Exhibit No.:
Issue: *NYMEX Natural Gas Futures Prices*
Witness: *Kwang Y. Choe*
Sponsoring Party: *MoPSC Staff*
Type of Exhibit: *Surrebuttal Testimony*
Case No.: *ER-2004-0570*
Date Testimony Prepared: *November 24, 2004*

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY SERVICES DIVISION

SURREBUTTAL TESTIMONY

OF

KWANG Y. CHOE

THE EMPIRE DISTRICT ELECTRIC COMPANY

CASE NO. ER-2004-0570

Jefferson City, Missouri
November 2004

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In The Matter of the Tariff Filing of The Empire District Electric Company to Implement a General Rate Increase for Retail Electric Service Provided to Customers in its Missouri Service Area.	)))))	Case No. ER-2004-0570

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 surrebuttal testimony in question and answer form, consisting of 7 pages to be presented in the above case; that the answers in the following surrebuttal 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

Kwang Y. Choe

Subscribed and sworn to before me this 22nd day of November 2004.

TONI M. CHARLTON NOTARY SEAL NOTARY PUBLIC STATE OF MISSOURI

Toni M. Charlton

Notary

TONI M. CHARLTON
NOTARY PUBLIC STATE OF MISSOURI
COUNTY OF COLE
My Commission Expires December 28, 2004

SURREBUTTAL TESTIMONY

OF

KWANG Y. CHOE

THE EMPIRE DISTRICT ELECTRIC COMPANY

CASE NO. ER-2004-0570

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 a 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 worked in the Department of Economics at the University of Missouri, Columbia as a graduate teaching instructor from 1997 to 1999, and as a graduate teaching assistant from 1991 to 1993 and from 1996 to 1999. Also, I am currently a visiting assistant professor in the Department of Economics at the University of Missouri, Columbia. 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 testimonies in three general rate cases, Case No. ER-2001-299 (The Empire District Electric Company), Case No. ER-2001-672 (Utilicorp United Inc. d/b/a Missouri Public Service), and Case No. ER-2004-0034 (Aquila, Inc. d/b/a Aquila Networks – MPS (Electric)).

Q. What is the purpose of your testimony in this case?

A. My purpose is to respond to the rebuttal testimony of The Empire District Electric Company (Empire or Company) witness Brad P. Beecher, 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.

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, 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]

[1] Rebuttal Testimony of Brad P. Beecher, Pages 2-16.
[2] Fletcher J. Strum, *Trading Natural Gas: A Non Technical Guide*, 1997, page 35.

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 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. When the natural gas demand and supply are fairly predictable and we can 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 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 several 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?

[3] Ibid.

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?

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]

[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 2004.
[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.

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 2004, there are significant discrepancies between these two prices during the winters of 1996 - 97, 2000 - 01, 2001 - 02, and 2002 - 03 (see Schedules 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 "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.

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,

---

[8] Chinn, Menzie, Michael LeBlanc, and Olivier Coibion, "The Predictive Characteristics of Energy Futures: Recent Evidence for Crude Oil, Natural Gas, Gasoline and Heating Oil", University of California, Santa Cruz Economics Working Paper No. 490, October 2001.

[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 – January 2004 and Williams Pipeline (WNG) First of Month Index Prices. WNG's March 2003 First of Month Index Price is not available.

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

Company witness Brad Beecher's proposal that the price of natural gas be based on the futures strip price on a single day is arbitrary at best and highly risky for purposes of setting permanent rates for electric service.

Q. Does this conclude your testimony?

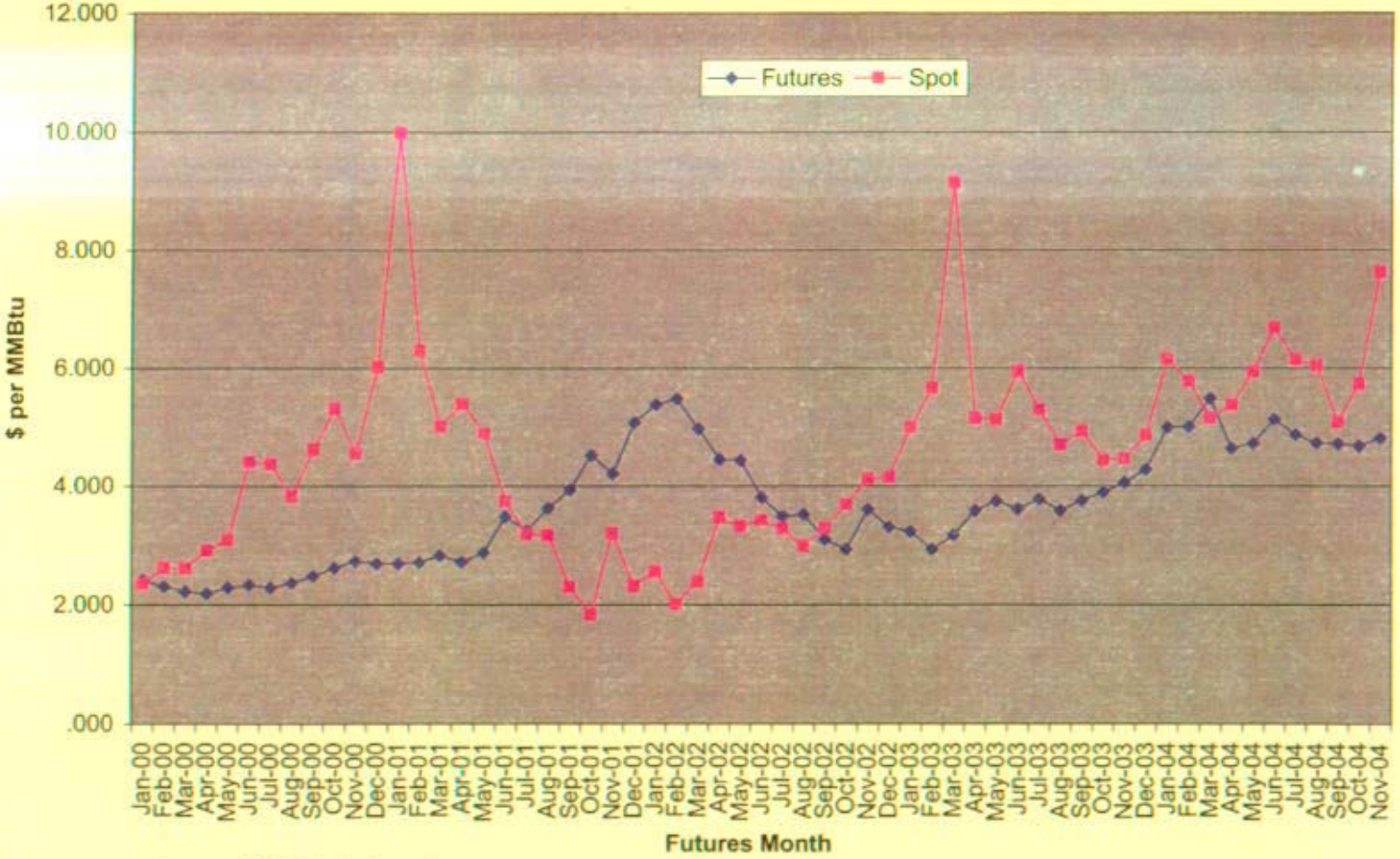
A. Yes, it does.

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

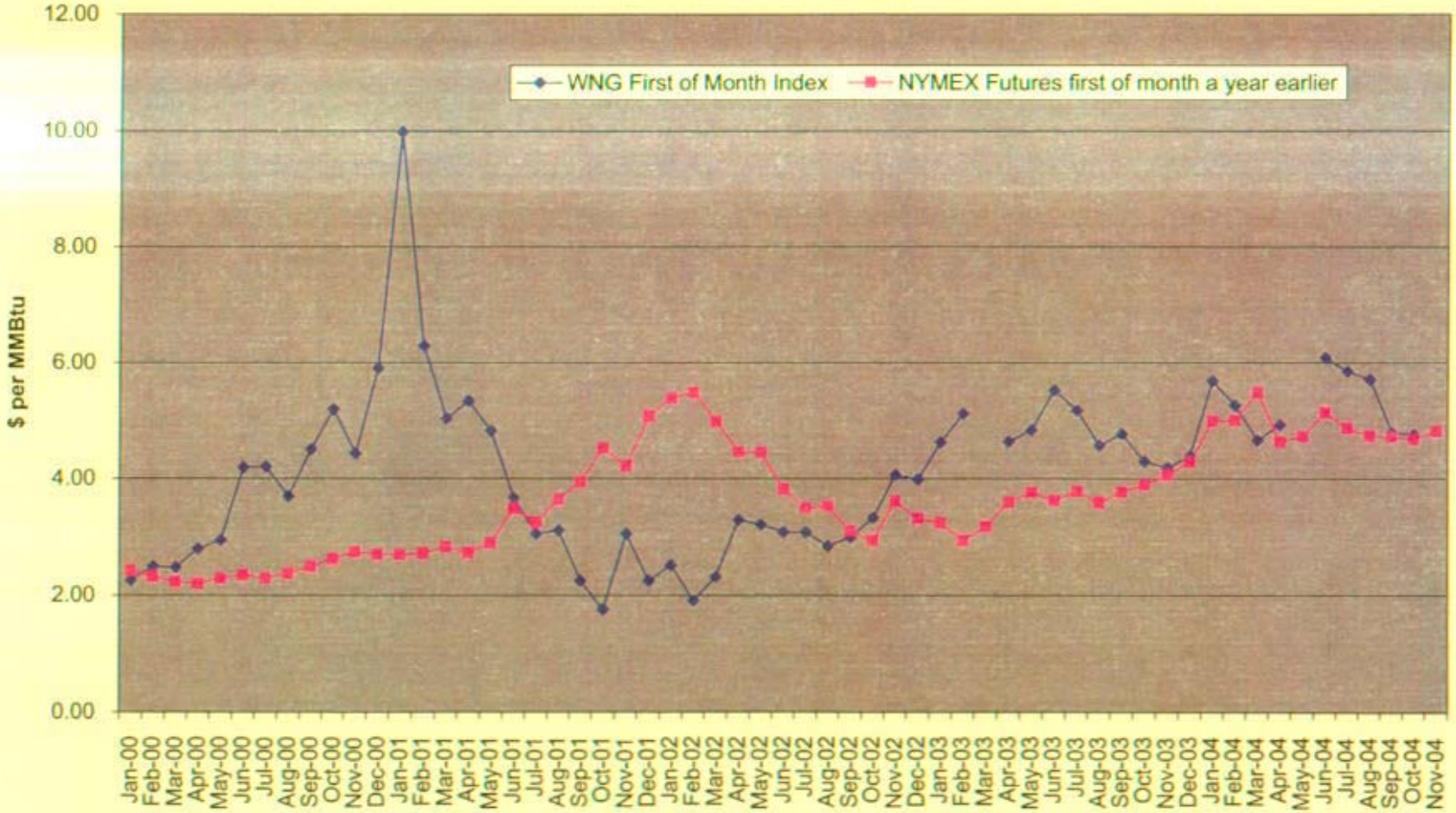
Futures vs. Spot
(Schedule2)



Source: Wall Steet Journal

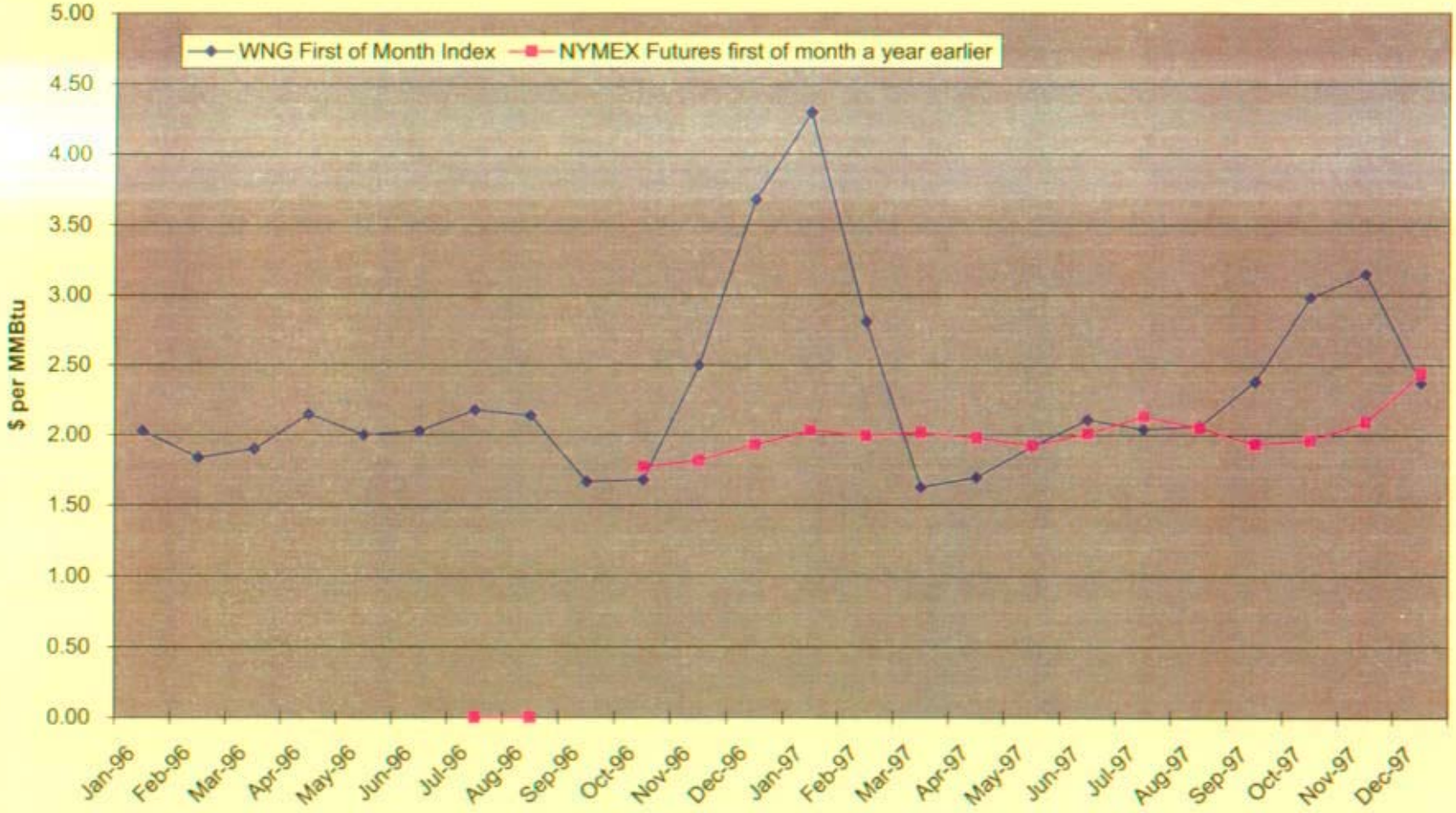
Schedule 2

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