

Approved _____ Date 3/28/84

MINUTES OF THE House COMMITTEE ON Energy and Natural Resources

The meeting was called to order by Rep. David J. Heinemann at _____
Chairperson

3:30 ~~a.m.~~/p.m. on February 14, 1984 in room 519-S of the Capitol.

All members were present except: Representatives Runnels, Roe and Charlton (excused)

Committee staff present:

Ramon Powers, Legislative Research
Theresa Kiernan, Revisor of Statutes Office
Pam Somerville, Committee Secretary

Conferees appearing before the committee:

Kurt H. Wulff, Donaldson, Lufkin and Jenrette

Mr. Kurt Wulff, an oil and gas investment analyst with Donaldson, Lufkin, and Jenrette in New York, appeared before the committee to address the issue of "Rediscovering Hugoton".

Mr. Wulff began by stating he recommends the citizens of Kansas to urge the corporation commission to permit infill drilling in the Hugoton gas field to create \$2 billion of new wealth today for the State and its citizens without increasing the cost of gas to consumers in Kansas by any meaningful amount. He said the benefits to the state are assured by the severance tax passed last session.

Estimated reserves in the Kansas Hugoton gas field exceed 8 trillion cubic feet on the basis of reports by pipeline companies to the Kansas corporation commission. Those reserves remain after the field has already produced some 16 trillion cubic feet. The anticipated life index is 40 years and will be almost 50 years at expected 1983 production. Mr. Wulff said the present-value calculation suggests that the "rediscovery value" of this large natural gas field is \$5,543 million, or almost \$6 billion in round numbers. That value gains more meaning when compared with the cost of acquiring reserves otherwise known as "finding and development" costs when applied to new fields.

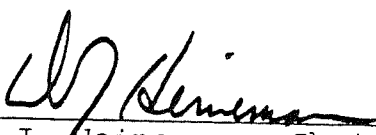
The economic benefits to Kansas of future revenue amounts to almost \$3 billion. (Based on Table 3 in Attachment 1).

In closing, Mr. Wulff stated that annually half of the wells in the Kansas Hugoton are shut in temporarily to measure wellhead pressure. The results are used to determine the deliverability of each well, which in turn is the most important factor in determining its basic allowable rate of production. (See Attachment 1).

A question and answer period followed Mr. Wulff's presentation.

There being no further business before the committee, the meeting adjourned at 4:40 p.m.

The next meeting of the House Energy and Natural Resources Committee will be held February 15, 1984 at 3:30 p.m.



David J. Heinemann, Chairman

Date Feb 14, 1984

GUESTS

HOUSE ENERGY AND NATURAL RESOURCES COMMITTEE

NAME	ADDRESS	ORGANIZATION
John A. Kincaid	Judicial Center	att. General
Rod Bicker	Topeka	Atty. Gen's office
Frank [unclear]	Nowyork	DLJ
Jim Collins	Tulsa	Cities Service Oil & Gas Co
Joe Hodges	TULSA	CITIES SERVICE OIL & GAS CO
Jan Johnson	Topeka	Budget Division
Romeo & Juliet	Paris	Agency of Love
ML Jenkins	"	Speaker's Office
N. Zogelman	"	"
Mr. [unclear]	Topeka	4701

2-15-84

Research Bulletin

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REDISCOVERING HUGOTON

Recommendation for Kansas

Summary and Recommendation

We recommend that the citizens of Kansas urge their State Corporation Commission to permit infill drilling in the Hugoton gas field to create \$2 billion of new wealth today for the state and its citizens without increasing the cost of gas to consumers in Kansas by any meaningful amount. Federal natural gas regulations are stripping Kansas of its energy resource birthright. As long as such controls remain in place, the state's most attractive alternative is to authorize the drilling of more wells whose production is eligible for a near market price about five times that from existing wells. The benefits to the state are assured by a severance tax passed in the spring of this year. Until now most of the local political sentiment has been opposed to actions that seem so clearly in the long-term best interests of the state. Having recently analyzed this issue from the investment research point of view, we think that the conclusions merit the attention of opinion leaders and policy makers in Kansas as well that of our investor clients.

1. *Export gas cheap, repurchase dear.* Ninety percent of the production from the largest natural gas field in the U.S. is purchased by federally regulated interstate pipelines at an average price of only one fifth its current value. No government entity anywhere in the world allows so much high-quality energy supply to be exported at such low prices. Compounding the folly, Kansas imports natural gas for its own requirements at prices five times what it receives for producing the same commodity.
2. *Kansas can change production regulations.* To redress this gross inequity, the state can modify the rules in the Hugoton gas field to allow a doubling in the number of wells. Production from new wells is eligible for a near-market price under existing federal regulations.
3. *The consumers are the producers!* Only a few months ago, Governor Carlin signed the severance tax reserving 8% of wellhead revenue for Kansas. Drilling 4,000 new wells would increase future revenues for the Hugoton field by about \$60 billion through the year 2020. The state of Kansas would keep almost \$5 billion of the increment with the severance tax, nearly \$3 billion with the state income tax, and local residents would earn about \$6 billion more mainly from royalties. Those future benefits of \$14 billion are worth more than \$2 billion in present value after discounting for the time value of money.

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Additional information is available upon request.

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4. *Pipeline suppliers use Hugoton to subsidize less economic sources.* Almost none of the low price old gas is delivered directly to Kansas users. Nearly all is obscured with high price supply from other sources such that the end users pay a delivered price that bears no resemblance to the wellhead price in Hugoton. Thus, higher wellhead prices for Hugoton gas would not necessarily translate to higher delivered prices for Kansas consumers.

An attached analysis of the economics and politics of the Hugoton field is extracted from one of our regular oil and gas investment research publications (see *U.S. Wildcat Profiles*, "Rediscovering Hugoton," August 1983).

Kurt H. Wulff

Hugoton Rediscovery Value More Than \$5 Billion

Estimated reserves in the Kansas Hugoton gas field exceed 8 trillion cubic feet on the basis of reports by pipeline companies to the Kansas Corporation Commission. Those reserves remain after the field has already produced some 16 trillion cubic feet. Until 1980, the Hugoton field alone provided more than 2% of total U.S. natural gas supply. Dividing 1982 production of a little more than 200 bcf into reserves results in a life index of 40 years. The life index will be almost 50 years at expected 1983 production! Annual volumes are likely to rebound two to three times from the 1983 low considering that actual production in 1978 was more than 550 bcf (See Table 1).

After volume, price is the next variable in analyzing value. Natural gas decontrol as proposed in the bill just endorsed by the U.S. Senate Energy Committee would result in the most price appreciation during the next few years. While the odds we place on the adoption of such legislation are 50%, few investors believe this. Even under our optimistic odds the risk that federal decontrol may not occur is substantial. That makes an alternate case more important. Without decontrol we think that the state of Kansas will authorize infill drilling within two years. A discussion of the political factors supporting this conclusion follows later. Drilling a second well for every square mile in more than 4,000 square miles of the Hugoton field would qualify for a higher price under existing controls. More than half of production would come from infill wells mainly because experience shows that the pressure of new wells is higher than that for existing wells for several years. Even if infill drilling is postponed, there is a gradual replacement of old wells that fail. Replacement wells qualify for a higher price after 1985. Infill drilling will be authorized in any event when capacity of the field declines to demand. Such an occurrence is inevitable before the field is fully depleted.

Oil-price escalation is likely to be higher than otherwise if there is no natural gas decontrol because regulations will tend to restrict the competitiveness of a major world energy source, U.S. natural gas. Oil prices are projected to escalate at 7% a year after a smaller increase in 1984. The industry average natural gas wellhead price is projected to reach 80% of the oil equivalent by the year 2000, and the Hugoton price reaches two-thirds of the industry average after infill drilling is completed in 1988 and then escalates to 80% of the natural gas average by the year 2000.

The discount rate used in the present value calculation is 12% rather than 15% that we normally use. On the other hand, price escalation rate is tied to long-term inflation at 7% per year, also lower than 10% that we have used previously.

The present-value calculation suggests that the "rediscovery value" of this large natural gas field is \$5,643 million, or almost \$6 billion in round numbers. That value gains more meaning when compared with the cost of acquiring these reserves otherwise known as "finding-and-development" costs when applied to new fields.

Table I
Kansas Hugoton Gas Field
Present Value of Future Cash Flow

Year	Production (bcf)	Price (\$/mcf)	Revenue (\$mm)	Operating Costs (\$mm)	Capital Costs (\$mm)	Depletion (\$mm)	Income Tax (\$mm)	Cash Flow (\$mm)	Present Value (\$mm)
1983	160	\$0.60	96	23		48	12	60	60
1984	200	0.65	130	27		60	22	82	73
1985	240	0.70	168	31		72	33	105	83
1986	280	1.00	280	42	200	84	7	31	22
1987	320	2.00	640	79	300	109	121	140	89
1988	360	3.00	1080	123	400	122	277	280	159
1989	400	4.00	1600	175		136	645	781	395
1990	400	4.40	1760	191		136	717	853	386
1991	400	4.90	1960	211		136	806	942	381
1992	400	5.40	2160	231		136	896	1032	372
1993	400	6.00	2400	256		136	1004	1140	367
1994	400	6.60	2640	280		136	1112	1248	359
1995	400	7.30	2920	308		136	1238	1374	353
1996	365	8.10	2953	311		124	1259	1383	317
1997	331	9.00	2983	314		113	1278	1390	285
1998	301	10.00	3013	318		102	1296	1399	256
1999	274	11.10	3040	321		93	1313	1406	229
2000	249	12.20	3038	320		85	1316	1401	204
2001	226	13.10	2965	313		77	1287	1364	177
2002	206	14.00	2881	305		70	1253	1323	154
2003	187	14.90	2787	296		64	1214	1278	132
2004	170	16.00	2721	289		58	1187	1245	115
2005	155	17.10	2644	282		53	1155	1207	100
2006	141	18.30	2572	275		48	1125	1172	87
2007	128	19.60	2504	268		43	1096	1140	75
2008	116	21.00	2439	262		39	1069	1108	65
2009	106	22.40	2365	255		36	1037	1073	56
2010	96	24.00	2304	249		33	1011	1044	49
2011	87	25.70	2243	243		30	985	1015	42
2012	79	27.50	2182	237		27	959	986	37
2013	72	29.40	2120	231		25	933	957	32
2014	66	31.50	2065	226		22	909	931	28
2015	60	33.70	2009	220		20	884	904	24
2016	54	36.00	1951	214		18	859	877	21
2017	49	38.50	1897	209		17	835	852	18
2018	45	41.20	1845	204		15	813	828	16
2019	41	44.10	1795	199		14	791	805	14
2020	37	47.20	1747	195		13	770	782	12
Total	8000	\$9.86	78897	8533	900	2685	33525	35940	5643

Hugoton Finding Costs Less Than \$3 Billion

Transactions whereby Hugoton properties change hands occur infrequently. A few years ago, Tenneco and Mesa in a joint venture acquired the Hugoton reserves of Ashland for some \$0.40 an mcf. The market for natural gas properties was stronger at that time, but even that level implies about \$3 billion for the whole field. The sponsor of legislation earlier this year in Kansas for the state to buy the Hugoton field estimated the cost between \$500 million and \$3 billion. While properties change hands infrequently, shares on the stock market trade every business day. The only issue concentrated exclusively on Hugoton gas, Dorchester Hugoton, has a stock market capitalization of less than \$30 million for 120 bcf of reserves (See Table 2). At \$0.20 an mcf, that puts a value on the whole field at less than \$2 billion. Similarly, only about \$140 million of KN Energy's stock market capitalization appears to be related to its nearly 500 bcf of Hugoton reserves suggesting a unit value of \$.30 an mcf. Perhaps 60% of Mesa Royalty Trust's stock market capitalization of more than \$400 million applies to its Hugoton reserves, suggesting a unit value of about \$.40 an mcf.

The low cost of acquiring Hugoton reserves contrasts with the cost of finding and developing new natural gas properties in recent years near \$1.50 an mcf. Reported costs compared with reserves added last year greatly exceeded this averaging over \$3 an mcf for eight natural gas pipelines (see DLJ *Industry Viewpoint*, "Natural Gas Pipelines, Buy the Resource-Rich Companies," July 14, 1983).

Moreover, the investment risks of acquiring Hugoton reserves are far lower than those associated with a new exploration program. The stock market value of Hugoton reserves reflects little more than the minimum that is almost sure to be realized under any foreseeable political outcome. The risk in an exploratory program is loss of the whole investment.

Table 2
 Kansas Hugoton Gas Field
 Stock Market Value of Natural Gas Reserves

	Dorchester Hugoton	KN Energy	Mesa Royalty Trust	Pandhandle Eastern
Stock price (\$/sh)	15	40	25	38
Shares (mm)	2	9	16	42
Market capitalization (\$mm)	27	340	410	1600
Attributable to Hugoton:				
Market cap (%)	100	40	60	10
Market cap (\$mm)	27	140	250	160
Reserves (bcf)	120	500	600	600
Life index-1983 (years)	30	25	35	40
Wellhead price-1983 (\$/m)	0.30	0.40	0.60	0.40
Market cap/reserves (\$/m)	0.20	0.30	0.40	0.30

Note: Hugoton amounts include Oklahoma for Dorchester and Panama-Council Grove pool for KN and Mesa Royalty.

We next outline the reasons for our belief that the political risks in acquiring Hugoton gas are not as great as they seem.

Economic Benefits to Kansas As Much As \$3 Billion

The most important political development in Kansas this year was the enactment of a severance tax of 8% on oil and gas wellhead revenue. Generating more than \$100 million a year, the tax made up a shortfall in the state's annual budget of \$1 billion. The need for new state revenues in a recession year overcame the opposition that had been successful in preventing enactment of a severance tax longer than in any other producing state. The debate on the tax paid little attention to its ultimate interaction with infill drilling in Hugoton. Nor do the congressmen and senators from Kansas who oppose federal decontrol acknowledge that with the severance tax the state gains more from higher wellhead prices than it gives up. Eight percent of incremental revenues flow directly to the state's coffers. In addition, a state income tax would gather in 5% more of incremental revenues. Finally, most of the landowners holding a one-eighth royalty on Hugoton production are residents of Kansas. Some of the working interest owners live in the state. We estimate that an additional 10% of wellhead revenues are retained by state residents. Thus, the state government and the residents of Kansas keep about 23% of incremental revenues from Hugoton gas production.

Along the lines of the calculation outlined earlier, the present value of future revenue that remains in Kansas amounts to almost \$3 billion. (See Table 3.) Even though the benefits of higher wellhead prices are substantial, the political emphasis so far has been entirely on the cost to Kansas residential consumers.

Table 3
Kansas Hugoton Gas Field
Present Value to State of Kansas
Infill Drilling Case

Year	Production (bcf)	Price (\$/mcf)	Revenue (\$mm)	Royalty (\$mm)	Severance Tax (\$mm)	Income Tax (\$mm)	Cash Flow (\$mm)	Present Value (\$mm)
1983	160	0.60	96	10	8	1	19	19
1984	200	0.65	130	13	10	2	26	23
1985	240	0.70	168	17	13	3	33	27
1986	280	1.00	280	28	22	1	51	36
1987	320	2.00	640	64	51	12	127	81
1988	360	3.00	1080	108	86	28	222	126
1989	400	4.00	1600	160	128	64	352	179
1990	400	4.40	1760	176	141	72	388	176
1991	400	4.90	1960	196	157	81	433	175
1992	400	5.40	2160	216	173	90	478	173
1993	400	6.00	2400	240	192	100	532	171
1994	400	6.60	2640	264	211	111	586	169
1995	400	7.30	2920	292	234	124	649	167
1996	365	8.10	2953	295	236	126	657	151
1997	331	9.00	2983	298	239	128	665	136
1998	301	10.00	3013	301	241	130	672	123
1999	274	11.10	3040	304	243	131	679	111
2000	249	12.20	3038	304	243	132	678	99
2001	226	13.10	2965	297	237	129	662	86
2002	206	14.00	2881	288	230	125	644	75
2003	187	14.90	2787	279	223	121	623	65
2004	170	16.00	2721	272	218	119	608	56
2005	155	17.10	2644	264	211	115	591	49
2006	141	18.30	2572	257	206	112	575	42
2007	128	19.60	2504	250	200	110	560	37
2008	116	21.00	2439	244	195	107	546	32
2009	106	22.40	2365	237	189	104	529	28
2010	96	24.00	2304	230	184	101	516	24
2011	87	25.70	2243	224	179	99	502	21
2012	79	27.50	2182	218	175	96	489	18
2013	72	29.40	2120	212	170	93	475	16
2014	66	31.50	2065	207	165	91	463	14
2015	60	33.70	2009	201	161	88	450	12
2016	54	36.00	1951	195	156	86	437	10
2017	49	38.50	1897	190	152	84	425	9
2018	45	41.20	1845	185	148	81	413	8
2019	41	44.10	1795	180	144	79	402	7
2020	37	47.20	1747	175	140	77	391	6
Total	8000	9.86	78897	7890	6312	3352	17554	2754

Consumer Impact Minimal in Kansas

Gary Haden, energy writer for the *Wichita Eagle Beacon*, the dominant newspaper in Kansas' largest city, describes the politics of natural gas in his state as "a circle of misery." Kansas consumers are angry because their gas costs have gone up almost as much as they have in other parts of the country. Distribution companies are not happy because the lower volume accompanying higher prices makes it necessary to fight for further increases from reluctant state regulators. The royalty owners and producers in the Hugoton field of southwest Kansas are unhappy because the price of their resource continues to be controlled at one-fifth the national average price. To add insult to injury, volumes in the Hugoton field have dropped by two-thirds. Completing the circle, Kansas politicians are frustrated by their powerlessness over their own energy economy.

Pushed to do something, Kansas politicians are taking the worst possible action by adding price controls to intrastate production wherever possible and by pushing for the continuation of wellhead price controls in Washington. Ultimately state price controls at lower-than-the-federal level will drive even more gas out of the state. Ninety percent of Hugoton gas already moves to interstate pipelines. As a result, federal price controls continue to penalize Kansas' revenues and have almost no benefits for Kansas consumers.

Only three purchasers of Hugoton gas deliver any meaningful amounts to Kansas consumers. Northwest Central, formerly Cities Service Gas and now owned by Northwest Energy, accounting for 40% of Hugoton field capacity took only 14% of the field volume in 1982. During the same period, Hugoton gas accounted for only 15% of total purchases by Northwest Central. Deliveries to Kansas consumers, in turn, accounted for less than a third of Northwest Central's total deliveries. This suggests that indirectly less than 5% of Hugoton gas moves through Northwest Central's pipeline to Kansas consumers. Meanwhile, Northwest Central pays about \$0.50 an mcf for Hugoton gas, while Kansas consumers pay more than \$5. Pipeline and distribution charges are about \$1.50 leaving the remaining \$3 to be paid to out-of-state producers. In other words, Kansas consumers through Northwest Central Pipeline pay a subsidy of \$3 an mcf amounting to some \$300 million a year, or 30% of the state budget, to non-Kansas producers. Some of this subsidy even finds its way to Mexico through another pipeline! KP&L must match the terms of any other potential purchaser including rate of take if it is to retain its Hugoton supply.

Most of the out-of-state payments went to Standard of Indiana for gas produced in Wyoming and shipped by Northwest Central to Kansas. Standard of Indiana hardly wins on this basis because it is also the second largest operator in the Hugoton field where it receives low prices that more than offset the high prices it gets in Wyoming. Meanwhile, Northwest Central has now reneged on some high-priced contracts with Standard of Indiana, while lobbying to keep the Hugoton price low. Abrogating its contract for Wyoming gas, Northwest Central will be able to reduce its purchased gas costs to bring them in line with the industry average.

At the same time, the head of Northwest Energy is doing his best to convince the Washington representatives from Kansas that they should continue to support price controls to keep the price of gas down to Kansas consumers. Our view is that decontrol would not change the industry average price and, therefore, the price to Kansas consumers would not change. Instead, by retaining more of the same amount spent, the state would be much better off.

There is only one major purchaser, Kansas Power & Light, that delivers Hugoton gas directly to Kansas consumers. Through KP&L, Kansas consumers used 11% of Hugoton volume last year even though KP&L has only 6% of the daily capacity of the field. Despite the low price of this supply, KP&L still charges residential customers two-thirds as much as does Gas Service Company, which gets its supply from Northwest Central. State legislation upheld by the Supreme Court until the end of next year keeps the price of 22% of KP&L's Hugoton supply at about \$2 an mcf instead of \$2.80 currently. The other 78% is restricted by contract to about \$0.28 an mcf giving KP&L an average price of about \$0.67 for Hugoton gas. KP&L buys all of its Hugoton gas from Mesa Petroleum, the operator for Mesa Royalty Trust. The president of KP&L also supports a continuation of federal price controls. Even under existing legislation, 22% of the Mesa KP&L volume will become unregulated in price after 1984. The contract for the remaining 78% expires at the end of 1989. At that time, Mesa has the option to sell the gas to any other purchaser, most likely an interstate pipeline. KP&L must match the terms of any other potential purchaser including rate of take if it is to retain its Hugoton supply. Since federal decontrol as now contemplated would not be fully effective until 1988 anyway, KP&L would save only two years of full benefit from the low contract price. Meanwhile, the state of Kansas loses the revenue it could be gaining from the great bulk of Hugoton production that moves out of state.

The only remaining meaningful amount of natural gas produced in Hugoton and sold in Kansas moves through the KN Energy system. KN also has about 6% of Hugoton capacity, but delivers less than one-sixth of its gas to Kansas. Thus, about 1% of Hugoton gas finds its way to Kansas consumers through the KN system. Other offtakers, including Panhandle and InterNorth deliver even smaller amounts to Kansas consumers.

The severance tax shifts the balance from costs to benefits of a wellhead price increase in the Hugoton field (see Table 4). Without the severance tax, the incremental benefits are 5% for the corporate income tax and 10% for the indigenous ownership. Costs of 11% for the KP&L volume, 5% for the Northwest volume, and 1% for the KN Energy volume offset the non-severance tax benefits. Adding 8% for the severance tax to the benefit side clearly tips the scale. The severance tax, corporate income tax, and indigenous ownership benefits continue indefinitely. The cost of 22% of the KP&L volume will be deregulated anyway on January 1, 1985, and the contracts for the remaining 78% of KP&L volume expires at the end of 1989. The Northwest Central numbers are soft also as the pipeline's charges to Kansas consumers have shown no relationship to the price of gas in the Hugoton field. Under decontrol, Northwest would be able to reduce the price that it pays for gas elsewhere to make up for the increased price that it would pay for Hugoton gas. Thus, on a long-term basis a wellhead price increase seems to be almost all benefit for Kansas and almost no cost.

Table 4
 Kansas-Hugoton Gas Field
 Wellhead Price Change
 Benefits and Costs to Kansas

			Incremental Revenue (%)
Benefits:			
Severance tax			8
Corporate income tax			5
Royalty and production income to Kansas citizens			10
		Total	23
	Share of Hugoton (%)	Delivered to Kansas (%)	
Costs:			
Kansas Power & Light	11	100	11
Northwest Central	15	30	5
KN Energy	13	10	1
Other			1
		Total	18

There is also the capital outlay for 4,000 wells. Expenditures of a half to a billion dollars in southwest Kansas would do a lot for the local economy as far away as Wichita, an oil-service center. While parts of Wichita show signs of growth, the recession in the oil-service business as well as in aircraft manufacture seems to have taken its toll in abandoned store fronts.

The irony of exporting all that Hugoton gas at one-fifth its value while paying full value for all the gas consumed in Kansas has not been lost on Kansas politicians. Frustrated, they are trying anything they can think of to regain control over their own resources. The Kansas legislature gave serious consideration to a bill that would establish a Kansas Natural Gas Authority empowering it with eminent domain to condemn the Hugoton field and buy the properties for the state. The bill was co-sponsored by 21 Republicans! Of course it did not get anywhere because the federal courts have made it abundantly clear that regulation of interstate natural gas is a federal affair. Efforts to continue federal regulation and to oppose infill drilling stem from the same frustration, but if successful would merely reinforce the control that outsiders have over Kansas resources. In the end, we think that it will be clear that if Kansas consumers are unable to get their hands on lower-priced Hugoton gas, the state may as well do all it can to get the price as high as possible. That means supporting the movement for federal decontrol, at least behind the scenes if not openly. Then if it becomes clear that decontrol will not be enacted this time, the state should authorize early infill drilling.

A Kansas Natural Gas Authority might still be a good idea. Instead of buying the whole Hugoton field it might just buy Mesa Royalty Trust, which has a 90% profits interest in the gas delivered to Kansas Power & Light. The state could issue tax-exempt bonds to finance the purchase and perhaps KP&L could become an equity participant. There is no lack of conviction at Kansas Power & Light about the value of its contract with Mesa. Because of the structure of Mesa Royalty Trust, there is no need to get a controlling interest. Each share represents ownership of properties. While the trust holders are not operators, it does not matter because the major operating decisions are made by the Kansas Corporation Commission when it establishes field rules. Just as we estimate that the present value of future cash flow to a taxable investor in Mesa Royalty Trust is \$40 a share, the present value to a tax-exempt investor, such as the state of Kansas, would be much higher.

After visiting with business and government leaders in Kansas, we sense that while the current problem is obvious, there has been little formal analysis of the long-term costs and benefits. Infill drilling has not yet been proposed to the Kansas Corporation Commission, which must make the final decision. The best timing for such a proposal may be when it is clear that Congress will not decontrol wellhead prices if such is the case. At the same time, it would be helpful if the volume decline in Hugoton reversed itself. As long as production remains at current levels there is no need for infill drilling to expand capacity. Once production turns, then the Kansas Corporation Commission can reckon that additional capacity will eventually be needed and that the drilling could start in anticipation of that day. While the driving force for infill drilling is undoubtedly economic, the ultimate rationale in the legal sense must be consistent with the encouragement of conservation of natural gas resources, which is the basis for state regulation of field rules. In support of this, infill wells would add 5 to 20% to total reserves.

Long-Life Reserves May Be Understated

Annually half of the wells in the Kansas Hugoton are shut in temporarily to measure wellhead pressure. The results are used to determine the deliverability of each well, which in turn is the most important factor in determining its basic allowable rate of production. During 1982 the measure of pressure in the Hugoton field actually increased even though gas production continued. Acknowledging that one year's measurement may be an anomaly, let's look at the results over the six years from 1977 through 1982. Shut-in pressure declined from 193 pounds per square inch gauge (PSIG) to 166 PSIG as 2.6 trillion cubic feet of gas were produced. The average amount produced per 1 PSIG change in pressure was 95 bcf. At that rate, the field would theoretically produce almost 16 trillion cubic feet before the pressure reached zero. Of course, the last few trillion cubic feet might take forever to extract. Eventually, vacuum equipment could be installed to speed this process along.

Six pipelines control 98% of the capacity in the Hugoton field (see Table 5). Thirteen producers operate more than 90% of the capacity. Over 100 operators are active in the field. While the State Corporation Commission of Kansas publishes data monthly on each of 4,163 wells, only the operator of each well is listed. The operator usually accounts for the dominant working interest, but not always. Normally the working interest is also subject to a one-eighth landowner royalty. Mesa Royalty Trust has a 90% net profits interest in half of the volume operated by Mesa. The other half of volume operated by Mesa is shared equally in ownership with Tenneco.

Table 5
 Kansas Hugoton Gas Field
 Deliverability by Purchaser and Operator
 (percent)

	NW Central	Inter- north	Pan- Coastal	handle	KN	Kansas P&L	Other	Total
Mobil	7.8	15.6	0.0	0.1	0.0	0.0	0.0	23.6
Std of Indiana	19.9	0.1	0.2	0.0	0.1	0.0	0.0	20.3
Occidental	3.6	3.4	2.8	2.4	1.6	0.0	0.0	13.9
Mesa	5.3	0.0	0.9	0.3	0.0	5.7	0.0	12.2
Panhandle	0.0	0.2	0.0	4.0	0.0	0.0	0.0	4.2
Helmerich & Payne	0.4	0.6	2.4	0.2	0.0	0.0	0.0	3.6
KN Energy	0.0	0.1	0.0	0.0	2.8	0.0	0.0	3.0
Atlantic Richfield	0.0	0.0	1.0	0.0	0.0	0.0	1.7	2.7
Union Pacific	0.1	0.4	0.9	0.0	0.6	0.0	0.0	2.1
Osborn	0.0	0.5	1.1	0.5	0.0	0.0	0.0	2.1
Northern Pump	1.2	0.2	0.0	0.0	0.0	0.0	0.0	1.4
Texaco	0.5	0.6	0.0	0.0	0.0	0.0	0.0	1.1
Walter Kuhn	0.0	0.5	0.1	0.5	0.0	0.0	0.0	1.1
Other	1.1	3.0	1.3	2.5	0.8	0.0	0.1	8.8
Total	39.9	25.2	10.8	10.6	6.0	5.7	1.8	100.0
Production, 1982	14.1	33.2	7.8	15.1	12.3	10.6	7.0	100.0
Reserves	29.0	26.3	6.7	15.7	7.6	7.7	7.0	100.0
Reserves/production	84	32	36	43	25	30	41	41
Pressure (psig)	173	167	183	144	174	129		166
Production (bcf)	30.2	71.0	16.6	32.3	26.4	22.6	14.9	214.0
Reserves (bcf)	2540	2310	590	1380	670	680	610	8770

Volume Rebounding

From an interim peak of 557 bcf in 1978, annual volume declined to 214 bcf last year, well below the allowable rate of production of 379 (see Table 6). Volume declines were particularly steep during the first three months of 1983. A turn may have occurred in May when volume exceeded that for the previous year on a monthly basis for the first time since at least 1980.

Already pipelines are finding ways to cut back on high-priced supplies and take more low-priced Hugoton gas, which has the automatic effect of slowing down and even reversing temporarily the increase in average cost of gas to pipelines. One of the major thrusts for new legislation in Washington is to break contracts that require pipelines to take high-priced gas. That alone would pave the way for increased Hugoton volumes, but we do not expect such legislation to be enacted except as part of a broader package. Contract abrogation is too serious a matter to pass lightly. If contracts are to be abrogated on high-priced gas, the cost of doing so will be abrogation of contracts on low-priced gas. In either case, Hugoton volume will be up and in the latter case Hugoton price will be up as well.

Investors seem to be unduly influenced by the negative trends of the past few years and by the political rhetoric accompanying last winter's price increases. These adverse influences contribute to making Hugoton gas one of the most attractive natural resource investments now available. That attraction applies to investors who can buy stocks such as Dorchester Hugoton, KN Energy, Mesa Royalty Trust, and Panhandle, which own Hugoton production; to exploration companies that can divert part of their exploration budget to buying properties that have little downside risk and as much upside potential as most exploration projects; to opportunistic financial entrepreneurs who could buy producing properties and royalty interests using pooled funds from institutional or individual investors; and to the state of Kansas, which can buy properties, particularly Mesa Royalty Trust, to lock in long-term economic benefits that will be difficult to preserve by artificial regulatory measures.

Table 6
 Kansas Hugoton Gas Field
 Allowable Production and Actual Production
 (billion cubic feet)

Year	Allowable Production	Actual Production		
1983E		170		
1982	379	214		
1981	393	373		
1980	411	418		
1979	544	497		
1978	599	557		
Actual Production			1983	1982
January			16.7	38.7
February			11.9	30.7
March			12.8	20.0
April			14.7	19.3
May			17.8	13.9
June			13.0	12.4
July			14.0	13.2
August			14.0	14.9
September			11.0	9.2
October			12.0	10.0
November			14.0	15.0
December			18.0	16.7
				30.6

Note: 1983 actual through May.

Kurt H. Wulff