company  
and Louisville Gas and Electric Company



# **APPENDIX 1**

# Illustration of How Sulfuric Acid Mist Emissions Form in LG&E/KU Units



### **Sulfur Reactions in a Coal-fired Boiler and Control Equipment**

Sulfur + Oxygen + combustion temperature = Sulfur Dioxide  
Sulfur Dioxide + Oxygen + very high temperature = Sulfur Trioxide  
Sulfur Dioxide + Oxygen + high temperature + SCR catalyst = Sulfur Trioxide  
Sulfur Trioxide + water vapor + cooling = Sulfuric Acid Mist  
Sulfuric Acid Mist + water evaporation = Sulfates (Blue Plume)

#### **Formulas:**

$\text{SO}_2$  = Sulfur Dioxide

$\text{SO}_3$  = Sulfur Trioxide

$\text{H}_2\text{SO}_4$  = Sulfuric Acid

$\text{SO}_4^{=}$  = Sulfate Salt

# APPENDIX 2



ERNIE FLETCHER  
GOVERNOR

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET  
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

TERESA J. HILL  
SECRETARY

Division for Air Quality  
8020 Veterans Memorial Dr Ste 110  
Florence, KY 41042  
www.kentucky.gov

October 23<sup>rd</sup>, 2006

Diana Freibert  
Louisville Gas & Electric  
Trimble Co Generating Station  
487 Corn Creek Rd  
Bedford, Kentucky 40006

Re: AI ID: 4054  
Louisville Gas & Electric  
Trimble Co Generating Station  
DAQ Alternate ID: 21-223-00002  
Trimble County, Kentucky  
Activity ID: CIN20060002

Dear Mrs. Freibert

Attached for your information and records is a copy of the DAQ-Partial Compliance Evaluation performed at Louisville Gas & Electric - Trimble Co Generating Station on September 19, 2006.

Please review and address any items of concern listed in the report. If you have any questions or comments concerning this inspection, please contact the Florence Regional Office at: (859) 525-4923.

Sincerely,

A rectangular box containing a handwritten signature in cursive script, which appears to read "Courtney Shattuck".

Courtney Shattuck  
Environmental Inspector II

cks  
cc:

Environmental and Public Protection Cabinet  
Department for Environmental Protection  
Division for Air Quality  
Air Inspection Report

**AI ID:** 4054      **AI Type:** ENERGY-Elec Power Trans, Control, & Distr (22112)  
**AI Name:** Louisville Gas & Electric - Trimble Co Generating Station  
**AI Address:** 487 Corn Creek Rd  
**City:** Bedford, **State:** Kentucky **Zip:** 40006  
**County:** Trimble **Regional Office:** Florence Regional Office  
**Latitude:** 38.584722 **Longitude:** -85.411944  
**Site Contact:** Diana Freibert **Title:** Chemist /Environmental Coordinator **Phone #:** 502-627-6204  
**Inspection Type:** DAQ-Partial Compliance Evaluation **Activity #:** CIN20060002  
**Inspection Start Date:** September 19, 2006 **Time:** 11:30 am **End Date:** September 19, 2006 **Time:** 3:00 PM  
**Site/Permit ID:** 21-223-00003

**Lead DEP Investigator:** Courtney Shattuck  
**Other DEP Investigators:** Clay Redmond; Jeny Slucher  
**Persons Interviewed:** Diana Freibert; Jeff Slocum

**General Comments:** The Florence Regional Office visited LG&E Trimble Co. Generating Station on September 19th and 20th, 2006, to observe SO3 mitigation testing. LG&E performed SO3 mitigation testing in the spring and determined that the addition of hydrated lime to the exhaust stream could reduce the amount of SO3 released to the atmosphere. The Florence Regional Office was concerned with LG&E's ability to maintain compliance with the particulate matter limit when injected hydrated lime after the control device. The purpose of the September testing was to determine if compliance with the particulate testing could be maintained while injecting lime. The Florence Regional Office believed that LG&E Trimble would be performing particulate testing in accordance with US EPA Reference Method 5. Unfortunately, LG&E was unable to meet the requirements of the test method; therefore, it may be necessary to conduct additional testing.

Although some amount of SO3 is created in the boiler, LG&E has noticed a greater amount of SO3 formation during ozone season due to the use of the SCR. The Florence Regional Offices believes that the increased formation of SO3 could contribute to excess opacity emissions that could violate the permit limit. A COM unit measures the opacity of the exhaust stream before it travels through the scrubber. Although the COM was reading an acceptable opacity, SO3 condenses in the FGD causing increased opacity as the exhaust gas exits the stack. The inspectors took no official Method 9 readings. However, qualitative observations indicated that LG&E was experiencing higher opacities when not controlling for SO3. We noticed that the opacity and appearance of the plume was noticeably better when SO3 emissions were controlled (injection of lime).

**Overall Compliance Status:** No Violations Observed

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**Investigation Results**

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SI: AIO04054

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**Documentation**

- |  |  |
|--|--|
| <input type="checkbox"/> Photos taken                        | <input type="checkbox"/> Record of visual determination of opacity |
| <input type="checkbox"/> Documents obtained from facility    | <input type="checkbox"/> Samples taken by DEP                      |
| <input type="checkbox"/> Samples taken by outside source     | <input type="checkbox"/> Regional office instrument readings taken |
| <input type="checkbox"/> Request for Submission of Documents | <input type="checkbox"/> Other documentation                       |

Inspector:

E-Signed by Courtney Shattuck  
VERIFY authenticity with ApproveIt  
*Courtney Shattuck*

Date: October 23<sup>rd</sup>, 2006

Received By: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_  
Delivery Method: USPS

AI#: 4054

Page 2

Activity #CIN20060002 :

# **APPENDIX 3**





ERNIE FLETCHER  
GOVERNOR

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET

DEPARTMENT FOR ENVIRONMENTAL PROTECTION

TERESA J. HILL  
SECRETARY

Division for Air Quality  
8020 Veterans Memorial Dr Ste 110  
Florence, KY 41042  
www.kentucky.gov

November 2<sup>nd</sup>, 2006

Carla Piening  
KY Utilities Co  
Ghent Generation Station  
9485 US 42 E  
Ghent, Kentucky 41045

Re: AI ID: 704  
KY Utilities Co - Ghent Generation Station  
DAQ Alternate ID: 21-041-00010  
Carroll County, Kentucky  
Activity ID: CIN20060002

Dear Ms. Piening

Attached for your information and records is a copy of the DAQ-Partial Compliance Evaluation performed at KY Utilities Co - Ghent Generation Station on September 25, 2006.

Please review and address any items of concern listed in the report. If you have any questions or comments concerning this inspection, please contact the Florence Regional Office at: (859) 525-4923.

Sincerely,

E-Signed by Courtney Shattuck  
VERIFY authenticity with ApproveIt  
*Courtney Shattuck*

Courtney Shattuck  
Environmental Inspector II

cks  
cc:

Environmental and Public Protection Cabinet  
Department for Environmental Protection  
Division for Air Quality  
Air Inspection Report

**AI ID:** 704      **AI Type:** ENERGY-Elec Power Trans. Control. & Distr (22112)  
**AI Name:** KY Utilities Co - Ghent Generation Station  
**AI Address:** 9485 US 42 E  
**City:** Ghent, **State:** Kentucky **Zip:** 41045  
**County:** Carroll **Regional Office:** Florence Regional Office  
**Latitude:** 38.748333 **Longitude:** -85.033611  
**Site Contact:** Carla Piening      **Title:** Senior Scientist      **Phone #:** 502-347-4008  
**Inspection Type:** DAQ-Partial Compliance Evaluation **Activity #:** CIN20060002  
**Inspection Start Date:** September 25, 2006 **Time:** 1:30 PM **End Date:** September 25, 2006 **Time:** 4:00 PM  
**Site/Permit ID:** 21-041-00010 / V-97-025

**Lead DEP Investigator:** Courtney Shattuck  
**Other DEP Investigators:** Clay Redmond  
**Persons Interviewed:** Carla Piening

**General Comments:** The Florence Regional Office visited KU-Ghent Generating Station on September 25th, 26th and 27th, 2006, to observe SO<sub>3</sub> mitigation testing. KU - Ghent performed SO<sub>3</sub> mitigation testing in the spring and determined that the addition of hydrated lime to the exhaust stream could reduce the amount of SO<sub>3</sub> released to the atmosphere. The Florence Regional Office was concerned with KU's ability to maintain compliance with the particulate matter limit when injecting hydrated lime after the control device. The purpose of the September testing was to determine if compliance with the particulate testing could be maintained while injecting lime. The Florence Regional Office believed that KU-Ghent would be performing particulate testing in accordance with US EPA Reference Method 5. Unfortunately, KU-Ghent was unable to meet the requirements of the test method; therefore, it may be necessary to conduct additional testing.

Ms. Piening believes that the hydrated lime particle size and porosity effects SO<sub>3</sub> reduction. Therefore, KU-Ghent tested hydrated lime manufactured by 3 different companies: Chemlime (conducted in the spring), Carmeuse Lime (tested on 9/26/06) and Mississippi Lime (tested on 9/27/06). Preliminary test results indicate that Chemlime and Mississippi Lime produced more desirable results.

Although some amount of SO<sub>3</sub> is created in the boiler, Unit #1 has a greater amount of SO<sub>3</sub> formation than the other generating units due to it being equipped with an SCR (for control of NO<sub>x</sub> emissions). Unit #1 is also unique in that it is equipped with a scrubber to control SO<sub>2</sub> emissions. During the facility visit we noticed an increase in opacity emissions, possibly due to the formation of SO<sub>3</sub>. Unit #1 does not have a Continuous Opacity Monitoring (COM) device to measure and record the opacity. KU - Ghent should realize that the increased formation of SO<sub>3</sub> could contribute to excess opacity emissions that could violate the permit limit. US EPA Reference Method 9 should be used in determining compliance with the opacity limit.

KU-Ghent has plans to install a particulate Continuous Emissions Monitoring (CEM) device on Unit #1 in the next few months. PM CEM Correlation testing will occur during the week of October 30<sup>th</sup>, 2006.

**Overall Compliance Status:** No Violations Observed