Exhibit 9

BEFORE THE

PUBLIC UTILITIES COMMISSION

STATE OF SOUTH DAKOTA

SOUTH DAKOTA INTRASTATE PIPELINE COMPANY

DOCKET NG92-005

TESTIMONY OF

STEVEN M. WEGMAN

ON BEHALF OF THE COMMISSION STAFF

DECEMBER, 1992

BEFORE THE
PUBLIC UTILITIES COMMISSION
STATE OF SOUTH DAKOTA

South Dakota Intrastate Pipeline Company
Application for Authority to Establish
Rates for Natural Gas Transmission Service
in South Dakota

Docket No. NG92-005
Testimony of Steven M. Wegman
On Behalf of the Commission Staff
December, 1992

Q. Please state your name, occupation and business address.

A. My name is Steven M. Wegman and I am employed as a Staff Analyst with the Fixed Utilities Division of the South Dakota Public Utilities Commission. My business address is South Dakota Public Utilities Commission, 500 East Capitol Avenue, Pierre, South Dakota, 57501-5070.

Q. Please describe your educational and professional background.

A. I attended South Dakota State University from 1972-1977, majoring in Civil Engineering. After attending South Dakota State University, I was employed with the South Dakota Department of Transportation as an Engineering Technician. In 1979 I was employed with the Governor's Office of Energy Policy as an Assistant Solar Officer, my principle duties included analysis of energy use for numerous structures. Additionally, I presented energy auditing workshops to utility companies, state personnel and weatherization personnel. In 1983 I became the Director of the Alternative Energy Program for the Governor's Office of Energy Policy, my primary duties were to develop energy programs for the State of South Dakota and advise the Governor on energy related matters. I started my present position with the Commission in March of 1990.

My primary responsibilities with the Commission include the review and presentation of demand side management programs, making recommendations on electric and natural gas rates and tariffs, and advising the Commission on the various engineering and technical matters that come before the Commission.

Q. Are you familiar with South Dakota Intrastate Pipeline Company's (SDIPC) application for natural gas rates in South Dakota?

A. Yes. I have reviewed SDIPC's prefiled testimony, exhibits, working papers and data responses that were supplied by SDIPC at the request of Commission Staff pertinent to the preparation of my testimony.

Q. What is your responsibility in this case?

A. The purpose of my testimony is to review the estimates of natural gas sales or throughput, conversions rates and the cost of competing fuels which are reflected by SDIPC in their filing.

Q. How did SDIPC estimate the annual gas throughput on their proposed transmission pipeline?

A. SDIPC's throughput estimate (which for the most part has results identical to those of the survey conducted for the City of Pierre by K.A.L. Inc.) is primarily based on a survey that the SDIPC conducted for the City of Pierre in December of 1991. There were 6100 surveys mailed. 6100 approximates the number of electric meters in Pierre at that time. The survey results indicated that approximately 50% of the residential, 50% of the small commercial and 65% of the large commercial customers returned the survey cards. The Company then assumed that the results of the returned survey cards would mirror the

unreturned survey cards. Other assumptions used were that electric baseboard heating would not convert to natural gas, efficiency savings of 15%, average residential annual usage of 90 mcf and small and large commercial customers average annual usage of 300 mcf. The estimate also included the conversion of the following buildings: State Capitol, Indian Learning Center, St. Mary's Hospital, Buhl Cleaners, Pierre Public Schools, JES Farms and Fort Pierre. The result of the Pierre study indicated that there appears to be a potential immediate market of 587,000 mcf. The detail for the study can be found on Attachment #1 and #2 to the July 22, 1992 letter to Greg Rislov from Walter Woods.

Q. Do you have any information that would show the number of residential, commercial and industrial customers in the City of Pierre?

A. Yes. I have obtained the following information from the City of Pierre for the month of October 1992 for the City of Pierre:

a) 5,400 residential electric meters
b) 622 commercial electric meters
c) 3,654 residential water meters
d) 572 commercial water meters

I have also obtained the following information from the Hughes County Director of Equalization for the month of October 1992 for the City of Pierre:

a) 3,125 single family housing units
b) 650 manufactured homes

From the aforementioned information one could estimate that there are approximately 1,625 [5,400 minus (3,125 plus 650)] apartment units in the City of Pierre. Approximately 80% of these units utilize electric baseboard heat.

Q. What are the primary sources for space and water heating in Pierre?

A. The heating fuels that are utilized for space heating and water heating in the City of Pierre at the present time are fuel oil, propane, electricity, wood and coal.

Q. Have you performed a formal study to determine the market share of each of the aforementioned fuels for the City of Pierre?

A. No, neither I nor anyone else have performed what I would classify as a formal study to determine the market share of each type of fuel that is utilized for space and water heating in the City of Pierre. My testimony is based upon a number of factors, including: a) My employment with the Governor's Office of Energy Policy, b) Years of contacts with fuel suppliers, city officials, building and heating contractors in the City of Pierre, and c) A residential energy survey that I conducted for the City of Fort Pierre in 1987. The results of that survey indicated that the market share for space heating was as follows:

a) 25% fuel oil
b) 35% propane
c) 39% electric
d) 1% other

I have also conducted an informal survey of the 3,775 (3,125 plus 650) single family residential housing units in the City of Pierre. The market share results are as follows:

1) Space heating
a) 15% fuel oil or 566 units
b) 45% propane or 1,699 units
c) 40% electricity or 1,510 units

2) Water heating

a) 70% electricity or 2,643 units

b) 30% propane or 1,132 units

Q. Have you prepared any exhibits that reflect the informal survey results detailed above for the City of Pierre to determine potential natural gas conversions and estimated annual usage from those conversions?

A. Yes. My Exhibit__(SMW-2) entitled Pierre Estimated Conversions And Usage reflects the abovementioned informal survey results.

Q. Please explain the format and assumptions used in Exhibit__(SMW-2).

A. The exhibit is broken out into the following categories: single family residential housing units-space heating and water heating, apartment units--space heating and water heating, commercial customers and other customers (mainly potential large users). I have further bisected the space and water heating categories by fuel use (fuel oil, propane and electricity) for the categories of single family residential and apartment units. This exhibit reflects the assumptions that: 1) 50% of existing fuel oil furnaces would convert to natural gas when their furnace needs replacing, and 2) that the average life for a fuel oil furnace is approximately 20 years. The bases for the assumptions are the high cost of the conversion to natural gas, in the range of $1,600 to $2,500, the effect of competition on fuel oil prices, and the average service life of the fuel oil furnace, which is generally longer than the 20 year life. A homeowner could significantly extend the life and improve the efficiency of a fuel oil furnace by replacing the burner assembly. This is accomplished at a cost much lower than converting to a natural gas furnace. I have reflected 42 conversions from fuel oil furnaces to natural gas in the first two years of SDIPC's operation. This compares favorably with information that I obtained from the Governor's Office

of Energy Policy (GOEP) which reported 55 furnace replacements to propane in the past 24 month period, a period in which GOEP provided low interest financing for furnace replacement.

Q. What assumptions did you utilize for the residential propane space heating customers?

A. I assumed that 70% of these customers would convert to natural gas after five years with 60% of those customers converting in the first year, 10% more (70% of the 70%) the second year, 15% (85%) the third year, 5% (90)% the fourth year and 10% (100%) the fifth year (conversion percentages by year are based on local gas distribution companies actual conversion experience). My assumptions are based on conversion cost versus savings generated by fuel switching, after determination of an acceptable payback period (if savings are positive). In addition, competition will typically bring the price of propane down, tank rental fees would likely be reduced or eliminated to meet competition, and current homeowners may suffer from a modicum of inertia, may have little interest in changing fuel source, or simply may not want their lawn disturbed to obtain natural gas.

Q. What is the approximate cost for converting to natural gas from propane for a typical space heating customer?

A. The cost ranges from $150 to $500 dependent on the applicable building code which may, for example, allow natural gas distributors to use existing interior propane piping. If a propane furnace has been installed within the last five years, conversion costs could be at the lower end of the range or approximately $150.

Q. What assumptions did you utilize for residential electric space heating

customers?

A. I assumed that there would be no conversions from electric space heating to natural gas in the first five years. My assumptions are based on conversion costs, the price of electricity, and efficient heat pumps. Customers that heat their homes with electricity generally utilize baseboard units or a heat pump. Homeowners with baseboard heating systems would be unlikely to switch to natural gas because cost of conversion would be prohibitive as one would need the furnace along with all the accompanying ductwork. SDIPC's survey (Attachment #1, July 22, 1992 letter to Greg Rislov from Walter Woods) appears to recognize these facts as it eliminates baseboard heating units from the potential market. I have not included any conversions from heat pumps to natural gas simply because heat pumps are more efficient than other sources of fuel, with a coefficient of performance of 2.1, and the electric rate in Pierre is relatively inexpensive. The coefficient of performance of 2.1 means that for every kilowatt of energy consumed in the unit it will produce 2.1 kilowatts of heat. Therefore if a homeowner converts to natural gas, the homeowner would be installing a furnace that uses more btu's for heating a given space. For example, a heat pump with a coefficient of performance of 2.1 and an electric rate of 3.8 cents per kwh will have a cost of approximately $5.30 per million btu's. This would be comparable to the price of natural gas at $6.48 per million btu's with a 90% efficient furnace.

Q. What assumptions did you make in regard to the single family residential water heating load in the City of Pierre?

A. As shown on Exhibit__(SMW-3), page 1 of 3, 30% of the water heating load is propane and the remainder is electric. I assumed that the propane water heaters would convert in the same manner as the detail provided for the propane space heating load. I also assume that there will be no conversions of

electric water heaters to natural gas based on the price of electricity, efficiency ratings, and conversion costs. According to the American Council For An Energy Efficient Economy Report for 1991, the typical electric water heater has a seasonal efficiency rating of approximately 90% while the typical propane or natural gas water heater has a seasonal efficiency rating of approximately 55%. The cost to convert from electric to a natural gas water heater is approximately $750, which includes the installation of proper venting. As an example, if natural gas sold for $6.00 per million btu's and the natural gas water heater had an efficiency rating of 55% with resultant annual usage of 20 million btu's, the annual cost for water heating would be approximately $174.00. Using the abovementioned assumptions, the annual cost of an electric water heater would be approximately $245.00, thus a savings of approximately $71.00. The payback period (payback analyses fail to account for the time value of money, so usage of simple payback may seriously understate true recovery periods) for installing a natural gas water heater would be approximately 10.5 years (750/71).

If time value of money is considered as part of the cost, and if the nominal rate of interest is 10%, there would actually be a loss in conversion, as the $750 would cost $75 per year before compounding of interest. $71 would thus be saved at a $75 cost.

Q. How did you determine the annual usages for residential space heating and water heating?

A. I used the results of a study performed in 1986 by the South Dakota Energy Office entitled Energy Savings and Cost-Effectiveness In the South Dakota Housing Development Authority Energy Efficiency Program New Construction and Retrofit Study. The applicable results were that an average South Dakota residential home uses approximately 75 million btu's for space heating and

approximately 20 million btu's for water heating per year.

Q. Could you explain the assumptions that you utilized for the apartment units in Pierre?

A. Yes. There are approximately 1625 apartment units in the City of Pierre, approximately 80% are heated with electricity and the remainder are heated with fuel oil. I assumed that virtually no apartment units with electric heat would convert to natural gas, based on the same assumptions enumerated for single family residential housing units. Additionally, landlords would have little incentive to convert to natural gas as the vast majority of the tenants are directly paying the heating bill. I assumed that the apartments which use fuel oil for space heating would convert to natural gas at the same rate determined for conversion of the single family residential units. Since almost no apartments are heated with propane, it's a reasonable assumption that all apartment water heaters are electric as well and therefore will not convert.

Q. Would you please explain your determination of commercial conversions and consumption?

A. I adopted SDIPC's assumption of 300 million btu's per commercial customer, and the City of Pierre's October 1992 listing of commercial water meters. It should be noted that the City's list included 572 commercial water meters, and 747 commercial electric meters. The reason for the difference is multiple metering of electric service for commercial buildings.

I then assume that 90% of the commercial buildings would convert to natural gas because:

1) Higher heating costs per square foot than residential

buildings, therefore greater potential savings;

2) Elimination of fuel tanks, with corresponding elimination of tank maintenance, tank unsightliness, tank storage areas, and liability; and

3) Improved efficiencies.

Q. Have you determined the annual usage of the commercial customers?

A. Yes. Exhibit_(SMW-2), Page 3 of 3 lists estimated consumption for each of the first five years.

Q. Does your commercial classification depicted above include all of the commercial customers?

A. No. It includes what may generally be thought of as a small commercial classification. It simplifies the analysis to categorize as a group and then apply assumptions to the group as a whole. However, there are normally customers in the commercial and/or industrial class of customer whose usage is so significant in terms of system consumption that it is better for analytical purposes to consider each customer separately. I have done that on Exhibit_(SMW-2), Page 3 of 3, and have listed them as "Other Customers".

Q. What have you done to estimate the potential usage of these businesses?

A. I have contacted the business owners or the physical plant operators for the following information:

1) Past five years' fuel usage,

2) Reasons for converting to natural gas,

3) Retention of fuel switching capability,

4) Consideration of bypassing the local distribution company, and
5) Fuel cost data.

On lines 7-15 of my above cited exhibit I've listed the "Other Customers", have shown potential consumption for those which have stated they may consider conversion, and have placed zeroes for those which stated they wouldn't convert absent a competitive cost per btu. Given the current cost per btu for their present fuel source and comparing that cost to a conservative (low) natural gas cost estimate, it appears fairly certain that no near term conversion would occur for those which have been listed at zero.

The total consumption for this category is estimated at 52,800 MMbtu's.

Q. There is a Fort Pierre listing in the "Other" category. What does this signify?

A. For purposes of ease of categorization, I listed all of the City of Fort Pierre under this category and assigned it no load.

Q. Why have you chosen to ignore potential Fort Pierre load?

A. There must be a pipeline crossing of the Missouri River before Ft. Pierre can obtain natural gas. To date, no one has determined if or when the crossing can be accomplished.

Q. What other differences are there between yours vs. SDIPC's estimate of this category's load?

A. I included a heating load for the Federal Building, Public Safety Building, and the DCI Building. SDIPC did not. The latter two buildings are part of the state complex, but have a heating system separate from the rest of the complex.

They therefore may benefit from a conversion.

Q. Does this complete your City of Pierre estimate?

A. Yes. On the bottom of Page 3 of 3 there is total listed consumption for each of the first five years. The total for the first year is 210,200 MMbtu's, and the fifth year total is 320,715 MMbtu's.

Q. What have you estimated for consumption in other communities?

A. The estimation process for consumption outside of Pierre is fraught with assumptions, absent a town-by-town market survey. After reviewal of expansion projects undertaken by other companies, and given my knowledge of the towns involved, I decided to use a ratio based upon the prior expansions and what we have determined for consumption and conversions in the City of Pierre. This ratio is applied to population.

Q. Have you, in determination of this ratio, reflected any differences between Pierre and the other communities?

A. One notable difference is the percentage of those with electric heat. While we assume 40% of Pierre residents heat with electricity and probably won't be interested in conversion, we estimated that in outlying towns only 10% of the heating load would remain electric.

Q. Where have you displayed your calculation of consumption in outlying communities along the pipeline route?

A. On Exhibit_(SMW-3).

Q. Would you explain the development of Exhibit_(SMW-3)?

A. I develop and apply per fuel source, MMbtu consumption percentages to the population in Pierre. I then apply those percentages (subject to the electric exception mentioned above) to the population of the outlying communities. I would note that I've used SDIPC's population list. SDIPC's list is higher than what the latest census would suggest, and includes the towns of Mobridge and Glenham. I decided to use SDIPC's population numbers, but I did exclude both Glenham and Mobridge as this filing is not designed to account for the cost of serving those towns.

Q. What is your total estimate of SDIPC sales?

A. My total estimate appears on Exhibit_(SMW-1). I list the first five years on this exhibit.

Q. Staff Witness Rislov has developed a levelized cost of service for ten years based upon your sales estimate. What have you done to develop the sales for years six through ten?

A. I assumed continued conversions of fuel oil heating systems based upon a 20-year life per system, with uniform replacement (1/20th per year); the remaining 30% of unconverted propane systems would convert; when a propane space heating system was converted, the water heating would be converted as well; the remaining fuel oil apartments would convert; and the remaining small commercial would convert. Although one could expect these conversions to occur uniformly over some period of time, I assumed all conversions would be effective in year six. This totalled to an additional 71,000 MMbtu's. I then added another 35,000 MMbtu's (as a gratuitous addition) to equal a total sales in years six through ten of 600,000 MMbtu's. It's fair to state that my

assumptions should result in overstatement as I've generously added MMbtu sales (to obtain a conservative number from SDIPC's view) in years six through ten over what my analysis seems to indicate. My numbers may further be overstated as I have not accounted for any efficiency gains.

Q. Are efficiency gains a concern?

A. Most certainly. We have witnessed remarkable efficiency gains over the past fifteen years related to natural gas consumption. Heating loads have decreased consumption by 20+ percent since 1978.

SDIPC has reflected an efficiency adjustment, but again, in the interest of conservatism and given the uncertainty already inherent in the sales estimate, I've chosen not to do so.

Q. What is the purpose of Exhibit_(SMW-4) and _(SMW-5)?

A. There has been a lot of questioning and confusion related to comparable fuel source consumption and costs. Exhibit_(SMW-4) lists on the left hand column a graded scale of cost differences per million btu's. The next three columns, labelled 75, 95, and 300, are simply three selected annual consumption amounts. To use the chart, one must determine potential savings, on a per MMbtu basis, related to usage of a fuel source. If it's $.50, and usage is 75 MMbtu annually, the cost differential is $37.50. One would save $37.50 from fuel switching before consideration of conversion costs. The second part of this exhibit states, on a simple payback basis, how long it takes to recover the conversion costs based upon annual fuel savings. So, following our example, if your annual fuel savings were $37.50, and you spent $500 converting your system, it would take 13.3 years to recover your conversion cost. This analysis' failure to account for the time value of money could lead to erroneous

conclusions, however, as I stated earlier in my testimony.

Exhibit_(SMW-5) develops per MMbtu comparable costs for natural gas, propane, and fuel oil.

Q. Have you anything further to add?

A. It should be noted that while I've incorporated no specific growth adjustment, I have liberally allowed, as covered fully above, a large amount of sales which cannot be justified within the context of my analysis.

The purpose of my testimony is to establish a sales estimate which is derived on a basis more detailed than the studies done by K.A.L. Inc., and SDIPC. I realize that my numbers are not as supportive of the construction of the pipeline, but my purpose was not to necessarily develop a rosy view. I have attempted to be objective. However, I also realize that we as a staff do not have a wealth of experience in estimating sales for new companies and communities. SDIPC and its consultants, given the risk of loss, must have some basis for the seemingly optimistic sales estimate they provide. I therefore would prefer that the Commission and other parties treat my estimate as an objective attempt at sales measurement, and I would defer to SDIPC's estimate for purposes of rate design.

Q. I have no further questions.

Exhibits 10

BEFORE THE

PUBLIC UTILITIES COMMISSION

STATE OF SOUTH DAKOTA

4-5 9:25

SOUTH DAKOTA INTRASTATE PIPELINE COMPANY

DOCKET NG92-005

EXHIBITS OF

STEVEN M. WEGMAN

ON BEHALF OF THE COMMISSION STAFF

DECEMBER, 1992

Exhibit ___ (SMW-1)

South Dakota Intrastate Pipeline Company
Total Towns Conversions and Usage
December, 1992

	(Million BTU's)	Annual Usage Pierre	Annual Usage Other Towns		Total Annual Usage (Million BTU's)	
	(a)	(b)	(c)		(d)	
1	Year 1	210,200	101,960	180,320	312,160	390,520
2	Year 2	237,675	122,352	216,384	360,027	454,059
3	Year 3	278,455	147,842	261,464	426,297	539,919
4	Year 4	292,960	158,038	279,496	450,998	572,454
5	Year 5	320,715	173,332	306,544	494,047	627,259

Sources:

Column (b): Exhibit ___ (SMW-2) page 3 of 3

Column (c): Exhibit ___ (SMW-3)

South Dakota Intrastate Pipeline Company
Pierre Estimated Conversions and Usage
December, 1992

	Pierre	Number of Housing Units	Estimated Conversions By Year	Annual Usage Per Unit (Million BTU's)	Total Annual Usage (Million BTU's)
	(a)	(b)	(c)	(d)	(e)
1	Single Family Residential Housing Units	3,775			
	Space Heating				
2	1) 15% Fuel Oil	566			
3	a) Year 1		14	75	1,050
4	b) Year 2		28	75	2,100
5	c) Year 3		42	75	3,150
6	d) Year 4		57	75	4,275
7	e) Year 5		71	75	5,325
8	2) 45% Propane	1,699			
9	a) Year 1		714	75	53,550
10	b) Year 2		833	75	62,475
11	c) Year 3		1,011	75	75,825
12	d) Year 4		1,070	75	80,250
13	e) Year 5		1,189	75	89,175
14	3) 40% Electric	1,510			
15	a) Year 1		0	75	0
16	b) Year 2		0	75	0
17	c) Year 3		0	75	0
18	d) Year 4		0	75	0
19	e) Year 5		0	75	0
	Water Heating				
20	1) 30% Propane	1,132			
21	a) Year 1		475	20	9,500
22	b) Year 2		555	20	11,100
23	c) Year 3		674	20	13,480
24	d) Year 4		713	20	14,260
25	e) Year 5		792	20	15,840
26	2) 70% Electric	2,643			
27	a) Year 1		0	20	0
28	b) Year 2		0	20	0
29	c) Year 3		0	20	0
30	d) Year 4		0	20	0
31	e) Year 5		0	20	0

Sources:

Lines 1, 2, 8, 14, 20 and 26:	Testimony of Staff Witness Wegman.
Column (c), Lines 3-7:	Assume 50% convert when their furnace needs replacing and a 20 year furnace life.
Column (c), Lines 9-13 and Column (c) lines 21-25:	Assume 70% convert after 5 years with 60% 1st year, 70% 2nd year, 85% 3rd year, 90% 4th year and 100% 5th year.
Column (d):	Testimony of Staff Witness Wegman.

South Dakota Intrastate Pipeline Company
Pierre Estimated Conversions and Usage
December, 1992

	Pierre	Number of Housing Units	Estimated Conversions By Year	Annual Usage Per Unit (Million BTU's)	Total Annual Usage (Million BTU's)
	(a)	(b)	(c)	(d)	(e)
1	Apartment Units	1,625			
	Space Heating				
2	1) 80% Electric	1,300			
3	a) Year 1		0	75	0
4	b) Year 2		0	75	0
5	c) Year 3		0	75	0
6	d) Year 4		0	75	0
7	e) Year 5		0	75	0
8	2) 20% Fuel Oil	325			
9	a) Year 1		8	75	600
10	b) Year 2		16	75	1,200
11	c) Year 3		24	75	1,800
12	d) Year 4		33	75	2,475
13	e) Year 5		41	75	3,075
	Water Heating				
14	1) 100% Electric	1,625			
15	a) Year 1		0	20	0
16	b) Year 2		0	20	0
17	c) Year 3		0	20	0
18	d) Year 4		0	20	0
19	e) Year 5		0	20	0

Sources:

Column (b) and (d): Testimony of Staff Witness Wegman.
Column (c), Lines 9-13: Assume 50% convert when their furnace needs replacing and a 20 year furnace life.

South Dakota Intrastate Pipeline Company
Pierre Estimated Conversions and Usage
December, 1992

	Pierre	Number of Commercial Units	Estimated Conversions By Year	Annual Usage Per Unit (Million BTU's)	Total Annual Usage (Million BTU's)
	(a)	(b)	(c)	(d)	(e)
1	Commercial Customers	572			
2	a) Year 1		309	300	92,700
3	b) Year 2		360	300	108,000
4	c) Year 3		438	300	131,400
5	d) Year 4		463	300	138,900
6	e) Year 5		515	300	154,500
	Other Customers				
7	State Capitol				0
8	Indian Learning Center				2,800
9	St. Mary's Hospital				16,800
10	Buhl Cleaners				10,000
11	Pierre Public Schools				19,000
12	JES Farms				0
13	Fort Pierre				0
14	Federal Building				2,800
15	Public Safety and DCI				1,400
16	**TOTAL OTHER**				52,800
	Total Single Family Residential, Apartment, Commercial and Other				
17	a) Year 1				210,200
18	b) Year 2				237,675
19	c) Year 3				278,455
20	d) Year 4				292,960
21	e) Year 5				320,715

Sources:

Columns (b), (d) and (e), Lines 7-15: Testimony of Staff Witness Wegman.

Column (c): Assume 90% will convert in 5 years with 60% 1st year, 70% 2nd year, 85% 3rd year, 90% 4th year and 100% 5th year.

Exhibit ___ (SMW-3)

South Dakota Intrastate Pipeline Company
Other Potential Towns' Conversions and Usage
December, 1992

	Residential & Commercial Consumption (Million BTU's) Pierre	Pierre Population Associated With Propane & Fuel Oil	Per Capita Consumption Column (b) /(c)	Pierre Per Capita Applied to Other Cities Potential Conversions	Total Usage Other Towns (Million BTU's)	
(a)	(b)	(c)	(d)	(e)	(f)	
a) Year 1	157,400	7,800	20	5,098	9,016 101,960	180,320
b) Year 2	184,875	7,800	24	5,098	122,352	216,384
c) Year 3	225,655	7,800	29	5,098	147,842	261,464
d) Year 4	240,160	7,800	31	5,098	158,038	279,496
e) Year 5	267,915	7,800	34	5,098	173,332	306,544

Sources:
Column (b): Exhibit ___ (SMW-2) page 3, lines 17-21 less line 16.
Column (c): Pierre population of 13,000 X 60% (propane and fuel oil percentages on Exhibit ___ (SMW-2), page 1).
Column (e): SDIPC's letter of July 22, 1992, to Greg Rislov, attachment #2 less the towns of Glenham and Mobridge reduced by 10% to reflect electric load that will not convert.

10,018 includes Glenham and Mobridge
x.90
9,016

South Dakota Intrastate Pipeline Company

Exhibit ____ (SMW-4)

Cost Savings and Payback
December 1992

Cost Savings / Million Btu's	Average Annual Energy Usage Million Btu's			Years to Recover $150 Conversion Cost Million Btu's			Years to Recover $500 Conversion Cost Million Btu's		
	75	95	300	75	95	300	75	95	300
$0.25	$18.75	$23.75	$75.00	8.0	6.3	2.0	26.7	21.1	6.7
$0.30	22.50	28.50	90.00	6.7	5.3	1.7	22.2	17.5	5.6
$0.35	26.25	33.25	105.00	5.7	4.5	1.4	19.0	15.0	4.8
$0.40	30.00	38.00	120.00	5.0	3.9	1.3	16.7	13.2	4.2
$0.45	33.75	42.75	135.00	4.4	3.5	1.1	14.8	11.7	3.7
$0.50	37.50	47.50	150.00	4.0	3.2	1.0	13.3	10.5	3.3
$0.55	41.25	52.25	165.00	3.6	2.9	0.9	12.1	9.6	3.0
$0.60	45.00	57.00	180.00	3.3	2.6	0.8	11.1	8.8	2.8
$0.65	48.75	61.75	195.00	3.1	2.4	0.8	10.3	8.1	2.6
$0.70	52.50	66.50	210.00	2.9	2.3	0.7	9.5	7.5	2.4
$0.75	56.25	71.25	225.00	2.7	2.1	0.7	8.9	7.0	2.2
$0.80	60.00	76.00	240.00	2.5	2.0	0.6	8.3	6.6	2.1
$0.85	63.75	80.75	255.00	2.4	1.9	0.6	7.8	6.2	2.0
$0.90	67.50	85.50	270.00	2.2	1.8	0.6	7.4	5.8	1.9
$0.95	71.25	90.25	285.00	2.1	1.7	0.5	7.0	5.5	1.8
$1.00	75.00	95.00	300.00	2.0	1.6	0.5	6.7	5.3	1.7
$1.05	78.75	99.75	315.00	1.9	1.5	0.5	6.3	5.0	1.6
$1.10	82.50	104.50	330.00	1.8	1.4	0.5	6.1	4.8	1.5
$1.15	86.25	109.25	345.00	1.7	1.4	0.4	5.8	4.6	1.4
$1.20	90.00	114.00	360.00	1.7	1.3	0.4	5.6	4.4	1.4
$1.25	93.75	118.75	375.00	1.6	1.3	0.4	5.3	4.2	1.3
$1.30	97.50	123.50	390.00	1.5	1.2	0.4	5.1	4.0	1.3
$1.35	101.25	128.25	405.00	1.5	1.2	0.4	4.9	3.9	1.2
$1.40	105.00	133.00	420.00	1.4	1.1	0.4	4.8	3.8	1.2
$1.45	108.75	137.75	435.00	1.4	1.1	0.3	4.6	3.6	1.1
$1.50	112.50	142.50	450.00	1.3	1.1	0.3	4.4	3.5	1.1
$1.55	116.25	147.25	465.00	1.3	1.0	0.3	4.3	3.4	1.1
$1.60	120.00	152.00	480.00	1.3	1.0	0.3	4.2	3.3	1.0
$1.65	123.75	156.75	495.00	1.2	1.0	0.3	4.0	3.2	1.0
$1.70	127.50	161.50	510.00	1.2	0.9	0.3	3.9	3.1	1.0
$1.75	131.25	166.25	525.00	1.1	0.9	0.3	3.8	3.0	1.0
$1.80	135.00	171.00	540.00	1.1	0.9	0.3	3.7	2.9	0.9
$1.85	138.75	175.75	555.00	1.1	0.9	0.3	3.6	2.8	0.9
$1.90	142.50	180.50	570.00	1.1	0.8	0.3	3.5	2.8	0.9
$1.95	146.25	185.25	585.00	1.0	0.8	0.3	3.4	2.7	0.9
$2.00	150.00	190.00	600.00	1.0	0.8	0.3	3.3	2.6	0.8
$2.05	153.75	194.75	615.00	1.0	0.8	0.2	3.3	2.6	0.8
$2.10	157.50	199.50	630.00	1.0	0.8	0.2	3.2	2.5	0.8
$2.15	161.25	204.25	645.00	0.9	0.7	0.2	3.1	2.4	0.8
$2.20	165.00	209.00	660.00	0.9	0.7	0.2	3.0	2.4	0.8
$2.25	168.75	213.75	675.00	0.9	0.7	0.2	3.0	2.3	0.7
$2.30	172.50	218.50	690.00	0.9	0.7	0.2	2.9	2.3	0.7
$2.35	176.25	223.25	705.00	0.9	0.7	0.2	2.8	2.2	0.7
$2.40	180.00	228.00	720.00	0.8	0.7	0.2	2.8	2.2	0.7
$2.45	183.75	232.75	735.00	0.8	0.6	0.2	2.7	2.1	0.7
$2.50	187.50	237.50	750.00	0.8	0.6	0.2	2.7	2.1	0.7

PAYBACK.

Exhibit _____ (SMW-5)

South Dakota Intrastate Pipeline Company

BTU and Price Comparisons

December 1992

(MMBTU'S)	Natural Gas Price Per MCF	Propane Price Per Gallon	Fuel Oil Price Per Gallon
	$5.00	$0.46	$0.70
	5.25	0.48	0.74
	5.50	0.50	0.77
	5.75	0.53	0.81
	6.00	0.55	0.84
	6.25	0.57	0.88
	6.50	0.60	0.91
	6.75	0.62	0.95
	7.00	0.64	0.98

ASSUMPTIONS:

91,600 BTU'S = 1 GALLON OF PROPANE
140,000 BTU'S = 1 GALLON OF FUEL OIL
1,000,000 BTU'S = 1 MCF OF NATURAL GAS
1,000,000 BTU'S = 10.92 GALLONS OF PROPANE
1,000,000 BTU'S = 7.14 GALLONS OF FUEL OIL