

Exhibit No: \_\_\_\_\_  
Issue: Cost of Capital  
Witness: Donald A. Murry  
Type of Exhibit: Rebuttal Testimony  
Case No.: GR-2004-0072

**FILED<sup>3</sup>**

JUN 21 2004

Missouri Public  
Service Commission

REBUTTAL TESTIMONY  
OF  
DONALD A. MURRY, Ph.D.

BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION

ON BEHALF OF THE  
AQUILA NETWORKS-MPS AND  
AQUILA NETWORKS-L&P  
OPERATING DIVISIONS  
OF  
AQUILA, INC.

FEBRUARY 2004

Exhibit No. 16  
Date 3/3/04 Case No. GR2004-0072  
Reporter RF

State of Oklahoma            )  
  ) ss  
County of Oklahoma         )

AFFIDAVIT OF DONALD A. MURRY

Donald A. Murry, being first duly sworn, deposes and says that he is the witness who sponsors the accompanying testimony and schedules entitled "Rebuttal Testimony of Donald A. Murry"; that said testimony was prepared by him and/or 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.

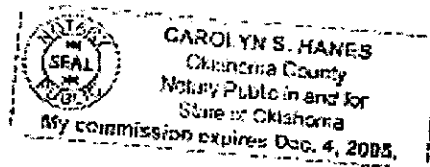
Donald A. Murry

Subscribed and sworn to before me this 10<sup>th</sup> day of February, 2004.

Carolyn S. Hanes  
Notary Public  
# 01019787

My Commission expires:

Dec. 4, 2005



1 C. H. GUERNSEY & COMPANY  
2 ENGINEERS - ARCHITECTS - CONSULTANTS  
3 OKLAHOMA CITY, OKLAHOMA  
4 BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION  
5 CASE NO.: GR - 2004-0072  
6  
7

8 Rebuttal Testimony  
9 of  
10 Donald A. Murry, Ph.D  
11

12 Q. WHAT IS YOUR NAME?

13 A. My name is Donald A. Murry.

14 Q. ARE YOU THE SAME DONALD A. MURRY WHO FILED DIRECT TESTIMONY  
15 PREVIOUSLY IN THIS PROCEEDING BEFORE THE MISSOURI PUBLIC  
16 SERVICE COMMISSION ("COMMISSION")?

17 A. Yes, I am.

18 Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

19 A. I have prepared rebuttal testimony in response to the direct testimony of  
20 Commission Staff ("Staff") witness, Mr. David Murray in the cases involving  
21 Aquila Networks-MPS and Aquila Networks-L&P, also referred to as "Aquila" or  
22 the "Company."

23 Q. WHAT IS THE NATURE OF YOUR REBUTTAL TESTIMONY OF STAFF  
24 WITNESS DAVID MURRAY?

25 A. My rebuttal testimony addresses the general inadequacy of Mr. Murray's  
26 recommendation for Aquila Networks and the apparent reasons for his reaching  
27 an inordinately low recommended return. My rebuttal testimony addresses his

1 methodological weaknesses and incorrect, mechanical calculations. Together  
2 these probably accounted for his recommendation of an extremely low,  
3 unsupported allowed return for Aquila Networks. This recommendation, in light of  
4 his own analysis, is particularly surprising. He should have been able to tell from  
5 his analysis of the returns, capital structure and interest coverages of his  
6 comparable companies that his recommendation was inadequate and out of line  
7 with the current market conditions. It is clear from his testimony that he ignored  
8 important findings from his analysis. In short, his recommendations regarding the  
9 overall cost of capital, if adopted by the Commission, will imperil the financial  
10 health of the Company. Furthermore, he had clear evidence of this from his  
11 reported analysis.

12 **Q. WHEN YOU REFERRED TO METHODOLOGICAL PROBLEMS CONCERNING**  
13 **MR. MURRAY'S TESTIMONY, TO WHAT DID YOU REFER?**

14 **A.** He ignored his interest coverage tests of adequacy of his recommended return.  
15 He ignored the returns and capital structures of his comparable companies. The  
16 most obvious problem is his selection of comparable companies. These  
17 companies do not fit the total revenue criterion that he said he used to select  
18 them. A second significant methodological problem is his use of the capital  
19 structure of Aquila, Inc. He used this capital structure when more accurate data  
20 regarding the capital structures of the Missouri gas affiliates were available.  
21 These results alone render his analysis unreliable, even before one begins to  
22 analyze the analytical errors in his analysis.

1 **Q. IN WHAT AREAS OF HIS TESTIMONY DID MR. MURRAY HAVE**  
2 **ANALYTICAL OR MECHANICAL PROBLEMS IN HIS ANALYSIS?**

3 A. Mr. Murray made basic analytical mistakes in his Discounted Cash Flow ("DCF")  
4 analysis. These diminish the reliability of his analysis. In addition, he also made  
5 mistakes in his Capital Asset Pricing Model ("CAPM") analysis. These are more  
6 readily obvious than the mistakes in his DCF analysis. This transparency is  
7 useful because it means that one can correct these errors and recalculate his  
8 CAPM estimate.

9 **Q. YOU STATED THAT MOST OF STAFF WITNESS DAVID MURRAY'S**  
10 **COMPARABLE GAS UTILITY COMPANIES DID NOT FIT HIS TOTAL**  
11 **REVENUE SELECTION CRITERION. WHAT COMPANIES THAT HE CHOSE**  
12 **FAILED TO MEET HIS OWN CRITERIA?**

13 A. Of the eight companies that he selected as comparable natural gas distribution  
14 companies, six companies did not meet the total revenue selection criterion that  
15 he set out in his Schedule 11, or had other problems of compatibility. The  
16 companies that failed to meet the selection criterion are AGL Resources, New  
17 Jersey Resources, Peoples Energy, Piedmont Natural Gas, South Jersey  
18 Industries, and WGL Holdings.

19 **Q. YOU STATED THAT THESE COMPANIES FAILED TO MEET THE TOTAL**  
20 **REVENUE SELECTION CRITERION. WHY IS THIS THE CASE?**

21 A. Mr. Murray's Schedule 11 cites the "Edward Jones Natural Gas Summary",  
22 September 30, 2003, as the source of the revenue data for these companies.  
23 Apparently, he relied on this summary without investigating the sources of the

1 revenues of his comparable companies. In response to the following Data

2 Request No. ILA-0181,

3 Reference Schedule 11 of the Direct Testimony of David Murray. Please  
4 explain Mr. Murray's rationale for including the following companies with  
5 distribution revenues less than ninety percent of their total revenues  
6 according to either the 10K Reports or annual reports:

- 7 a. New Jersey Resources
- 8 b. Piedmont Natural Gas
- 9 c. South Jersey Industries
- 10 d. WGL Holdings

11  
12 he responded, "Please see Mr. Murray's Schedule 11 for the criteria that he used  
13 to include New Jersey Resources, Piedmont Natural Gas, South Jersey  
14 Industries and WGL Holdings"

15 **Q. DOES AGL RESOURCES HAVE DISTRIBUTION REVENUES BELOW**  
16 **NINETY PERCENT?**

17 A. Because of customer choice, it is difficult to compare the revenues of AGL  
18 Resources to the revenues of other gas distribution companies. For example,  
19 according to AGL's 2002 Annual Report: "AGL Resources' wholesale service  
20 segment records its energy marketing and risk management revenue on a net  
21 basis."

22 **Q. YOU SAID THAT NEW JERSEY RESOURCES ("NJR") ALSO FAILED TO**  
23 **MEET MR. MURRAY'S SELECTION CRITERIA. WHY DID YOU MAKE THAT**  
24 **STATEMENT?**

25 A. NJR's 2003 Annual Report shows natural gas distribution revenues of \$760  
26 million out of \$2,544 million total revenue in 2003. In 2002, the distribution  
27 revenue was \$775 million out of \$1,832 million total revenue. In other words,

1 NJR's revenues from gas distribution operations amounted to only 30 percent in  
2 2003 and 42 percent in 2002 of total revenue.

3 **Q. YOU ALSO SAID THAT PEOPLES ENERGY FAILED TO MEET MR.**  
4 **MURRAY'S SELECTION CRITERION. IS THIS CORRECT?**

5 A. Yes. Peoples Energy's 2003 Annual Report states that for 2003 gas distribution  
6 revenues accounted for \$1,512 million out of \$2,138 million total, or 70 percent of  
7 total revenue. In 2002, distribution revenues contributed \$1,067 million out of  
8 \$1,482 million total revenue, or 72 percent of total revenue.

9 **Q. YOU ALSO SAID THAT PIEDMONT NATURAL GAS FAILED TO MEET MR.**  
10 **MURRAY'S SELECTION CRITERION. WHY IS THIS THE CASE?**

11 A. Piedmont has an ownership interest in a marketing partnership with AGL  
12 Resources to sell gas to retail customers in Georgia under its retail choice  
13 program. Piedmont's 2002 Annual report states in Note No 10 under its "Notes  
14 to Consolidated Financial Statements" that "operating revenues and operating  
15 income shown in the consolidated financial statements represent utility  
16 operations only."

17 **Q. YOU STATED THAT SOUTH JERSEY INDUSTRIES DID NOT MEET MR.**  
18 **MURRAY'S SELECTION CRITERION. WHY DID YOU MAKE THIS**  
19 **STATEMENT?**

20 A. South Jersey's 2002 Annual Report reports revenues from Gas Utility  
21 Operations as \$417 million out of \$505 million total revenue in 2002. This is 82  
22 percent of total revenue.

1 **Q. YOU STATED THAT WGL HOLDINGS ALSO FAILED TO MEET MR.**  
2 **MURRAY'S SELECTION CRITERION. WHY DID YOU MAKE THIS**  
3 **STATEMENT?**

4 **A. WGL's 2003 Annual Report shows that the revenues of the regulated utility**  
5 **operations were \$1,313 million out of \$2,064 million total revenue in 2003, or 64**  
6 **percent. Likewise, it reports that utility revenues were \$939 million out of \$1,585**  
7 **million total revenue in 2002, or 59 percent. Both years, WGL fell far short of Mr.**  
8 **Murray's selection criterion.**

9 **Q. DO YOU BELIEVE MR. MURRAY'S NINETY PERCENT MINIMUM FOR**  
10 **DISTRIBUTION REVENUES IS A REASONABLE CRITERION FOR**  
11 **SELECTING COMPARABLE COMPANIES IN THIS PROCEEDING?**

12 **A. No, I do not.**

13 **Q. WHY IS THE NINETY PERCENT REVENUE REQUIREMENT**  
14 **UNREASONABLE?**

15 **A. Because gas company revenues are so weather sensitive, they are very volatile,**  
16 **especially in current markets. Weather affects both the amount of gas sold and**  
17 **the price of natural gas, especially during peak periods, and both of these factors**  
18 **are significant determinants of total revenues. Gas distribution companies may**  
19 **see total revenues swing dramatically from year to year.**

20 **Q. WHY IS THE FAILURE OF MR. MURRAY TO MEET HIS SELECTION**  
21 **CRITERION IMPORTANT?**

22 **A. It indicates that these companies are not truly comparable to the small Missouri**  
23 **gas distribution companies. By not recognizing this lack of comparability, Mr.**



1 Murray apparently made no compensation in his analysis and his  
2 recommendation. Moreover, he compounded this non-comparability of his  
3 "comparable" companies by selecting companies as large as \$5 billion in total  
4 capitalization as comparable to these Missouri gas operating divisions.

5 **Q. DO YOU HAVE ANY OTHER CONCERNS ABOUT MR. MURRAY'S**  
6 **SELECTION OF COMPARABLE COMPANIES IN HIS ANALYSIS?**

7 A. Yes. Mr. Murray used a narrow definition of gas distribution companies, i.e., of  
8 "distribution revenues to total revenues greater than or equal to 90 percent," that  
9 he cited in Schedule 11.

10 **Q. OTHER THAN THE PROBLEMS THAT YOU MENTIONED, ARE THERE**  
11 **OTHER REASONS TO AVOID SELECTING LARGE COMPANIES AS**  
12 **COMPARABLE COMPANIES IN AN ANALYSIS OF SMALLER COMPANIES?**

13 A. Yes, analysts agree that small companies are normally more risky than large  
14 companies because of lower economies of scale and scope in operations and  
15 less liquidity. Smaller companies have a narrower, less diverse customer base  
16 with a smaller geographic market. They also have more limited access to capital  
17 markets and relatively higher financial costs. Mr. Murray provides no evidence  
18 that he makes any adjustment for the risk differential associated with size.

19 **Q. WHAT ARE THE CONSEQUENCES OF MR. MURRAY'S CALCULATIONS**  
20 **USING COMPANIES THAT ARE NOT COMPARABLE TO THE AQUILA**  
21 **NETWORKS-MPS AND AQUILA NETWORKS-L&P?**

22 A. It is apparent that by using a group of noncomparable companies in his analysis,  
23 his results are not reliable.

1 **Q. PLEASE DISCUSS IN GREATER DETAIL THE PROBLEMS WITH THE**  
2 **CAPITAL STRUCTURE THAT MR. MURRAY USED IN HIS ANALYSIS.**

3 A. He stated, page 21, lines 18-19, of his direct testimony that he used the parent  
4 company's, Aquila, Inc.'s, capital structure in this proceeding, "Because the debt  
5 and equity are generated from the parent company...." This position has two  
6 major inconsistencies. First, the capital of the parent company, Aquila, Inc.  
7 includes the capital supporting the non-utility businesses and international  
8 operations of Aquila, Inc. These assets do not support the Missouri gas utility  
9 operations. Furthermore, Aquila has stated its intentions and taken actions to  
10 return to the core utility business. Consequently, Aquila, Inc.'s capital structure  
11 does not represent the capital used to support the services provided by Aquila  
12 Networks to Missouri natural gas customers in the past or in the future. Most  
13 importantly, the Aquila capital structure is not the capital structure that will  
14 support the assets of Aquila Networks during the period when the rates set in this  
15 proceeding are in effect. Second, this capital structure is inconsistent with the  
16 principle set forth by the Company in this rate application, namely to isolate and  
17 to protect the utility ratepayers from the risks and costs of the non-regulated  
18 operations of Aquila. Using Aquila, Inc.'s capital structure with its higher financial  
19 risk violates this straightforward regulatory principle, as well.

20 **Q. ARE YOU AWARE OF ANY OTHER REASONS WHY THE PARENT'S**  
21 **CAPITAL STRUCTURE SHOULD NOT BE USED AS A SURROGATE FOR**  
22 **THE CAPITAL STRUCTURE OF AQUILA NETWORKS?**

1 A. Yes. Superior information exists that more closely links the costs of capital used  
2 for serving the Missouri customers to the assets used to serve the customers.  
3 This is the divisional capital structure used by Aquila Networks that takes into  
4 account the relevant risks of these utility operations and was predicated on utility  
5 industry standards. Moreover, contrary to Mr. Murray's recommended use of  
6 Aquila, Inc.'s capital structure, the Company's divisional capital structure isolates  
7 the utility ratepayers from the risks of the non-utility operations. Use of the  
8 parent company's capital structure exposes ratepayers to higher financial risk.

9 **Q. YOU STATED THAT THE DIVISIONAL CAPITAL STRUCTURE WAS**  
10 **SUPERIOR TO THE AQUILA, INC. CAPITAL STRUCTURE FOR THIS CASE.**  
11 **ARE THERE ANY OTHER REASONS THAT YOU BELIEVE THAT THIS IS**  
12 **THE CASE?**

13 A. Yes, there are. Aquila has maintained a capital allocation, or assignment,  
14 process since 1988 that was designed to separate the capital costs of the  
15 divisions from the other operations of Aquila, Inc. This is especially important  
16 because of the significant international operations, the non-regulated operations  
17 and the utility operations in other states. The target capital structure for the  
18 natural gas operating divisions was consistent with realistic targets at that time,  
19 and as I indicated in my direct testimony, it is still appropriate today. The capital  
20 structures of the operating divisions were known when they were blended into  
21 the parent corporation, and the process tracks capital changes. The resulting  
22 capital structure is superior to either the use of Aquila, Inc.'s capital structure or a  
23 purely hypothetical capital structure.

1 Q. WHEN, IN YOUR OPINION, IS A HYPOTHETICAL CAPITAL STRUCTURE  
2 APPROPRIATE FOR UTILITY RATEMAKING PURPOSES?

3 A. Analysts generally recognize that a hypothetical capital structure is appropriate  
4 for ratemaking when the actual capital structure of a regulated utility is  
5 indeterminate or not representative of capital used to support the operating utility.  
6 It can serve to more accurately estimate the costs of supporting the utility as well  
7 as protecting the customers from the impact of costs from non-utility operations.  
8 For example, when applying the "rule" concerning use of the actual capital  
9 structure, Bonbright, *et.al.*, in the well-known *Principles of Public Utility Rates*,  
10 page 309, advocate that

11 ... if the existing capital structure is clearly unsound or is extravagantly  
12 conservative, the rule may need to be modified in the public interest.  
13 Actual cost of capital may then be disqualified in favor of legitimate cost.  
14 The diversification of utilities into nonregulated activities in recent years is  
15 one potential area where the rule may have to be modified. The firm's  
16 overall capital structure may not be reflective of a capital structure  
17 appropriate to the financing of a public utility as a consequence of risk  
18 differentials between regulated and nonregulated activities.

19  
20 Another example, in a survey of techniques of regulatory practices, David  
21 Parcell, in *The Cost of Capital – A Practitioner's Guide* at page 4-22, stated that a  
22 hypothetical capital structure would be appropriate when "The utility is funded as  
23 part of a diversified organization whose overall capital structure reflects its  
24 diversified nature rather than its utility operations only." These stated principles  
25 are common among cost of capital analysts and the above statement  
26 characterizes Aquila's circumstances in this proceeding.

27 Q. HAS THE STAFF ADDRESSED THIS CONCEPT AS IT PERTAINS TO  
28 AQUILA?

1 A. Yes. The Staff, in a report to the Commission in December 2002, at page 21,  
2 specifically summarized the merits of using a hypothetical capital structure for  
3 Aquila, Inc. The Staff in that report stated as follows:

4 To prevent or mitigate Aquila's higher cost of capital from being charged to  
5 Missouri ratepayers, the Commission can order the use of a hypothetical  
6 capital structure for ratemaking purposes to determine the appropriate mix  
7 of debt and equity that is appropriate for MPS and /or L&P. This capital  
8 structure *would not be dependent on* the capital structure currently in  
9 effect for Aquila. [Emphasis added].

10

11 **Q. HAS THE COMMISSION EVER REJECTED THE USE OF AQUILA INC.'S  
12 CAPITAL STRUCTURE FOR RATEMAKING PURPOSES?**

13 A. Yes. In its Report and Order on Remand in Case No. ER-93-37, page 38, the  
14 Commission rejected the use of the parent's capital structure for UtiliCorp, now  
15 Aquila, and stated:

16 Because MoPub must raise capital through UtiliCorp, the use of UtiliCorp's  
17 consolidated capital structure may be a valid approach. However, this is  
18 not the best approach for this case because UtiliCorp is comprised of both  
19 operating divisions and unregulated subsidiaries, and its capital structure  
20 reflects that mix.

21

22 The Commission went on to affirm, page 38, that an assigned capital  
23 structure, in this case in an electric utility proceeding, would insulate the Missouri  
24 ratepayers from the impacts from the unregulated affiliates.

25 Use of MoPub's assigned capital structure will help insulate it to some  
26 extent from UtiliCorp's unregulated subsidiaries, and the assigned capital  
27 structure is actually analogous to the capital structures of comparable  
28 electric companies.

29

30 **Q. DID MR. MURRAY RECOGNIZE THE RISKS OF THE MISSOURI NATURAL  
31 GAS OPERATIONS OF AQUILA?**

1 A. It appears that he did recognize that the risks of Aquila's natural gas operations  
2 were greater than the group of comparable gas companies that he analyzed. For  
3 example, he made an "...upwards adjustment of 32 basis points to take into  
4 consideration Aquila's additional risk as it relates to the comparable group," as  
5 stated on page 22, lines 9-10 of his direct testimony. However, this adjustment is  
6 inadequate. It does not link the capital costs of serving Missouri gas customers  
7 with the risks of utility operations in Missouri.

8 **Q. SHOULD MR. MURRAY HAVE RECOGNIZED THAT HIS RECOMMENDED**  
9 **CAPITAL STRUCTURE IS INCONSISTENT WITH THE PRINCIPLES OF**  
10 **LINKING CAPITAL COSTS TO THE RISKS OF THE UTILITY OPERATIONS?**

11 A. Yes, I think that he should have seen how his recommendation was inconsistent  
12 with the companies that he used as comparable companies. The inconsistency,  
13 or mismatch, in his recommended return on common stock and the  
14 recommended common stock equity ratio is obvious, and his own analysis shows  
15 this. Mr. Murray recommended a common stock equity ratio of 35.31 percent. As  
16 a comparison I have reproduced column (1) of his Schedule 20 in my Rebuttal  
17 Schedule DAM-1. This schedule shows that the average common stock equity  
18 ratio of the companies that he selected for his analysis as comparable to Aquila  
19 Networks was 49.68 percent. However, not one of the companies that he  
20 selected as comparable and to use as a ratemaking standard had an equity ratio  
21 close to the one that he is recommended for Aquila's Missouri gas operations.

22 **Q. WHY IS MR. MURRAY'S CAPITAL STRUCTURE RECOMMENDATION SO**  
23 **IMPORTANT IN THIS PROCEEDING?**

1 A. Mr. Murray ignored the financial risk associated with his capital structure, and this  
2 is a very important consideration in setting an allowed return in this proceeding.  
3 The greater the financial risk, the higher the return on a common equity will be  
4 necessary to attract and retain investors.

5 **Q. HAVE THE OPERATING DIVISIONS OF AQUILA, INC., INSULATED THE**  
6 **MISSOURI RATEPAYERS FROM THE IMPACTS OF THE COSTS OF THE**  
7 **UNREGULATED AFFILIATES?**

8 A. Yes. The debt costs of the Missouri operating divisions are capped at the debt  
9 costs of a BBB utility. Also, in my direct testimony I developed a recommended  
10 cost of common stock equity based on the earnings of a group of healthy natural  
11 gas utilities with similar financial characteristics to Aquila's Missouri operating  
12 divisions.

13 **Q. HOW CAN YOU SAY THAT MR. MURRAY IGNORED THE FINANCIAL RISK**  
14 **OF THE MISSOURI GAS OPERATIONS OF AQUILA?**

15 A. Mr. Murray recommended an allowed return on common stock of 9.72 percent  
16 with a common stock equity ratio of 35.31 percent. However, his comparable  
17 companies earned an average return of 11.50 percent in 2003 according to his  
18 Schedule 20 with a common stock equity ratio average of 49.68 percent. These  
19 equity levels and returns of his comparable companies are not consistent with his  
20 recommendation. He recommended a much lower return of 9.72 with a much  
21 lower common stock equity ratio. I have illustrated this comparison in Rebuttal  
22 Schedule DAM-2.

1 **Q. YOU STATED PREVIOUSLY THAT MR. MURRAY COMMITTED ANALYTICAL**  
2 **ERRORS THAT AFFECTED HIS DCF ANALYSIS. WHAT ERRORS WERE**  
3 **YOU REFERRING TO IN THIS STATEMENT?**

4 **A.** Mr. Murray relied on DCF results of large gas utilities that are not comparable to  
5 the two Aquila Networks divisions in Missouri, and these analytical results are not  
6 acceptable regulatory standards. In addition he averaged historical growth rates  
7 that cannot be representative of the future expectations of investors to produce  
8 unrealistically low estimates of the cost of capital for these non-comparable  
9 companies.

10 **Q. WHAT WERE YOU REFERRING TO WHEN YOU STATED THAT MR.**  
11 **MURRAY MADE ERRORS IN HIS CAPM CALCULATIONS?**

12 **A.** Mr. Murray made three obvious mistakes in his CAPM analysis. Each caused him  
13 to underestimate the cost of common stock using this method. Taken together,  
14 these errors are significant. It is important, however, that they are readily  
15 identifiable and correctable.

16 **Q. CAN YOU EXPLAIN THESE ERRORS IN THE CAPM ANALYSIS THAT ARE**  
17 **IMPORTANT, BUT SUBJECT TO CORRECTION?**

18 **A.** Yes. First, Mr. Murray used a negative risk premium to calculate his CAPM.  
19 This assumption is contrary to the basic theoretical construct of the CAPM and  
20 without any precedent or theoretical justification. At minimum, if Mr. Murray  
21 thought for some reason that the "risk premium" actually was negative, he should  
22 have explained why such a theoretical anomaly occurred. Second, he selected  
23 an incorrect risk premium from the source he cited. Apparently he erred by



1 selecting the wrong number from the page that he cited as a reference. Third, he  
2 failed to make a recommended adjustment for empirical bias when the data that  
3 he used in his CAPM called for this adjustment. The authors of the data source  
4 that he cited recommended this correction, and he just ignored their  
5 recommendation.

6 **Q. YOU SAID THAT MR. MURRAY USED A NEGATIVE RISK PREMIUM IN HIS**  
7 **CAPM ANALYSIS. PLEASE EXPLAIN THE SIGNIFICANCE OF THIS.**

8 A. It is an illogical assumption, and it will lead to meaningless calculations. In his  
9 Schedule 17, Mr. Murray identified a short-term risk premium of -0.34 percent.  
10 However, a negative risk premium in a CAPM analysis is not logical. It implies  
11 that the investors in the common stocks of the analyzed companies, in this case  
12 Mr. Murray's comparable companies, believe that these common stocks are less  
13 risky investments than U.S. Treasury bonds.

14 **Q. COULD YOU TELL IF MR. MURRAY INTENDED TO INTRODUCE THIS**  
15 **ILLOGICAL ASSUMPTION INTO HIS CAPM ANALYSIS?**

16 A. This is not clear. Mr. Murray made precisely the same calculation in cases  
17 numbered ER-2004-0034 and HR-2004-0024. In those cases, he responded to a  
18 Data Request (Number 0629), as follows: "Mr. Murray is not recommending that  
19 a negative risk premium be used in determining the required return on equity in a  
20 regulatory proceeding." However, from his calculations, as illustrated in Schedule  
21 17, it is apparent that this is exactly what he did. In this schedule he shows the  
22 results of estimating a CAPM cost of equity ( $4.91\% = 5.13\% + (0.66 \cdot -0.34\%)$ ). He  
23 also cites this 4.91 percentage at page 31, line 2 of his Direct Testimony. These

1 calculations imply that a rational investor would pass up a virtually certain return  
2 of 5.13 percent from an investment in U.S. Treasury bonds in favor of a less  
3 certain, or more risky return, of 4.91 percent from an investment in the common  
4 stocks of his comparable companies. This is an implausible consequence of Mr.  
5 Murray's incorrectly structured CAPM analysis.

6 **Q. YOU STATED THAT MR. MURRAY SELECTED THE WRONG NUMBER**  
7 **FROM ONE OF HIS CITED SOURCES. CAN YOU EXPLAIN?**

8 A. Yes. Mr. Murray did not select the correct number for a risk premium for his  
9 CAPM analysis from the source, Ibbotson Associates, which he cited in Schedule  
10 17. He stated that the risk premium is 6.4 percent. In fact, the risk premium in the  
11 source that he cited is 7.0 percent. I have enclosed the appropriate table as my  
12 Rebuttal Schedule DAM-3.

13 **Q. YOU STATED THAT MR. MURRAY IGNORED A METHODOLOGICAL**  
14 **RECOMMENDATION FROM ONE OF HIS SOURCES. PLEASE EXPLAIN.**

15 A. Because of known biases in the data favoring large firms, Ibbotson Associates,  
16 which is the source that he used in his CAPM analysis, recommends making a  
17 size adjustment based on the market capitalization of the company when the  
18 data are used for a CAPM analysis. Ibbotson Associates, which he cited in this  
19 Schedule 17, even recommends the level of adjustment to compensate for this  
20 bias. Mr. Murray ignored the presence of this bias and Ibbotson Associates'  
21 recommended adjustment. This recommended change is also explained by  
22 Ibbotson Associates in the attached schedule.

1 Q. YOU STATED THAT MR. MURRAY'S CAPM ANALYSIS WAS  
2 CORRECTABLE. DID YOU CORRECT THESE ANALYTICAL ERRORS AND  
3 RECALCULATE THE CAPM USING HIS METHODOLOGY?

4 A. Yes.

5 Q. WHEN YOU CORRECTED MR. MURRAY'S CAPM ANALYSIS, WHAT  
6 RESULTS DID HIS METHODOLOGY PRODUCE?

7 A. When calculated correctly, after correcting for these three errors, Mr. Murray's  
8 CAPM analysis produced an estimate of the cost of common stock for his  
9 comparable companies of 11.15 percent. Notably, the corrected CAPM produces  
10 a return on equity estimate of 13.65 percent for Aquila, Inc. I have shown these  
11 calculations using his methodology in Rebuttal Schedule DAM-4.

12 Q. WHY DID YOU STATE THAT THE RESULTS OF MR. MURRAY'S TESTIMONY  
13 IMPERILED THE FINANCIAL CONDITION OF THE COMPANY?

14 A. His recommended capital structure and his recommended return together, as  
15 shown by his own interest coverage analysis, show that he disregarded his  
16 analysis of financial integrity in addition to ignoring sound financial practice.

17 Q. WHAT FINANCIAL INTEGRITY MEASURES DID MR. MURRAY DISREGARD?

18 A. He calculated before tax interest coverage ratios to test the range of his rate of  
19 return recommendation, and he reported these in his Schedule 21. However, he  
20 either dismissed these results or misinterpreted them.

21 Q. WHAT IS THE EVIDENCE THAT HE DISMISSED OR MISINTERPRETED HIS  
22 FINANCIAL INTEGRITY MEASURES?

1 A. I have reproduced interest coverages from column (3) of Mr. Murray's Schedule  
2 20 and the Pre-Tax Interest Coverage that he calculated on Schedule 21 using  
3 his return recommendation and illustrated this comparison in Rebuttal Schedule  
4 DAM-5. It shows that the average Pre-Tax Interest Coverage of his comparable  
5 companies is 3.66. As this schedule also shows, Mr. Murray's calculated pre-tax  
6 coverage using his recommended return for Aquila Networks would only be in the  
7 range of 2.25. As this schedule also shows, this is significantly below the average  
8 coverage for Staff Witness Murray's comparable companies.

9 **Q. YOU MENTIONED THE FINANCIAL INFORMATION IN THE EDWARD JONES**  
10 **REPORT THAT MR. MURRAY CITED IN HIS SCHEDULE 11. DID THIS**  
11 **REPORT BY EDWARD JONES PRESENT INFORMATION REGARDING THE**  
12 **COMPANIES THAT MR. MURRAY SELECTED AS COMPARABLE**  
13 **COMPANIES?**

14 A. Yes. The Edward Jones report that Mr. Murray used to select his comparable  
15 companies included financial information concerning these companies. For  
16 example, as I have illustrated in Rebuttal Schedule DAM-6, the average common  
17 stock equity of Mr. Murray's comparable companies, as reported by Edward  
18 Jones, was 50.13 percent. The return on common stock equity reported by  
19 Edward Jones is 11.91 percent. The interest coverage reported by Edward Jones  
20 was 3.68 percent. I have also compared his recommended return with those of  
21 his comparable companies as shown in the report that he used to select his  
22 comparable companies. Remarkably, my recommended common stock equity,  
23 my recommended return on common stock equity, and my recommended before

1 tax interest coverage are very close to the average statistics of Mr. Murray's  
2 comparable companies.

3 **Q. HAVE YOU COMPARED YOUR RECOMMENDED ALLOWED RETURN,**  
4 **COMMON STOCK EQUITY AND INTEREST COVERAGES TO THOSE OF MR.**  
5 **MURRAY AND THE EDWARD JONES REPORT?**

6 A. Yes. I made this comparison, which I have illustrated in Rebuttal Schedule DAM-  
7 7. As this schedule shows, Mr. Murray's recommended return on common stock,  
8 common stock equity, and pretax interest coverage for both Aquila Networks –  
9 MPS Aquila Networks-L&P are extremely low when compared to the Edward  
10 Jones Report, and the numbers that he cited in his own Schedule 20. In  
11 comparison, my recommended returns on common stock, common equity ratio  
12 and interest coverages are very similar to the averages for Mr. Murray's  
13 comparable companies, as reported by Edward Jones.

14 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

15 A. Yes, it does.

16

**Aquila Networks – MPS and SJLP**

**Summary of Rebuttal Schedules**

- Rebuttal Schedule R-1: Comparison of Common Equity Ratios
- Rebuttal Schedule R-2: Comparison of Returns on Common Equity
- Rebuttal Schedule R-3: Table C-1 from Ibbotson Associates 2003 SBI Yearbook: Valuation Edition
- Rebuttal Schedule R-4: Capital Asset Pricing Model
- Rebuttal Schedule R-5: Comparison of Before Tax Coverage Ratios
- Rebuttal Schedule R-6: Edward Jones' Key Financial Statistics
- Rebuttal Schedule R-7: Comparison of Key Financial Statistics

Aquila Networks - MPS & SJLP

Comparison of Common Equity Ratios

For Staff Witness Murray's Comparable Gas Utility Companies

Company Name	Year 2002 Common Equity to Total Capital Ratio
AGL Resources	41.70%
Cascade Natural Gas	40.90%
New Jersey Resources	49.40%
Northwest Natural Gas Corporation	51.50%
Peoples Energy Corporation	59.30%
Piedmont Natural Gas Company	56.10%
South Jersey Industries, Inc.	46.10%
WGL Holdings, Inc.	52.40%
<b>Average</b>	<b>49.68%</b>
Witness Murray's Proposed Equity Ratio	35.31%

Source: Direct Testimony of Staff Witness David Murray, Schedule 20

Aquila Networks - MPS & SJLP

Returns on Common Equity

For Staff Witness Murray's Comparable Gas Utility Companies

Company Name	2003 Projected Return on Common Equity
AGL Resources	13.50%
Cascade Natural Gas	7.50%
New Jersey Resources	15.00%
Northwest Natural Gas Corporation	9.00%
Peoples Energy Corporation	12.00%
Piedmont Natural Gas Company	10.50%
South Jersey Industries, Inc.	12.50%
WGL Holdings, Inc.	12.00%
<b>Average</b>	<b>11.50%</b>
Witness Murray's Proposed Return On Equity	9.72%

Source: Direct Testimony of Staff Witness David Murray, Schedule 20



Table C-1

Rebuttal Schedule R-3

## Key Variables in Estimating the Cost of Capital

	Value		
<b>Yields (Riskless Rates)<sup>1</sup></b>			
Long-term (20-year) U.S. Treasury Coupon Bond Yield	4.8%		
Intermediate-term (5-year) U.S. Treasury Coupon Note Yield	2.6		
Short-term (30-day) U.S. Treasury Bill Yield	1.2		
<b>Equity Risk Premium<sup>2</sup></b>			
Long-horizon expected equity risk premium: large company stock total return minus long-term government bond income returns	7.0		
Intermediate-horizon expected equity risk premium: large company stock total returns minus intermediate-term government bond income returns	7.4		
Short-horizon expected equity risk premium: large company stock total returns minus U.S. Treasury bill total returns	8.4		
<b>Size Premium<sup>3</sup></b>			
	Market Capitalization of Smallest Company (in millions)	Market Capitalization of Largest Company (in millions)	Size Premium (Return in Excess of CAPM)
Decile			
Mid-Cap, 3-5	\$1,144.452	\$5,012.705	0.82%
Low-Cap, 6-8	\$314.174	\$1,143.845	1.52
Micro-Cap, 9-10	\$0.501	\$314.042	3.53
Breakdown of Deciles 1-10			
1-Largest	\$11,636.618	\$293,137.304	-0.32
2	\$5,018.316	\$11,628.735	0.42
3	\$2,686.479	\$5,012.705	0.66
4	\$1,691.463	\$2,680.573	0.95
5	\$1,144.452	\$1,691.210	1.16
6	\$791.917	\$1,143.845	1.48
7	\$521.400	\$791.336	1.35
8	\$314.174	\$521.298	2.06
9	\$141.529	\$314.042	2.56
10-Smallest	\$0.501	\$141.459	5.67
Breakdown of the 10th Decile			
10a	\$64.798	\$141.459	3.98
10b	\$0.501	\$64.767	9.16

<sup>1</sup> As of December 31, 2002. Maturities are approximate.

<sup>2</sup> Expected risk premia for equities are based on the differences of historical arithmetic mean returns from 1926-2002 using the S&P 500 as the market benchmark.

<sup>3</sup> See chapter 7 for complete methodology.

Note: Examples on how these variables can be used are found in Chapters 3 and 4

## Aquila Networks - MPS &amp; SJLP

## Capital Asset Pricing Model

For Staff Witness Murray's Comparable Gas Utility Companies

Company	Risk Free Rate	Company's Value Line Beta	Market Risk Premium	Size Premium	CAPM Cost of Common Equity
AGL Resources	5.13%	0.75	7.00%	0.82%	11.20%
Cascade Natural Gas	5.13%	0.65	7.00%	3.53%	13.21%
New Jersey Resources	5.13%	0.65	7.00%	1.52%	11.20%
Northwest Natural Gas Corporation	5.13%	0.60	7.00%	1.52%	10.85%
Peoples Energy Corporation	5.13%	0.75	7.00%	0.82%	11.20%
Piedmont Natural Gas Company	5.13%	0.70	7.00%	0.82%	10.85%
South Jersey Industries, Inc.	5.13%	0.50	7.00%	1.52%	10.15%
WGL Holdings, Inc.	5.13%	0.65	7.00%	0.82%	10.50%
<b>Average</b>	5.13%	0.66	7.00%	1.42%	11.15%
Aquila, Inc.	5.13%	1.00	7.00%	1.52%	13.65%

Sources: Direct Testimony of Staff Witness David Murray, Schedule 17, Rebuttal Schedule R-3

## Aquila Networks - MPS &amp; SJLP

## Before Tax Coverage Ratios

For Staff Witness Murray's Comparable Gas Utility Companies

Company Name	Pre-Tax Interest Coverage Ratio
AGL Resources	2.90
Cascade Natural Gas	2.60
New Jersey Resources	6.10
Northwest Natural Gas Corporation	3.10
Peoples Energy Corporation	4.70
Piedmont Natural Gas Company	3.70
South Jersey Industries, Inc.	3.40
WGL Holdings, Inc.	2.80
<b>Average</b>	<b>3.66</b>
Standard & Poor's BBB Median Interest Coverage	<b>2.85</b>
Witness Murray's Proposed Interest Coverage (High)	<b>2.25</b>

Source: Direct Testimony of Staff Witness David Murray, Schedules 20 and 21

## Aquila Networks - MPS &amp; SJLP

## Staff Witness Murray's Comparable Gas Utility Companies

## Financial Statistics Reported by Edward Jones

Company	Equity Ratio	Return on Equity	Interest Coverage
AGL Resources	39.00%	13.70%	2.42
Cascade Natural Gas Corporation	42.00%	7.40%	3.93
New Jersey Resources Corporation	54.00%	16.50%	6.30
Northwest Natural Gas Company	50.00%	8.50%	3.41
Peoples Energy Corporation	60.00%	12.30%	3.04
Piedmont Natural Gas Company	58.00%	10.70%	2.98
South Jersey Industries	45.00%	13.20%	3.91
WGL Holdings	53.00%	13.00%	3.46
Average	50.13%	11.91%	3.68

Source: Staff Response to Data Request No. ILA-0179

**Aquila Networks - MPS & SJLP**

**Comparison of Key Financial Statistics**

Statistic	(1) Staff's Proposed Level	(2) Edward Jones' Comparable Companies' Averages	(3) Staff's Comparable Companies' Averages	(4) Missouri Public Service Proposed Level	(5) St. Joseph Light & Power Proposed Level
Common Equity Ratio	35.31%	50.13%	49.68%	50.00%	50.00%
Return On Equity	9.72%	11.91%	11.50%	12.00%	12.00%
Interest Coverage Ratio	2.25	3.68	3.66	3.70	3.54

**Sources:**

Column (1) - Direct Testimony of Staff Witness David Murray, Schedules 21 & 23

Column (2) - Rebuttal Schedule R-6

Column (3) - Direct Testimony of Staff Witness David Murray, Schedule 20

Column (4) - Direct Testimony of Aquila Networks - MPS & SJLP Witness Donald A. Murry, Schedule 22

Column (5) - Direct Testimony of Aquila Networks - MPS & SJLP Witness Donald A. Murry, Schedule 23