

Exhibit No.:

Issues: Weather  
Normalization

Witness: Shawn E. Lange

Sponsoring Party: MO PSC Staff

Type of Exhibit: Direct Testimony

Case No.: ER-2005-0436

Date Testimony Prepared: October 11, 2005

**MISSOURI PUBLIC SERVICE COMMISSION**

**UTILITY OPERATIONS DIVISION**

**DIRECT TESTIMONY**

**OF**

**SHAWN E. LANGE**

**AQUILA, INC.**

**D/B/A AQUILA NETWORKS – MPS**

**AND AQUILA NETWORKS – L&P**

**CASE NO. ER-2005-0436**

**Jefferson City, Missouri  
October 2005**

**FILED**

FEB 24 2006

Missouri Public  
Service Commission

Exhibit No. 51  
Case No(s) ER 2005-0436  
Date 1-05-06 Rptr KE

**BEFORE THE PUBLIC SERVICE COMMISSION**  
**OF THE STATE OF MISSOURI**

In the Matter of Aquila, Inc. d/b/a Aquila )  
Networks-MPS and Aquila Networks- )  
L&P, for Authority to File Increasing )  
Electric Rates For the Service Provided to )  
Customers in the Aquila Networks-MPS )  
and Aquila Networks-L&P Area.

Case No. ER-2005-0436

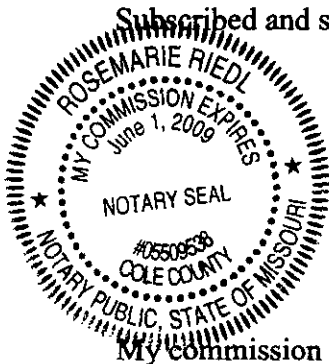
**AFFIDAVIT OF SHAWN LANGE**

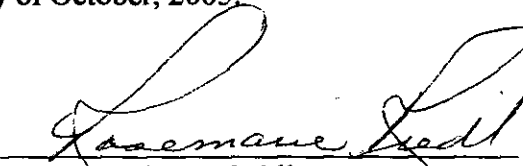
STATE OF MISSOURI     )  
                                  ) ss  
COUNTY OF COLE     )

Shawn Lange, of lawful age, on his oath states: that he has participated in the preparation of the following Direct Testimony in question and answer form, consisting of 10 pages of Direct Testimony to be presented in the above case, that the answers in the following Direct Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true to the best of his knowledge and belief.

  
Shawn Lange

Subscribed and sworn to before me this 12<sup>th</sup> day of October, 2005.



  
Notary Public

My commission expires June 1, 2009

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**DIRECT TESTIMONY**

**OF**

**Shawn E. Lange**

**AQUILA, INC.**

**D/B/A AQUILA NETWORKS – MPS**

**AND AQUILA NETWORKS – L&P**

**CASE NOS. ER-2005-0436**

Q. Please state your name and business address.

A. My name is Shawn E. Lange and my business address is Missouri Public Service Commission, P.O. Box 360, Jefferson City, MO 65102.

Q. What is your present position with the Missouri Public Service Commission (Commission)?

A. I am a Utility Engineering Specialist I in the Engineering Analysis Section, Energy Department, Utility Operations Division.

Q. Would you please review your educational background and work experience.

A. In December of 2002, I received a Bachelor of Science Degree in Mechanical Engineering from the University of Missouri, at Rolla. Since then, I have pursued dual Masters Degrees in Mechanical Engineering and Business Administration at the University of Missouri, at Columbia. I joined the Commission Staff (Staff) in January 2005. I am a registered Engineer-in-Training in the State of Missouri.

Q. What is the purpose of your direct testimony?

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1           A.     The purpose of my testimony is to recommend that the Commission adopt  
2 the Staff's weather adjustments and days adjustments to class usage for the weather  
3 sensitive rate classes of Aquila Networks - MPS (MPS) and Aquila Networks - L&P  
4 (L&P). These adjustments are presented by rate class in Schedule 1. Staff witness Janice  
5 Pyatte calculated the corresponding adjustments to class revenues based on these  
6 adjustments to class usage. These adjustments to class usage were also included in my  
7 calculation of hourly generation requirements.

8                     I also recommend that the Commission adopt the hourly net system loads  
9 that I calculated. Staff witness David W. Elliott used these hourly loads in his fuel model  
10 to normalized fuel and purchase power expenses for the test year. A monthly summary  
11 of the normalized net system load for L&P is shown on Schedule 2 and for MPS on  
12 Schedule 3.

13           Q.     To which of the Aquila, Inc. (Aquila) operations are you directing your  
14 testimony?

15           A.     This testimony only addresses the electric operations of Aquila in  
16 Missouri.

17     **EXECUTIVE SUMMARY**

18           Q.     Please provide a brief summary of your testimony.

19           A.     The purpose of the testimony is to provide a general description of  
20 weather normalization, describe the process I used, and present the results. The Staff's  
21 recommendation to the Commission on weather normalization is to adopt the Staff's  
22 weather adjustment, days adjustment, and the weather-normalized hourly net system  
23 loads.

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1           Schedule 1 contains the adjustments to sales by rate class for L&P and MPS,  
2           Schedule 2 contains a monthly summary for the normalized net system load for L&P,  
3           Schedule 3 contains a monthly summary for the normalized net system load for MPS, and  
4           Schedule 4 contains a list of cases in which Staff's weather normalization method was  
5           used in the normalization of net system loads.

6           The results of the weather normalization of sales were used by Staff Witness  
7           Janice Pyatte to normalize revenues.

8           The weather-normalized loads were used as an input to the fuel run Staff Witness  
9           David W. Elliott used to normalized fuel and purchased power expense.

10           **NORMALIZATION OF USE**

11           Electricity use is very sensitive to weather conditions. Because of the high  
12           saturation of air conditioning and the presence of significant electric space heating in  
13           Aquila's Missouri service territories, the level of sales and the magnitude and shape of  
14           Aquila's load curve is directly related to daily temperatures.

15           The weather during the test year differed from normal conditions. The winter  
16           months of January, February, March, and December 2004 were warmer than normal.  
17           The summer months of June through August 2004 were cooler than normal. The effect  
18           of both of these conditions was to lower the amount of electricity consumed relative to  
19           normal levels.

20           **HOURLY NET SYSTEM LOADS**

21           The hourly loads were normalized using the method described in the document  
22           "Weather Normalization of Electric Loads, Part A: Hourly Net System Loads"

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(November 28, 1990), written by Dr. Michael Proctor, Manager of the Economic  
Analysis Department.

**NORMAL WEATHER VARIABLES**

The normal weather variables were developed using the method described in the  
document "Weather Normalization of Electric Loads, Demonstration: Calculation of  
Weather Normals." October 25, 1991. The normal weather variables were developed  
using the consecutive 30 years from January 1, 1971 to December 31, 2000.

**NORMALIZATION OF USAGE**

Q. Why is it necessary to weather normalize electricity usage?

A. Electricity use is very sensitive to weather conditions. Because of the high  
saturation of air conditioning and the presence of significant electric space heating in  
Aquila's Missouri service territories, the magnitude and shape of Aquila's load is directly  
related to daily temperatures. The weather during the test year differed from normal  
conditions. The winter months of January, February, March, and December 2004 were  
warmer than normal. The warmer than normal temperatures, resulted in decreased  
energy consumption and lower than normal heating usage. The summer months of June  
through August 2004 were cooler than normal. The cooler than normal temperatures  
resulted in decreased energy consumption and lower than normal cooling usage.

Q. What method did you use to calculate the weather adjustments to class  
usage?

A. I used the Hourly Electric Load Model (HELM) to calculate the weather  
adjustments to class usage. In this model, the response to daily weather is first estimated  
for each of the rate classes from hourly class level load data. Weather normalized usage

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1 is then calculated for each month for each of the weather sensitive classes, given normal  
2 weather variables based on the estimated response. The weather variables are carefully  
3 matched to correspond to the usage in the time period over which usage was recorded.  
4 The weather adjustment to class usage is calculated as the difference between the weather  
5 normalized usage and the actual usage.

6 Q. What are the inputs to this model?

7 A. There are four data inputs into the model – monthly class usage, hourly  
8 class load data, and actual and normal daily weather variables. The monthly class usage  
9 and the hourly class loads were supplied by Aquila. I used the actual high and low  
10 temperatures for the test year and the history of high and low temperatures for the Kansas  
11 City International (KCI) Airport National Oceanic Atmospheric Administration (NOAA)  
12 weather station.

13 Q. How was the days adjustment determined?

14 A. HELM includes a calculation of the adjustment necessary to convert the  
15 billing month sales, which corresponds to how customer meters are read, to calendar  
16 month sales. The model calculates the weather normalized usage on a daily basis and  
17 then aggregates these daily usages to estimate the weather adjustment to both billing and  
18 calendar month sales. I calculated the “days adjustment” as the difference between the  
19 weather normalized calendar month sales and the weather normalized billing month sales.

20 Q. Did you make any adjustments or corrections to the billing cycle usage  
21 data?

22 A. Yes. The monthly billing data, provided by Aquila, was disaggregated by  
23 billing cycle. While reviewing the billing cycle data provided by Aquila, I noticed that



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1 the usage in some billing cycles in certain months was negative. I used information on  
2 specific billing corrections provided by Aquila to correct the monthly billing cycle usage  
3 data.

4 Q. Did you calculate any adjustments to monthly sales to account for leap  
5 year?

6 A. Yes. I calculated leap year adjustments to each month's sales as 1/366 of  
7 that month's weather normalized sales.

8 Q. Do any Missouri electric utilities use HELM?

9 A. Yes. Aquila used HELM to weather normalized its billing month sales in  
10 this rate case. Kansas City Power and Light Company (KCPL), Aquila, AmerenUE, and  
11 The Empire District Electric Company (Empire) have all used HELM to analyze loads in  
12 their Missouri resource planning process. KCPL and Empire both used HELM to  
13 weather normalize billing month usage and hourly loads in their most recent rate design  
14 cases. Empire also used HELM to weather normalize sales in its most recent rate case.

15 Q. Has Staff previously used HELM?

16 A. Yes, Staff has used HELM in rate cases involving Empire and Aquila.

17 **HOURLY NET SYSTEM LOADS**

18 Q. What is hourly net system load?

19 A. Hourly net system load is the hourly electric supply necessary to meet the  
20 energy demands of company's customers and the company's own internal needs. It is net  
21 of (i.e., does not include) station use, which is the electricity requirement of the  
22 company's generating plants. The hourly loads used in my analysis of the test year  
23 January 2004 through December 2004 were provided to Staff in response to Data Request

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1 numbers 35 and 36 and the respective supplements to these requests. I also used hourly  
2 load data submitted monthly by Aquila in compliance with the Commission's rule  
3 4 CSR 240-3.190 to cross check and correct errors that were found in the data request  
4 response.

5 Q. What method did Staff use to weather normalize net system hourly loads?

6 A. The Staff's weather normalization procedure was developed by the  
7 Economic Analysis Department of the Commission in 1988. The process is described in  
8 detail in the document "Weather Normalization of Electric Loads, Part A: Hourly Net  
9 System Loads" (November 28, 1990), written by Dr. Michael Proctor, Manager of the  
10 Economic Analysis Department.

11 Q. Briefly summarize the process you used.

12 A. In order to reflect normal weather, daily peak and average loads are  
13 adjusted independently, but using the same methodology. Independent adjustments are  
14 necessary because average loads respond differently to weather than peak loads.

15 Daily average load is calculated as the daily energy divided by twenty-four hours  
16 and the daily peak is the maximum hourly load for the day. Separate regression models  
17 estimate both a base component, which is allowed to fluctuate across time, and a weather  
18 sensitive component, which measures the response to daily fluctuations in weather for  
19 daily average loads and peak loads. The regression parameters, along with the difference  
20 between normal and actual cooling and heating measures, are used to calculate weather  
21 adjustments to both the average and peak loads for each day. The adjustments for each  
22 day are added respectively to the actual average and peak loads for each day. The  
23 starting point for allocating the weather normalized daily peak and average loads to the

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1 hours is the actual hourly loads. A unitized load curve is calculated for each day as a  
2 function of the actual peak and average loads for that day. The corresponding weather  
3 normalized daily peak and average loads, along with the unitized load curves, are used to  
4 calculate weather normalized hourly loads.

5 This process includes many checks and balances, which are included in the  
6 spreadsheets that are used. In addition, the analyst is required to examine the data at  
7 several points in the process.

8 Q. Has this method been used in other rate cases?

9 A. Yes, this method has been used in several cases before this Commission.  
10 Please refer to Schedule 4 for a list of these cases.

11 Q. What data was used in this process?

12 A. Actual hourly net system loads for the time period from October 1, 2003  
13 through March 31, 2005 were provided by Aquila. The actual daily weather variables  
14 from the NOAA KCI weather station were used. I calculated the normal weather  
15 variables using a method developed by the Staff in 1991. The process is described in the  
16 document "Weather Normalization of Electric Loads, Demonstration: Calculation of  
17 Weather Normals," October 25, 1991 and summarized in the next section of my  
18 testimony.

19 Q. Were modifications made to the test year weather normalized hourly net  
20 system loads to account for Staff adjustments to test year usage?

21 A. Yes. I adjusted the weather-normalized hourly net system loads to be  
22 consistent with the Staff's weather-normalized, annualized test year usage.

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1 Q. How were the hourly loads adjusted to account for the annual adjustments  
2 to usage?

3 A. I added wholesale sales and company usage to the Staff's weather-  
4 normalized, annualized test year usage. Then, I increased the annual usage adjustment by  
5 the loss factor supplied to me by Staff witness Alan J. Bax in order to obtain the  
6 additional amount of generation (net system input) necessary to serve this additional  
7 generation. A factor was applied to each hour of the weather-normalized loads to  
8 produce an annual sum of the hourly net-system loads that equals the adjusted test year  
9 usage, plus losses, and consistent with normalized revenues. A monthly summary of the  
10 adjusted loads is shown on Schedule 2.

11 Q. Which Staff witness used your hourly-normalized net system loads?

12 A. Staff witness David W. Elliott used the test year hourly normalized system  
13 loads in developing test year fuel and purchased power expense.

14 **NORMAL WEATHER VARIABLES**

15 Q. What did you use to represent normal weather in these calculations?

16 A. The normal weather used in both the normalization of class usage and  
17 hourly net system loads was calculated using Staff's ranking method and daily weather  
18 values for the time period January 1, 1971 through December 31, 2000. Staff's ranking  
19 method estimates daily normal values, which range from the temperature value that is  
20 "normally" the hottest to the temperature value that is "normally" the coldest.

21 Using ranked normals to estimate the weather adjustment to usage is important  
22 because electricity use does not respond to temperature by a constant factor. Customer  
23 response to a change in temperature of one degree from 70 to 71 is very different from a

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1 change in temperature of one degree from 90 to 91. The ranking method of calculating  
2 normals allows for a more accurate estimate of changes in usage due to deviations from  
3 normal weather.

4 Using ranked normals is also important in estimating fuel and purchased power  
5 expense because these expenses are greatly impacted by daily weather extremes. Since  
6 every year has days with extreme temperatures, the daily normals should also contain  
7 extremes. The ranking method that was used estimates normal extremes.

8 Q. How are the daily normals derived?

9 A. The daily normal variables are calculated by ranking the temperatures in  
10 each year of the history. These temperatures are then averaged by rank, not by the day of  
11 the year. This results in the normal extreme being the average of the most extreme  
12 temperatures in each year of the history. The second extreme normal variable is based on  
13 the average of the second most extreme day of each year and so forth. The normal  
14 variables calculated from this ranking are then assigned to the days in the test year based  
15 on the rankings of the actual temperatures in the year. This assignment results in as small  
16 a weather normalization adjustment to the hourly loads on each day as is possible for a  
17 given annual adjustment.

18 Q. Does this conclude your direct testimony?

19 A. Yes, it does.

**Aquila Networks L&P**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Residential General Use (MO910)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (366 Days)	Leap Year Adjustment
Jan-04	26,483,691	28,450,051	1,966,360	7.42%	(2,886,734)	25,563,317	(69,845)
Feb-04	24,551,405	24,084,725	(466,680)	-1.90%	(578,853)	23,505,872	(64,224)
Mar-04	21,563,028	22,476,797	913,769	4.24%	(1,515,414)	20,961,383	(57,272)
Apr-04	18,114,504	18,024,828	(89,676)	-0.50%	(2,105,092)	15,919,736	(43,497)
May-04	19,537,118	17,465,609	(2,071,509)	-10.80%	1,427,524	18,893,133	(51,621)
Jun-04	26,537,527	23,420,565	(3,116,962)	-11.75%	7,153,541	30,574,106	(83,536)
Jul-04	32,468,097	41,372,866	8,904,769	27.43%	8,670,909	50,043,775	(136,732)
Aug-04	32,918,495	44,808,866	11,890,371	36.12%	(3,820,794)	40,988,072	(111,989)
Sep-04	30,334,222	34,114,009	3,779,787	12.46%	(9,030,753)	25,083,256	(68,533)
Oct-04	23,182,507	22,017,574	(1,174,933)	-5.07%	(2,733,689)	19,263,885	(52,688)
Nov-04	18,172,618	18,300,880	128,262	0.71%	1,985,906	20,286,786	(55,428)
Dec-04	23,780,927	24,635,657	854,730	3.59%	2,867,368	27,503,025	(75,145)
<b>Total</b>	<b>297,654,139</b>	<b>319,172,427</b>	<b>21,518,288</b>	<b>7.23%</b>	<b>(566,081)</b>	<b>318,606,346</b>	<b>(870,509)</b>
<b>Summer</b>	<b>122,258,341</b>	<b>143,716,306</b>	<b>21,457,965</b>	<b>17.55%</b>	<b>2,972,903</b>	<b>146,689,209</b>	<b>(400,780)</b>
<b>Other</b>	<b>175,395,798</b>	<b>175,456,121</b>	<b>60,323</b>	<b>0.03%</b>	<b>(3,538,984)</b>	<b>171,917,137</b>	<b>(469,719)</b>

**Aquila Networks L&P**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Residential General Use (MO911)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (366 Days)	Leap Year Adjustment
Jan-04	209,446	228,534	19,088	9.11%	(29,986)	188,548	(542)
Feb-04	190,207	182,185	(8,022)	-4.22%	5,428	187,813	(513)
Mar-04	172,999	181,909	8,910	5.15%	(8,118)	173,791	(475)
Apr-04	139,974	137,438	(2,536)	-1.81%	(7,174)	130,264	(356)
May-04	178,073	155,491	(22,582)	-12.68%	7,576	163,067	(446)
Jun-04	244,306	218,551	(25,755)	-10.54%	37,372	255,923	(699)
Jul-04	278,266	370,845	92,579	33.27%	27,549	398,394	(1,089)
Aug-04	231,520	328,012	96,492	41.68%	8,304	336,316	(919)
Sep-04	266,330	273,920	7,590	2.85%	(63,328)	210,592	(575)
Oct-04	180,662	175,168	(5,494)	-3.04%	(12,779)	162,389	(444)
Nov-04	147,587	149,992	2,405	1.63%	9,453	159,445	(436)
Dec-04	188,657	194,901	6,044	3.20%	6,550	201,451	(550)
<b>Total</b>	<b>2,428,227</b>	<b>2,596,946</b>	<b>168,719</b>	<b>6.95%</b>	<b>(19,153)</b>	<b>2,577,793</b>	<b>(7,043)</b>
<b>Summer</b>	<b>1,020,422</b>	<b>1,191,328</b>	<b>170,906</b>	<b>16.75%</b>	<b>9,897</b>	<b>1,201,225</b>	<b>(3,282)</b>
<b>Other</b>	<b>1,407,805</b>	<b>1,405,618</b>	<b>(2,187)</b>	<b>-0.16%</b>	<b>(29,050)</b>	<b>1,376,568</b>	<b>(3,761)</b>

**Aquila Networks L&P**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Residential Water Heat (MO913)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (366 Days)	Leap Year Adjustment
Jan-04	8,557,922	9,166,790	608,868	7.11%	(774,566)	8,392,224	(22,930)
Feb-04	8,082,235	7,884,098	(198,137)	-2.45%	(120,534)	7,763,564	(21,212)
Mar-04	7,102,031	7,420,735	318,704	4.49%	(622,722)	6,798,013	(18,574)
Apr-04	5,866,808	5,984,567	117,759	2.01%	(511,060)	5,473,507	(14,955)
May-04	5,840,875	5,600,919	(239,956)	-4.11%	(8,337)	5,592,582	(15,280)
Jun-04	6,769,884	6,231,128	(538,756)	-7.96%	979,298	7,210,426	(19,701)
Jul-04	7,798,981	9,418,580	1,619,599	20.77%	1,712,471	11,131,051	(30,413)
Aug-04	7,822,915	10,026,713	2,203,798	28.17%	(846,004)	9,180,709	(25,084)
Sep-04	7,252,665	7,849,844	597,179	8.23%	(1,550,783)	6,299,061	(17,211)
Oct-04	6,186,002	5,955,312	(230,690)	-3.73%	(252,046)	5,703,266	(15,583)
Nov-04	5,550,409	5,614,673	64,264	1.16%	756,880	6,371,553	(17,409)
Dec-04	7,403,759	7,670,311	266,552	3.60%	1,032,957	8,703,268	(23,779)
<b>Total</b>	<b>84,234,486</b>	<b>88,823,670</b>	<b>4,589,184</b>	<b>5.45%</b>	<b>(204,446)</b>	<b>88,618,224</b>	<b>(242,129)</b>
<b>Summer</b>	<b>29,644,445</b>	<b>33,526,265</b>	<b>3,881,820</b>	<b>13.09%</b>	<b>294,982</b>	<b>33,821,247</b>	<b>(92,408)</b>
<b>Other</b>	<b>54,590,041</b>	<b>55,297,405</b>	<b>707,364</b>	<b>1.30%</b>	<b>(499,428)</b>	<b>54,797,977</b>	<b>(149,721)</b>

**Aquila Networks L&P**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Residential Water Heat (MO914)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (365 Days)	Leap Year Adjustment
Jan-04	5,275	5,604	329	6.24%	(34)	5,570	(15)
Feb-04	5,352	5,277	(75)	-1.40%	30	5,307	(15)
Mar-04	5,103	5,325	222	4.35%	(1,091)	4,234	(12)
Apr-04	3,698	3,768	70	1.89%	(435)	3,333	(9)
May-04	3,534	3,453	(81)	-2.29%	968	4,421	(12)
Jun-04	6,366	5,759	(607)	-9.54%	1,270	7,029	(19)
Jul-04	7,415	8,929	1,514	20.42%	1,544	10,473	(29)
Aug-04	7,521	9,667	2,146	28.53%	(1,064)	8,603	(24)
Sep-04	6,712	7,337	625	9.31%	(1,919)	5,418	(15)
Oct-04	4,682	4,485	(197)	-4.21%	850	5,335	(15)
Nov-04	5,283	5,277	(6)	-0.11%	(1,104)	4,173	(11)
Dec-04	4,182	4,355	173	4.14%	805	5,160	(14)
<b>Total</b>	<b>65,123</b>	<b>69,236</b>	<b>4,113</b>	<b>6.32%</b>	<b>(180)</b>	<b>69,056</b>	<b>(189)</b>
<b>Summer</b>	<b>28,014</b>	<b>31,692</b>	<b>3,678</b>	<b>13.13%</b>	<b>(169)</b>	<b>31,523</b>	<b>(86)</b>
<b>Other</b>	<b>37,109</b>	<b>37,544</b>	<b>435</b>	<b>1.17%</b>	<b>(11)</b>	<b>37,533</b>	<b>(103)</b>

**Aquila Networks L&P**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Residential General Use (MO915)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (365 Days)	Leap Year Adjustment
Jan-04	603,783	646,953	43,170	7.15%	(114,853)	532,100	(1,454)
Feb-04	508,803	500,785	(8,018)	-1.58%	(60,506)	440,279	(1,203)
Mar-04	371,265	386,226	14,961	4.03%	(77,914)	308,312	(842)
Apr-04	249,907	249,495	(412)	-0.16%	(37,738)	211,757	(579)
May-04	240,826	219,837	(20,989)	-8.72%	(21,217)	198,620	(543)
Jun-04	244,618	211,468	(33,150)	-13.55%	66,666	278,134	(760)
Jul-04	289,584	364,040	74,476	25.72%	101,433	465,473	(1,272)
Aug-04	321,705	434,971	113,266	35.21%	184,269	619,240	(1,692)
Sep-04	478,650	575,292	96,642	20.19%	(104,724)	470,568	(1,286)
Oct-04	561,939	530,704	(31,235)	-5.56%	125,150	655,854	(1,792)
Nov-04	653,090	652,973	(117)	-0.02%	(50,507)	602,466	(1,646)
Dec-04	664,894	689,445	24,551	3.69%	69,041	758,486	(2,072)
<b>Total</b>	<b>5,189,044</b>	<b>5,462,189</b>	<b>273,145</b>	<b>5.26%</b>	<b>79,100</b>	<b>5,541,289</b>	<b>(15,140)</b>
<b>Summer</b>	<b>1,334,537</b>	<b>1,585,771</b>	<b>251,234</b>	<b>18.83%</b>	<b>247,644</b>	<b>1,833,415</b>	<b>(5,009)</b>
<b>Other</b>	<b>3,854,507</b>	<b>3,876,418</b>	<b>21,911</b>	<b>0.57%</b>	<b>(168,544)</b>	<b>3,707,874</b>	<b>(10,131)</b>

**Aquila Networks L&P**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Residential Space Heat (MO920)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (365 Days)	Leap Year Adjustment
Jan-04	40,134,416	47,586,679	7,452,263	18.57%	(1,133,007)	46,453,672	(126,923)
Feb-04	44,337,060	41,160,120	(3,176,940)	-7.17%	(700,940)	40,459,180	(110,544)
Mar-04	33,071,091	36,829,247	3,758,156	11.36%	(8,128,826)	28,700,421	(78,416)
Apr-04	21,021,566	21,960,754	939,188	4.47%	(4,972,049)	16,988,705	(46,417)
May-04	17,056,475	16,553,446	(503,029)	-2.96%	(1,701,223)	14,852,223	(40,580)
Jun-04	17,423,373	16,350,998	(1,072,375)	-6.15%	1,578,610	17,929,608	(48,988)
Jul-04	19,349,063	22,544,946	3,195,883	16.52%	2,648,388	25,193,334	(68,834)
Aug-04	18,476,895	22,505,311	4,028,416	21.80%	(974,846)	21,530,465	(58,826)
Sep-04	18,281,937	19,182,704	920,767	5.04%	(3,487,038)	15,695,666	(42,884)
Oct-04	15,684,142	15,175,985	(508,157)	-3.24%	634,698	15,810,683	(43,199)
Nov-04	17,023,756	18,346,550	1,322,794	7.77%	7,508,231	25,854,781	(70,641)
Dec-04	32,126,171	34,867,480	2,741,309	8.53%	8,265,376	43,132,856	(117,849)
<b>Total</b>	<b>293,965,945</b>	<b>313,064,220</b>	<b>19,098,275</b>	<b>6.50%</b>	<b>(462,626)</b>	<b>312,601,594</b>	<b>(854,103)</b>
<b>Summer</b>	<b>73,511,268</b>	<b>80,583,959</b>	<b>7,072,691</b>	<b>9.62%</b>	<b>(234,886)</b>	<b>80,349,073</b>	<b>(219,533)</b>
<b>Other</b>	<b>220,454,677</b>	<b>232,480,261</b>	<b>12,025,584</b>	<b>5.45%</b>	<b>(227,740)</b>	<b>232,252,521</b>	<b>(634,570)</b>

**Aquila Networks L&P**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Residential Space Heat (MO921)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (366 Days)	Leap Year Adjustment
Jan-04	754,872	886,620	131,748	17.45%	329,613	1,216,233	(3,323)
Feb-04	1,173,226	1,149,878	(23,348)	-1.99%	(185,844)	964,034	(2,634)
Mar-04	870,957	948,890	77,933	8.95%	(208,469)	740,421	(2,023)
Apr-04	553,002	584,114	31,112	5.63%	(151,125)	432,989	(1,183)
May-04	436,457	423,893	(12,564)	-2.88%	(80,521)	343,372	(938)
Jun-04	392,556	360,172	(32,384)	-8.25%	39,942	400,114	(1,093)
Jul-04	415,062	474,416	59,354	14.30%	52,029	526,445	(1,438)
Aug-04	397,935	485,354	87,419	21.97%	(8,519)	476,835	(1,303)
Sep-04	393,196	425,852	32,656	8.31%	(85,155)	340,697	(931)
Oct-04	359,964	346,661	(13,303)	-3.70%	39,849	386,510	(1,056)
Nov-04	406,977	427,303	20,326	4.99%	167,469	594,772	(1,625)
Dec-04	689,223	754,147	64,924	9.42%	237,779	991,926	(2,710)
<b>Total</b>	<b>6,843,427</b>	<b>7,267,300</b>	<b>423,873</b>	<b>6.19%</b>	<b>147,048</b>	<b>7,414,348</b>	<b>(20,258)</b>
<b>Summer</b>	<b>1,598,749</b>	<b>1,745,794</b>	<b>147,045</b>	<b>9.20%</b>	<b>(1,703)</b>	<b>1,744,091</b>	<b>(4,765)</b>
<b>Other</b>	<b>5,244,678</b>	<b>5,521,506</b>	<b>276,828</b>	<b>5.28%</b>	<b>148,751</b>	<b>5,670,257</b>	<b>(15,493)</b>

**Aquila Networks L&P**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Residential Space Heat (MO922)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (366 Days)	Leap Year Adjustment
Jan-04	74,482	88,948	14,466	19.42%	(4,250)	84,698	(231)
Feb-04	83,803	75,768	(8,035)	-9.59%	(1,526)	74,242	(203)
Mar-04	55,939	63,223	7,284	13.02%	(17,675)	45,548	(124)
Apr-04	30,140	31,438	1,298	4.31%	(8,929)	22,509	(62)
May-04	21,325	20,725	(600)	-2.81%	(516)	20,209	(55)
Jun-04	25,942	24,398	(1,544)	-5.95%	4,675	29,073	(79)
Jul-04	34,921	41,229	6,308	18.06%	2,823	44,052	(120)
Aug-04	31,056	37,952	6,896	22.21%	(704)	37,248	(102)
Sep-04	31,385	32,499	1,114	3.55%	(8,051)	24,448	(67)
Oct-04	21,479	20,809	(670)	-3.12%	487	21,296	(58)
Nov-04	23,103	25,153	2,050	8.87%	13,012	38,165	(104)
Dec-04	52,867	57,220	4,353	8.23%	14,196	71,416	(195)
<b>Total</b>	<b>486,442</b>	<b>519,362</b>	<b>32,920</b>	<b>6.77%</b>	<b>(6,458)</b>	<b>512,904</b>	<b>(1,401)</b>
<b>Summer</b>	<b>123,304</b>	<b>136,078</b>	<b>12,774</b>	<b>10.36%</b>	<b>(1,257)</b>	<b>134,821</b>	<b>(368)</b>
<b>Other</b>	<b>363,138</b>	<b>383,284</b>	<b>20,146</b>	<b>5.55%</b>	<b>(5,201)</b>	<b>378,083</b>	<b>(1,033)</b>

**Aquila Networks L&P**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Small General Service (MO930)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (366 Days)	Leap Year Adjustment
Jan-04	2,330,597	2,522,998	192,401	8.26%	(193,841)	2,329,157	(6,364)
Feb-04	2,167,245	2,097,338	(69,907)	-3.23%	(38,692)	2,058,646	(5,625)
Mar-04	1,952,230	2,035,506	83,276	4.27%	(177,956)	1,857,550	(5,075)
Apr-04	1,578,083	1,568,619	(9,464)	-0.60%	(153,071)	1,415,548	(3,868)
May-04	1,529,900	1,448,616	(81,284)	-5.31%	39,837	1,488,453	(4,067)
Jun-04	1,736,822	1,651,794	(85,028)	-4.90%	272,271	1,924,065	(5,257)
Jul-04	2,051,706	2,282,891	231,185	11.27%	50,372	2,333,263	(6,375)
Aug-04	1,858,019	2,129,308	271,289	14.60%	(9,463)	2,119,845	(5,792)
Sep-04	1,887,727	1,956,056	68,329	3.62%	(263,152)	1,692,904	(4,625)
Oct-04	1,566,266	1,525,082	(41,184)	-2.63%	40,109	1,565,191	(4,276)
Nov-04	1,645,751	1,661,317	15,566	0.95%	142,579	1,803,896	(4,929)
Dec-04	2,021,217	2,091,525	70,308	3.48%	221,294	2,312,819	(6,319)
<b>Total</b>	<b>22,325,563</b>	<b>22,971,050</b>	<b>645,487</b>	<b>2.89%</b>	<b>(69,713)</b>	<b>22,901,337</b>	<b>(62,572)</b>
<b>Summer</b>	<b>7,534,274</b>	<b>8,020,049</b>	<b>485,775</b>	<b>6.45%</b>	<b>50,028</b>	<b>8,070,077</b>	<b>(22,049)</b>
<b>Other</b>	<b>14,791,289</b>	<b>14,951,001</b>	<b>159,712</b>	<b>1.08%</b>	<b>(119,741)</b>	<b>14,831,260</b>	<b>(40,523)</b>



**Aquila Networks L&P**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Small General Service (MO931)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (366 Days)	Leap Year Adjustment
Jan-04	4,034,708	4,370,066	335,358	8.31%	(369,786)	4,000,280	(10,930)
Feb-04	3,835,358	3,717,855	(117,503)	-3.06%	14,226	3,732,081	(10,197)
Mar-04	3,519,820	3,663,320	143,400	4.07%	(190,768)	3,472,552	(9,488)
Apr-04	3,102,796	3,082,296	(20,500)	-0.66%	(19,271)	3,063,025	(8,369)
May-04	3,519,704	3,329,902	(189,802)	-5.39%	283,370	3,613,272	(9,872)
Jun-04	4,280,490	4,065,574	(214,916)	-5.02%	475,872	4,541,446	(12,408)
Jul-04	4,780,174	5,317,337	537,163	11.24%	319,112	5,636,449	(15,400)
Aug-04	4,561,632	5,220,587	658,955	14.45%	38,907	5,259,494	(14,370)
Sep-04	4,662,351	4,850,784	188,433	4.04%	(627,405)	4,223,379	(11,539)
Oct-04	3,840,401	3,735,119	(105,282)	-2.74%	(411,877)	3,323,242	(9,080)
Nov-04	3,296,783	3,323,786	27,003	0.82%	106,877	3,430,763	(9,374)
Dec-04	3,682,969	3,811,299	128,330	3.48%	16,924	3,828,223	(10,460)
<b>Total</b>	<b>47,117,286</b>	<b>48,487,925</b>	<b>1,370,639</b>	<b>2.91%</b>	<b>(363,719)</b>	<b>48,124,206</b>	<b>(131,487)</b>
<b>Summer</b>	<b>18,284,647</b>	<b>19,454,282</b>	<b>1,169,635</b>	<b>6.40%</b>	<b>206,486</b>	<b>19,660,768</b>	<b>(53,718)</b>
<b>Other</b>	<b>28,832,639</b>	<b>29,033,643</b>	<b>201,004</b>	<b>0.70%</b>	<b>(570,205)</b>	<b>28,463,438</b>	<b>(77,769)</b>

**Aquila Networks L&P**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Small General Service (MO932)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (366 Days)	Leap Year Adjustment
Jan-04	520,578	563,214	42,636	8.19%	(44,432)	518,782	(1,417)
Feb-04	531,304	512,859	(18,445)	-3.47%	(8,551)	504,308	(1,378)
Mar-04	444,559	463,153	18,594	4.18%	(123,544)	339,609	(928)
Apr-04	230,740	228,891	(1,849)	-0.80%	(7,598)	221,293	(605)
May-04	235,993	222,875	(13,118)	-5.56%	(7,135)	215,740	(589)
Jun-04	244,083	232,527	(11,556)	-4.73%	28,962	261,489	(714)
Jul-04	278,725	310,723	31,998	11.48%	17,510	328,233	(897)
Aug-04	272,188	312,512	40,324	14.81%	(4,190)	308,322	(842)
Sep-04	272,520	280,923	8,403	3.08%	(30,247)	250,676	(685)
Oct-04	233,069	227,065	(6,004)	-2.58%	(8,467)	218,598	(597)
Nov-04	226,796	229,822	2,826	1.25%	65,178	294,800	(805)
Dec-04	385,703	398,323	12,620	3.27%	116,704	515,027	(1,407)
<b>Total</b>	<b>3,876,258</b>	<b>3,982,687</b>	<b>106,429</b>	<b>2.75%</b>	<b>(5,810)</b>	<b>3,976,877</b>	<b>(10,866)</b>
<b>Summer</b>	<b>1,067,518</b>	<b>1,136,685</b>	<b>69,169</b>	<b>6.48%</b>	<b>12,035</b>	<b>1,148,720</b>	<b>(3,139)</b>
<b>Other</b>	<b>2,808,742</b>	<b>2,846,002</b>	<b>37,260</b>	<b>1.33%</b>	<b>(17,845)</b>	<b>2,828,157</b>	<b>(7,727)</b>

**Aquila Networks L&P**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Small General Service (MO933)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (366 Days)	Leap Year Adjustment
Jan-04	2,379,778	2,580,309	200,531	8.43%	(92,723)	2,467,586	(6,797)
Feb-04	2,504,839	2,421,632	(83,207)	-3.32%	(67,773)	2,353,859	(6,431)
Mar-04	2,123,297	2,210,851	87,354	4.11%	(227,119)	1,983,532	(5,419)
Apr-04	1,641,441	1,633,547	(7,894)	-0.48%	(246,191)	1,387,356	(3,791)
May-04	1,484,401	1,404,906	(79,495)	-5.36%	6,151	1,411,057	(3,855)
Jun-04	1,687,226	1,610,168	(77,058)	-4.57%	160,862	1,771,030	(4,839)
Jul-04	1,779,088	1,983,132	204,044	11.47%	62,707	2,045,839	(5,590)
Aug-04	1,632,849	1,870,820	237,971	14.57%	16,010	1,886,830	(5,155)
Sep-04	1,645,116	1,705,719	60,603	3.68%	(152,677)	1,553,042	(4,243)
Oct-04	1,471,419	1,432,324	(39,095)	-2.66%	(63,939)	1,348,385	(3,684)
Nov-04	1,381,364	1,394,301	12,937	0.94%	298,276	1,692,577	(4,625)
Dec-04	2,129,890	2,203,013	73,123	3.43%	364,500	2,567,513	(7,015)
<b>Total</b>	<b>21,860,708</b>	<b>22,450,522</b>	<b>589,814</b>	<b>2.70%</b>	<b>38,084</b>	<b>22,488,606</b>	<b>(61,444)</b>
<b>Summer</b>	<b>6,744,279</b>	<b>7,169,839</b>	<b>425,560</b>	<b>6.31%</b>	<b>86,902</b>	<b>7,256,741</b>	<b>(19,827)</b>
<b>Other</b>	<b>15,116,429</b>	<b>15,280,683</b>	<b>164,254</b>	<b>1.09%</b>	<b>(48,818)</b>	<b>15,231,865</b>	<b>(41,617)</b>

**Aquila Networks L&P**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Small General Service (MO934)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (365 Days)	Leap Year Adjustment
Jan-04	416,042	448,281	32,239	7.75%	(34,756)	413,525	(1,130)
Feb-04	392,523	381,919	(10,604)	-2.70%	2,301	384,220	(1,050)
Mar-04	369,098	385,391	16,293	4.41%	(35,507)	349,884	(956)
Apr-04	302,893	302,452	(441)	-0.15%	(56,436)	246,016	(672)
May-04	267,308	254,324	(12,984)	-4.86%	40,270	294,594	(805)
Jun-04	356,961	336,628	(20,332)	-5.70%	61,315	397,944	(1,087)
Jul-04	432,341	479,304	46,963	10.86%	79,415	558,719	(1,527)
Aug-04	473,122	539,205	66,083	13.97%	(29,767)	509,438	(1,392)
Sep-04	436,410	458,565	22,155	5.08%	(66,570)	391,995	(1,071)
Oct-04	360,588	350,331	(10,267)	-2.85%	(70,606)	279,725	(764)
Nov-04	265,623	267,012	1,389	0.52%	37,696	304,708	(833)
Dec-04	349,791	363,137	13,346	3.82%	51,027	414,184	(1,132)
<b>Total</b>	<b>4,422,710</b>	<b>4,566,550</b>	<b>143,840</b>	<b>3.25%</b>	<b>(21,618)</b>	<b>4,544,932</b>	<b>(12,418)</b>
<b>Summer</b>	<b>1,698,834</b>	<b>1,813,703</b>	<b>114,869</b>	<b>6.76%</b>	<b>44,393</b>	<b>1,858,096</b>	<b>(5,077)</b>
<b>Other</b>	<b>2,723,876</b>	<b>2,752,847</b>	<b>28,971</b>	<b>1.06%</b>	<b>(66,011)</b>	<b>2,686,836</b>	<b>(7,341)</b>

**Aquila Networks L&P**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Large General Service (MO940)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (365 Days)	Leap Year Adjustment
Jan-04	31,684,474	33,204,086	1,519,612	4.80%	(1,331,187)	31,872,899	(87,084)
Feb-04	31,683,610	31,080,136	(603,474)	-1.90%	(504,056)	30,576,080	(83,541)
Mar-04	30,874,599	31,431,516	556,917	1.80%	(3,429)	31,428,087	(85,869)
Apr-04	27,858,618	27,752,023	(106,595)	-0.38%	(322,324)	27,429,699	(74,945)
May-04	29,859,571	29,125,853	(733,718)	-2.46%	1,007,528	30,133,381	(82,332)
Jun-04	32,914,294	32,015,558	(898,736)	-2.73%	1,469,749	33,485,307	(91,490)
Jul-04	34,869,823	37,214,316	2,344,493	6.72%	369,804	37,584,120	(102,689)
Aug-04	32,928,800	35,680,016	2,751,216	8.36%	692,988	36,373,002	(99,380)
Sep-04	33,728,143	34,284,175	556,032	1.65%	(1,744,497)	32,539,678	(88,906)
Oct-04	30,642,853	30,097,089	(545,764)	-1.78%	(1,670,379)	28,426,690	(77,669)
Nov-04	27,094,587	26,830,917	(263,670)	-0.97%	885,000	27,715,917	(75,727)
Dec-04	32,424,806	32,703,645	278,839	0.86%	1,431,882	34,135,527	(93,286)
<b>Total</b>	<b>378,564,178</b>	<b>381,419,310</b>	<b>4,855,132</b>	<b>1.29%</b>	<b>281,077</b>	<b>381,700,387</b>	<b>(1,042,897)</b>
<b>Summer</b>	<b>134,441,060</b>	<b>139,194,065</b>	<b>4,753,005</b>	<b>3.54%</b>	<b>788,042</b>	<b>139,982,107</b>	<b>(382,465)</b>
<b>Other</b>	<b>242,123,118</b>	<b>242,225,245</b>	<b>102,127</b>	<b>0.04%</b>	<b>(506,965)</b>	<b>241,718,280</b>	<b>(660,432)</b>

**Aquila Networks L&P**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Small General Service (MO941)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (365 Days)	Leap Year Adjustment
Jan-04	384,242	417,931	33,689	8.77%	(229)	417,702	(1,141)
Feb-04	435,398	417,830	(17,569)	-4.04%	(28,767)	389,063	(1,063)
Mar-04	325,030	338,820	13,790	4.24%	(71,022)	267,798	(732)
Apr-04	197,150	197,066	(84)	-0.04%	(39,762)	157,304	(430)
May-04	158,213	148,958	(7,255)	-4.64%	(5,894)	143,064	(391)
Jun-04	157,710	147,686	(10,024)	-6.36%	8,008	155,694	(425)
Jul-04	158,298	174,325	16,027	11.53%	13,925	188,250	(514)
Aug-04	152,324	174,812	22,488	14.76%	4,527	179,339	(490)
Sep-04	160,153	166,871	6,718	4.19%	(18,694)	148,177	(405)
Oct-04	146,051	142,102	(3,949)	-2.70%	152	142,254	(389)
Nov-04	162,811	164,624	1,813	1.11%	60,300	224,924	(615)
Dec-04	291,813	301,997	10,184	3.49%	52,948	354,945	(970)
<b>Total</b>	<b>2,725,194</b>	<b>2,793,022</b>	<b>67,828</b>	<b>2.49%</b>	<b>(24,508)</b>	<b>2,768,514</b>	<b>(7,564)</b>
<b>Summer</b>	<b>626,485</b>	<b>663,694</b>	<b>37,209</b>	<b>5.94%</b>	<b>7,766</b>	<b>671,460</b>	<b>(1,835)</b>
<b>Other</b>	<b>2,098,709</b>	<b>2,129,328</b>	<b>30,619</b>	<b>1.46%</b>	<b>(32,274)</b>	<b>2,097,054</b>	<b>(5,730)</b>

**Aquila Networks MPS**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Small General Service (MO710 & MO711)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (365 Days)	Leap Year Adjustment
Jan-04	66,130,542	69,613,760	3,483,218	5.27%	(4,339,885)	65,273,875	(178,344)
Feb-04	63,029,591	61,671,161	(1,358,430)	-2.16%	(2,454,143)	59,217,018	(161,795)
Mar-04	60,448,103	62,045,240	1,597,137	2.64%	(632,504)	61,412,736	(167,794)
Apr-04	53,057,711	52,149,549	(908,162)	-1.71%	(2,169,008)	49,980,541	(136,559)
May-04	55,874,030	52,989,520	(2,884,510)	-5.16%	3,545,981	56,535,501	(154,469)
Jun-04	65,256,529	62,441,401	(2,815,128)	-4.31%	6,004,835	68,446,236	(187,012)
Jul-04	72,738,811	81,136,201	8,397,390	11.54%	5,695,694	86,831,895	(237,246)
Aug-04	70,386,716	80,197,431	9,810,715	13.94%	(1,513,808)	78,683,623	(214,983)
Sep-04	69,297,606	71,474,745	2,177,139	3.14%	(8,643,917)	62,830,828	(171,669)
Oct-04	57,318,366	55,965,584	(1,352,782)	-2.36%	(3,602,043)	52,363,541	(143,070)
Nov-04	50,842,332	50,450,062	(392,270)	-0.77%	87,249	50,537,311	(138,080)
Dec-04	58,461,383	59,289,595	828,212	1.42%	5,667,737	64,957,332	(177,479)
<b>Total</b>	<b>742,841,720</b>	<b>759,424,249</b>	<b>18,582,529</b>	<b>2.23%</b>	<b>(2,353,812)</b>	<b>757,070,437</b>	<b>(2,068,498)</b>
<b>Summer</b>	<b>277,679,662</b>	<b>295,249,778</b>	<b>17,570,116</b>	<b>6.33%</b>	<b>1,542,804</b>	<b>296,792,582</b>	<b>(810,909)</b>
<b>Other</b>	<b>465,162,058</b>	<b>464,174,471</b>	<b>(987,587)</b>	<b>-0.21%</b>	<b>(3,896,616)</b>	<b>460,277,855</b>	<b>(1,257,590)</b>

**Aquila Networks MPS**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Large General Service (MO720)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (365 Days)	Leap Year Adjustment
Jan-04	65,628,433	69,104,643	3,476,210	5.30%	(3,179,708)	65,924,935	(180,123)
Feb-04	60,958,326	59,351,756	(1,606,570)	-2.64%	(2,664,510)	56,687,246	(154,883)
Mar-04	60,776,176	62,035,508	1,259,332	2.07%	1,406,841	63,442,349	(173,340)
Apr-04	55,265,864	54,581,578	(684,286)	-1.24%	287,134	54,868,712	(149,915)
May-04	61,385,710	59,854,891	(1,531,019)	-2.49%	2,420,880	62,275,571	(170,152)
Jun-04	64,173,931	62,777,298	(1,396,633)	-2.18%	3,206,062	65,983,360	(180,282)
Jul-04	74,095,046	79,658,217	5,563,171	7.51%	2,148,697	81,804,914	(223,511)
Aug-04	69,548,830	75,246,047	5,697,217	8.19%	1,349,280	76,595,327	(209,277)
Sep-04	73,205,264	74,142,207	936,943	1.28%	(4,277,403)	69,864,804	(190,887)
Oct-04	65,577,254	64,962,530	(614,724)	-0.94%	(1,637,720)	63,324,810	(173,019)
Nov-04	59,336,768	59,069,485	(267,283)	-0.47%	(1,829,064)	57,130,421	(156,094)
Dec-04	62,612,745	63,153,114	540,369	0.88%	3,277,341	66,430,455	(181,504)
<b>Total</b>	<b>772,564,347</b>	<b>783,927,074</b>	<b>11,362,727</b>	<b>1.47%</b>	<b>405,830</b>	<b>784,332,904</b>	<b>(2,142,986)</b>
<b>Summer</b>	<b>281,023,071</b>	<b>291,823,769</b>	<b>10,800,698</b>	<b>3.84%</b>	<b>2,424,636</b>	<b>294,248,405</b>	<b>(803,957)</b>
<b>Other</b>	<b>491,541,276</b>	<b>492,103,305</b>	<b>562,029</b>	<b>0.11%</b>	<b>(2,018,806)</b>	<b>490,084,499</b>	<b>(1,339,029)</b>

**Aquila Networks MPS**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Schools and Churches (MO740)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (365 Days)	Leap Year Adjustment
Jan-04	2,498,062	2,729,943	231,881	9.26%	(117,933)	2,612,010	(7,137)
Feb-04	2,546,554	2,450,763	(95,791)	-3.76%	(76,096)	2,374,667	(6,488)
Mar-04	2,299,877	2,422,898	123,021	5.35%	(167,775)	2,255,123	(6,162)
Apr-04	1,886,880	1,873,819	(13,061)	-0.69%	(113,610)	1,760,209	(4,809)
May-04	1,978,422	1,796,861	(181,561)	-9.18%	161,815	1,958,676	(5,352)
Jun-04	2,375,046	2,218,985	(156,061)	-6.57%	305,704	2,524,689	(6,898)
Jul-04	2,685,534	3,242,463	556,929	20.74%	576,767	3,819,230	(10,435)
Aug-04	2,812,256	3,470,514	658,258	23.41%	(287,866)	3,182,648	(8,696)
Sep-04	2,617,615	2,952,514	134,899	4.79%	(296,963)	2,855,551	(7,256)
Oct-04	2,420,044	2,330,925	(89,119)	-3.68%	(356,111)	1,974,814	(5,396)
Nov-04	1,846,116	1,821,185	(24,931)	-1.35%	71,026	1,892,211	(5,170)
Dec-04	2,192,189	2,263,654	71,465	3.26%	164,565	2,428,219	(6,634)
<b>Total</b>	<b>28,358,595</b>	<b>29,574,524</b>	<b>1,215,929</b>	<b>4.29%</b>	<b>(136,477)</b>	<b>29,438,047</b>	<b>(80,432)</b>
<b>Summer</b>	<b>10,690,451</b>	<b>11,884,476</b>	<b>1,194,025</b>	<b>11.17%</b>	<b>297,642</b>	<b>12,182,118</b>	<b>(33,284)</b>
<b>Other</b>	<b>17,668,144</b>	<b>17,690,048</b>	<b>21,904</b>	<b>0.12%</b>	<b>(434,119)</b>	<b>17,255,929</b>	<b>(47,147)</b>

**Aquila Networks MPS**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Residential General Use (MO860)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (366 Days)	Leap Year Adjustment
Jan-04	135,549,238	144,473,365	8,924,127	6.58%	(13,188,694)	131,284,671	(358,701)
Feb-04	124,359,768	121,476,175	(2,883,593)	-2.32%	(7,275,807)	114,200,368	(312,023)
Mar-04	104,451,798	108,490,241	4,038,443	3.87%	(3,488,645)	105,001,596	(286,890)
Apr-04	95,836,853	94,028,796	(1,808,057)	-1.89%	(9,733,890)	84,294,906	(230,314)
May-04	102,091,396	91,013,690	(11,077,706)	-10.85%	13,713,081	104,726,771	(288,139)
Jun-04	142,693,538	128,710,629	(13,982,909)	-9.80%	32,924,731	161,635,360	(441,627)
Jul-04	174,850,974	222,858,947	48,007,973	27.46%	48,729,901	271,588,848	(742,046)
Aug-04	177,341,342	239,534,616	62,193,274	35.07%	(21,444,724)	218,089,892	(595,874)
Sep-04	161,226,563	179,466,576	18,240,013	11.31%	(49,789,438)	129,677,138	(354,309)
Oct-04	119,870,797	114,364,036	(5,506,761)	-4.59%	(14,652,384)	99,711,652	(272,436)
Nov-04	93,459,936	93,568,281	98,345	0.11%	8,294,678	101,852,959	(278,287)
Dec-04	117,457,418	120,684,271	3,226,853	2.75%	12,421,924	133,106,195	(363,678)
<b>Total</b>	<b>1,549,189,821</b>	<b>1,658,659,623</b>	<b>109,470,002</b>	<b>7.07%</b>	<b>(3,489,267)</b>	<b>1,655,170,356</b>	<b>(4,522,323)</b>
<b>Summer</b>	<b>656,112,417</b>	<b>770,570,768</b>	<b>114,458,351</b>	<b>17.44%</b>	<b>10,420,470</b>	<b>780,991,238</b>	<b>(2,133,856)</b>
<b>Other</b>	<b>893,077,204</b>	<b>888,088,855</b>	<b>(4,988,349)</b>	<b>-0.56%</b>	<b>(13,909,737)</b>	<b>874,179,118</b>	<b>(2,388,468)</b>

**Aquila Networks MPS**  
**Actual and Weather Normalized Sales (kWh)**  
**Jan-Dec 2004**  
**Residential Space Heat (MO870)**

Billing Month	Actual	Weather Norm	Weather Adj	% Weather Adj	Days Adjustment	Normalized (366 Days)	Leap Year Adjustment
Jan-04	97,964,741	113,071,265	15,106,524	15.42%	(2,773,172)	110,298,093	(301,361)
Feb-04	104,654,181	98,867,516	(5,786,665)	-5.53%	(4,682,089)	94,185,427	(257,337)
Mar-04	78,103,179	86,385,070	8,281,891	10.60%	(14,897,808)	71,487,262	(195,320)
Apr-04	56,379,997	58,082,559	1,712,562	3.04%	(13,453,087)	44,639,472	(121,966)
May-04	47,283,505	44,599,462	(2,684,043)	-5.68%	(1,682,661)	42,916,801	(117,259)
Jun-04	55,041,010	51,161,074	(3,879,936)	-7.05%	10,522,698	61,683,772	(168,535)
Jul-04	64,139,083	76,703,412	12,564,329	19.59%	11,784,135	88,487,547	(241,769)
Aug-04	64,243,379	80,243,036	15,999,657	24.90%	(4,461,560)	75,781,476	(207,053)
Sep-04	61,166,374	65,742,695	4,576,321	7.48%	(12,655,026)	53,087,669	(145,048)
Oct-04	51,564,178	49,597,057	(1,967,121)	-3.81%	(3,682,218)	45,914,839	(125,450)
Nov-04	46,012,181	48,402,234	2,390,053	5.19%	16,641,631	65,043,865	(177,715)
Dec-04	78,280,994	84,458,320	6,177,326	7.89%	(511,148)	83,947,172	(229,364)
<b>Total</b>	<b>804,832,802</b>	<b>857,323,700</b>	<b>52,490,898</b>	<b>6.52%</b>	<b>(19,850,305)</b>	<b>837,473,395</b>	<b>(2,288,179)</b>
<b>Summer</b>	<b>244,589,846</b>	<b>273,850,217</b>	<b>29,260,371</b>	<b>11.96%</b>	<b>5,190,247</b>	<b>279,040,464</b>	<b>(762,406)</b>
<b>Other</b>	<b>560,242,956</b>	<b>583,473,483</b>	<b>23,230,527</b>	<b>4.15%</b>	<b>(25,040,552)</b>	<b>558,432,931</b>	<b>(1,525,773)</b>

**Aquila Networks - L&P**  
**Net System Load**  
**Normalized for 2004\***  
**ER-2005-0436**

Month	Monthly Usage (MWh)			Monthly Peaks (MW)			Load Factor	
	Actual	Normal	Adj	% Adj	Actual	Normal	Adj	% Adj
Jan-04	190,394	202,722	12,328	6.48%	357	351	(6)	-1.63%
Feb-04	170,388	172,112	1,724	1.01%	333	335	2	0.68%
Mar-04	154,480	157,542	3,062	1.98%	268	282	14	5.21%
Apr-04	135,975	132,710	(3,265)	-2.40%	242	237	(5)	-1.91%
May-04	153,318	142,295	(11,023)	-7.19%	332	301	(31)	-9.45%
Jun-04	159,827	169,652	9,825	6.15%	337	339	2	0.47%
Jul-04	181,798	217,583	35,785	19.68%	398	432	34	8.61%
Aug-04	172,487	190,546	18,059	10.47%	399	379	(20)	-4.99%
Sep-04	159,117	156,061	(3,056)	-1.92%	341	325	(16)	-4.64%
Oct-04	142,425	141,480	(945)	-0.66%	240	233	(7)	-3.09%
Nov-04	149,879	154,140	4,261	2.84%	284	275	(9)	-3.15%
Dec-04	178,991	185,857	6,866	3.84%	329	332	3	0.91%
Annual	1,949,079	2,022,702	73,623	3.78%	399	432	33	8.34%

Summer	673,229	733,843	60,614	9.00%	399	432	33	8.34%	0.58
Other	1,275,850	1,288,859	13,009	1.02%	357	351	(6)	-1.63%	0.63

\* Normalized for weather, growth, and large customers

Month	Monthly Usage (MWh)			Monthly Peaks (MW)			Load Factor	
	Actual	Normal	% Adj	Actual	Normal	% Adj	Actual	Normal
Jan-04	513,600	542,769	5.68%	951	897	(54)	0.73	0.81
Feb-04	461,895	467,689	1.25%	893	889	(4)	0.74	0.76
Mar-04	427,767	434,916	1.67%	735	777	42	0.78	0.75
Apr-04	387,591	374,272	-3.44%	689	651	(38)	0.78	0.80
May-04	468,836	427,996	-8.71%	1,064	879	(185)	0.59	0.65
Jun-04	497,124	532,022	7.02%	1,171	1,169	(2)	0.59	0.63
Jul-04	581,011	718,138	23.60%	1,344	1,412	68	0.58	0.68
Aug-04	545,734	618,846	13.40%	1,335	1,338	3	0.55	0.62
Sep-04	491,001	477,207	-2.81%	1,133	1,049	(84)	0.60	0.63
Oct-04	409,677	406,106	-0.87%	727	704	(23)	0.76	0.78
Nov-04	425,352	437,105	2.76%	864	833	(31)	0.68	0.73
Dec-04	501,823	519,782	3.58%	957	931	(26)	0.70	0.75
Annual	5,711,411	5,956,848	4.30%	1,344	1,412	68	0.49	0.48
Summer	2,114,870	2,346,213	10.94%	1,344	1,412	68	0.54	0.57
Other	3,596,541	3,610,635	0.39%	1,064	931	(133)	0.58	0.67

### Schedule 3

**Cases in Which Staff Weather Normalization Method Was Used  
in the Normalization of Net System Loads**

EO-87-175	ER-94-163	EM-2000-292
EO-90-101	ER-94-174	ER-2001-299
EO-90-138	ER-95-279	ER-2001-672
ER-93-37	ER-97-81	EC-2002-1
ER-93-41	EM-97-575	ER-2002-424
EO-93-351	ER-2004-0034	ER-2004-0570
ER-2005-0436		