Exhibit No.:	
Issue:	*NYMEX Natural Gas Futures Prices*
Witness:	*Kwang Y. Choe*
Sponsoring Party:	*MoPSC Staff*
Type of Exhibit:	*Rebuttal Testimony*
Case No.:	*ER-2005-0436*
Date Testimony Prepared:	*November 18, 2005*

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY SERVICES DIVISION

REBUTTAL TESTIMONY

OF

KWANG Y. CHOE

AQUILA, INC.
d/b/a AQUILA NETWORKS – MPS (ELECTRIC)

CASE NO. ER-2005-0436

Jefferson City, Missouri
November 2005

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of the Tariff Filing of Aquila, Inc., to Implement a General Rate Increase for Retail Electric Service Provided to Customers in Its MPS and L&P Missouri Service Areas.	))))	Case No. ER-2005-0436 Tariff No. YE-2005-1045

AFFIDAVIT OF KWANG Y. CHOE

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

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

Kwang Y. Choe

Subscribed and sworn to before me this 17th day of November 2005.

Notary

TONI M. CHARLTON
Notary Public - State of Missouri
My Commission Expires December 28, 2008
Cole County
Commission #04474301

TONI M. CHARLTON NOTARY SEAL NOTARY PUBLIC STATE OF MISSOURI

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OF

KWANG Y. CHOE

AQUILA, INC., d/b/a AQUILA NETWORKS-MPS (ELECTRIC)

CASE NO. ER-2005-0436

Q. Please state your name and business address.

A. Kwang Y. Choe, P.O. Box 360, Jefferson City, Mo. 65102.

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

A. I am the Regulatory Economist of the Procurement Analysis Department with the Missouri Public Service Commission (Commission).

Q. How long have you been employed with the Commission?

A. I commenced employment with the Commission Staff (Staff) in January of 2000.

Q. Please describe your educational background and experience.

A. I received Bachelor of Arts, Master of Arts, and Doctor of Philosophy degrees in economics. My undergraduate degree is from the University of California, San Diego. My graduate degrees are from the University of Missouri, Columbia. I taught economics in the Department of Economics at the University of Missouri, Columbia. I am currently a visiting assistant professor in the Department of Economics at the University of Missouri, Columbia. My fields of study are financial economics and economics of regulation. I am a member of the International Association for Energy Economics.

Q. What has been the nature of your duties at the Commission?

A. Since early 2000, I have assisted the Commission with monitoring and evaluating the various economic aspects of the natural gas market, both nationally and in Missouri.

Q. Have you previously testified before the Commission?

A. Yes. I previously filed testimony in the following four general rate cases:

1) Case No. ER-2001-299-The Empire District Electric Company;

2) Case No. ER-2001-672-Utilicorp United Inc. d/b/a Missouri Public Service;

3) Case No. ER-2004-0034-Aquila, Inc. d/b/a Aquila Networks – MPS Electric; and

4) Case No. ER-2004-0570-The Empire District Electric Company.

EXECUTIVE SUMMARY

Q. Please state the purpose of your testimony in this case and summarize your finding.

A. My purpose is to respond to the direct testimony of Aquila Networks – MPS (Aquila) witness Jerry G. Boehm, who recommends the use of the natural gas futures market in setting the price of natural gas in this case.[1] In doing so, I will provide the Commission with a general outline of the natural gas futures market. I will explain why the natural gas futures market is not a reliable forecasting tool for predicting actual future natural gas prices, and therefore, should not be used for forecasting in the ratemaking process.

NATURAL GAS FUTURES MARKET / NATURAL GAS PRICES

Q. How did Aquila use the natural gas futures market to determine the level of natural gas prices in this case?

A. Aquila witness Boehm identifies at page 10, line 14 of his direct testimony that "the company has averaged the NYMEX futures market price for the 2006 calendar year that occurred in the last three months of 2004. These prices are known and represent actual market transactions for natural gas in that time period."

[1] Direct Testimony of Jerry G. Boehm, pages 10-11.

Q. What are natural gas futures?

A. Natural gas futures are financial derivatives for natural gas, and traded on the New York Mercantile Exchange (NYMEX). Stated more specifically, a natural gas futures contract is:

> ...a tradable document which entitles the buyer of the contract to claim physical delivery of the commodity, that is, natural gas from the seller at the contract delivery point at a specified date in the future, and entitles the seller to deliver the physical commodity to the buyer under the same conditions.[2]

A unique characteristic of natural gas futures contracts is that they are standardized contracts, meaning that each natural gas futures contract has the same quality and quantity of natural gas, and is to be delivered and received at the same delivery location (see Schedule 1 attached to this rebuttal testimony, for the standard contract specifications for the NYMEX natural gas futures contract).[3] Natural gas futures prices are based on demand for and supply of the commodity in the future.

Q. What purpose do natural gas futures mainly serve?

A. Natural gas futures serve mainly for risk management purpose.

Q. Please explain.

A. If the natural gas demand and supply were fairly predictable and we could buy or sell the commodity at any time in the future for the prices that we want, there may not be a real need for a natural gas futures market. But we cannot predict, with any certainty, what the future of the natural gas market will bring, and therefore, it is difficult to plan ahead for this market. This is where the natural gas futures market comes in; i.e., it helps to minimize uncertainty or

[2] Fletcher J. Strum, *Trading Natural Gas: A Non Technical Guide*, 1997, page 35.
[3] Ibid.

risk associated with price movements. But the natural gas futures market is in no way able to accurately predict that there will be a certain price prevailing in the future.

Q. What are some of the factors that affect natural gas prices?

A. There are many factors that affect natural gas prices, including weather, oil prices, drilling rig counts, the level of electric generation from natural gas-fired combustion turbines, national storage levels for natural gas, the level of economic activity, war, and the psychology of the natural gas market participants. All of these factors influence market speculation as to where the natural gas market will be heading.

Q. What is an index price?

A. An index price is typically an average of fixed prices at which buyers and sellers agree, during the last week of a month, to purchase and sell gas for the following month.[4]

Q. Do you believe there is any significant correlation between prices in the futures market one year before closing of a contract and spot prices at the time of closing a year later?[5]

A. There is no systematic correlation between the two prices (see Schedule 2).[6]

Q. Please explain.

A. According to the data, while the futures market has predicted a relatively stable price trend going forward at the 12-month horizon, actual spot prices have fluctuated considerably since May 2000 (see Schedule 2). This indicates that there is no systematic correlation between futures market prices and spot prices.

Q. Is the natural gas futures market an accurate predictor of actual future natural gas prices?

[4] Typically this index price is denoted as a first of month index price and tied to a specific natural gas pipeline. See schedules 3 and 4.
[5] Spot prices refer to the prices for immediate delivery of natural gas.
[6] Based on the New York Mercantile Exchange (NYMEX) Natural Gas Futures Prices (Monthly) with one-year maturity and the prices at the time of closing a year later, *Wall Street Journal*, Jan 1999 – November 2005.

A. No.

Q. Please explain.

A. The idea that the natural gas futures market can accurately predict the actual future natural gas prices is predicated upon the assumption that the natural gas futures market is efficient. The efficient market theory, when applied to the natural gas futures market, says that the natural gas futures price today contain all available relevant information regarding the actual natural gas price in the future and, as such, permits a correct forecast of the future actual prices.[7] However, that is not true of the natural gas futures market.[8] If you look at the price comparisons between the futures prices and the subsequent spot prices at the 12-month horizon during July 1995 through November 2005, there are significant discrepancies between these two prices during the winters of 1996-1997, 2000-2001, 2001-2002, 2002-2003, and also since September 2005 (see Schedules 2, 3, and 4).[9] This demonstrates another characteristic of the futures market; namely, its inherent volatility. Therefore, it is very difficult to predict the future movement of the market.[10]

Q. Can the natural gas futures market be successfully used in the determination of the rates that customers pay for electricity use?

A. No. Because of the inherent risk in the market and the historical volatility of natural gas prices, it is extremely difficult to develop a method that will provide enough assurance to be able to use the futures market prices in the ratemaking process. There is no

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[7] W. David Walls, "An Econometric Analysis of the Market for Natural Gas Futures," The Energy Journal, Vol. 16, No. 1, 1995, pages 71-83.

[8] Ahmed El Hachemi Mazighi, "The efficiency of natural gas futures markets", OPEC Review, Vol. 27, Issue 2, June 2003, pages 143-158.

[9] Based on the New York Mercantile Exchange (NYMEX) Natural Gas Futures Prices, *Wall Street Journal and Inside FERC's Gas Market Report,* July 1995 – November 2005 and Williams Pipeline (WNG) First of Month Index Prices. WNG's March 2003 and October 2005 First of Month Index Prices are not available.

[10] Victor Chwee, "Chaos in Natural Gas Futures?", The Energy Journal, Vol. 19, No. 2, 1998, pages 149-164.

"safety net" for consumers if the futures market prices overstate natural gas prices, and ultimately, fuel expense. Using futures market prices to determine natural gas prices for fuel expense places substantial risk on the customers in that any overstatement will be a windfall to the Company in higher fuel costs. Conversely, if the futures market prices understate actual natural gas prices, and ultimately fuel expense, this would place the risk of raising natural gas prices on the utility's shareholders, and potentially result in an under collection of fuel costs.

CONCLUSION

Q. What is your conclusion?

A. The efficient market theory does not apply to the natural gas futures market because the market faces a great deal of uncertainty. Furthermore, due to the inherent volatility of the natural gas futures market, it is highly risky to rely solely on what the natural gas futures market indicates as a means of determining actual future natural gas prices. In particular, Company witness Jerry G. Boehm's proposal that the price of natural gas be based on the futures strip price is arbitrary at best and highly risky for purposes of setting permanent rates for electric service and, therefore, should not be relied upon to set rates in this case.

Q. Does this conclude your testimony?

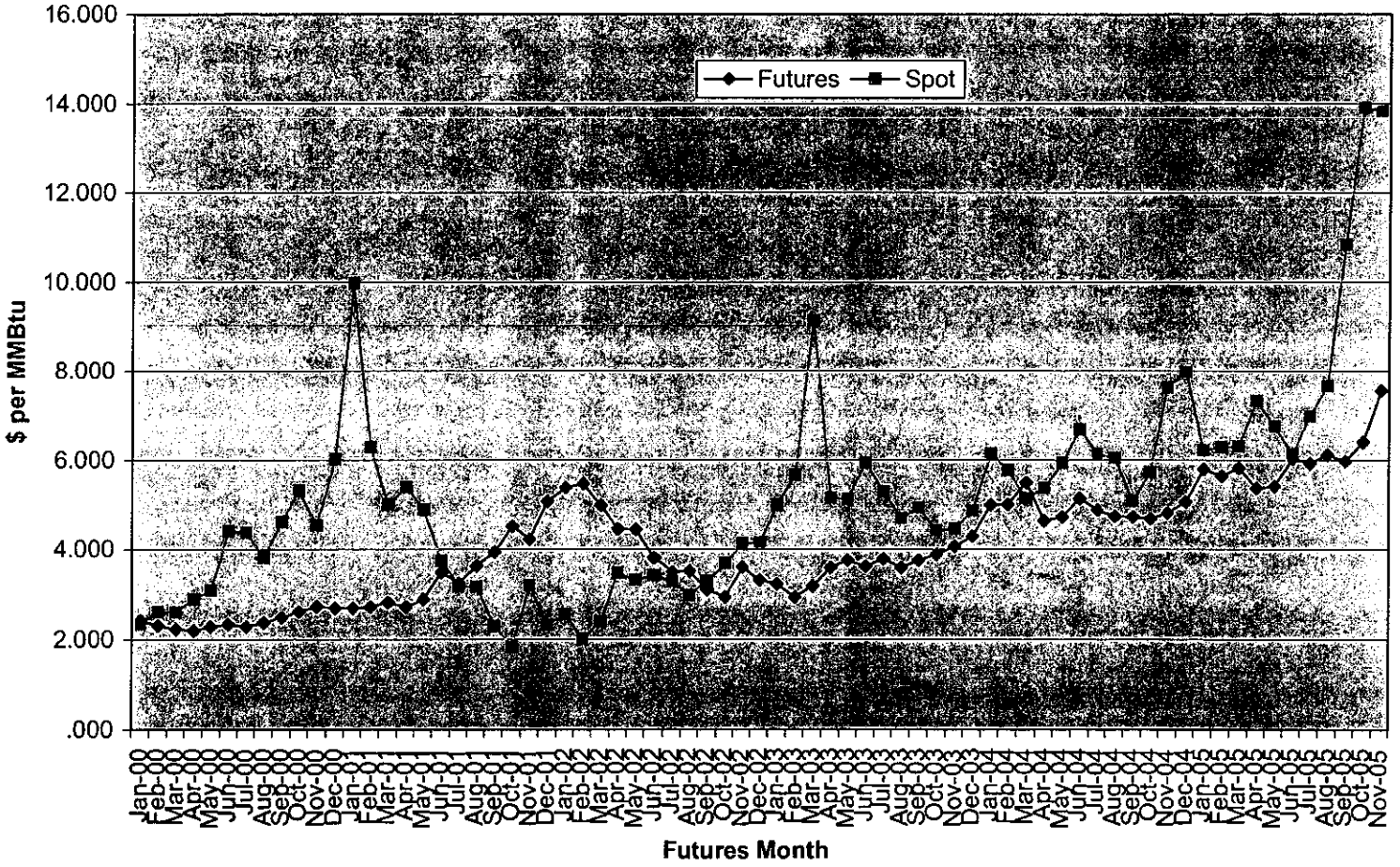
A. Yes, it does.

The New York Mercantile Exchange Natural Gas Futures Contract Specifications

Delivery Location:	Sabine Pipeline Hub at Henry, Louisiana
Contract Size:	One (1) contract equals 10,000 MMBtu
Minimum Price Fluctuation:	$0.001 per MMBtu ($10.00 per contract)
Maximum Daily Price Fluctuation:	$3.00 per MMBtu for all months ($30,000 per contract)
Trading Months:	Seventy-two (72) consecutive months commencing with the next calendar month
Last Trading Day:	Three (3) business days prior to the first calendar day of the delivery month

Source: http://www.nymex.com

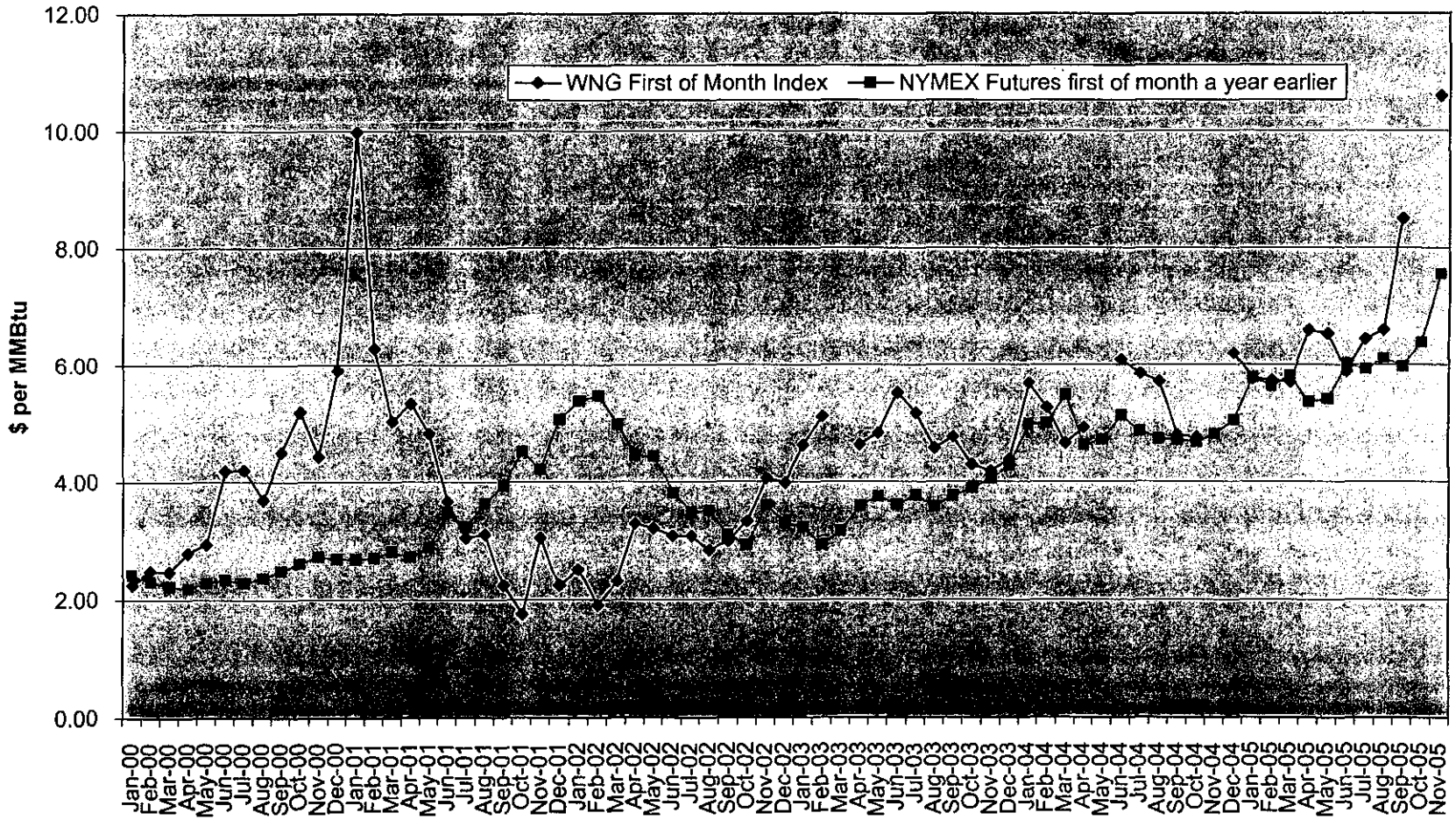
Futures vs. Spot
(Schedule2)



Source: Wall Steet Journal

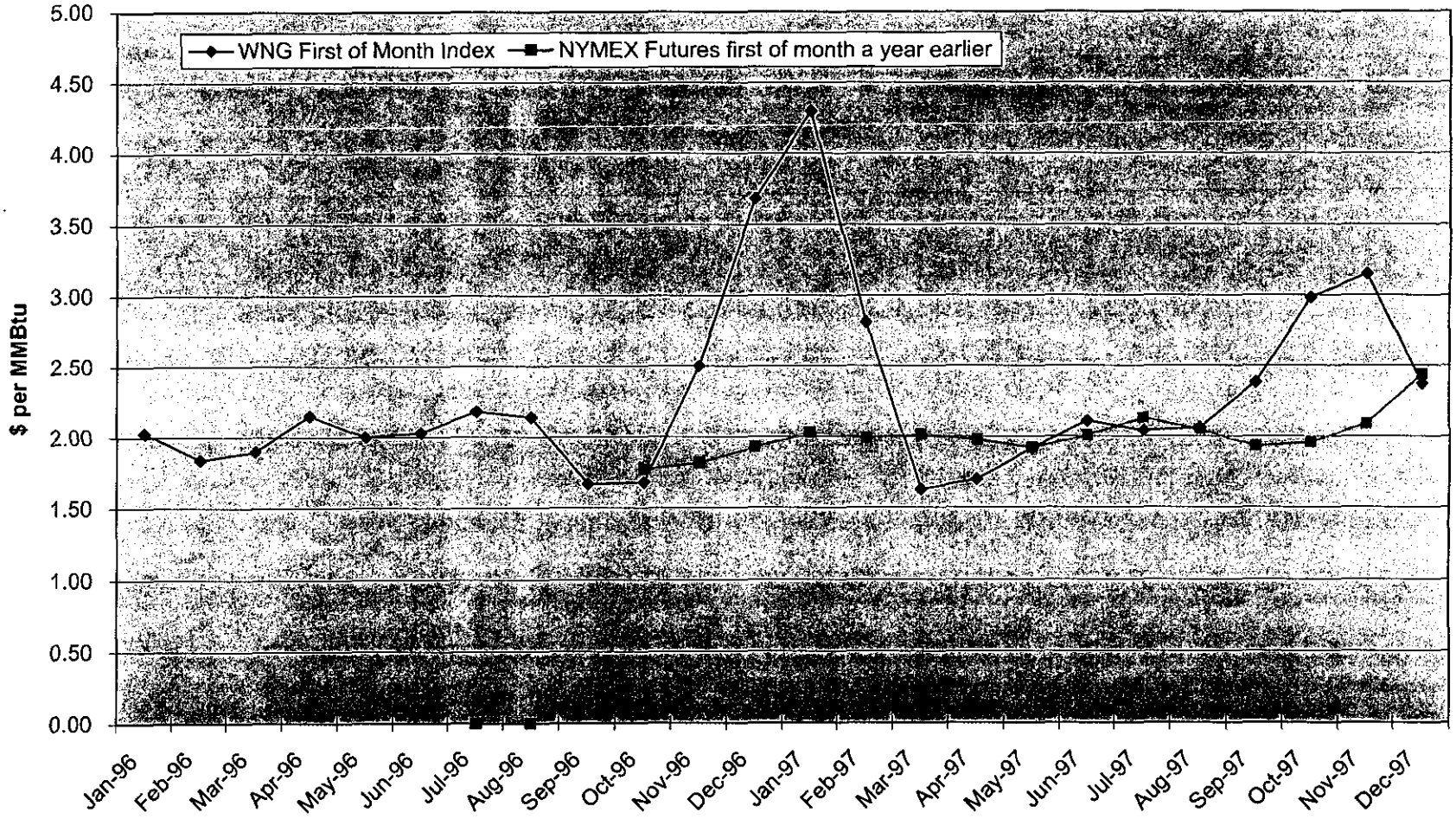
Schedule 2

Williams Pipeline(WNG) First of Month Index vs NYMEX Futures Prediction A Year Earlier
(Schedule 3)



Source: Wall Street Journal and Inside FERC's Gas Market Report

Williams Pipeline(WNG) First of Month Index vs NYMEX Futures Prediction A Year Earlier
(Schedule 4)



Source: Wall Street Journal and Inside FERC's Gas Market Report