PPL companies

John N. Voyles
Vice President, Transmission
and Generation Services

LG&E and KU Energy LLC
220 West Main Street
P.O. Box 32010
Louisville, KY 40232
T 502-627-4762
F 502-627-4165
john.voyles@lge-ku.com

VIA CERTIFIED MAIL/RETURN RECEIPT REQUESTED

July 27, 2011

Mr. Stephen Hoffman
US Environmental Protection Agency
Two Potomac Yard
2733 S. Crystal Drive
5th Floor, N-237
Arlington, VA 22202-2733

RE: Plan for Addressing Recommendations in Site Assessment Report
Kentucky Utilities Company
Tyrone Station Ash Pond

Dear Mr. Hoffman:

This is a response on behalf of Kentucky Utilities Company (KU) to EPA's June 27, 2011 letter requesting KU to inform you of our plans to address the recommendations in EPA's site assessment report for the Tyrone Station Ash Pond. Specifically, this response covers how KU intends to address the recommendations made by EPA's engineering contractor, AMEC, as a result of a site assessment conducted at the Tyrone facility on August 3, 2010. The attached (Table 1) restates AMEC's recommendations (in italics) and KU's specific plans and schedules for implementing each of the recommendations.

In conducting their assessment, AMEC utilized guidelines issued by the Mine Safety and Health Administration (MSHA). However, the MSHA guidelines are aimed at coal slurry ponds found at mine sites rather than the CCR impoundments found at a power plant. The MSHA guidelines are not legally applicable to our impoundments and differ substantially from the regulations that are applicable to our facilities. As you know, over the past two years EPA has assessed impoundments at several other facilities owned by KU or its affiliates. None of the EPA contractors conducting the assessments of our facilities used MSHA guidelines. In fact, of the dozens of assessments of power plant impoundments that EPA has conducted across the nation, we are unaware of any EPA contractor, other than AMEC, using MSHA guidelines. Consequently, we object to the use of MSHA guidelines for the assessments of our facilities because they are inappropriate from a technical standpoint, legally

inapplicable and inconsistent with past EPA practice. In the present situation where EPA is conducting nation-wide assessments to determine whether CCR impoundments pose any significant risk to the public, it is particularly inappropriate for EPA to apply differing standards depending on the EPA contractor that conducts the assessment.

KU will continue to comply with applicable regulations and take necessary actions to ensure the structural integrity of our CCR impoundments. We believe the Tyrone Ash Pond is in satisfactory condition and in compliance with all applicable Kentucky dam safety regulations.

Please contact the following individuals if you have any questions regarding this response.

Primary: David Millay at (502) 627-2468 or David.Millay@lge-ku.com
Secondary: Michael Winkler at (502) 627-2338 or Michael.Winkler@lge-ku.com

Sincerely,

Attachment:

Table 1 - KU Response to EPA Contractor Recommendations for Tyrone Station Ash Pond

Cc: David Millay, LG&E and KU Services
Michael Winkler, LG&E and KU Services
Gary Wells, Kentucky Division of Water

Table 1 – KU Response to EPA Contractor Recommendations for Tyrone Ash Pond

	Impoundment	EPA Contractor Recommendation	KU Plan	KU Schedule
1	Tyrone Ash Pond	*In order to confirm that the impoundment will not be overtopped during a design storm event, as well as determine whether acceptable freeboard conditions exist, the appropriate design storm rainfall (per MSHA guidelines), or ½ PMF, should be applied to the impoundment "s entire tributary watershed to determine the resulting water surface elevation in the pond.*	KU utilizes Kentucky dam safety regulations rather than MSHA guidelines to evaluate the performance of Coal Combustion Residual (CCR) impoundments. In KU's opinion, Kentucky regulations provide an appropriately conservative design storm rainfall. KU completed a comprehensive Hydrologic and Hydraulic (H&H) analysis and concluded that the Tyrone Ash Pond performs in accordance with Kentucky dam safety regulations. KU will continue to operate and maintain the Tyrone Ash Pond to meet applicable state regulations. KU has completed actions to implement this recommendation.	H&H analysis report completed in January, 2011. No further action scheduled.
2	Tyrone Ash Pond	*Although the January 2011 hydrologic and hydraulic information supplied by KU addressed more current conditions, some inadequacies remain. MSHA guidelines for dams assigned a Significant Hazard classification, applied to the dam by AMEC in this assessment as a result of its proximity to the Kentucky River, suggest that structure should be capable of passing the ½ PMF precipitation event while maintaining a minimum freeboard of 3 feet.*	KU utilizes Kentucky dam safety regulations rather than MSHA guidelines to evaluate the performance of Coal Combustion Residual (CCR) impoundments. In KU's opinion, Kentucky regulations provide an appropriately conservative design storm rainfall. KU completed a comprehensive Hydrologic and Hydraulic (H&H) analysis and concluded that the Tyrone Ash Pond performs in accordance with Kentucky dam safety regulations. KU will continue to operate and maintain the Tyrone Ash Pond to meet applicable state regulations. The Tyrone Ash Pond is currently operating with an available freeboard of over 10 feet. KU has completed actions to implement this recommendation.	H&H analysis report completed in January, 2011. No further action scheduled.
3	Tyrone Ash Pond	*Additionally, although the 2011 Hydrologic and Hydraulic Assessment (Attachment 3 of KU "s Draft Report comments) and design documents indicate the Tryone Ash Pond principal spillway discharge pipe diameter is 15-inches, plant personnel have confirmed the pipe is 18-inches in diameter. Hydraulics associated with the existing larger pipe would provide additional freeboard compared to values shown in the calculations/assessment. The correct pipe size should be used in all future hydrologic and hydraulic calculations that are performed for the structure.*	KU will use the correct pipe size in future hydrologic and hydraulic calculations. KU has completed actions to implement this recommendation.	No further action scheduled.

Table 1 (continued) – KU Response to EPA Contractor Recommendations for Tyrone Ash Pond

	Impoundment	EPA Contractor Recommendation	KU Plan	KU Schedule
4	Tyrone Ash Pond	*In the opinion of the assessing professional engineer, the criteria for minimum safety factor should be in accordance with USACE EM 1110-2-1902 with a minimum seismic safety factor of 1.2 as recommended by 2007 MSHA Coal Mine Impoundment Inspection and Plan Review Handbook, page 88. Likewise, if the dam does not meet the above seismic factor of safety, then the stability of the embankment should be analyzed and the amount of embankment deformation or settlement that may occur should be evaluated to assure that sufficient section of the crest will remain intact to prevent a release from the impoundment.*	Per MACTEC's *Addendum A Report of Geotechnical Exploration and Slope Stability Analyses KU Tyrone Power Station – Ash Pond Tyrone, Woodford County, Kentucky:* *"The Tyrone Ash Pond is under the jurisdiction of the Kentucky Environment and Energy Cabinet. Therefore, the minimum factors of safety computed during our slope stability analyses were compared to the target factors of safety obtained from Commonwealth of Kentucky documents referenced on Page 4 of our report."* MACTEC's stability analyses calculated safety factors that exceeded 1.2 for all analyzed sections. KU has completed actions to implement this recommendation.	Addendum A-Stability analysis report completed in January, 2011. No further action scheduled.
5	Tyrone Ash Pond	*However, in the opinion of the assessing professional engineer, the analyses should be revised in accordance with the following recommendations. The analysis should consider all critical stages over the life of the pond including pond full conditions. These conditions would need to be determined in conjunction with the hydrologic and hydraulic recommendations above.*	Per MACTEC's *Addendum A Report of Geotechnical Exploration and Slope Stability Analyses KU Tyrone Power Station – Ash Pond Tyrone, Woodford County, Kentucky:* *"The stability of the selected cross sections at the Tyrone Ash Pond were originally evaluated under three conditions: steady-state/maximum flood, rapid drawdown, and dynamic (seismic) loading. The results of these analyses were provided in our Report of Geotechnical Exploration and Slope Stability Analyses. The ash profile was modeled based on the conditions provided to us at the time of our analyses, which reflect a partial load in the pond. Information provided recently by LG&E-KU suggests it may be possible during normal operation of the ash pond that solids in the pond reach a maximum level near the upstream embankment crest elevation. Therefore, we have performed additional stability analyses for the downstream embankment slopes for the original six cross sections that reflect the "pond full" condition. The results of these additional analyses have been included on the attached Results of Slope Stability Analyses – Tyrone Power Station Ash Pond table. In addition, the section geometry, input parameters, and stability analysis results are provided on the attached STABL6H output plots."* KU completed a comprehensive Hydrologic and Hydraulic (H&H) analysis and concluded that the Tyrone Ash "pond full" condition is elevation 529.9. Because this elevation is lower than the more conservative "pond full" elevation of over 533 used by MACTEC for modeling the phreatic surface for the long term steady state case, additional modeling is not necessary. KU has completed actions to implement this recommendation.	Addendum A-Stability analysis report completed in January, 2011. H&H analysis report completed in January, 2011. No further action scheduled.

Table 1 (continued) – KU Response to EPA Contractor Recommendations for Tyrone Ash Pond

	Impoundment	EPA Contractor Recommendation	KU Plan	KU Schedule
6	Tyrone Ash Pond	*The friction angle value of 30 degrees used for the CCW (ash) in the analysis appears high for loose, saturated ash. More typical ash friction values are 28 degrees for compacted, 24 degrees for loosely compacted, and 11 degrees for uncompacted material. Consideration should be given for lowering strength values to account for exhibited lower strengths or inconsistencies within the fill or foundation materials. Lowering the friction value, by one or two degrees, or more for weaker soils would be conservative and more appropriate. More layering of the embankment materials is needed to model lower strength materials, such as the low strength material encountered in Boring 6T.*	Per MACTEC's *Addendum A Report of Geotechnical Exploration and Slope Stability Analyses KU Tyrone Power Station – Ash Pond Tyrone, Woodford County, Kentucky:* *"Our rationale for selection of unit weight and shear strength values was provided in Section 5.3 of our Report of Geotechnical Exploration and Slope Stability Analyses. MACTEC has extensive experience with CCW at LG&E-KU facilities in Kentucky and with other similar facilities in the southeastern United States. Laboratory testing (both triaxial and direct shear tests) of CCW from other facilities indicated friction angles of 28 to over 42 degrees. We selected 30 degrees to provide, in our opinion, the appropriate level of conservatism."* KU agrees with MACTEC and believes it is unnecessary to analyze different types of failure surfaces. KU has completed actions to implement this recommendation.	Addendum A-Stability analysis report completed in January, 2011. No further action scheduled.
7	Tyrone Ash Pond	*Consideration should also be given to allowing some time for water levels in the piezometers to develop and stabilize.*	Per MACTEC's *Addendum A Report of Geotechnical Exploration and Slope Stability Analyses KU Tyrone Power Station – Ash Pond Tyrone, Woodford County, Kentucky:* *"Piezometers were installed in three crest borings (B-1C, B-3C, and B-5C) on August 11, 2010. Groundwater levels in the piezometers were initially measured on August 25, 2010, two weeks following installation, allowing measurement of stabilized groundwater levels. These readings were reported in both our Draft Report and our Report of Geotechnical Exploration and Slope Stability Analyses. Additional readings were taken in December 2010 and January 2011, subsequent to our geotechnical report. The piezometer readings for this project are presented on the attached Table 2. Summary of Piezometer Readings."* KU has completed actions to implement this recommendation.	Addendum A-Stability analysis report completed in January, 2011. No further action scheduled.

Table 1 (continued) – KU Response to EPA Contractor Recommendations for Tyrone Ash Pond

	Impoundment	EPA Contractor Recommendation	KU Plan	KU Schedule
8	Tyrone Ash Pond	*Some of the analyses presented appear limited to a circular surface; different types of failure surfaces should be analyzed and optimized.*	Per MACTEC's *Addendum A Report of Geotechnical Exploration and Slope Stability Analyses KU Tyrone Power Station – Ash Pond Tyrone, Woodford County, Kentucky:* *"A circular failure surface is the accepted industry standard and appropriate for this analysis. In addition, Table 4in our Report of Geotechnical Exploration and Slope Stability Analyses indicates that the calculated factors of safety are much greater than the minimum required by the Commonwealth of Kentucky."* KU agrees with MACTEC and believes it is unnecessary to analyze different types of failure surfaces. KU has completed actions to implement this recommendation.	Addendum A-Stability analysis report completed in January, 2011. No further action scheduled.
9	Tyrone Ash Pond	*The study should be revised to address the recommendations in this report and reviewed when complete. The completed analyses should include data sheets to show all input parameters, discussion on how each parameter was derived and preferably an AutoCAD (or equivalent) section to facilitate review.*	MACTEC's *Report of Geotechnical Exploration and Slope Stability Analyses KU Tyrone Power Station – Ash Pond Tyrone, Woodford County, Kentucky* and *Addendum A* completed in December 2010 and January 2011 implemented this recommendation. Per MACTEC's *Addendum A Report of Geotechnical Exploration and Slope Stability Analyses KU Tyrone Power Station – Ash Pond Tyrone, Woodford County, Kentucky:* *"The material input parameters (e.g., total and saturated unit weights, cohesion, and angle of internal friction) used for each loading condition for each cross section analyzed, as well as the horizontal acceleration for seismic loading, where applicable, are presented on the respective STABL6H plots included in our reports. The embankment geometry, including material layering and piezometric surface, is presented graphically on the respective ST ABL6H plots. Section 5.3 of our Report of Geotechnical Exploration and Slope Stability Analyses clearly describes the soil parameter selections."* KU has completed actions to implement this recommendation.	Stability analysis report completed in September, 2011. Addendum A-Stability analysis report completed in January, 2011. No further action scheduled.

Table 1 (continued) – KU Response to EPA Contractor Recommendations for Tyrone Ash Pond

	Impoundment	EPA Contractor Recommendation	KU Plan	KU Schedule
10	Tyrone Ash Pond	*In addition, it is recommended that the downstream slopes adjacent to the west and northwest sides of the pond be analyzed.*	MACTEC's slope stability analyses conducted in 2010-2011 included the downstream slopes adjacent to the west and northwest sides of the Tyrone Ash Pond. KU plans to consult with a qualified geotechnical engineer to complete additional analysis as recommended.	Stability analysis report completed in September, 2010. Addendum A-Stability analysis report completed in January, 2011. If recommended, additional analysis will be completed in 2011.
11	Tyrone Ash Pond	*The "groundwater" seep in the area below section 3 and the new scarps occurring on the slopes below the impoundment indicate instability and warrant study, stability analyses, repair as needed, and diligent monitoring of the area to protect the stability of the above ash pond embankments.*	MACTEC's slope stability analysis conducted in 2010-2011 included the downstream slopes adjacent to the west and northwest sides of the Tyrone Ash Pond. KU repaired this area in May 2010 and plans to implement additional repairs if needed. Qualified KU personnel routinely inspect the Tyrone Ash Pond on a weekly basis and monitor areas of concern noted from previous inspections.	Stability analysis report completed in September, 2010. Addendum A-Stability analysis report completed in January, 2011. No repairs needed at this time. Routine weekly monitoring ongoing.
12	Tyrone Ash Pond	*Three piezometers were installed as part of the stability analysis investigation in August 2010. It would be prudent for the Tyrone Generating Station to maintain and protect these instruments, and document monitoring frequently until base line phreatic readings are apparent. After that time, a regular monitoring frequency should be maintained and the results evaluated by an engineer. Monitoring should include pond and river levels and should include additional readings and evaluation in response to elevated pond levels or specific rainfall events.*	KU plans to continue to maintain and protect piezometers on the Tyrone Ash Pond. Qualified KU personnel monitor instrumentation at least twice a year and more frequently as needed. KU plans to continue having instrumentation readings periodically evaluated by engineers.	Instrument maintenance, monitoring, and evaluation ongoing.

Table 1 (continued) – KU Response to EPA Contractor Recommendations for Tyrone Ash Pond

	Impoundment	EPA Contractor Recommendation	KU Plan	KU Schedule
13	Tyrone Ash Pond	*AMEC recommends that, at minimum, additional instrumentation be installed at the crest and toe of critical slopes. Installation should occur as budgets allow, or immediately upon development of future problems.*	In 2010, KU installed three piezometers on the Tyrone Ash Pond and plans to install additional instrumentation if necessary. KU has completed actions to implement this recommendation.	Instrumentation installed in 2010. No further action scheduled.
14	Tyrone Ash Pond	*As stated in the draft report, AMEC recommends the monitoring of the piezometers to include pond and river levels and additional readings for significant rain events. Documentation for recent and/or significant rain events should be included in the monitoring data.*	In 2010, KU installed three piezometers on the Tyrone Ash Pond. Qualified KU personnel monitor and document instrumentation at least twice a year and more frequently as needed.	Routine monitoring ongoing.
15	Tyrone Ash Pond	*The recent appearance of scarps on the hillside slopes below the ash pond, indicate KU should evaluate performing a geotechnical study including the installation of piezometers on these slopes.*	MACTEC's slope stability analysis conducted in 2010-2011 included the downstream slopes adjacent to the west and northwest sides of the Tyrone Ash Pond. The scarps on the hillside slopes below the dam have existed for several decades and qualified KU staff routinely monitors this area for changes on a weekly basis. KU plans to consult with a qualified geotechnical engineer and complete additional studies/install piezometers as recommended.	Stability analysis report completed in September, 2011. Addendum A-Stability analysis report completed in January, 2011. Routine weekly monitoring ongoing. If recommended, additional analysis and piezometer installation will be completed in 2011.