Exhibit No.:
Issue: *NYMEX Futures Prices*
Witness: *Kwang Choe*
Sponsoring Party: *MoPSC Staff*
Type of Exhibit: *Direct Testimony*
Case No.: *ER-2001-299*
Date Testimony Prepared: *April 3, 2001*

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY SERVICES DIVISION

DIRECT TESTIMONY

OF

KWANG CHOE

THE EMPIRE DISTRICT ELECTRIC COMPANY

CASE NO. ER-2001-299

Jefferson City, Missouri
April 2001

Exhibit No. 41
Date 5/29/01 Case No. ER-2001-299
Reporter KLM

DIRECT TESTIMONY

OF

KWANG Y. CHOE

THE EMPIRE DISTRICT ELECTRIC COMPANY

CASE NO. ER-2001-299

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, and Master of Arts degrees in economics. My undergraduate degree is from the University of California, San Diego. My graduate degree is from the University of Missouri, Columbia. I am currently working on a dissertation (I had completed all but the dissertation) for the Doctor of Philosophy degree in economics from the University of Missouri, Columbia. Also, 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. I am a member of the International Association for Energy Economics.

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

A. From early 2000, I 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. No.

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

A. My purpose is to provide the Commission with a general outline of the natural gas futures market and to explain why the natural gas futures market is not the best 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. They are financial derivatives for natural gas, and traded on regulated exchanges such as the New York Mercantile Exchange (NYMEX) or the Kansas City Board of Trade. 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.[1]

[1] 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).[2] Natural gas futures prices are based on demand for and supply of the commodity in the future. Furthermore, 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 need for a natural gas futures market. But we cannot predict without much uncertainty what the future of 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., to help minimize uncertainty or risk associated with price movements. But the natural gas futures market is in no way 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, electric generation from natural gas-fired combustion turbines, national storage levels for natural gas, the level of economic activity, and psychological factors that 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.

[2] Ibid.

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?

A There is no systematic correlation between the two prices (see Schedule 2).[3]

Q. Why does Staff believe there is no systematic correlation between futures market prices and spot prices?

A. While the futures market predicts a fairly stable price trend going forward, 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. Can the natural gas futures market always correctly predict the actual future natural gas prices?

A. No.

Q. Please explain.

A. The idea that the natural gas futures market can correctly predict the actual future natural gas prices is predicated upon the assumption that the natural gas futures market is efficient. The efficient market theory suggests that the natural gas futures price today contains all available relevant information regarding the actual natural gas price in the future, and, as such, permits a correct forecast of the future actual price.[4]

[3] 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,* June 1998 – February 2001.

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

Unfortunately, that is not always the case. If you look at the price comparisons between the futures prices and the actual prices for the same period during July 1995 through January 2001, there are significant discrepancies between these two prices during the early winter of 1996 and 1997, and during the winter season just past (see Schedules 3 and 4).[5] This demonstrates to another characteristic of the futures market; namely, its inherent volatility. Therefore, it is very difficult to predict the future movement of the market.[6]

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. Are you responsible for developing the natural gas prices in this case?

A. No. Staff witness V. William Harris identified in his direct testimony the approach that Staff is using with regard to natural gas prices.

Q. What is your conclusion?

---

[5] 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 2001 and Williams Pipeline (WNG) First of Month Index Prices.

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

A. The efficient market theory does not apply to the natural gas futures market when 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 predicts to determine the actual future natural gas prices.

Q. Does this conclude your testimony?

A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of the Application of the Empire District Electric Company for a General Rate Increase	)))	Case No. ER-2001-299

AFFIDAVIT OF KWANG CHOE

STATE OF MISSOURI	)	
	)	ss.
COUNTY OF COLE	)	

Kwang Choe, of lawful age, on his oath states: that he has participated in the preparation of the foregoing Direct Testimony in question and answer form, consisting of 6 pages to be presented in the above case; that the answers in the foregoing Direct 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 Choe

Subscribed and sworn to before me this 2nd day of April 2001.

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

TONI M. CHARLTON NOTARY SEAL NOTARY PUBLIC STATE OF MISSOURI

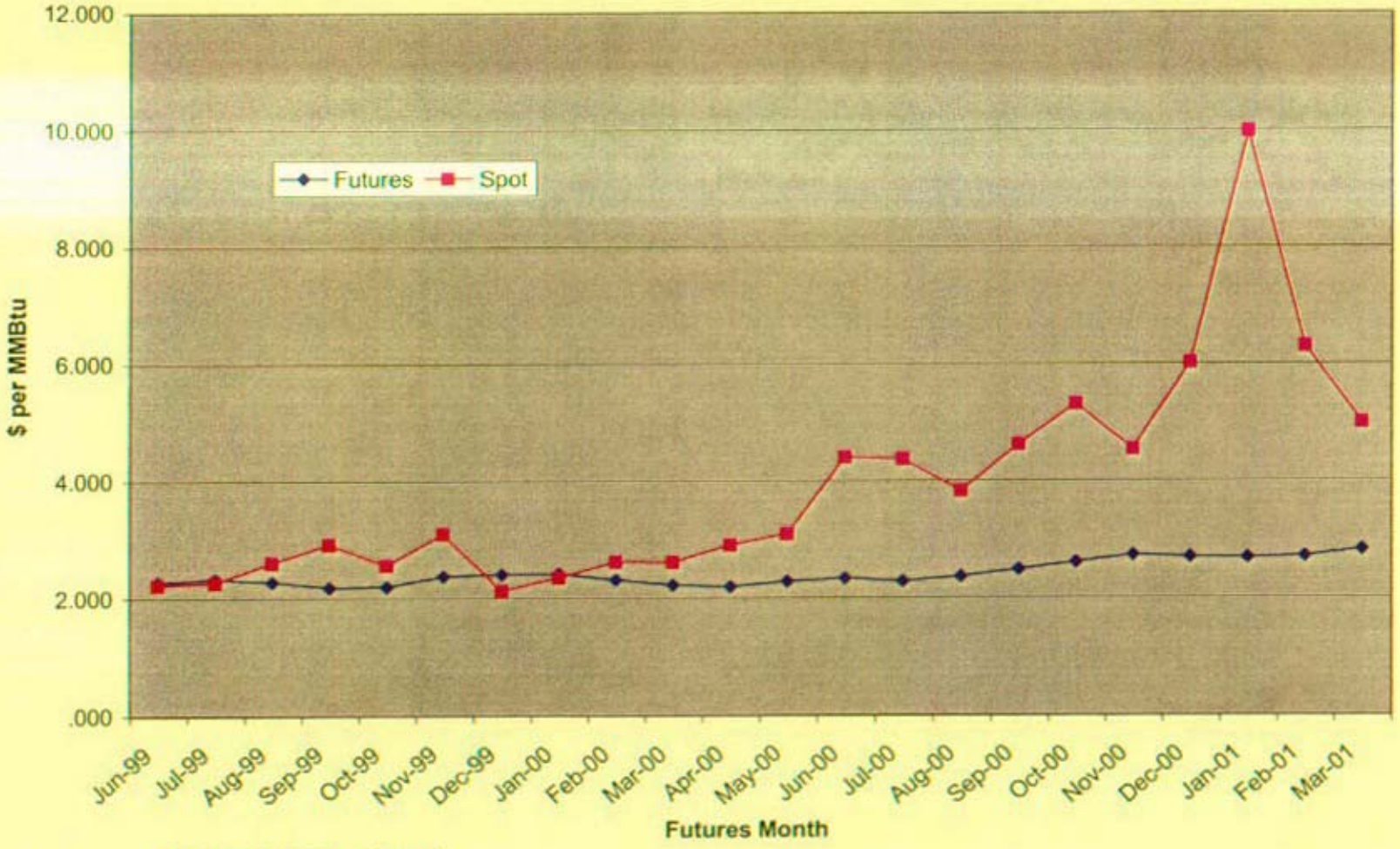
The New York Mercantile Exchange Natural Gas Futures Contract Specifications

(Schedule 1)

Delivery Location:	Sabine Pipeline Hub at Henry, Louisiana
Contract Size:	1 contract equals 10,000 MMBtu
Minimum Price Fluctuation:	$0.001 per MMBtu
Maximum Daily Price Fluctuation:	$1.00 per MMBtu for all months
Trading Months:	36 consecutive months commencing with the next calendar month, plus a long-dated contract, initially listed 36 months out
Last Trading Day:	Three business days prior to the first calendar day of the delivery month

Source: http://www.nymex.com

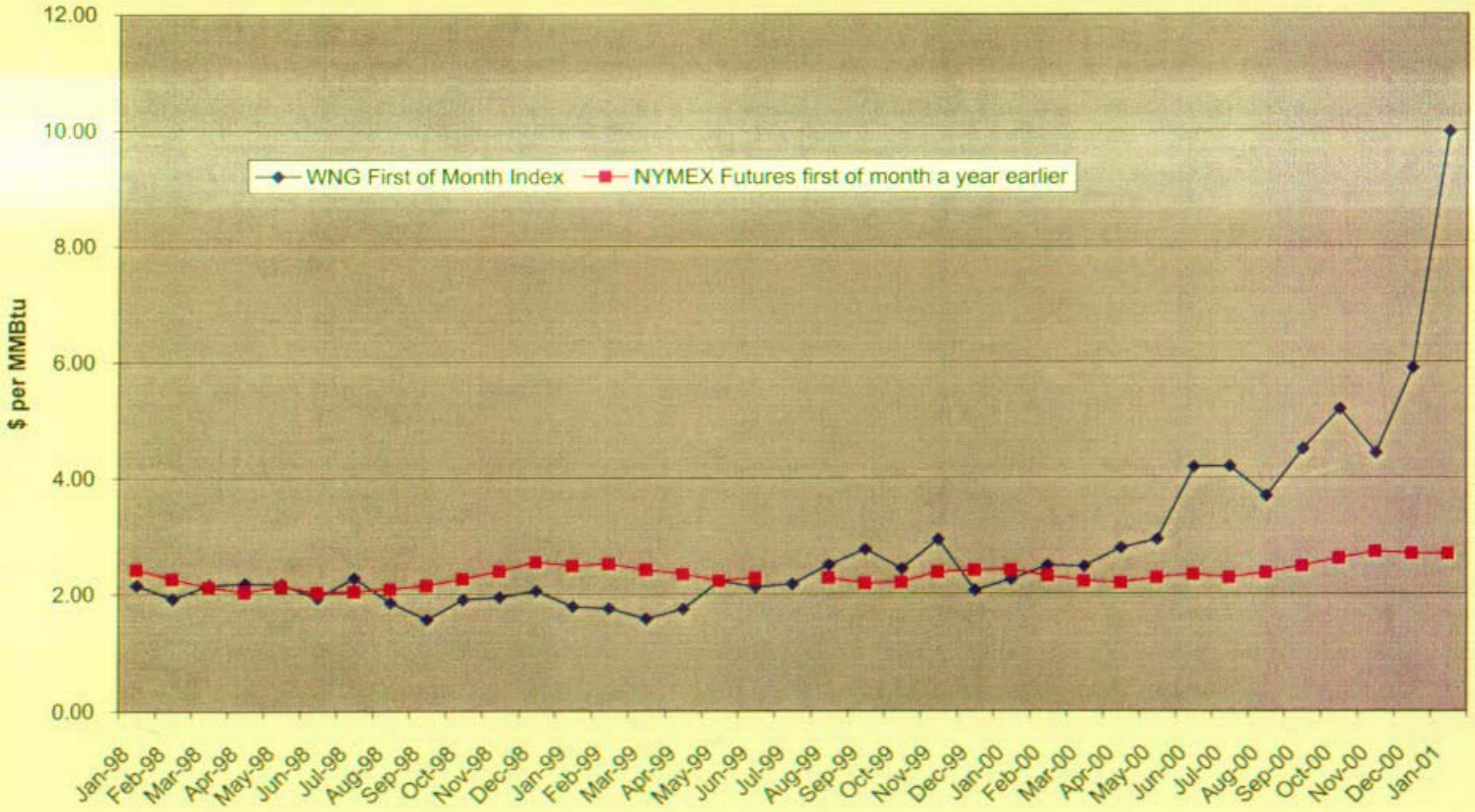
Futures vs. Spot
(Schedule 2)



Source: Wall Steet Journal

Schedule 2

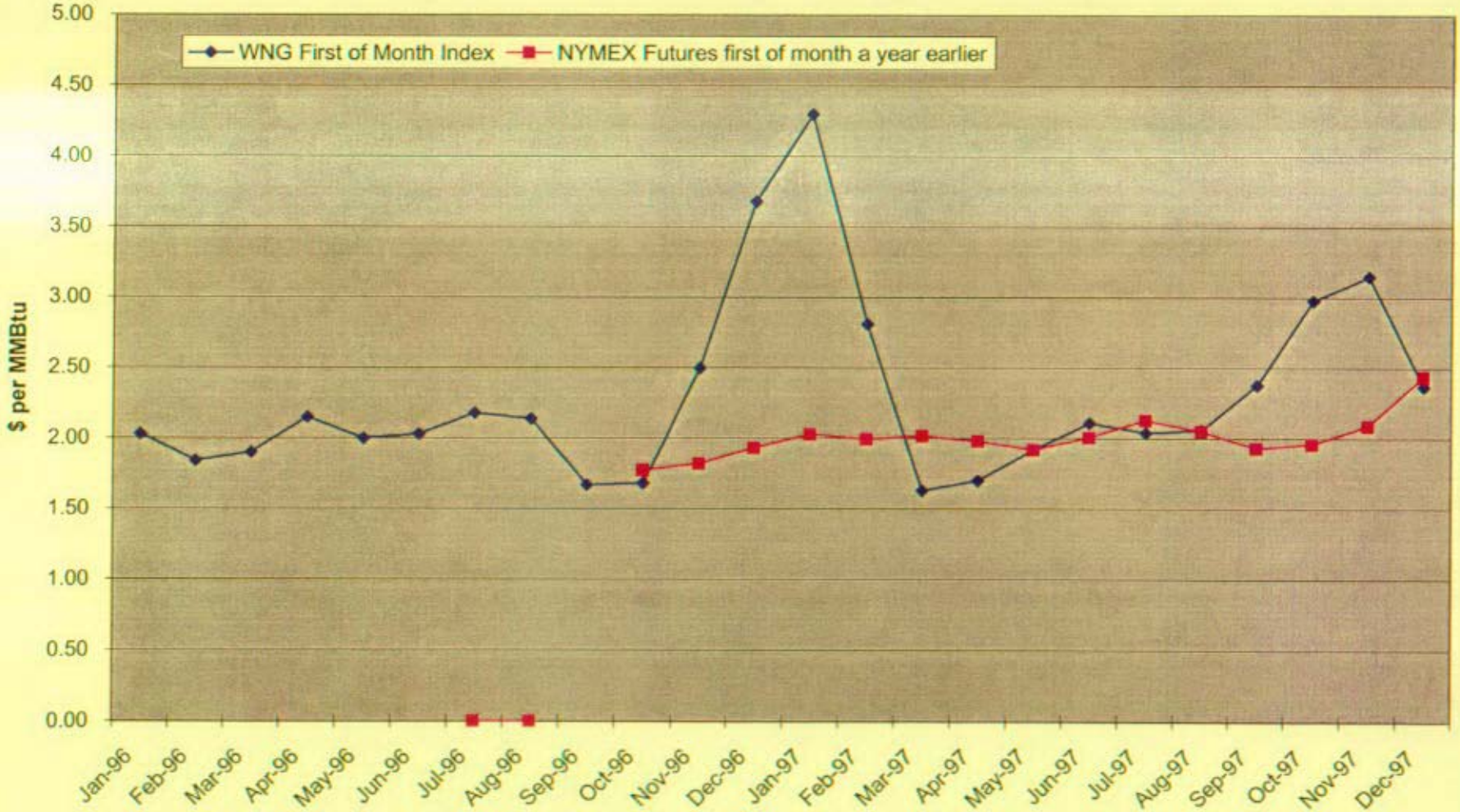
Williams Pipeline(WNG) First of Month Index vs NYMEX Futures Prediction A Year Earlier
(Schedule 3)



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

Schedule 3

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

Schedule 4