

Exhibit No.:

Issues: Fuel

Witness: Glenn P. Keefe

Sponsoring Party: Aquila Networks-MPS  
And L&P

Case No.: ER-2005-0436

FILED<sup>2</sup>

FEB 24 2006

Missouri Public  
Service Commission

Before the Public Service Commission  
of the State of Missouri

Rebuttal Testimony

of

Glenn P. Keefe

Exhibit No. 19  
Case No(s) ER-2005-0436  
Date 1-09-06 Rptr 45

**BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF MISSOURI  
REBUTTAL TESTIMONY OF GLENN P. KEEFE  
ON BEHALF OF AQUILA, INC.  
D/B/A AQUILA NETWORKS-MPS AND AQUILA NETWORKS-L&P  
CASE NO. ER-2005-0436**

1 Q. Please state your name and business address.

2 A. My name is Glenn P. Keefe. My business address is 10700 East 350 Highway, Kansas  
3 City, Missouri 64138.

4 Q. By whom are you employed and in what capacity?

5 A. I am employed by Aquila, Inc. ("Aquila") as Operating Vice President - Missouri  
6 Electric. I have responsibilities for the operation of the Aquila's regulated electric utility  
7 in Missouri. In Missouri, Aquila currently conducts its regulated utility business through  
8 its Missouri Public Service ("MPS") and its St. Joseph Light & Power ("L&P") operating  
9 divisions.

10 Q. Briefly describe your education and work experience.

11 A. In 1973 I received a Bachelor of Science degree in Mechanical Engineering from the  
12 University of Missouri - Rolla. After receiving my degree, I joined the Missouri Public  
13 Service Company, which later became UtiliCorp and recently Aquila, as Staff Engineer at  
14 the Sibley Generating Station. In 1974, I was promoted to Station Superintendent at the  
15 Ralph Green Generation Station in Pleasant Hill, Missouri. In 1976, I returned to the  
16 Sibley Generating Station as Operating Engineer. From 1979 through 1989, I served as  
17 Assistant Station Superintendent at the Sibley Generating Station and in 1989 was  
18 promoted to Station Superintendent. From 1997 through 2002, I have served as Vice  
19 President, Generation. As Vice President, Generation, I supervised the operation and

1 maintenance of 41 generating units at 15 different locations in Missouri, Kansas and  
2 Colorado. Since April of 2003, I have served in my present capacity as Operating Vice  
3 President – Missouri Electric. The 2002 re-organization of Aquila Networks from a  
4 function based focus to a State based focus eliminated my responsibilities of the  
5 Colorado and Kansas generating units. I retained the responsibility of the twenty-two  
6 Missouri generating units including our 18% ownership of the Iatan station operated by  
7 Kansas City Power & Light Company and Missouri's 8% share of the Jeffrey Energy  
8 Center operated by Westar Energy. My new duties also include the leadership of the  
9 Substation and Distribution function in Missouri. My operating group is referenced as  
10 Missouri Electric ("MOE") and includes MPS and L&P (merger of L&P 12/31/00).  
11 Recently, MOE added three additional units at the South Harper Peaking Facility.

12 Q. What is the purpose of the rebuttal testimony you now are submitting?

13 A. The purpose of my rebuttal testimony is to address the direct testimony filed by Sharon  
14 Hennings on behalf of the Federal Executive Agencies, Sedalia Industrial Energy Users'  
15 Association and St. Joseph Industrial Group involving the use of petroleum coke as a  
16 method to reduce fuel cost at our generating facilities. The assumptions made by Sharon  
17 Hennings in her testimony makes me question the merit of the testimony from an  
18 engineering point of view.

19 Q. Why do you question the merit of the testimony?

20 A. It appears that Ms. Hennings does not understand the combustion processes in a coal  
21 fired utility plant.

22 Q. Why do you say this?

1 A. Her testimony on page 5 states " No calculations for the additional cost of the sulfur  
2 credits have been made for my analysis because the sulfur dioxide credits are based on  
3 plant emissions, not on the content of the fuel. The precipitators and other emission  
4 control equipment can modify the emissions." It appears from this statement that the she  
5 does not understand basic chemical engineering and how sulfur dioxide is formed in the  
6 combustion process. It also appears that the Ms. Hennings does not understand the  
7 functions of an electrostatic precipitator. She implies that the electrostatic precipitator  
8 removes sulfur dioxide. She also states that there is no correlation between sulfur in the  
9 fuel and sulfur dioxide produced by the combustion process. This is wrong. There is a  
10 direct relationship to sulfur in the fuel and sulfur dioxide produced as measured by the  
11 continuous emission monitors at our plants.

12 Q. What is the relationship of sulfur in the fuel and sulfur dioxide?

13 A. In the combustion process, the sulfur in the fuel (S) is introduced to oxygen (O<sub>2</sub>) and  
14 forms sulfur dioxide (SO<sub>2</sub>) in a gaseous form. In general terms, a pound of sulfur in the  
15 combustion process generates approximately two pounds of gaseous sulfur dioxide.  
16 There is a direct correlation between the sulfur in the fuel and sulfur dioxide produced.

17 Q. Do Aquila's coal-fired units have electrostatic precipitators to control emissions?

18 A. Yes

19 Q. Do the electrostatic precipitators remove sulfur dioxide as Sharon Hennings implies in  
20 her direct testimony?

21 A. No. The electrostatic precipitator removes particulate matter or dust in the gas stream  
22 and would not remove gaseous SO<sub>2</sub>. Actually, the electrostatic precipitator performance

1 is enhanced with sulfur in its function of removing particulate matter by increasing the  
2 resistivity of the ash. The device does not remove gaseous sulfur dioxide.

3 Q. If there is a direct correlation between sulfur in the fuel and sulfur dioxide generated,  
4 should there be a cost assigned based on increased sulfur dioxide generated?

5 A. Yes. The sulfur content of petroleum coke (5.72% as received) is more than 15 times  
6 higher than the content of our predominant fuel source, PRB coal (0.31% as received).  
7 The November SO<sub>2</sub> allowance market closure cost is \$1,300 per allowance. With this  
8 cost used, the \$/ton delivered price of petroleum coke from our calculation is \$184.08 per  
9 ton or \$6.02 per million Btu. This compares to Sharon Hennings direct testimony of a  
10 petroleum coke cost of \$0.88 per million Btu (page 5 line 15) – but she assumes no  
11 additional cost in SO<sub>2</sub> allowances. As allowance prices decrease, the overall cost of  
12 utilizing petroleum coke decreases. For example, at \$700 per SO<sub>2</sub> allowance, the \$/ton  
13 delivered price of petroleum coke would decrease to \$115.50 per ton or \$3.77 per million  
14 Btu delivered cost. Petroleum coke is not a low cost alternative fuel when allowance  
15 costs are added to the equation and considering other operating risk.

16 Q. Did Aquila you burn petroleum coke in the past?

17 A. Yes.

18 Q. Were there any operational difficulties while experimenting with the use of petroleum  
19 coke to decrease fuel cost?

20 A. We did experience difficulties unloading and handling the fuel to the boiler. Any errors  
21 in blending could cause overheating of tube metal in the cyclone burner. This introduced  
22 the risk of forced outages.

23 Q. What was the main reason for ceasing use of petroleum coke as a fuel source?

1 A. The increased problems of handling the fuel, increased risk of forced outages, and the  
2 increased cost due to cost of SO<sub>2</sub> allowances.

3 Q. Why didn't the cost of SO<sub>2</sub> allowances originally stop you from burning petroleum coke?

4 A. The price of SO<sub>2</sub> allowances have increased from approximately \$200/allowance when  
5 Aquila last burned petroleum coke to a current price of approximately \$1,300/allowance.


6 Q. Does this conclude your rebuttal testimony?

7 A. Yes it does.


In the matter of Aquila, Inc. d/b/a Aquila  
Networks-MPS and Aquila Networks-L&P,  
for authority to file tariffs increasing electric  
rates for the service provided to customers in  
the Aquila Networks-MPS and Aquila  
Networks-L&P area

County of Jackson             )  
                                              )  
State of Missouri            )                 ss

Glenn P. Keefe, being first duly sworn, deposes and says that he is the witness who sponsors the accompanying testimony entitled "Rebuttal Testimony of Glenn P. Keefe;" that said testimony was prepared by him and under his direction and supervision; that if inquiries were made as to the facts in said testimony and schedules, he would respond as therein set forth; and that the aforesaid testimony and schedules are true and correct to the best of his knowledge, information, and belief.

  
Glenn P. Keefe

Subscribed and sworn to before me this 18th day of November, 2005.

01 September, 2005.  
  
 \_\_\_\_\_  
 Notary Public  
 Terry D. Lutes

8-20-2008



**TERRY D. LUTES**  
Jackson County  
My Commission Expires  
**August 20, 2008**