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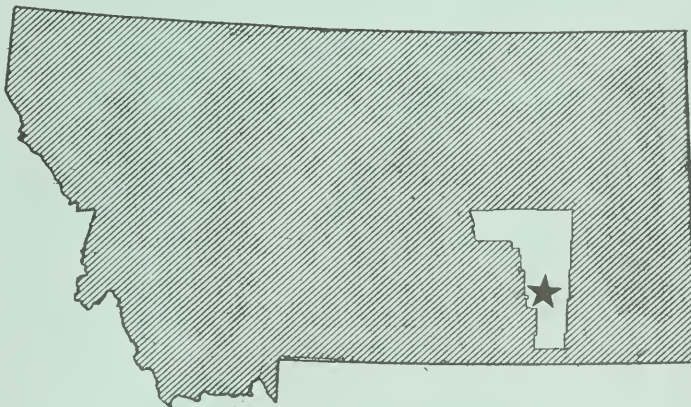


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STATE DOCUMENTS

THE ECONOMIC IMPACT OF PROPOSED
COLSTRIP UNITS 3 AND 4 ON THE
ROSEBUD COUNTY ECONOMY



RESEARCH AND INFORMATION SYSTEMS DIVISION
MONTANA DEPARTMENT OF INTERGOVERNMENTAL RELATIONS

Ronald P. Richards
Director

August, 1974

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The economic impact of proposed Colstrip



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The Economic Impact of Proposed Colstrip Units
3 and 4 on the Rosebud County Economy.

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August 15, 1974

Helena, Montana

Preface

This report was prepared to satisfy the requirements of the Montana Utility Siting Act of 1973, which requires certain state agencies to study and report on the impacts of proposed utility construction, in the fields of their expertise.

In preparing the report it was decided to look beyond just the legal requirements of the Utility Siting Act. The area of interest was local problems associated with massive amounts of capital investment in undeveloped rural areas. The report contains data which may assist local planners and public officials in Rosebud County, and possibly planners in rural Montana experiencing similar growth developments.

The Colstrip project proved to be unique in several ways, among which was the fact that the existence of a company town provided a "test tube" example for looking at methods for controlling massive economic growth in relatively undeveloped economies.

To put the report together required the considerable cooperation of individuals in the County, as well as companies and agencies inside and outside of Montana. Much of the information was obtained directly from records of the Montana Power Company in Butte and Colstrip and their major contractor, Bechtel Corporation. In Rosebud County however, much of the information could not have been gathered without the assistance of Mr. Eldon Rice, the Rosebud County Planner.

Information gathering in the county proved an interesting experience. It seems Rosebud County has been overrun with bureaucrats, journalists, and assorted social analysts writing reports. Once the local people find out you are "one of those impacters" either admission is denied or the conversation comes to a halt. Mr. Rice was of considerable assistance in guiding us to informed individuals and groups and making sure we were not mistaken for the common, everyday variety of "impacters".

In Helena the assistance of the Local Government Services Division of IGR was very valuable in untangling school district, city and county accounting. The Research and Analysis section of the Employment Security provided important data on Rosebud County companies.

The Burlington Northern in Billings provided considerable detail on their present and future operations in Rosebud County as did Mountain Bell in Helena. There were many local business people, farmers and ranchers in Rosebud county who also provided helpful looks at their operations.

Mr. Ed Coleman, Chief of the Measurement Section of the Regional Economics Division, Bureau of Economic Analysis, U.S. Department of Commerce in Washington and his group were both diligent and accommodating in providing up to date, detailed information.

Mr. Gordon Jackson, Research Associate in our Division, gathered information on Montana Power and the Rosebud County tax structure. Lastly, a hearty thanks to the secretaries who typed from quantities of very rough manuscript.

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CHAPTER ONE
METHODOLOGY

Where and Why

The objective of investigation is to be as specific as possible with regard to the consequences of a particular phenomenon. The construction and operation of coal-fired generating units in Colstrip, Montana affects in varying degrees the people and the economies of Rosebud County, the rest of Montana and the entire nation. However, the greatest impact will be felt within Rosebud County itself. The Rosebud County towns of Forsyth and Colstrip and their school districts are the most affected areas. Thus, our economic analysis has concentrated on the Rosebud County economy and the governmental units of the county, the city of Forsyth and the school districts of Forsyth and Colstrip.

Data and Methodology Limitations

Before reporting on the results of the analysis the reader should be aware of the data and methodology used to obtain the projected results. The credibility of any economic analysis rests on an appraisal of their relative merit.

Generally, the limitations fall within the categories of the data and the statistical techniques. First, Montana has available the considerable expertise of the Regional Economic Division, Bureau of Economic Analysis, U.S. Department of Commerce. The economists in this division have assembled a

yearly data series for all counties in the U.S. under the name of the Regional Economics Information System (R.E.I.S.) files. The Montana county data from the R.E.I.S. files are by far the best, most consistent statistical series available at the county level.

As good as this data series is, it does have limitations. For example, the data in the files contain distortions within Standard Industrial Classification Codes at the county, level, which should be adjusted before the data is usable for detailed economic projections. The adjustment process requires knowledge of how the files have been assembled, and access to their basic reporting sources.

Another problem with county economic data is its scarcity. County personal income accounts for only two thirds of the total income in the county. Also, monetary stock or monetary flow of funds series at a county level does not exist.

The second limitation is the statistical technique to quantify economic phenommon. Economic analysis must quantify relationships which must anticipate what people will do with their monetary resources. A noted English economist described this problem succinctly when he said, "But of course, economics cannot be compared with the exact physical sciences;

for it deals with every changing and subtle force of human nature." (1)

At the county level the technique must put into numerical form highly qualitative relationships. For example, people, employees or employers, must decide how much of their earnings they will save and how much they will consume. They must decide whether or not they will save or consume locally, or outside of the county. The business entrepreneur must decide how much to invest, whether to invest locally or outside of the county. Description of this dynamic process is easy; however, precise quantification of consumption, saving and investment at the state or county level in Montana is currently not possible. Anticipation of the dynamic economic process at these levels, through projections, becomes an exercise in statistical ridiculousness.

The Dynamic Economic Process

Figure 1 illustrates the economic process that determines employment and earnings in the local economy and the rest of the economy. The diagram becomes very real if the outside investment decision, flowing into local economy becomes the \$600 million that Montana Power, et al, are investing in Rosebud county at the Colstrip project. Thus, the "local"

(1) Alfred Marshall, Marshall's Principles of Economics (N.Y., N.Y.: The MacMillan Company, 1920) p. 14

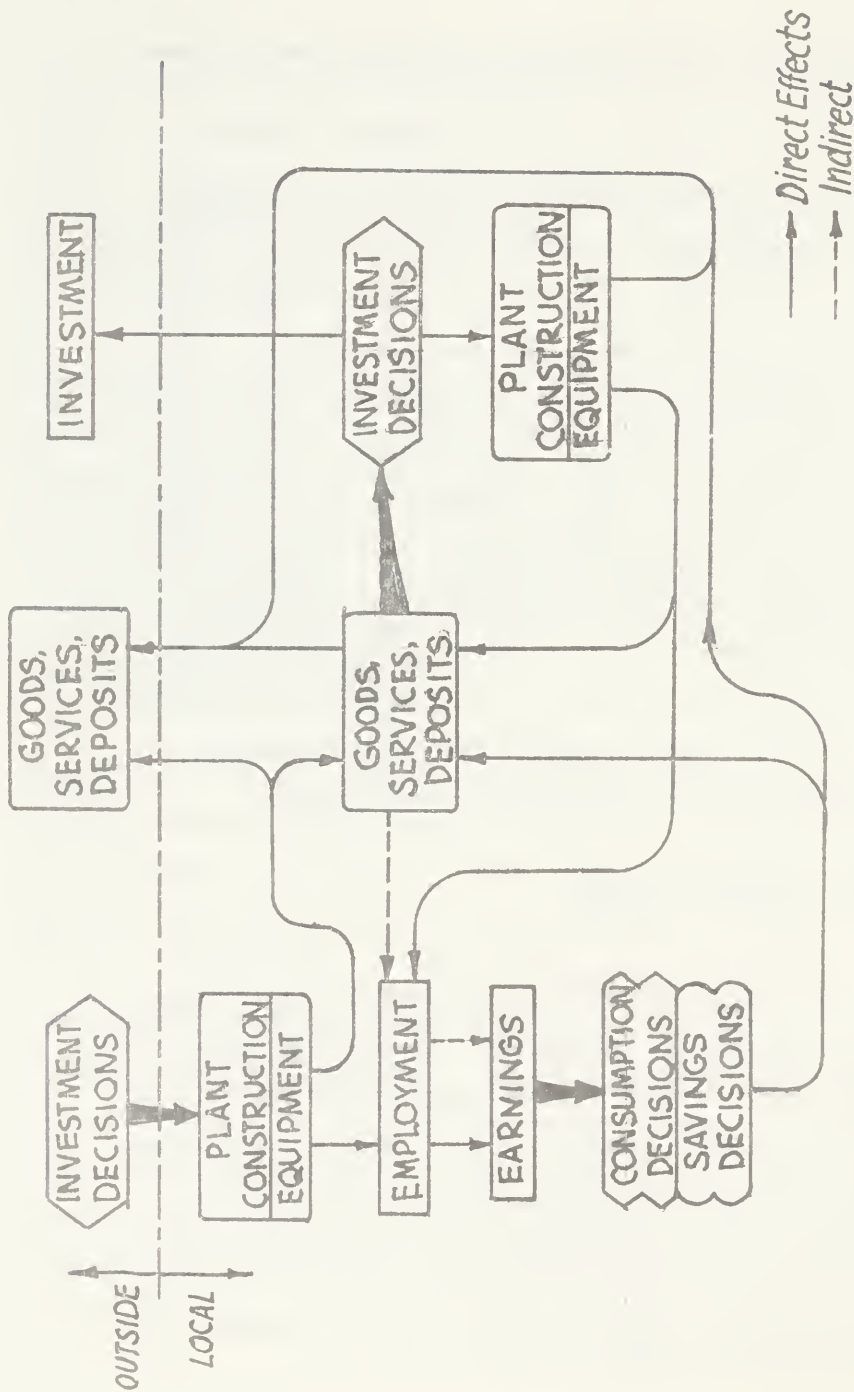


Fig. 1 Employment, Earnings Flow Diagram

portion might be Rosebud County and the "outside" may be the rest of Montana or anywhere in the entire U.S.

Outside Investment

The process begins when the companies raise the investment capital for the Colstrip project. The beginning of construction marks the direct employment of people and purchasing of the goods and services, some locally, most outside.

Indirectly, locally purchased goods and services create a demand for local labor. The businesses employ people to produce or simply sell the goods. The businesses pay wages and salaries to the employees and the proprietors earn profits.

Local Consumption

These monies, in addition to the earnings of those directly employed people and the earnings of the remainder of people employed in the county, comprise the pool of money from which people either consume or save. Of major importance to the local economy is how much of the earnings are consumed or saved locally and how much is consumed or put into savings outside of the county. In most cases the capture of local consumption and savings dollars is determined initially by the quality and quantity of business services offer-

ed locally. If the local business community has a generous array of goods and services, people will consume locally; if not they will go elsewhere.

Local Investment

After the initial stages of a major investment, the local investment decisions made either by local businessmen or by outside businessmen investing locally will affect the capture of the earnings dollars. Basically it is the amount of, and the assimilation of investment in any economy which determines the rate of economic growth. John M. Keynes described the phenomenon, as follows: "Let us call k the investment multiplier. It tells us that when there is an increment of aggregate investment, income will increase by an amount which is k times the increment of investment." (2)

The Efficiency of Capital

The amount of investment, whether locally or outside is determined by the efficiency of capital. In this process the business entrepreneur measures prospective rate of return on an investment, over the cost of the capital to determine whether or not an investment is warranted.

(2) John M. Keynes, *The General Theory of Employment Interest and Money*, (N.Y., N.Y. Harcourt, Brace & World, Inc.) p. 114

Generally, when the difference between the capital cost and the return exceeds the current rate of interest, the investment becomes viable. While the efficiency of an investment is in part determined by fixed business relationships, it is also determined by the efficiency of the business entrepreneur.

The interrelationship between consumption, saving and investment is what might be called a dynamic economic process. Some of the variables which affect the relationships are consumer tastes, prices of goods and services, labor's work preferences, quality of goods and services, stock of capital, interest rates, efficiency of the entrepreneur, etc. Individually consumption, savings and investment are all daily topics of discussion among people. However, aggregate quantification of them and their interrelationships is quite another matter. While precise quantification is difficult, the demands of society require estimates be made.

Economic Reality

Of the items in the flow diagram, only the employment and personal earnings are available at the county or state level from a good quality, consistent source. Consumption, saving and investment levels within Rosebud County, or the state are not known. More important, their interrelationship is an immensely complex phenomenon which even at the national

level is not yet totally quantifiable. Thus, the projection of employment and earnings must be accomplished by a statistical technique which is less dynamic than the process described above.

Impact Techniques

In preparing the projections for Rosebud County, emphasis was placed on analysis of the individual firm within major industries. The projection of employment (in mining, manufacturing, and transportation, communication, and public utilities industries) used anticipated changes in physical output, changes in productive capacity and output per man. In utilizing either productivity (output per man) or output volumes or changes in physical capacity whenever possible, a degree of dynamics was introduced into the projection process. For example, the amounts of coal shipped from Westmoreland Coal, Western Energy and Peabody Coal determines the number of people employed by the B.N. in Forsyth, Montana.

Mining

In the Rosebud County mining industry, individual company estimates of output per man were used in obtaining employment from projected coal tonnages to 1981. Once yearly employment projections were derived at the firm level, 1973 earnings based on total labor costs at the firm level were

applied to them to arrive at total projected earnings per firm in 1973 dollars. Then the data of firms within an industry were summed to an industry level. In those few situations where proprietary earnings were present, 1973 proprietary earnings or a five-year average were used in the total earnings projections.

Agriculture

In agriculture, the Rosebud County earnings projections were based on projected physical quantities of production of particular agriculture commodities times the average 1973 prices of those commodities. In the livestock sectors, physical projections were based on Rosebud County's relative efficiency compared to state production for each livestock commodity. In the crops section, acreage and yields per acre by commodity were used in the projection of physical quantities per commodity. The assumption was made that increasing acreage in Rosebud County would continue to be devoted to livestock input items (corn silage, hays and feed grains).

Construction

In the construction industry, projections were based on actual or anticipated capital expansion plans of individual firms or government entities. Construction employment

projections for the Colstrip generation units and Western Energy's coal mining activities were based on engineering analysis. They were also time-sequenced based on an engineering construction timetable. Construction employment projections for Colstrip town, Rosebud County road projects, other public projects and a residual construction element for the remainder of the county were incorporated into the projections.

Manufacturing

Projections of employment and earnings were based on anticipated capital expansion plans of firms, and sales changes directly related to new economic activity in Colstrip. Only one manufacturing firm in Rosebud County was found to have sales directly related to this new activity. Manufacturing in the county is not a large sector of the county's economy.

Transportation, Communication and Public Utilities

This category includes not only Montana Power, but also M.D.U., Mountain Bell, B.N., Milwaukee, Prince Transport, Tongue River Electric Co-op, Range Telephone, Northern Cheyenne Utilities and others. Montana Power's projected employment was based on their manpower needs in Colstrip to operate generation facilities, the town and their substation and transmission lines in Rosebud County. Projections of employment for the other firms were based in most cases on major

anticipated capital expansion programs and estimates of direct and indirect sales relationships to new economic activity in Colstrip and Forsyth.

Residence Adjustment

The Colstrip data were adjusted for daily and weekly out-of-county commuting using two commuting employment estimates obtained from Western Energy Company. Because of the time and cost only two stock estimates (employment by place of residence at a point in time) were used. The out-of-Rosebud County employment commuting estimate was 10.4% in the winter and 25.1% in the summer of total employment on the Colstrip project. Employment included Bechtel (the primary contractor) and the sub-contractors. These estimates were averaged and they were used to residence-adjust all Rosebud County construction employment.

The Threshold Model

In the service industries employment was estimated for each year based on population changes that occurred as a result of employment changes in the five sectors mentioned above (Mining, manufacturing, agriculture, construction and transportation, communication and public utilities). The technique used to measure these changes is called a threshold model. The model estimates the amount of service sector employment

that will occur as a result of changes in the county population level.

In the model, the various service industries have different thresholds which determine the employment changes that will occur in those sectors, depending on the slope of a regression line. For example, 200 new people in a community may generate enough food retail sales to cause one new person to be employed in food retailing, but it may take 20,000 people before enough brokerage sales are generated for a new employee to be added to a stock brokerage business.

There are some business sectors in which there are minimum threshold levels. This means no employment occurs in those sectors until population reaches a certain level. A minimum threshold indicates a low population county like Rosebud County for example, would not support a stock brokerage business.

In the development of technique it was found that a strong correlation existed between the number of people in Montana counties and the number of people employed in county service industries (35 S.I.C. code service sectors).⁽³⁾ This may be initially startling, but it is numerical evidence to sub-

(3) For a detailed statistical analysis see the paper appended to this study, written by Richard Dodge.

stantiate the fact that there is a relatively uniform demand for services in Montana counties, and that the size of service demand is strongly related to the population size of an area. Thus, the threshold model incorporates 35 separate regression formulas into the calculation of four division level service sectors: (1) Wholesale-Retail Trade, (2) Finance, Insurance and Real Estate, (3) Services, (4) Government.

Why The Threshold Model

Two common techniques to estimate secondary employment are used by Economists: the export base and the input-output multipliers. Both are static, in that they are based on past recorded economic relationships. They vary only in their level of economic detail and economic process. In a situation where \$600 million is being invested into the local economy with a personal income of \$30 million, historical direct and indirect interindustry relationships are of little value.

Where inter-industry relationships change rapidly in size and composition, the threshold technique anticipates new levels of service sector demands, through employment, in these sectors in a manner which more closely approximates what actually happens in a dynamic economy.

In discussing Figure 1, it was pointed out that local sales (and thus, local service sector employment) are a function of the level of total county consumption, the portion of total consumption dollars disbursed locally, the amount of investment by county residents and total local investment. The end result of this dynamic process is to produce new levels of local employment and earnings. The relationships described above, however, are unknown at a county level and unavailable at even the state level from a consistent, uniform, statistical source.

The threshold model quantifies the fact that there is a relatively uniform demand for services (as quantified by employment in those sectors) in Montana counties. It utilizes the fact that the service sector demand varies basically in proportion to the number of people residing in a county.

Thus, the technique quantifies the addition of factor inputs (employment) at the margin. Rather than using marginal output (sales) to determine the expansion of factor inputs, the technique uses the numbers of additional people to determine the new level of employment in the various service sectors.

Instead of using a single static multiplier, the threshold technique uses production (employment) data relevant to the

numerous individual service sectors. In short, it is more dynamic than a single multiplier and it quantifies in a more realistic fashion the process of economic growth.

Population

In a rapidly changing county economy, the most dynamic element of one firm in an industry can greatly affect the number of people employed in a community, thus its population. However, in using employment as the basis for the population projection, it must be adjusted for the number of people working, but not living in a community. Estimating population at a sub-county level is even more difficult for the same reason, but is compounded by the lack of a consistent sub-county employment series.

In Colstrip population is greatly affected by commuting patterns (people working, but not living in Colstrip). These commuting patterns are a function of consumer preferences in housing, and a myriad of other factors. While a Colstrip population projection is possible, it would be considerably less reliable than one made at the county level.

Once the projected county employment has been adjusted for place of residence, a relatively stable relationship (that

of population to employment) was used to estimate population. Interestingly, the population-to-employment ratio exhibits considerable stability statewide, with a minor, but stable difference for Rosebud County. The ratio of population to employment used in this study is a five year average, 1967-72, of 2.33.

CHAPTER TWO

ROSEBUD ECONOMY

The Structure of the Economy

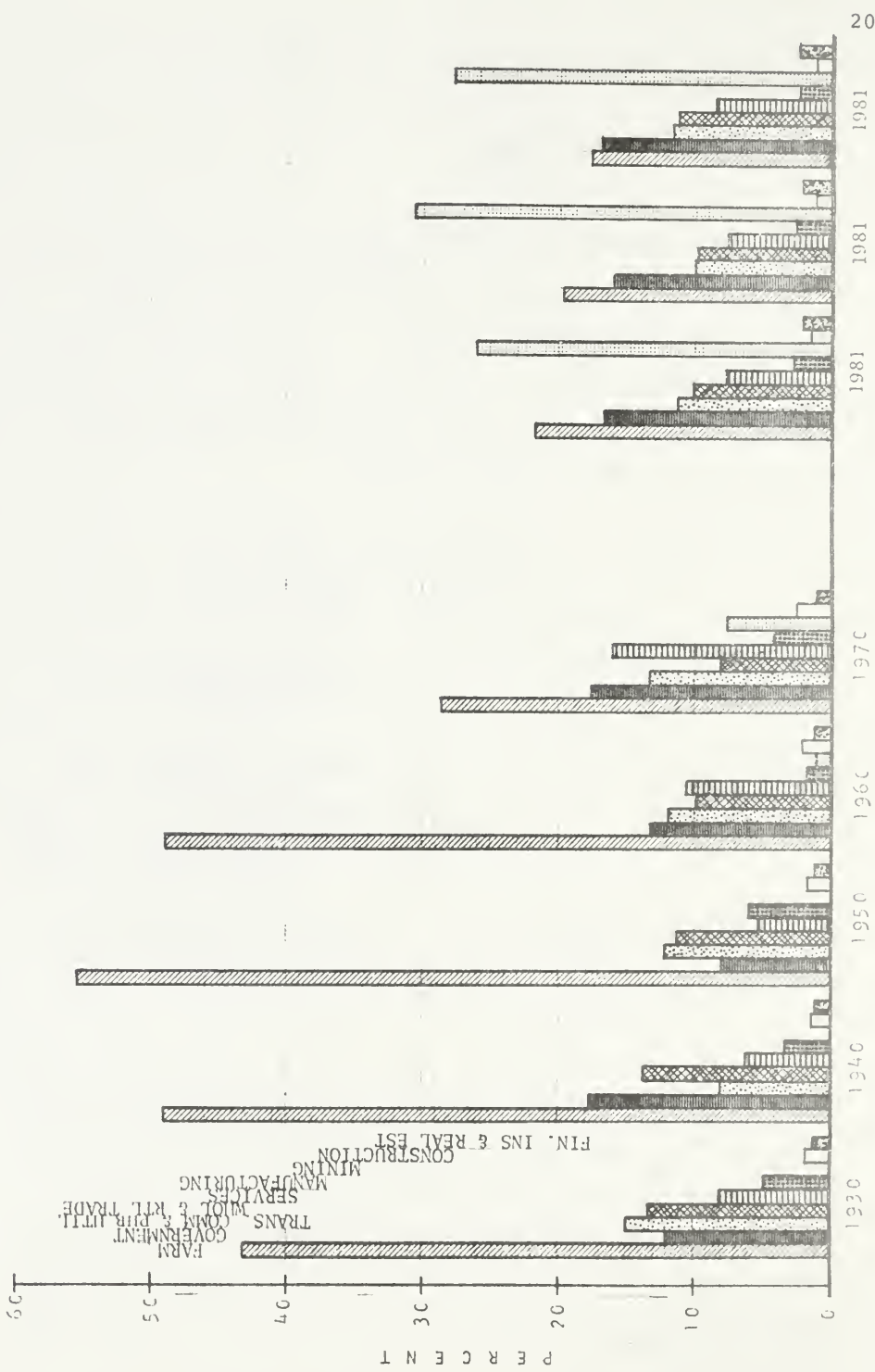
Historically, Rosebud County's economy has been dominated by agriculture. If agriculture did well so did the county's residents and vice-versa. However, in recent years agriculture's relative share of the county's economy has been declining and it will continue under any of the economic growth scenarios described in Table 1 below.

Table 1 -- Economic Growth Scenarios

	Generation Units	Western Energy Coal Production
Scenario I (Minimum growth)	Plants 1,2	Coal for Plants 1,2 Current existing sales contracts
Scenario II (Coal export)	Plants 1,2	Coal for Plants 1 and 2 Current existing sales contracts Additional contracts equivalent to Plant 3 and 4 requirements, but exported from state.
Scenario III (With 3 and 4)	Plants 1,2,3,4	Coal for plants 1,2,3,4 Current existing sales contracts

Figure 2 illustrates the relative size of various sectors of Rosebud County economy over 50 years. In 1930 farm earnings represented 44% of the total earnings generated in the county (earnings included proprietors' net income and wages and salaries). By 1950 the farm sector had risen to 55% of the total county earnings. With the rise of the service and

Fig. 2 Rosebud County Earnings by Broad Industrial Sector; 1930-1981
(Percent of Total), with Three Scenarios



SOURCE: Bureau of Economic Analysis, U.S. Dept. of Commerce, and Research and Information Systems Division, Dept. Intergovernmental Relations.

SCENARIO I SCENARIO II SCENARIO III

government sectors in 1970, farm earnings declined to 28% of the total. (1)

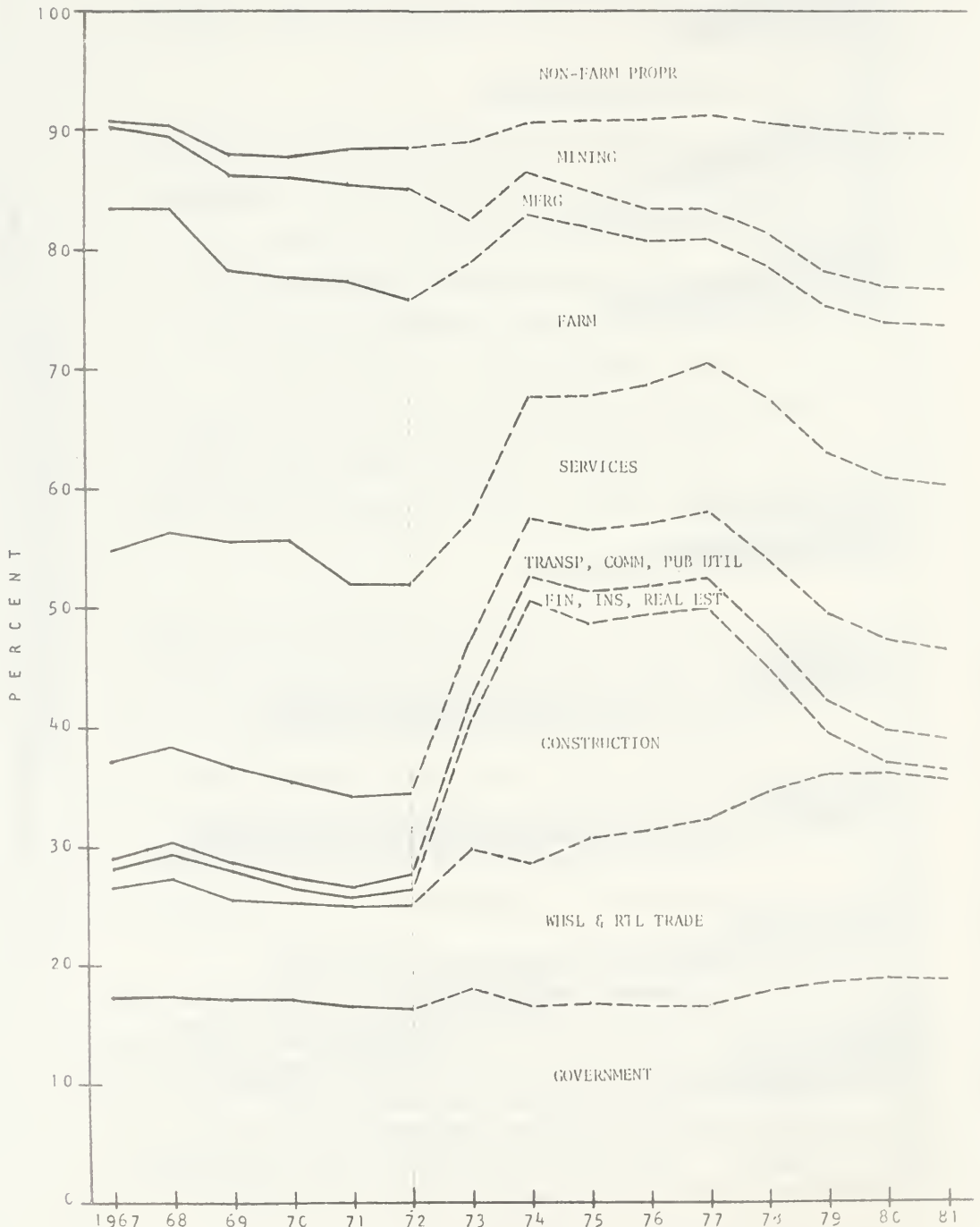
Whatever happens in regard to the Utility Siting Act and the Colstrip generating 3 and 4, agriculture will be displaced as the number one industry in the county's economy. If generating units 3 and 4 are approved, agriculture will represent only 18% of the county's earnings compared to mining's 28% in 1981 (Scenario III). If just units 1 and 2 are built and only coal for 1 and 2 and the current existing coal sales contracts are mined, agriculture would represent 20% of the county's total earnings and mining 26%. (Scenarios in Figure 2)

In Figures 3 through 8 the industrial composition of Rosebud County employment year by year is traced under three different economic growth alternatives. If units 3 and 4 are approved in Colstrip by 1981, mining would represent 13%, agriculture 14%, transportation, communication and public utilities (T.C.P.U.) 8% and government 19% of the total full and part-time employment. (2) (See Figure 3) If the units 3

(1) The Rosebud government and service sectors include the wages and salaries earned by government employees of the Northern Cheyenne Indian reservation and the earnings of employees of the Northern Cheyenne Tribal Council (a non-profit membership organization, S.I.C. Code 86).

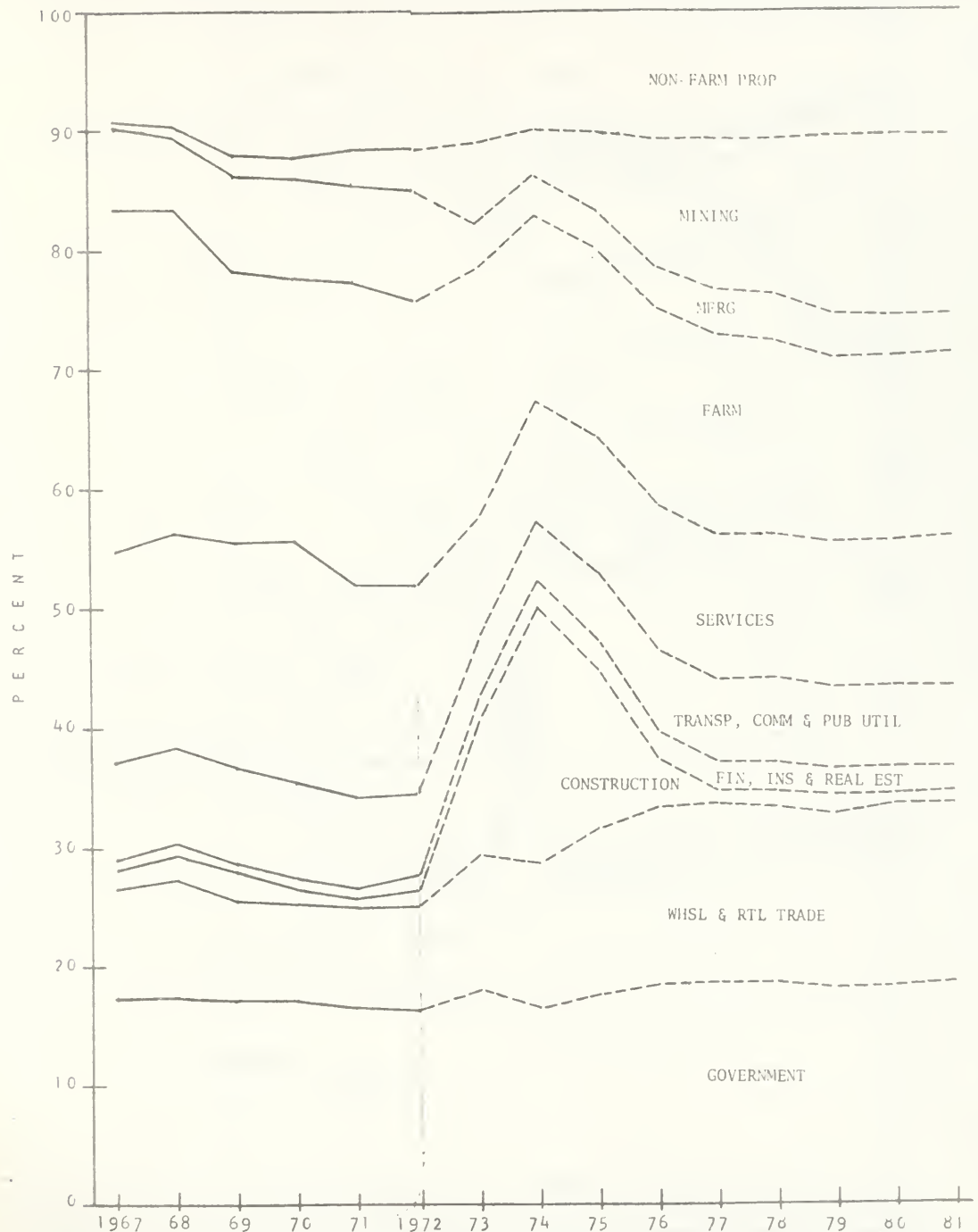
(2) Generation operating employees and wages and salaries are included in the transportation, communication and public utilities sector. Agricultural employment includes full and part-time wage and salary employees and farm proprietors.

Fig. 3 Rosebud County Full & Part-Time Employment, by Broad Industrial Sector, 1967-1981 (Percent of Total); Scenario III. (Construction Residence-adjusted)



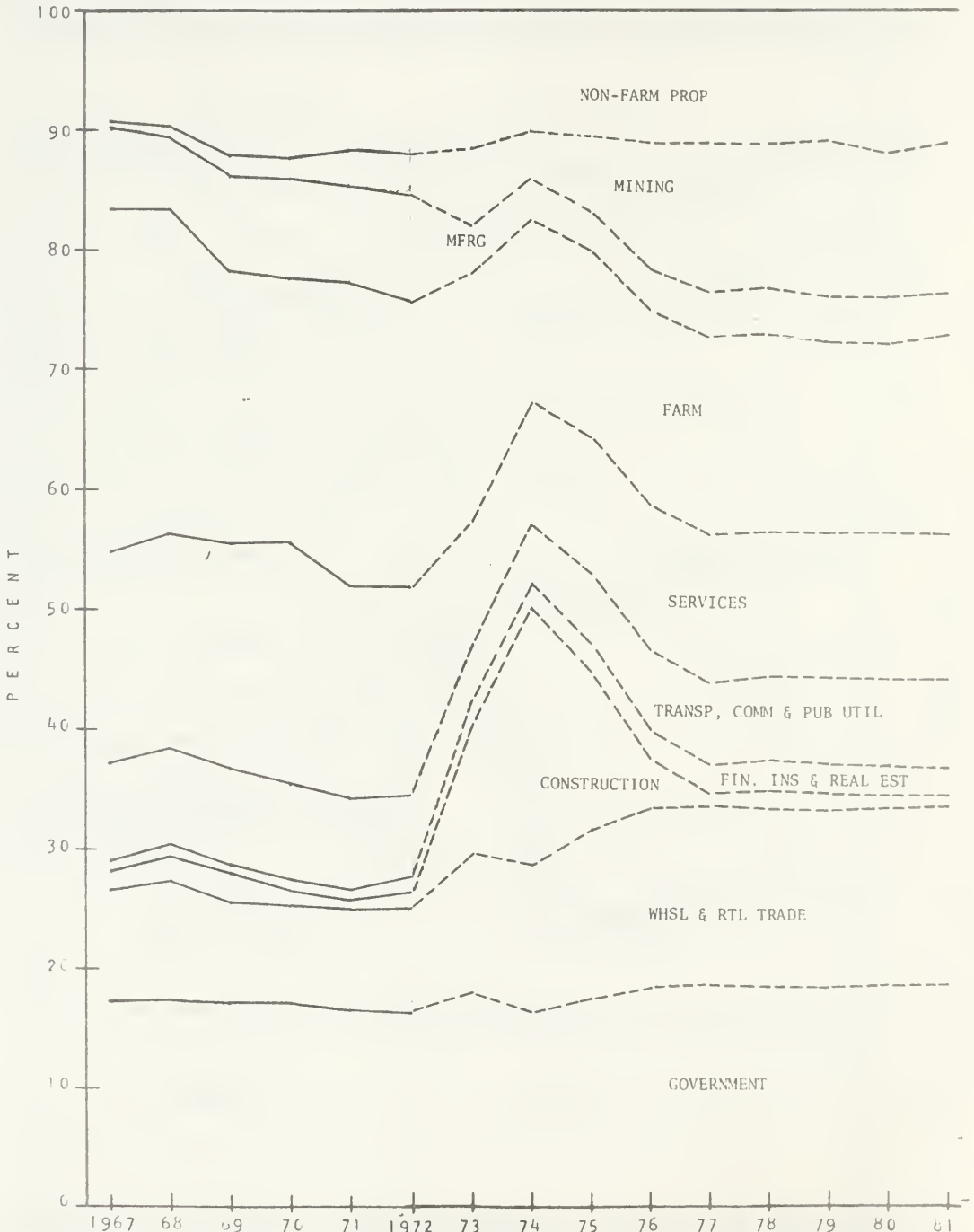
SOURCE: Bureau of Economic Analysis, U.S. Dept. of Commerce, and Research and Information Systems Division, Dept. Intergovernmental Relations.

Fig. 1 Rossford County Full & Part-Time Employment, by Broad Industrial Sector, 1967-1981 (Percent of Total); Scenario II. (Construction Residence-adjusted)



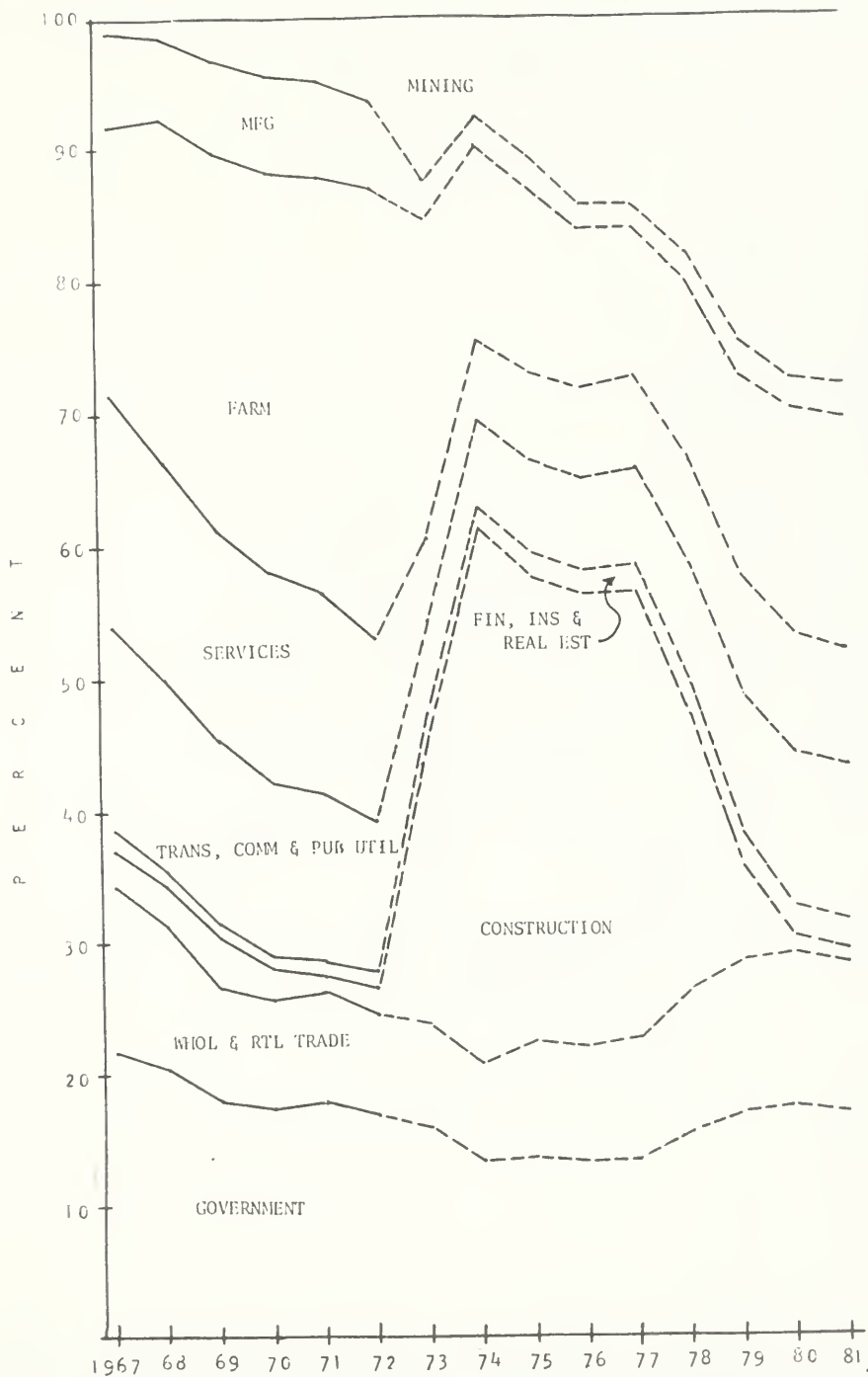
SOURCE: Bureau of Economic Analysis, U.S. Dept. of Commerce, and Research and Information Systems Division, Dept. Intergovernmental Relations.

Fig. 5 Rosebud County Full & Part-Time Employment, by Broad Industrial Sector, 1967-1981 (Percent of Total); Scenario 1. (Construction Residence-adjusted)



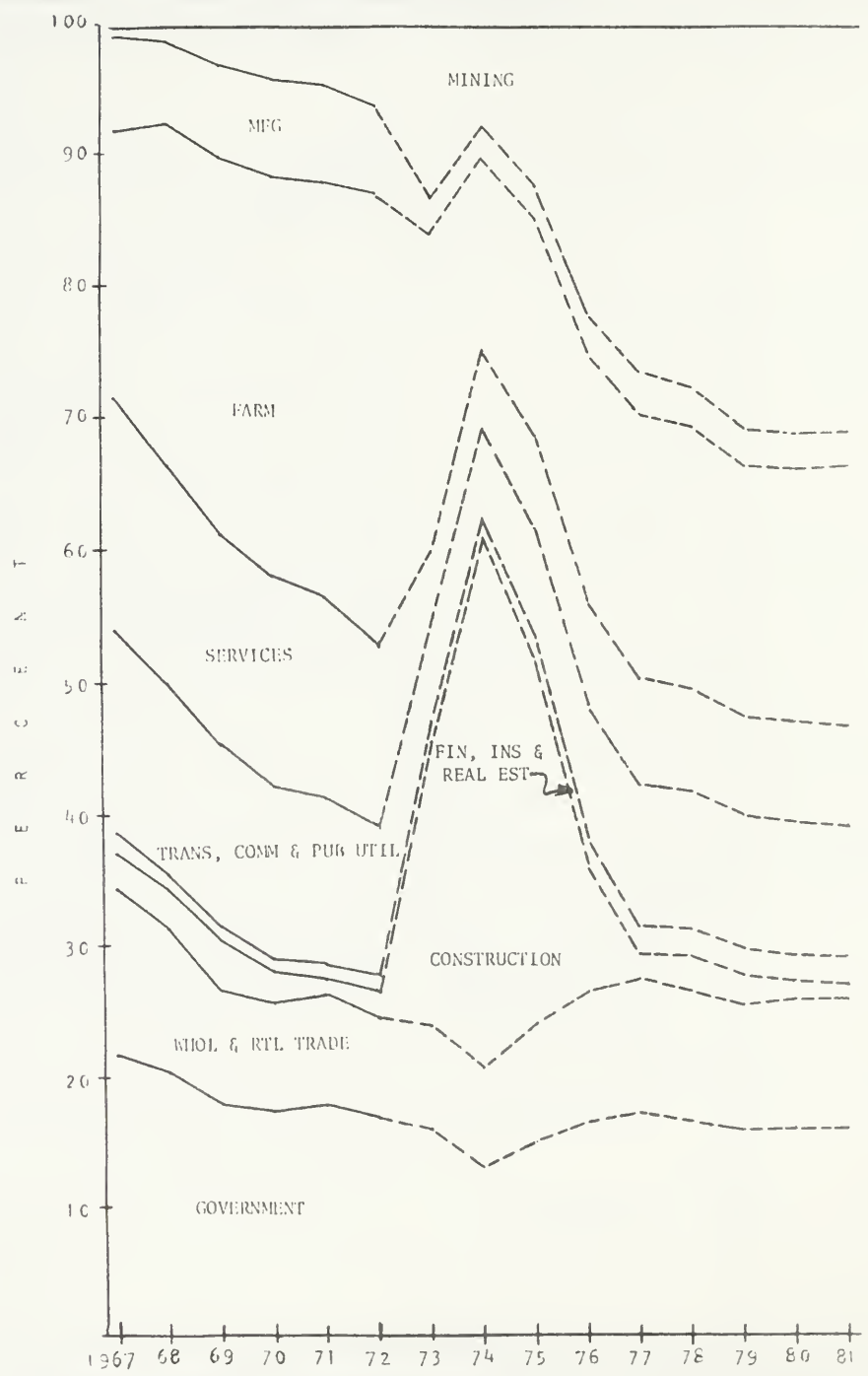
SOURCE: Bureau of Economic Analysis, U.S. Dept. of Commerce, and Research and Information Systems Division, Dept. Intergovernmental Relations.

Fig. 6 Rosebud County Earnings, by Broad Industrial Sector, 1967-1981
(Percent of Total); Scenario III



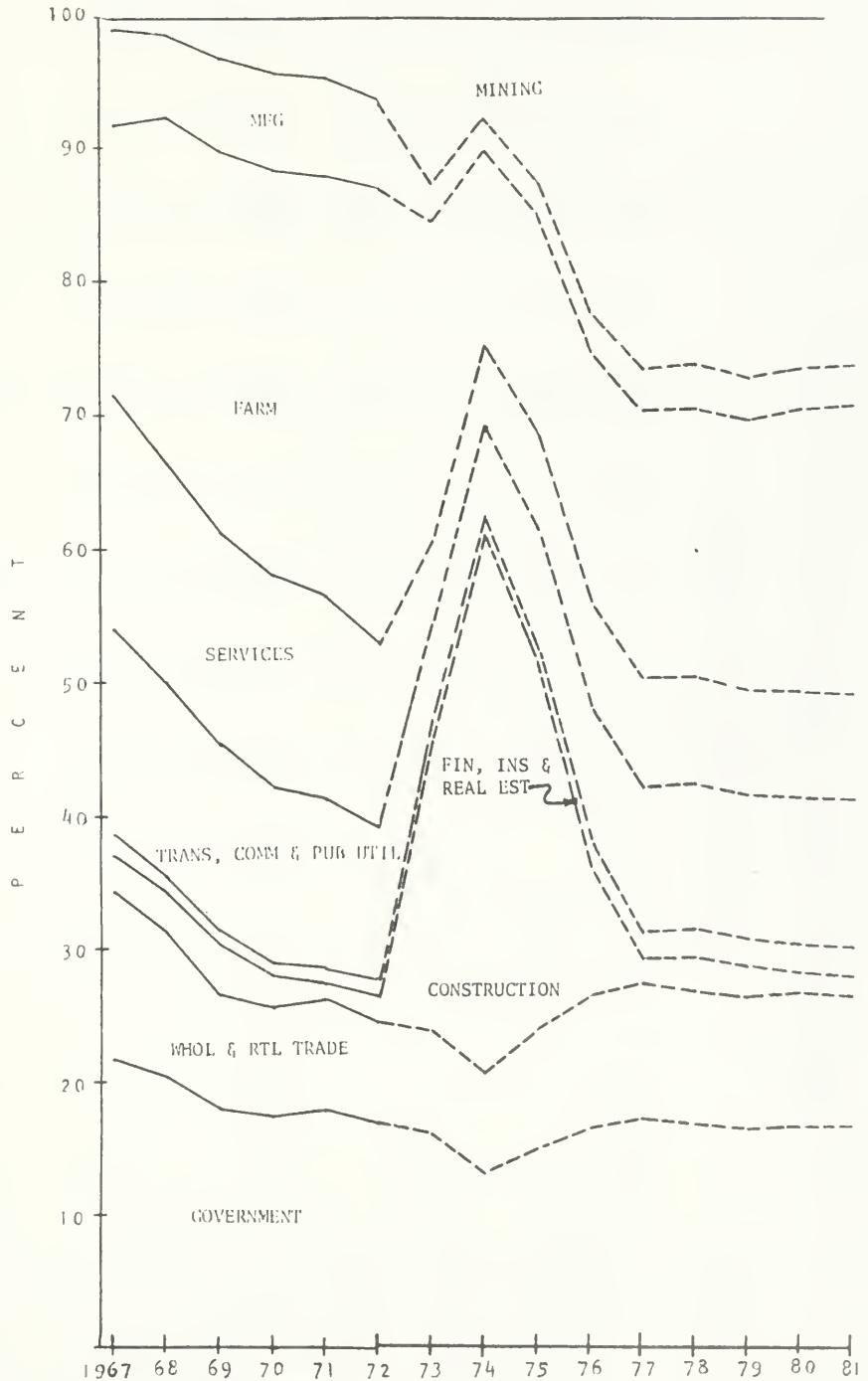
SOURCE: Bureau of Economic Analysis, U.S. Dept. of Commerce, and Research and Information Systems Division, Dept. Intergovernmental Relations.

Fig. 7 Rosebud County Earnings by Broad Industrial Sector, 1967-1981 (Percent of Total); Scenario II



SOURCE: Bureau of Economic Analysis, U.S. Dept. of Commerce, and Research and Information Systems Division, U.S. Dept. of Energy

Fig. 8 Rosebud County Earnings by Broad Industrial Sector, 1967-1981 (Percent of Total); Scenario I



SOURCE: Bureau of Economic Analysis, U.S. Dept. of Commerce, and Research and Information Systems Division, Dept. Intergovernmental Relations.

TABLE 2
Rosebud County
Personal Income by Major Source,
and Earnings by Broad Industrial Sector
(\$'000)

	1929	1940	1950	1959	1962	1965	1966	1967	1968	1969	1970	1971	1972
Total Personal Income	3,194	3,325	9,795	12,434	14,241	12,483	12,553	13,527	15,456	17,390	19,094	21,067	24,191
Total Wage and Salary Disbursements	1,784	1,531	3,704	NA	NA	NA	NA	NA	8,286	9,239	9,764	11,044	12,332
Other Labor Income	22	21	80	NA	NA	NA	NA	NA	438	525	605	690	816
Proprietors Income	1,060	1,474	4,914	NA	NA	NA	NA	NA	3,231	3,800	4,467	4,836	6,264
Farm Proprietors Income	668	1,123	4,083	5,434	6,015	1,428	1,493	NA	2,107	2,641	3,260	3,721	5,121
Nonfarm Proprietors Income	392	351	831	930	983	1,052	1,085	NA	1,124	1,159	1,207	1,115	1,143
Property Income	263	185	587	1,152	1,328	1,856	1,874	NA	2,233	2,515	2,714	2,876	3,045
Transfer Payments	75	138	651	951	1,055	1,296	1,429	NA	1,783	1,911	2,181	2,395	2,478
Less Personal Contributions for Soc. Ins.	10	24	141	241	300	374	417	NA	515	600	637	774	744
Total Earnings	2,866	3,026	8,698	10,572	12,158	9,705	9,467	10,326	11,955	13,564	14,836	16,570	19,412
Farm Earnings	1,214	1,495	4,782	5,290	5,806	1,193	1,387	2,081	3,093	3,859	4,369	5,018	6,332
Government Earnings	344	557	676	1,340	1,795	2,157	2,161	2,251	2,424	2,459	2,584	2,993	3,302
Manufacturing	(D)	(D)	(D)	145	75	587	698	723	758	983	1,116	1,297	1,349
Mining	(D)	(D)	(D)	93	159	1,030	261	126	148	432	628	893	1,248
Contract Construction	45	10	168	224	200	434	239	281	358	498	325	205	393
Trans., Comm. & Pub Util	461	248	1,060	1,172	1,613	1,425	1,532	1,600	1,721	1,839	1,961	2,082	2,204
Wholesale & Retail Trade	384	407	975	1,052	1,107	1,188	1,225	1,286	1,320	1,166	1,233	1,371	1,471
Fin. Ins. & Real Est Services	34	24	81	122	123	147	156	156	158	156	148	196	258
	35	182	447	1,134	1,280	1,544	1,808	1,822	1,975	2,172	2,362	2,515	2,655

NA = Not Available
(D) = Data Withheld to Avoid Disclosure
SOURCE: Bureau of Economic Analysis U.S. Dept of Commerce and Research Information Systems Division - Department of Intergovernmental Relations

TABLE 3

Rosebud County Employment by Broad Industrial Sector, 1967 - 1972
(Full and Part Time Wage and Salary Employment Plus Proprietors)

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
Total	2,569	2,544	2,506	2,550	2,782	2,909
Total Proprietor	664	663	730	732	737	734
Total Farm Proprietor	431	430	428	423	417	410
Total Non-Farm Proprietor	233	233	302	309	320	324
Wages and Salary Employment	1,905	1,881	1,776	1,818	2,045	2,175
Total Farm Employment	310	267	263	263	286	286
Total Non-Farm Employment	1,595	1,614	1,513	1,555	1,759	1,889
Government	444	445	431	439	455	470
Total Federal	135	131	117	108	111	119
Federal Civilian	134	130	117	108	111	119
Federal Military	1	1	--	--	--	--
State and Local	309	314	314	331	344	351
Private Non-Farm	1,151	1,169	1,082	1,116	1,304	1,419
Manufacturing	168	154	200	213	229	265
Mining	13	19	37	43	79	103
Contract Construction	38	52	55	29	25	39
Trans., Communication & Public Utilities	205	207	204	207	208	206
W.R.T.	238	256	214	212	238	263
F.I.R.E.	23	21	19	19	25	36
Services	461	454	343	387	495	501
Other	5	6	10	6	5	6

SOURCE: Bureau of Economic Analysis, U.S. Dept. of Commerce, and Research and Information Systems Division, Dept. Intergovernmental Relations.

and 4 are not approved and the coal equivalent to be used in them is not produced, mining would represent 11%, agriculture 17%, T.C.P.U. 7% and government 19% of the total employment (F. and P.T.) by 1981. (See Figure 5) Figures 3 through 8 illustrate how the earnings or employment in one particular sector can swell total earnings or employment for a particular year.

Under any of the growth scenarios the economic balance in Rosebud County will be improved. Specifically this will mean the next downturn in agricultural prices, or incomes, will not necessarily result in the county's business community being under severe financial pressure because of weakness in one primary industry. It will mean the farmer or rancher caught in a price/cost squeeze might not have to sell his properties and move to an urban area to support his family. It would mean additional employment and earnings opportunities for the county's residents. In short, economic diversity in a local economy means additional economic security for its citizens.

Rosebud County Growth

1920 - 1970

Figures 9, 10 and 11 show Rosebud County population has been slowly declining from 1920 to 1970 while personal incomes

Fig. 9 Rosebud County Personal Income, 1929-1981
Scenarios I, II, and III



(1929-1972 in current dollars, 1973-1981 in 1973 dollars)

have been growing at modest rates. Table 2 indicates that from 1929 to 1970 Rosebud County personal incomes grew from \$3,194,000 to \$19,094,000, or 497.8% in 41 years. On the other hand, the county's population declined from 8,002 in 1920 to 6,032 in 1970, a 24.6% decline over 50 years.

The Rosebud personal income has grown by some 497.8% from 1929 to 1970, but Montana's personal income grew by 672.6% and the entire U.S. personal income grew by 836.5%. Thus, over the same 41 year period, personal income has grown slower in Rosebud County than in Montana or the U.S. as a whole.

Population Decline

Rosebud County population has been on a slow slide since 1920. The population decline it has experienced is a phenomenon common to rural, basically agricultural, areas throughout the entire U.S. in the 1920 to 1970 period.

The industry of these areas, agriculture, has been subject to relatively low prices over the period. The national demand for industrial labor has been strong and unit labor prices high. The result of low farm prices and a strong industrial demand was the bidding away of labor from the farm.

Fig. 10 Rosebud County Earnings, 1929-1981
Scenarios I, II, and III



(1929-1972 in current dollars, 1973-1981 in 1973 dollars)

SOURCE: Bureau of Economic Analysis, U.S. Dept. of Commerce, and Research and Information Systems Division, Dept. Intergovernmental Relations.

Fig. 11 Rosebud County Population, 1920-1981, and Employment, 1967-1981; Scenarios I, II, and III



SOURCE: Bureau of Economic Analysis, U.S. Dept. of Commerce, and Research and Information Systems Division, Dept. Intergovernmental Relations.

TABLE 4

Rosebud County Total Earnings, Personal Income, Employment, Population and Growth Rates, 1920 - 1981, Three Scenarios (% Change)

	Earnings ⁽¹⁾ (000\$)	P. I. ⁽²⁾ (000\$)	Percent Change	Employ. ⁽³⁾	Pop.	Percent Change	
Actual	1920				8002		
	1929	2866					
	1930		3194				
	1940	3026	3325	+ 4.1		7347	- 8.2
	1950	8698	9795	+195.6		6477	-11.8
	1959	10572	12434	+ 26.9		6570	+ 1.4
	1960					6100	- 7.2
	1962	12158	14241	+ 14.5		6187	+ 1.4
	1965	9705	12483	- 12.3		6100	- 1.4
	1966	9467	12353	- 1.1		5900	- 3.3
	1967	10326	13527	+ 9.5	2569	6200	+ 5.1
	1968	11955	15456	+ 14.2	2544	8100	- 1.6
	1969	13564	17390	+ 12.5	2506	6100	N. C.
	1970	14836	19094	+ 9.8	2550	6032	- 1.1
1971	16570	21069	+ 10.3	2782	6100	+ 1.1	
1972	19412	24191	+ 14.8	2909	6400	+ 4.9	
Projected	1973-I	28298	34762	+ 44.7	3333	7766	+21.3
	II	28298	34762	+ 44.7	3333	7766	+21.3
	III	28298	34762	+ 44.7	3333	7766	+21.3
	1974-I	43133	52984	+ 52.4	4611	10744	+38.3
	II	43133	52984	+ 52.4	4611	10744	+38.3
	III	43133	52984	+ 52.4	4611	10744	+38.3
	1975-I	40835	50161	- 5.3	4604	10727	- 0.2
	II	40835	50161	- 5.3	4604	10727	- 0.2
	III	47374	58194	+ 9.8	5112	11911	+10.9
	1976-I	37164	45633	- 9.0	4437	10338	- 3.6
	II	37164	45653	- 9.0	4437	10338	- 3.6
	III	57633	70797	+ 82.2	6114	14246	+19.6
	1977-I	35517	43629	- 4.4	4347	10129	- 2.0
	II	35517	43629	- 4.4	4347	10129	- 2.0
	III	64830	79638	+ 12.5	6932	16152	+13.8
	1978-I	36344	44645	+ 2.3	4388	10224	+ 0.9
	II	37225	45728	+ 4.8	4455	10380	+ 2.5
	III	56458	69353	- 12.9	6489	15119	- 6.4
	1979-I	37485	46046	+ 3.1	4464	10401	+ 2.9
	II	40262	49458	+ 8.2	4685	10901	+ 5.0
	III	49771	61138	- 11.8	5967	13903	- 8.0
1980-I	36663	45037	- 2.2	4392	10233	- 1.6	
II	40576	49844	+ 0.8	4725	11009	+ 1.0	
III	45935	56426	- 7.7	5577	12994	- 6.5	
1981-I	36778	45178	+ 0.3	4376	10196	- 0.4	
II	40966	50322	+ 1.0	4757	11084	+ 0.7	
III	45251	55586	0.0	5417	12622	- 2.9	

N.C. = No Change

(1), (2) 1929-'72 (Current Dollars) 1973-'81 (1973 Dollars)

(3) Residence Adjusted Construction Industry

Source: U.S. Department of Commerce, Bureau of Census, Bureau of Economic Analysis Research and Information Systems Div., MT Dept. of IGR

In the same period farm productivity has risen sharply, caused by more capital intensive, less labor intensive farm machinery. The net effect of these phenomena has been to make a typical farmer or rancher a large land owner and efficient, capital intensive food producer. Agriculture in Rosebud County was no exception.

Thus, over the last 50 years the Rosebud County personal income has lagged, and its people have been siphoned out, but by 1970 its agriculture was emerging with new economic vigor, even with the relatively low prices of 1970. With high 1973 agriculture prices, caused by a strong U.S. and worldwide demand, agricultural producers in Rosebud County, as elsewhere, emerged after years of farm outmigration and unit mergers, as a very efficient sector of the economy whose economic influence was reasserted. In Rosebud County and Montana as well as in the entire U.S., it became once again the major export sector of our economy.

1970 - 1981

With agricultural shortages and high prices came shortages and high prices in the energy industries. This situation saw the return of coal mining and the beginning of construction of generating units 1 and 2 in Rosebud County. With this minimum level of industrial development, the Rosebud County economy will probably never be the same.

Minimum Growth - Scenario I

From 1972 to '74 without any economic activity related to units 3 and 4, Rosebud County real personal income will grow by 97.1% (See Table 4). In the same two years county population will expand by almost 60% from 6,400 people in '72 to 10,744 people in 1974. Thus, the question is not whether or not to have economic growth in Rosebud County, but how to assimilate it with the absolute minimum of adverse air, water, wildlife, community and social effects; in effect, to internalize any of the external effects of industrial economic growth.

Coal Export - Scenario II

If 3 and 4 units are not approved, but coal related to them is sold outside of Montana, real personal income (1973=100) will be \$50,322,000 in 1981, some 21.8% higher than total real personal income at the end of construction of units 1 and 2. The county population under the scenario would be 11,084 people by 1981, again 21% higher than at the end of construction of units 1 and 2.

Under this scenario Rosebud County will still be under considerable economic growth pressure with many environmental, community and economic growth externalities. Thus, if

the goal is to minimize adverse effects of industrial economic growth on the life styles of eastern Montana residents, it will be only moderately served by exporting coal to urban areas of the United States. The real issues are the techniques by which external costs associated with major industrial development in rural, non-polluted areas are internalized.

With Units 3 and 4 - Scenario III

If Colstrip generation units 3 and 4 are approved, the mechanisms, legal, economic and practical, for assimilation of massive economic growth at the county level become all the more important. With units 3 and 4 from 1975 to 1977 the county must assimilate another \$26,654,000 in real personal income and an additional 5,408 people. This is in addition to the 97.1% increase in real personal income and the 60% increase in people from units 1 and 2.

By 1977 with the construction of units, 1, 2, 3 and 4 Rosebud County would have to absorb 152.4% more people and 229.2% more real personal income than it had in 1972. On an average annual basis that is a 45.8% yearly increase in real personal income and a 30.5% yearly increase in population. If Yellowstone County had the same economic growth rate its 1975 population would be 221,000 people, 133,300 more people than its 1970 population of 87,700.

Income Distribution

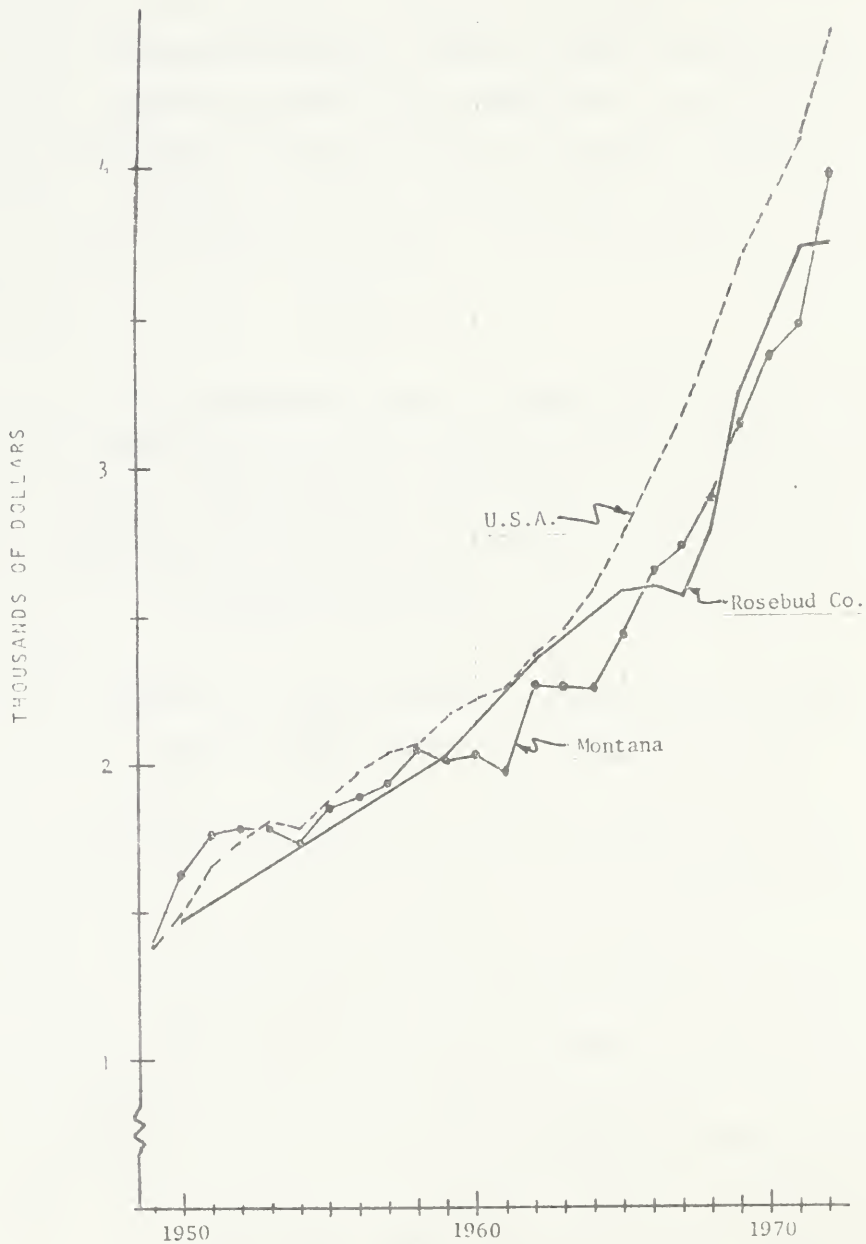
Per capita personal income is a basic economic measure of material well-being. When compared with other geographic areas it becomes a measure of relative geographic affluence. In Figure 12 the per capita personal income (in current dollars) is charted for the U.S., Montana and Rosebud County, 1949 to 1972.

In times past Montana's personal income has exceeded the national average. Since 1950 Montana's per capita income has consistently dropped below the national average. Rosebud County's relative income measure has exceeded the Montana measure on occasion, but never the national average.

With industrial development in Rosebud County, per capita personal income will exceed the Montana measure and on occasion exceed the U.S. average. In Figure 13, real per capita personal income (R.P.C.P.I.) has been charted using a 1967 dollar base.

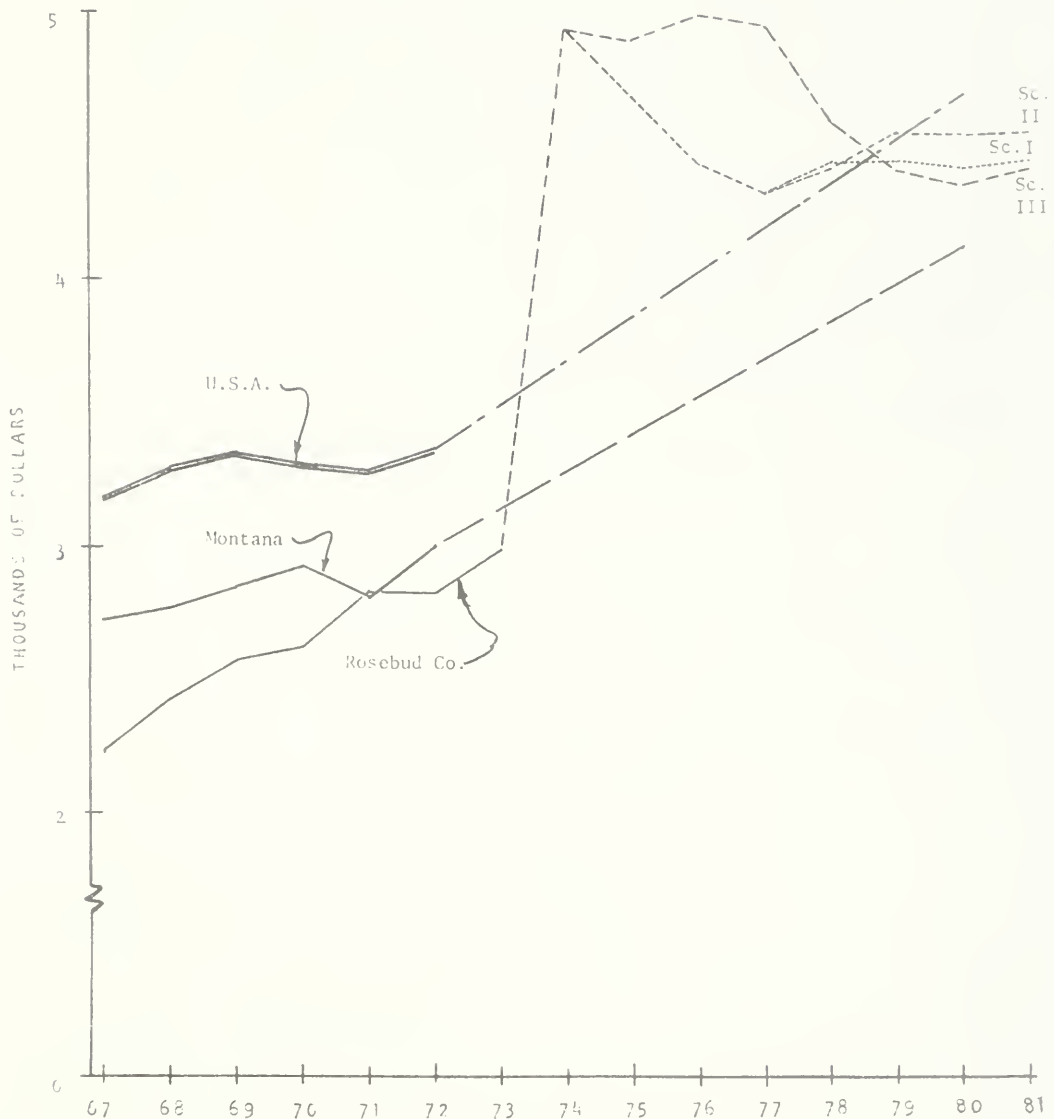
While Montana and U.S. per capita projections were not available in the early years of the Colstrip projects, the fact that 1974 real personal income in Rosebud County under any of the growth scenarios exceeds the U.S. and the Montana measure in 1980, indicates there will be a positive real income effect. (See Figure 13) By 1980 real income per

Fig. 12 Per Capita Personal Income; Rosebud County, Montana, and the U.S.A., 1949-1972, in Current Dollars



SOURCE: Bureau of Economic Analysis, U.S. Dept. of Commerce, and Research and Information Systems Division, Dept. Intergovernmental Relations.

Fig. 13 Real Per Capita Personal Income; Rosebud County, Montana,
and the U.S.A., 1967-1981 (in 1967 Dollars);
Scenarios I, II, and III



SOURCE: Bureau of Economic Analysis, U.S. Dept. of Commerce, and Research and Information Systems Division, Dept. Intergovernmental Relations.

individual will exceed the Bureau of Economic Analysis projected real per capita personal income for Montana, but it will be slightly below the national average (98%).

In all three scenarios as construction winds down and operational people begin working in the county, and as the county expands its service sectors, personal income per person will decline from the peak construction period highs. Interestingly, per capita personal income in scenario II, a maximum coal mining scenario, exceeds the real per capita personal income in scenario III -- with units 1, 2, 3, and 4. This is due to the relatively high wages paid in the coal mining industries.

CHAPTER THREE
IMPLICATIONS FOR THE PUBLIC SECTOR

Assessing the impact of the construction of Colstrip plants 3 and 4 on public services and the ability of political government units to provide them, is complicated by at least one unusual situation. These impacts would be imposed, not on the county as it has been since the decline of earlier coal production, but on top of the already considerable effects of construction of units 1 and 2 -- the largest single construction project in the history of the county. The task becomes one of trying to sort out and project trends in factors that have been changing so rapidly that many of the figures have not yet had time to appear in the customary statistical series.

Before 1970, it has already been noted that trends in the county had been downward in population and in relative per capita personal incomes. The tax base was decreasing in the early 1960's, and the increases since 1967 were largely attributable to inflation, until the time when coal production began its recent increase. It seemed perfectly logical, in a statewide study of community water and sewer systems in 1970, to project a continued population decline for all the communities in the county, and to describe the Forsyth water supply system as antiquated but "adequate for present and future needs of the town."

By far the greatest changes, resulting both from current construction and the still larger project proposed at Col-

strip are to be found, first in Colstrip itself, but also in Forsyth, 40 miles to the north -- the county seat and historically the largest community in the county.

Forsyth, 1974

In the summer of 1974 the city of Forsyth, with a count of 1,873 in the 1970 census (down from 2,032 ten years earlier) is estimated by county officials as being nearer 3,000. It shows most of the outward signs of a small town having to adjust too rapidly to an extraordinary population increase. Available housing is scarce and comparatively expensive; vacant store fronts on the main street facing the railroad track are few and far between; and transient facilities, in spite of a new motel on the main highway across the tracks from the town proper, are typically filled to capacity.

The offices of County Sheriff and the city Chief of Police were combined in recent years, but under the influence of greatly increased population throughout the county, the caseload per officer on the nine-man staff has grown to the extent that the Chief has requested two additional deputies in his 1974-75 budget. The workload involves not only criminal investigation but also a considerable volume of civil activities such as repossessions and the serving of subpoenas. Not surprisingly the jail facilities, dating back to 1914, are antiquated and barely adequate. A new

furnace is regarded an absolute necessity, but no other capital improvements are planned now.

The office of the County Attorney is another that is feeling the pressure of increased workload. An additional Deputy Attorney is on request.

The Forsyth city water plant was built in 1932, and although its nominal capacity is 1.5 million gallons per day, its current capacity is actually no more than 85 percent of that rating according to the City Engineer. Design work has already been done on rebuilding of the water plant, including doubling its capacity and adding a new million-gallon steel storage tank. The expansion is dependent on Public Service Commission approval of a requested water rate increase, and successful marketing of revenue bonds for the \$735,000 project.

An even more urgent situation appears to be presented by the city's sewerage and solid waste disposal facilities. Forsyth has two sewage lagoons totalling 8 acres along the Yellowstone river, for primary treatment of the city's sewage. Current Montana recommendations are reported to be one acre per hundred residents for this type of treatment; so with the current population of 3,000 or more, the facilities are considerably over-burdened. There have been reports of raw sewage spilling into the river; and in any case the pollu-

tion contributed by Forsyth to the Yellowstone is far above allowable limits. The city is currently considering a new lagoon which would cost about \$100,000, and is on the waiting list for federal funds to cover costs of such projects. There are no present plans for secondary treatment facilities. As a result, developers of proposed new housing subdivisions outside the city limits are in danger of denial of their petitions to be brought into the municipality until water and sewerage can be adequately supplied.

Solid waste disposal is by sanitary landfill, but the present site is inadequate and a new one is being sought.

Most of the streets in Forsyth are paved, and the city is planning for more paving this year; but the streets in residential areas do not have curbs and gutters, and there is no storm drainage. This presents a possible health problem in a city situated on flat valley land, as is most of Forsyth, as well as considerable inconvenience during periods of heavy water runoff.

Educational facilities in Forsyth consist of an elementary school, with a capacity of from 300 to 350, a Junior High which can handle 125 to 150 students, and a High School with a capacity of 325. The elementary school, built in 1920, is a venerable structure but is considered adequate for the 300 students it had last spring. Junior High school students

numbered 112 at the close of the school year, and are taught in a modern, well-equipped facility leased from the Catholic diocese. The High School, built from 1948 to 1950, is the next-oldest education building. Its 215 students last spring meant that there was capacity for considerable growth in the high-school-age population, and a new vocational-agriculture education building is being planned.

The Superintendent feels the biggest problem, if Forsyth continues growing, will be finding space for elementary students, but indicates there is enough classroom capacity to work out problems in the near future. At some time the community may consider purchase of the Jr. High School from the diocese.

Forsyth has a new 26-bed community hospital, whose financial records, because it is technically a "county hospital", are carried on the county books under the category of "Charities and Corrections." This classification does not, however, seem to determine the clientele, some 40 percent of which are said to be from Colstrip. The break-even point for financial stability of the hospital is reported by the Administrator to be at about 75 percent of rated bed capacity, but except for the period of the strike at Colstrip during the summer of 1974, it has been running from 80 to 100 percent of capacity. Three doctors in Forsyth currently work out of the hospital, and one more surgeon will be added to the staff in the fall. In addition to the hospital there is a nursing home in Forsyth, also

supported with county funds. It has 39 beds and is maintained at 100 percent capacity, but there are no present plans for expansion.

For fire protection, Forsyth has a volunteer force. The fire equipment is modern and considered adequate to meet the city's needs; but its ability to answer those needs depends of course on an adequate water supply at the appropriate time. Consequently fire protection adequacy also depends on the provision of water storage capacity. The city is now rated Class 7 for insurance purposes, and hopes to achieve a Class 5 rating with planned improvements.

On the high ground to the east of Forsyth is located the municipal airport, now consisting of one paved 2600-foot and two grass (or dirt) runways. Construction of an expansion program is to begin this summer, to add a 4800 ft, paved runway with a taxiway, and medium-intensity lighting, and including provision for expansion if necessary to 6,300 feet -- if the land can be acquired. No buildings are planned. Total cost for the project is estimated by Morrison-Maierle, the consulting engineers at \$405,555. These facilities are considered adequate to handle any modest demands for air service at Forsyth for many years.

The county welfare service staff has been under heavy pressure this summer, not directly but indirectly because of the presence

of work force at Colstrip. Normally there is no unemployment at Colstrip, because only those employed in construction, mining, or operation of the plants can live on the company-owned land.

Wages and salaries are well above customary levels in the area, and local residents consider the workers well paid. During the strike, many of the workers left the county, but some 300 of them, since they came under the category of the unemployed, signed up for food stamps under the county welfare program. This unusual development, combined with the fact that Northern Cheyenne reservation residents of the county were also being brought under the food stamp program, made the welfare staff inadequate to handle the load.

No budgetary increase for welfare has so far resulted from the construction of Colstrip plants 1 and 2, and at present only 4.6 mills of the permissible 12 mills for welfare are being levied. Welfare personnel are not sure the construction of plants 3 and 4 would necessitate higher mill levies to meet whatever increased need for their services may result; they point out that at that time each mill will be worth more in tax receipts because of the greatly increased tax base. It is noted, however, that because of the change in the composition of the county's population, there is a noticeable shift in the makeup of the case-load, with more child welfare referrals, and a somewhat higher incidence of broken home cases.

Colstrip

The most important -- and by far the most expensive -- service provided by the public sector at Colstrip is education. Because of the unusual nature of the community, the high school has also provided out-of-the-ordinary services of other kinds. Since Colstrip was without any commercial services, for example, the only place in the town to buy certain grocery and refreshment items in past years has been at a counter in the basement of the high school building. The auditorium was built to accommodate larger audiences than the expected student bodies, and a program of motion picture entertainment was offered to Colstrip area residents by the school.

In the 1973-74 school year, the combined elementary and high school enrollment was 200 to 300 students; and in 1974-75, under the continued influence of the construction projects, is expected to be between 500 and 1100. School administrators find the school district (#19) has changed from one described as a comparatively affluent agricultural district to one made up of predominantly "blue-collar" construction workers, whose votes will be decisive in future district elections. If work on the two 700Mw plants begins as proposed, and numbers of both permanent and temporary residents of Colstrip rise, the change in make-up of school district voters will of course be further accentuated.

Enrollments in the past two years, according to school officials, have corresponded closely with the projections made by the Westinghouse division study done for the power company applicants. The expected numbers of students next year cannot be accommodated in existing facilities, but Western Energy and Puget Sound Power and Light companies have arranged for the installation of movable classroom units in anticipation of fall enrollments.

A new school facility is being planned by the administration, with the assistance of Billings architectural consultants. According to current plans a bond election will be held in the spring of 1975, followed by construction beginning in the spring of 1976 or earlier, so as to have space available by the fall of 1977. Plans are understandably dependent on whether or not generation plants 3 and 4 materialize.

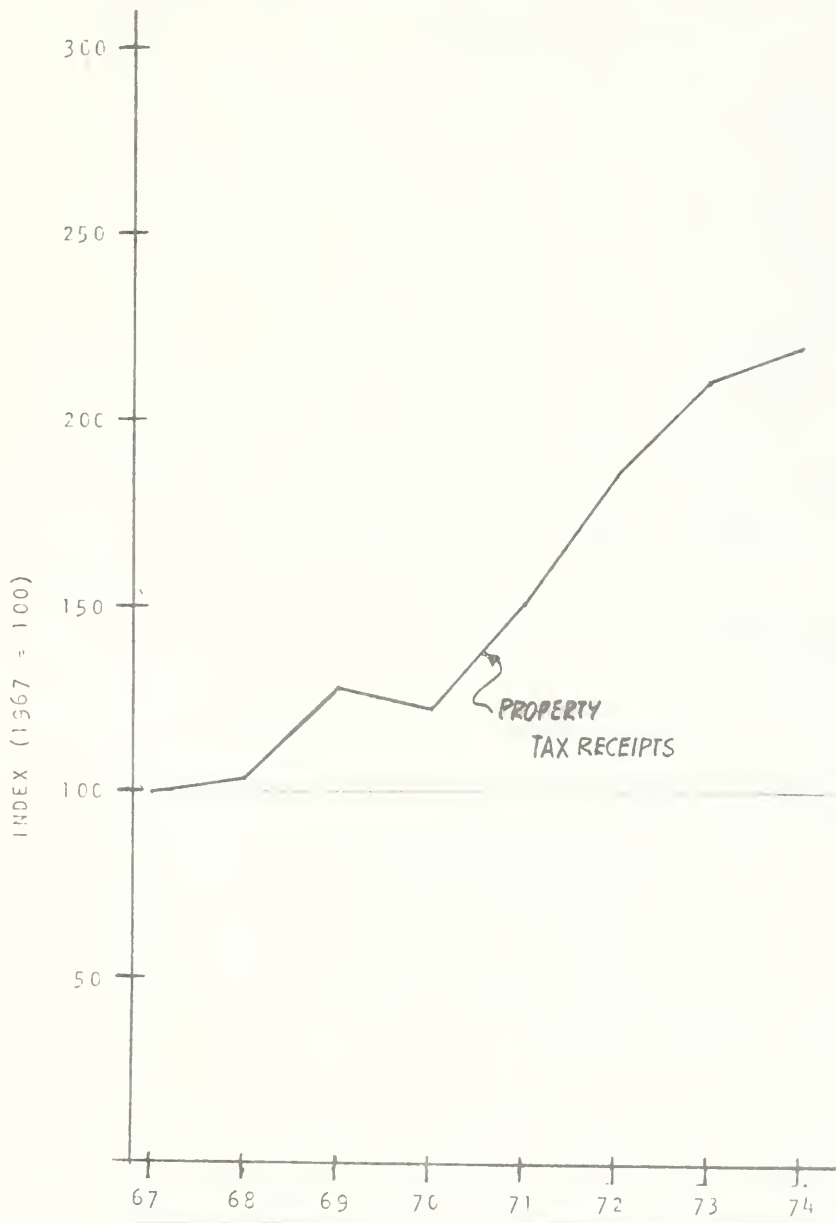
Local Government Finances

To estimate the public sector impacts of a project like the plants at Colstrip, where very large investments are largely concentrated at one relatively small site, it is necessary to take into account some of the other levels of local government below the county. For purposes of this analysis these are the incorporated towns --in this case the only one, Forsyth -- and the school districts.

In the bookkeeping for county government in Montana, several principal sources of receipts are of course identified. These include General Revenue (taxes) and a number of miscellaneous revenues from collections, fees and license, rentals and sales, payments from state and federal sources for specified purposes; and in recent years, Revenue Sharing. It is with funds from these sources that the county governmental operations are run. As with other counties in Montana, however, the largest share of funds handled by the county are the so-called Trust and Agency, or "T & A" Receipts. These pass through the county treasury from state, federal, and local sources to the school districts and other special districts, with the county government acting as banker for the funds but not sharing in their use directly.

The primary source of county income aside from the T & A accounts, is the advalorem property tax, levied on varying proportions of the assessed value of real and personal property, and on various other values, some of which come into the discussion later. In Rosebud county since 1967, the proportion has varied from 75 percent or more to around 40 percent. Although the proportion has gone down somewhat with the increase in other components such as Revenue Sharing, the amount of the tax has increased steadily as shown in Figure 14. The trend can be explained by a combination of increasing costs, rising taxable valuations and the general expansion of government services.

Fig. 14 Indexes of Rosebud County
Property Tax Receipts, 1967-1974



SOURCE: Montana Taxpayers' Association and County Records

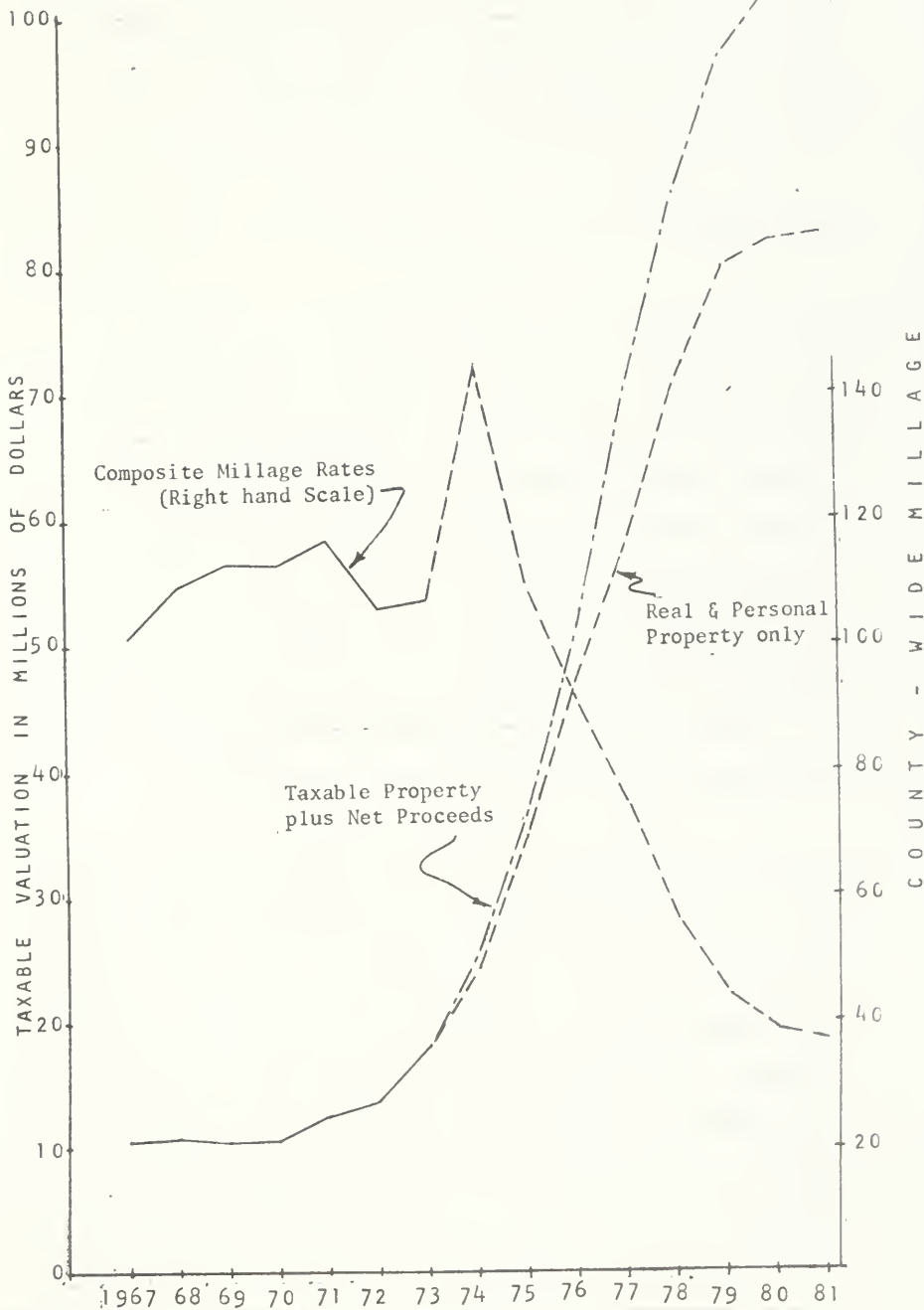
Since 1967, that part of the total millage rate in Rosebud county for general government purposes has remained nearly constant (one mill is equivalent to a one dollar tax per \$1000 of taxable valuation) but because of the requirements for education costs, the total rate has increased from 75.4 mills in fiscal year 1966-67, to 114.2 in 1973-74 according to reports of the Montana Taxpayers' Association. Total taxable valuation of real and personal property in the county decreased in the 1960's before 1967, but between that year and 1973, partly under the influence of increased coal development, it rose at an average rate of 6½ percent per year, as is shown in Figure 15.

Computing Millage

The actual rate is determined each year by a process of budget estimation for each Fund (or general category of use) for the next fiscal year. From the total estimated requirements there is subtracted the expected sources of revenue other than ad valorem taxes. The remaining amount is then divided by the applicable taxable property valuation to determine the millage rate.

The process, however, is subject to a number of restrictions and controls. No significant increase in revenue levels can take place without a public hearing. The county commissioners are not in general permitted to accumulate funds in

Fig. 15 Taxable Valuation, Rosebud County, 1967-1973, with Projections to 1981; Scenario III



SOURCE: State Board of Equalization; County records; Research and Information Systems Division, Dept. Intergovernmental Relations.

anticipation of unusual future requirements; and the statutes set millage limits for each fund, based on the classification of the county based on its total taxable valuation. Rosebud, for example, is now a Class 5 county, but is due in the very near future to be placed in Class 4 or 3.

Coal Taxes

Before proceeding to a discussion of the impact of the Colstrip plants on tax levels in the county, a review of the relevant taxes applying to coal operations in the county is in order. For an operation like the Colstrip complex, there are five coal-based taxes in Montana that apply, and one on the production and sale of electrical power. Three of them contribute directly to the county, and two through the county to the school district in which the coal is mined. As it happens, both the coal mines in the county are in school district #19 -- the Colstrip district.

Besides real and personal property taxes, paid at rates which combine the millage of the county and the district, and applied to 40% of the assessed valuation, the operators of a strip coal mine are also taxed on the net proceeds of the mine. The same combined millage rate is applied to the gross value of coal mined during the year, less the costs of production (including land reclamation costs), but taxed at the full assessed value. In addition, the 1974 legislature

provided that 3 cents per ton of coal mined regardless of its value, shall be returned by the state Department of Revenue each year to the general fund of the county in which the coal is mined. In Rosebud county this 3 cents comes out of a total of 34 cents per ton with the state collects on coal with the heat value (Btu per pound) of the sub-bituminous coal mined there.

Projections

It now remains to show the effect of the proposed Colstrip plants on the tax burden for county residents. It was out of the question to try to estimate the effects district by district because public services are a function of population, but population statistics are not reported by school district or other special districts. Consequently it was decided to make use of the combination of three measures, one reported biennially for counties by the Department of Revenue, and the other two derived from annual reports of the county Clerk and Recorder, and from Forsyth city records.

The measures are: School Levies and Special Levies, reported by the Department of Revenue; and measures of the local-tax supported portion of county and city government expenditures. The combination gives a measure for which there are historical records for comparison, and which can be projected into the future along with other measures presented in this study.

The most important of these is probably population, projections for which have been made based on three assumptions or "scenarios." It is the third, including construction of all four power plants, that is used first in this discussion. Next, assumptions have to be made as to future costs of governmental services supplied by the county and its units.

Local Government Cost Projections

Per capita costs of county government have shown a not-surprising increase in recent years -- although to be sure some of the apparent increases can probably be attributed to the difficulties in making accurate population estimates. The Census Bureau, for example, reported Rosebud county's population to be constant from 1967 to 1971. During this period actual counts of student population were increasing fairly steadily, and expenditures for county government rose from \$1/2 million to nearly a million dollars.

If we assume, however, that the range, magnitude, and per capita costs of services provided by county government through 1981 will be about what they were on the average for the years 1973 to 1974, then county budgets for the years 1974-75 through 1980-81, based on Scenario III population projections, would be as follows (to the nearest \$500):

<u>Year</u>	<u>County Budget</u>
1975	\$2,779,500
1976	3,324,500
1977	3,769,000
1978	3,528,000
1979	3,244,500
1980	3,032,000
1981	2,945,500

Tax-Supported Costs

Since 1967 an average of 60.6 percent of the total county funds (other than T & A Receipts) have been raised by advalorem property taxation. Beginning with 1974, however, a predictable additional sources of funds began coming to the county's General Fund, from the Strip Coal Mines License Tax. At 3¢ per ton of coal mined by Western Energy and Peabody Coal companies, this tax will contribute amounts starting with \$255 thousand in 1975 and rising to \$711 thousand in 1980 and 1981. These amounts are subtracted from the dollars to be raised by property taxation each year in the projections.

Education Expenditure Assumptions

Expenditures for education exceed all other county expenses put together, so these must be added to the totals so far. The basis for projection of this public expenditure in the present analysis is tax cost per student, which in Rosebud county averaged \$913.25 in the school years 1972 and 1973 -- with considerable variation between schools and school

districts. This figure is used in the projections.

Student population estimates have been based on the historical relationship between total population and numbers of enrolled public school students in the county. This basis is likely to give a somewhat overstated student population, because the greatest population "peaks" in the future projections are caused by the presence of construction workers. This employment group includes somewhat higher proportions of single persons than the customary population of Rosebud county, before and after the construction period.

Finally, taxes supporting local government of the city of Forsyth were included. Most of the funds for this purpose come from fees and charges arising out of the city's operations, but amounts varying from 25 to 36 percent of the total in recent years have come from taxation. For estimates of future amounts it was assumed, to be on the safe side, that the population of Forsyth would tend to change at a rate corresponding to that of the county. Tax-supported expenditures for Forsyth have averaged \$10.70 per capita using county-wide population as the base, so this figure was used to compute the column in Table 5 on "Forsyth City Tax Costs".

TABLE 5

Estimated Rosebud County Tax-Supported Governmental Costs (in 1973 dollars) Projected to 1981, with Taxable Valuation and Composite Millage Rates (Based on Scenario III Projections)

Year	Local Tax-Supported County Gov't. Expenditures	School District Costs	Forsyth City Tax Costs	Coal Mines License Tax Receipts	Bond Retirement Cost	Taxable Valuation (\$'000's)		Required Millage Rates
						Total		
1974	\$1,519,310	\$2,176,275	\$114,961	\$153,000		\$3,657,546	\$ 24,070	142.36
1975	1,685,166	2,412,806	127,448	225,000	\$53,350	4,023,770	36,775	109.42
1976	2,015,521	2,884,957	152,432	459,000	"	4,647,260	51,003	91.12
1977	2,285,182	3,271,262	172,826	543,000	"	5,239,620	70,035	74.81
1978	2,139,033	3,062,127	161,773	585,000	"	4,831,283	85,875	56.26
1979	1,966,994	2,816,463	148,762	699,000	"	4,286,569	96,829	44.27
1980	1,838,388	2,631,986	139,036	711,000	"	3,951,760	101,911	38.78
1981	1,785,758	2,556,187	135,055	711,000	"	3,819,350	103,910	36.76

SOURCE: State Board of Equalization; County and City Records; Montana Power Company.

Taxable Valuation

Since 1967, Rosebud county's tax base (measured by total taxable valuation) has approximately doubled, from about \$10 million to just under \$20 million, with most of the growth taking place since 1970. In the future there would be two sources of increase in the tax base as a result of coal company operations.

One would be the increased valuation of the power generation and coal mining complexes, and the residential and commercial growth of Colstrip. The other would be the net proceeds, based on value of the mined coal itself, less the cost of producing it. For purposes of this particular discussion, however, only the taxable net proceeds of Western Energy Co. are included, so the taxable values are understated by the amounts represented each year by Peabody Co. net proceeds. Figure 15 shows what would happen to taxable valuation in the county if we assume all other valuation remains constant at the 1974 level.

Bond Assumption

Based on these rather conservative assumptions, and using the total governmental expenditure projections described above, it is then possible to compute a sort of composite millage rate required each year to raise the necessary

funds. One more addition to the requirements was first applied. It was assumed that beginning in 1975, a total of \$1,000,000 would have to be raised by bonds issued for capital expenditures -- in this case, 20-year serial bonds at a 6.7 percent interest rate. This would cover such items as new school building for Colstrip, a jail at the county seat, purchase or construction of other school facilities there, or other expenditures.

In actual practice, of course, this is not the way capital-expenditure funds would be raised, since the county does not sell bonds for construction of schools in a particular district. To be completely realistic, careful and detailed estimates would have to be made taking into account the finances of the district in which school construction would take place, and in which bonded indebtedness would be incurred.

School districts are limited, in the bonded indebtedness they may incur, to 5 percent of the total assessed valuation. In 1974, however, Colstrip Elementary School District, with an assessed valuation of \$17 $\frac{2}{3}$ million, still has a permissible margin of \$842,543 it may raise by bond issues; and for the High School district, the permissible amount is \$847,085. Similarly the Forsyth Elementary and High School districts have margins of \$556,944 and \$773,150 respectively.

Class 7 Status

If the two generation plants were to be taxed under the provision that grants "class 7" status to new industries in the state utilizing Montana raw materials, at least two results would ensue.

For one thing, the taxable valuation for a period of 3 years would be computed at only 7% of the assessed valuation instead of the normal 30%. For another, school district #19 in which the plants would be located could require that the industrial facility enter into an agreement such that the district could with the approval of the voters, exceed its bonding limitation by an amount equal to a maximum of 5 percent of the estimated assessed value of the completed facility, thus doubling the amount it could raise by bond issue if it wished to.

As a matter of fact, however, because Montana Power Co. is one of the owners of the facility, and because power generation does not constitute for it a "new industrial endeavor" in the state, it is unlikely that the state Department of Revenue would grant the power plants Class 7 status; and in fact no application at this time has been made for such status.

Tax Needs and Resources

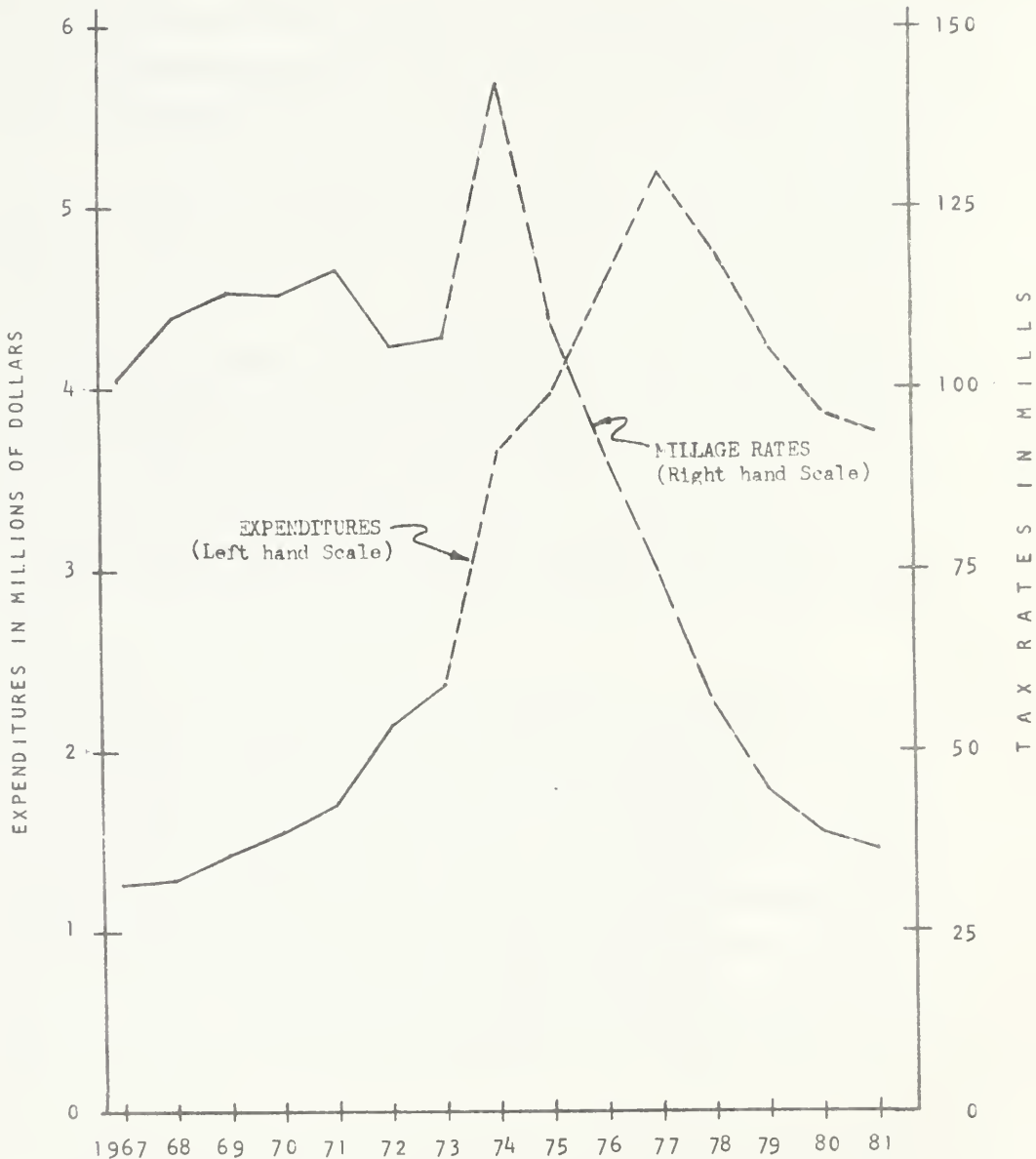
Results of the calculations of projected total county government costs supported by local taxation, and composite millage rates based on future increased in taxable valuation, are given in Table 5. They are shown graphically in Figure 16, which traces the comparable measure for the county since 1967.

Because expenditures are linked closely to population, they peak in 1977, the year of maximum population under Scenario III conditions. The millage rates after 1974 decrease rapidly as the tax base (Fig. 16) continues to rise; and after 1975 become progressively lower than at any time since 1967.

The same kinds of calculations for scenarios I and II are given in Table 6 and presented graphically in Figure 17. It will be seen that the effect on composite millage rates is to make them drop more sharply and remain lower than for scenario III estimates, until after 1978. From there until the end of the projection period in 1981, however, the millage rates for scenarios I and II level off, while those for the full-development scenario III continue to decrease.

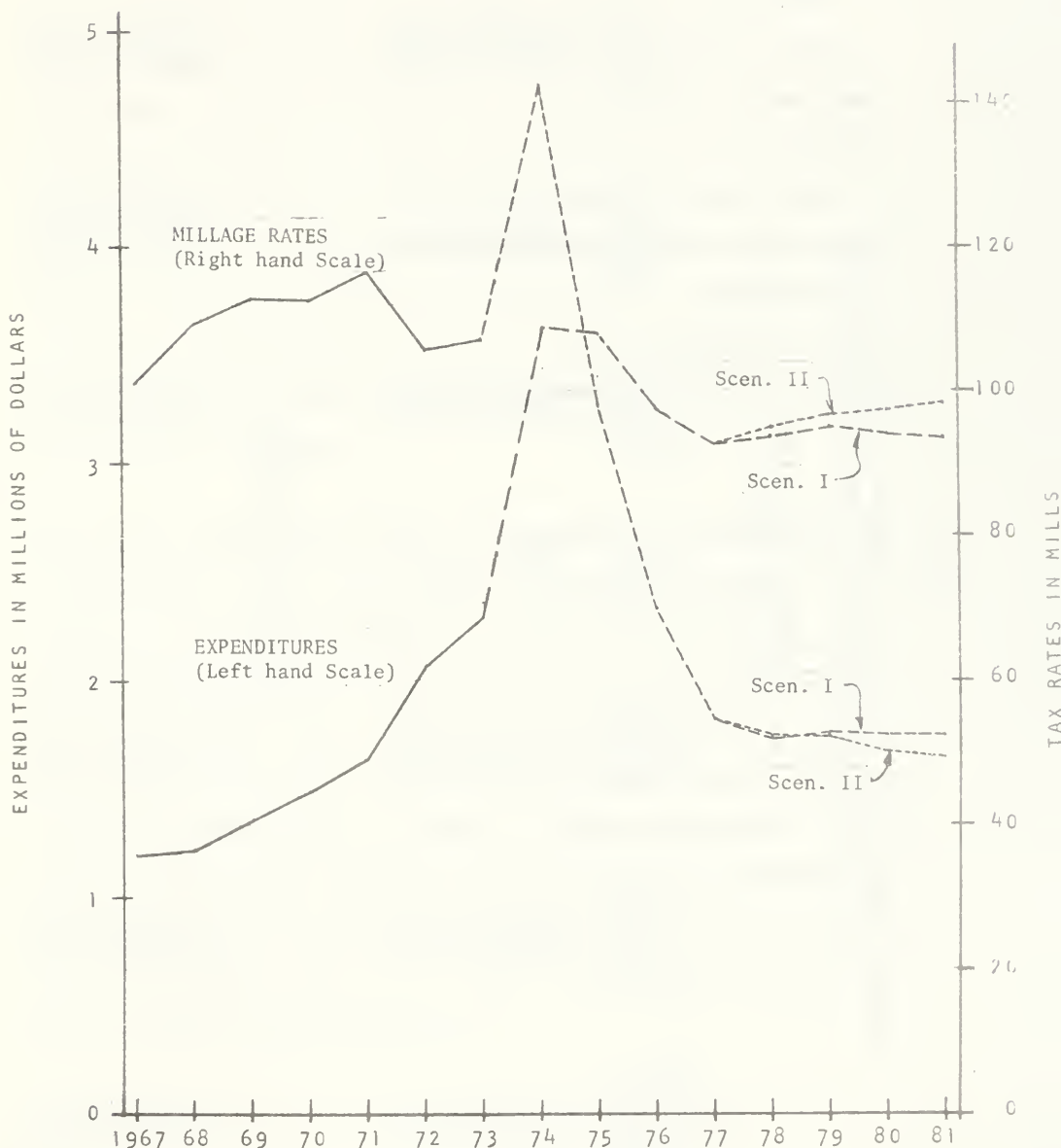
Once again, it should be remembered that these do not represent millage rates for taxpayers in any one location, but

Fig. 16 Local Tax Supported Public Expenditures, Rosebud County, 1967-1973, with Projections to 1981 (1973 Dollars), and Composite Millage Rates



SOURCE: State Board of Equalization; County records; Research and Information Systems Division, Dept. Intergovernmental Relations.

Fig. 17 Local Tax Supported Public Expenditures, Rosebud County, 1967-1973, with Projections to 1981 (1973 Dollars), and Composite Millage Rates. (Scenario I and II Projections)



SOURCE: State Board of Equalization; County and City Records; Montana Power Company

TABLE 6

Estimated Rosebud County Tax-Supported Governmental Costs (1973 Dollars) Projected
To 1981 With Taxable Valuation, Composite Millage Rates.

Scenario I Projections

Year	Local Tax-Supported County Gov't. Expenditures (\$'000's)	School District Costs (\$'000's)	Forsyth City Tax Costs (\$'000's)	Bond Retirement Cost	Coal Mines License Receipts (\$'000's)	Total Expenditures (000's)	Taxable Valuation (000's)	Required Millage Rates
1974	1,520	2176	115.0		153	3658.00	25692	142.4
1975	1,518	2173	114.8	\$53,350	255	3604.15	36775	98.0
1976	1,463	2094	110.6	"	459	3261.95	46803	69.7
1977	1,433	2052	108.4	"	543	3103.75	56835	54.6
1978	1,446	2071	109.4	"	543	3136.75	60475	51.9
1979	1,472	2107	111.3	"	573	3170.65	60020	52.8
1980	1,448	2073	109.5	"	543	3140.85	59998	52.3
1981	1,443	2065	109.1	"	543	3127.45	59842	52.3

Scenario II Projections

1974	1,520	2176	115.0		153	3658.00	25692	142.4
1975	1,518	2173	114.8	"	255	3604.15	36775	98.0
1976	1,463	2094	110.6	"	459	3261.95	46803	69.7
1977	1,433	2052	108.4	"	543	3103.75	56835	54.6
1978	1,469	2102	111.1	"	585	3150.45	60475	52.1
1979	1,544	2211	116.8	"	699	3226.15	61576	52.4
1980	1,558	2230	117.8	"	711	3248.15	64665	50.2
1981	1,568	2245	118.6	"	711	3273.95	66064	49.6

SOURCE: State Board of Equalization; County and City Records; Montana Power Company.

are composite rates indicating a county-wide average. There is an obvious high point for millage rates in the current year, if expenditures follow the assumptions made in these projections. This is indicative of the problems facing the county now, during the current construction and the resulting population increases. The chart also indicates that because of the increased tax base created by the first two plants, the financial resources next year and thereafter (assuming construction of the next 2 plants) should be adequate to meet the county's fiscal requirements without burdening the property taxpayer.

This not to say, though, that no financial problems would occur. Meeting the needs assumed in these calculations requires not only the financial resources but also the inclination and will to act on the part of the public and their representatives. Because of the nature of the political process, the public sector is notoriously slower than private organizations to respond to needs and problems. The evidence in Rosebud county is that many of the problems currently causing troubles are largely the result of lateness in planning and action to meet situations that would seem to have been predictable.

CHAPTER FOUR
ECONOMIC GROWTH, MANPOWER AND THE COMPANY TOWN

A concern most often expressed in Montana is: How can economic growth be controlled to minimize its adverse effects in Montana life styles? The coal mining activity and the Colstrip generating units 1, 2, 3, and 4 if approved, may only be the beginning of industrial expansion in that region of Montana. Thus, the real question is not whether or not to have economic growth, but how it can utilize more efficiently unemployed and underemployed human resources, and how it can be controlled to minimize adverse air, water, and wildlife, community and social effects on the citizens of Montana.

Economic Development

The Montana Power Company and the consortium knows of no other major industrial projects being actively planned in the area other than their generating facilities and related coal mining activities. Their plans in the area include only completion of units 1, 2, 3, 4 and do not include any additional industrial project. However, that it is not to say no other industrial project will settle in the area.

In energy intensive industries there exist certain industrial savings when they locate close to efficiently produced electrical power. In the U.S. aluminum industry, for example, the most efficient aluminum smelters are located near efficiently produced electrical energy sources. This includes sites near low cost hydroelectric power as well as large

mine mouth coal generation units in various areas of the U.S. Thus, there exists the very real possibility that at some future time, energy intensive industries will look favorably upon siting at, or near the eastern Montana power sources.

These industrial development possibilities as well as additional coal mining, coal liquefaction, coal gasification, coal based chemical facilities and other power generating possibilities means that eastern Montana in particular, and the state as a whole, could be under increasing industrial development pressures in the years to come.

There are two fundamental unresolved questions facing Montanans: (1) Whether or not to allow a particular industrial project, and (2) If it is allowed, or if no legal means exists by which it can be disallowed, how to minimize the externalities which it will result. (Externalities are defined as air, water and other environmental problems, community growth and social problems associated with a major capital investment in a community, which are not specifically funded.) The answer to the first question lies in law. Whether or not Montana can selectively deny a major interstate oriented industrial project is a major uncertainty. This section of the report describes a process by which those externalities called community growth problems can be minimized.

The Company Town

The company town to most Americans is an anachronism. The American folk ballads portraying it, conjure visions of social and economic injustice. It is true that in the past, company towns did restrict individual or collective political, economic and social freedoms. They served as a very tangible company purpose: maintenance and control of a captive labor pool. The town served as a means of reducing labor turnover, mobility and unionization. This situation helped a company minimize its labor costs and maximize its production.

The company town then, as now, represented to a company the investment of non-productive capital and non-productive operating costs. The investment outlays and operating costs were justified within companies on the basis of maximizing production, thus return on investment.

Today with the mobility of labor in the U.S., a good quality transportation system and strong demand for, and the unionization of, skilled and industrial labor, the old economic reasons for a company town have largely disappeared. But, new economic criteria have appeared to make it again attractive.

Colstrip - The Company Town

The question arises, why then did the companies retain Colstrip

as a company town and incur considerable non-productive capital and operating costs when they were not legally required to do so? It would have been less costly to Western Energy Co., M.P.C. and other companies to decontrol the town and its surrounding area and let private enterprise provide the capital and manpower to meet service needs of the workers.

The reason Colstrip has maintained its status as a company town is still economic. It is to minimize negative political exposure as an inefficiently planned and aesthetically undesirable community. The non-productive capital outlays and operation expenses to build and operate the town represented, on a cumulative basis, a relatively small amount of the total \$600 million being invested there.

Although the return on the town investment is currently unquantifiable in dollars, nevertheless the investment return or the lack of it becomes very real if the entire project is quashed because of adverse public relations and negative political decisions.

Controlled Economic Growth

At this stage of the construction activities in Colstrip, the importance of it as a company town lies not in what has been done, aesthetically, but what has not been allowed to happen.

Housing

During the construction phase of generating units 1 and 2, employment has gone from less than a few hundred several years ago to nearly 2,000 people employed during the summer of 1974. The company has not allowed housing units to sprawl indiscriminately around the town site. Instead it has laid out, in an orderly manner, sufficient trailer and home sites to accommodate the local housing demand. It has provided permanent water and sewer facilities rather than an individualized septic tank system. It has provided a street system and in some areas curbing and paved roads. These policies will not result in cheap, splotchy housing development around the town site.

Business Growth

The company has not allowed the private business sector to respond to every conceivable service demand a community of 4,000 people would require. Service sector demand during construction has been "bottled up" and spread over a much wider area: Forsyth, Miles City, Billings, and other towns.

Rather than allow the private business sector to compete indiscriminately for the Colstrip earnings dollar, Western Energy has constructed only a modest but an attractive service facility. They have also controlled the amount and location

of business development around the town site. These policies will not result in overbuilt, cheap, quickly constructed business sprawl common to boom towns.

Labor Force

Lastly, the company has prevented the overexpansion in the job market which accompanies a major construction project like Colstrip. Control of the labor supply has been handled by the housing supply. People do not live in Colstrip unless they are employed by the firms working in the area, or will be employed in the schools, or have been retired by BN. The result is that Colstrip, other than during strike periods, has virtually no unemployment, and a minimum of welfare problems.

Manpower Development

Construction Phase

The Bechtel Corporation and its subcontractors control employment at Colstrip during the construction of the generation plants. However, people do not work at the site unless they are certified by Montana Building Trade unions, mostly out of Billings and Helena.

As with most unions, jobs are obtained based on seniority.

As a practical matter this means construction jobs are offered first to Montanans "on the bench" with the necessary union certified skill levels. Second, they are offered to members of building trades internationals with "traveling cards" and thirdly, to new people who obtain "white cards." White cards allow an individual from anywhere to present himself at the construction site to qualify for a certain skill level.

As with an employer in this state, Bechtel and the sub-contractors cannot discriminate against out-of-state workers. Again, as a practical matter, Bechtel provides a welder's school and a pipe fitter-welder apprentice program for those Montanans, or any one else, wishing to learn these skills.

More intensive utilization of Montana people on these construction projects requires the active participation and consent of organized labor, the employers and government.

Operational Phase

Montana Power Company, besides being one of the owners of the two 350 Mw plant complex, has been given responsibility for operation of both plants. Since the scale of operations

far exceeds that of any steam generation plants in the state so far, it has been necessary to plan well in advance of their scheduled opening in 1975 and 1976, for staffing them with operating personnel. One of the requirements has been to recruit and train people for the new responsibilities; and since the Corette steam plant at Billings is the largest one on the system to date, the training begins with a program set up at that facility, and continues at Colstrip as the mechanical and electrical systems take shape.

Recruitment began with a canvass of the MPC system for volunteers to staff the complex, which will require a total of about 85 "new" employees. The supervisor has already been selected from within the company. Next, applications were invited from elsewhere in Montana as well as from other states. Of the 40 or so trainees already in the program, 75 percent or more are reported to be Montana residents, and it is expected that about the same proportion of Montanans will make up the future recruits.

If 700 Mw plants 3 and 4 are approved, and if plant #3 is scheduled to begin operation in 1978, recruitment for the additional 90 to 100 trainees for new plants will commence in 1976. Presumably the company will also be responsible for operation of the 1400 Mw complex. Officials in charge of training do not consider that recruitment for plants 1 and 2 has by any means exhausted the supply of eligible trainees

from Montana, although for some of the functions requiring years of experience in electrical generation and transmission systems, undoubtedly personnel will have to be recruited from other states having advanced power systems. It is also expected that by that time other employees from among MPC personnel will elect to transfer to the Colstrip plants. The result will be that through upgrading and recruiting there will be an increase of some 780 positions in plant and supervisory personnel, local transmission and operation, and mining -- which in this case consists largely of heavy equipment operators. The average salary involved will be between \$10,000 and \$11,000, exclusive of fringe benefits (a check on wage and salary scales of the 36 employees at the Billings plants gives a current take-home pay level averaging around \$10,750).

It would perhaps be favorable to the project to be able to report that all positions would be filled by residents of the state, but this is not likely in spite of the company's preferences in the matter. For one thing, the first concern in filling the positions in such a costly enterprise as this must be obtaining employees with the highest qualifications. For another, employers these days must be keenly aware, in setting up hiring practices, of the requirements of the Equal Employment Opportunity Commission, which would frown on procedures that would penalize applicants for having out-of-state origins.

The Company Town - Its Significance

There are no Montana Laws which require companies, when they make major plant and equipment expenditures in rural areas, to provide adequate housing, furnish water and sewer control, control housing and business sprawl in the area and control the supply and demand for labor at the construction site. The next major industrial expansion in rural eastern Montana will be under no obligation, other than a moral one, to initiate controls similar to those in existence at Colstrip.

While the company town continues to be an anachronism, the process of control and assimilation of economic growth in Colstrip might serve as a precedent for controlling rapid economic growth in rural Montana areas in the future. The process of control and assimilation need not take the form of a company town, but may consist of legislation to accomplish those goals.

Summary of Findings

Historically, and currently in the Rocky Mountain west, boom towns have been characterized by the overexpansion in the business sectors, poorly planned inadequate housing and other related facilities, the influx of a large itinerant labor force and the over-utilization and under-development of public facilities when the needs are most urgent. In short, boom towns have been characterized by an over-responsive private (business) sector and a public (government) sector which lacks the decisiveness and the resources to solve its problems.

The investment of 600 million dollars over 10 years in the Rosebud County economy (with a personal income of \$24 million in 1972) cannot possibly avoid causing some economic growth problems as well as create economic opportunities. The major community economic growth problems in Colstrip have been effectively handled through the mechanism of the company town. In contrast, Forsyth, on the periphery of the major impact has been pushed to capacity.

Colstrip and Forsyth

In Colstrip some of these boom town characteristics are not present at all and others are only minimally present. The only public facilities (government owned and operated) in

the Colstrip area are the school and the state highway. Both facilities are being utilized above their normal capacity levels and both, when the needs are more pressing, are lacking in specific capital investment. In Colstrip, through the largess of the companies sufficient temporary school facilities are being provided to meet a temporary demand.

For pre-development residents of the Colstrip areas (mostly farmers and ranchers), there has been experienced a noticeable degradation in the quality of public facilities. Their road is a mass of chuckholes and the school, built with agricultural base tax dollars, is overcrowded to the point that movable school facilities have been set up to accommodate the influx of students. If the quality of public facilities is a measure of the quality of life, then pre-development residents of the Colstrip - Rosebud Creek area have experienced a noticeable deterioration in that measure.

The other characteristics common to boom towns are not present in Colstrip. Colstrip is one of the few places where the demand for labor equals the supply of labor. There is not an itinerant labor force present and unemployment lasts only as long as it takes to move the trailer off its pad and get moving down the road.

The business sector has not been allowed to cater to every whim and wish of the residents of Colstrip. Supply of services has

been severely restricted and it is being decontrolled only very cautiously. This policy has dispersed the demand for goods and services of Colstrip residents over a much wider area: Forsyth, Miles City, Billings and other towns.

The housing provided -- mostly trailer pads and permanent houses and apartments -- has been adequate to meet the demand. Permanent water, sewer, curbs and street facilities have been provided. Enough control has been exercised so that housing units have not sprawled indiscriminately around the town.

While the company town remains an anachronism, its utility as a tool for controlling massive economic growth in rural undeveloped areas has clearly been demonstrated. Colstrip, Rosebud County and the state have incurred fewer negative effects during the construction of generating units 1 and 2 than if no control was exercised in Colstrip.

Currently, there are no Montana or federal laws which require companies to control economic growth when a large capital investment is made in a local area. Most companies in a competitive environment look upon these community activities and expenditures, as non-productive costs which must either be borne through higher product prices or absorbed in profits. If they are absorbed in profits the desirability of the investment diminishes.

Montanans can be sure that unless new legislation appears, the next major capital investment project in rural eastern Montana will be under no obligation other than a moral one, to control community economic growth in the same way it was controlled in Colstrip.

For years prior to the expansion of Colstrip, Forsyth businesses had been under increasing sales pressure because of good quality highway to either Miles City or Billings, and declining population base. At the same time there was also considerable excess housing available in the city.

By the early summer of 1974 Forsyth was full. Housing in any condition was scarce at best, or non-existent. The business sector was enjoying a strong demand for its goods and services. In this sector, since the new Colstrip development there has been some new construction, but business has mostly reoccupied vacant facilities. They utilized excess business capacity which had accumulated over the years. In housing much the same has been true. There has been new construction, but many old, unoccupied houses have been reoccupied.

Forsyth has a physical limitation to population growth. The city lies between the Yellowstone River and the steep hills on the south above the city. The subdivision activity has been restricted by the availability of adjacent land, as well as the lack of water and sewer facilities.

There have been some problems with an itinerant labor force in Forsyth, but the number of itinerant people has been limited by the lack of availability of permanent and temporary housing. It is the typical situation, where demand exceeds supply, so unit prices rise. Strong demand, limited supply and high prices of housing has limited the itinerant labor force. In addition, a more efficient city-county police force has monitored potential adverse social problems closely.

While the private sector has absorbed much of the increased economic growth through excess capacity, the public sector, with the exception of the schools has not. The water system, built in 1932, is at capacity and some doubts have been raised about water availability in a fire situation. New water storage and treatment facilities are being planned to alleviate any potential problems.

The sewer system is very much overburdened. The primary sewage treatment lagoons are nowhere near adequate to meet the demands. There are presently no plans for secondary sewage treatment, but new primary lagoons are being planned to alleviate sewage problems somewhat.

Most of the streets in Forsyth are paved but they lack curbs, gutters, and storm drains. In a flat valley city like Forsyth, accumulated water has the tendency to stand causing mostly inconvenience, but possibly health problems.

Fire, police, medical, penal and welfare facilities are all currently adequate, but on occasion are strained to capacity. The new hospital facilities were planned based on needs prior to the recent Colstrip development. With additional people coming into the county if units 3 and 4 are approved, the new facility could possibly be overburdened.

In the years prior to the new Colstrip development, Forsyth's schools experienced the same phenomenon common to most rural areas in the late 1960s -- declining population and lower fertility rates. This combination caused Forsyth schools to develop excess physical capacity. With the Colstrip developments the Forsyth schools still have excess physical capacity. The demands on the school system can be expected to escalate under any of the economic growth scenarios outlined in this report.

Local Finances

Local government finances at the various levels are not a simple matter, and a number of things combine to make response to problems and needs in the public sector cumbersome and slow. Whether or not the response is made at all depends, first, on the availability of adequate funds; but also on the ability and inclination of the voting public and their representatives to take action in a timely way.

In Rosebud County the evidence is that a rapidly rising tax base will satisfy the first condition, and that the needs in the public sector brought about by the construction of plants 3 and 4 could be met without burdening the taxpaying public, because of taxable resources furnished by the first two plants now under construction.

This situation did not apply, of course, when work began on plants 1 and 2, and some of the current problems of communities in the county are the consequences of this fact. The way in which these problems in the public sector have overtaken the local governments in this period of rapid change makes an eloquent case for the desirability of the kind of county-wide planning now being undertaken by representatives in Rosebud County.

The Rosebud County Economy

There are three alternative economic growth scenarios described in this report, and discussed in detail in Chapter III. They involve projections of Rosebud County employment and income to 1981, the beginning of operation of units 3 and 4 should they be approved.

The first scenario is a minimum economic growth alternative. It assumes just those projects at Colstrip currently under construction (units 1 and 2) and anticipates coal mining

based on current contractual requirements. *

Scenario II is the coal export alternative. This assumes units 1 and 2 are built and operating but units 3 and 4 are not. The coal that would have been used in units 3 and 4 would be mined and marketed outside of Rosebud County.

Scenario III is the maximum economic growth alternative, with units 3 and 4 constructed and operating. The coal mining activity includes coal for units 1,2,3, and 4 and the current existing outside sales contracts.

Historical data from the 1920s through 1970 present the Rosebud County as a predominantly agriculture economy, growing somewhat slower than the Montana economy and that of the entire U.S.A. Population has been gradually declining over the period. Between 1970 and 1972 the economy and the population growth began to pick up, partly because of the relative efficiency and resurgence of the Rosebud County agricultural sector and the initial activities in Colstrip.

Scenario I - Minimum Growth

Without generating units 3 and 4 and their associated coal development Rosebud County real personal income would still

*The real economic growth in all other sectors of the Rosebud County economy were built into all the projections. This includes other mining activity (Peabody Coal) manufacturing, agriculture, government, services, etc.

grow by 97.1% and population would expand by 60% from 1972 to 1974. (See pages 31 and 33)

Scenario II - Coal Export

Without units 3 and 4 but with the coal equivalent to their usage being exported, results of this study show Rosebud County real personal income would grow by 21.8% and population by 21% between the end of construction of units 1 and 2 and 1981.

Scenario III - With Units 3 and 4

With units 3 and 4, their coal, plus currently existing outside sales contracts, calculations indicate the county's real personal income would grow 229.2% and population by 152.2% between 1972 and 1977. (See pages 31 and 33)

All of the growth scenarios presented above represented considerable economic growth potential for Rosebud County. In a sense, these are all minimum growth alternatives since no numerical consideration was given to potential new coal mines or coal related industrial plants in the county. Since these are very real possibilities, Rosebud County and all of southeastern Montana could be under recurring economic growth pressure in the next 10 to 20 years.

The real questions to be answered, in an examination of economic

growth, are not so much whether any of it is desirable, but when it occurs, how to minimize adverse effects on air, water, land, wildlife, the community, and the social structure. These are all legitimate concerns of good government. But aside from such adverse effects, for government to decide which economic growth is intrinsically "good" and which is the "bad" requires a level of economic knowledge equivalent to omniscience.

APPENDIX I

PUBLIC CAPITAL INVESTMENT: COLSTRIP, MONTANA

COMMUNITY PLANNING DIVISION
DEPARTMENT OF INTERGOVERNMENTAL RELATIONSIntroduction

Rosebud county and the towns within this county, particularly Forsyth and Colstrip, are in a position where capital investment for public facilities is necessary, as a result of community expansion related to development of Plants 3 and 4. The development of 3 and 4 will create a situation of rapid population increase and community expansion; and early, sufficient capital investment for public facilities can help minimize negative community impacts resulting from population increase. It can be expected that these communities will be in need of funds from one source or another, to facilitate public capital investment to overcome any tax base lag.

Background

A community that finds itself on the threshold of rapid population increase is confronted with needs which include, but go beyond, mere housing and a new shopping center. The communities of eastern Montana affected by coal development will require expanded community services (police, fire protection, and community administration) and installation of community "hardware" (sewer and water systems, schools, parks, and roads) as a result of an

increasing population. The responsibility to provide these services and facilities has traditionally rested with the affected community by default on the part of all other parties involved in community expansion; without assessment of responsibilities or capability to meet them. It is the purpose of this discussion to consider the responsibility and implementation capabilities of industries, federal government and the state of Montana, in addition to the coal development communities.

Assessment of Responsibilities

Delegating responsibility on the basis of capacity to provide, is as inequitable a system as the current method of delegation by default. Neither system provides for rational equitability yet when it is acknowledged that the community in fact should not be solely responsible, this simplistic alternative is the one most frequently offered. The direct and indirect involvement, and related responsibilities of industries and the federal, state, and local governments must be considered. A brief assessment of responsibility is as follows:

Industry--A group of power companies including Montana Power Company proposes to develop plants 3 and 4, and hire employees for the construction phase and subsequent operation of these facilities. Construction employees will provide the initial population increase, and associated development will encourage

additional population as individuals are attracted by expanded sales and service markets. The consortium of power companies is the industrial developer whose actions are directly responsible for the primary industrial development of the area, and indirectly, for secondary commercial development.

Federal Government--Federal policies, such as Project Independence, indirectly affect development rates in the coal region. If the local communities of eastern Montana have the responsibility to respond to national energy needs and undergo industrial development, then the nation through the federal government has some responsibility to share federal funds with these communities to fulfill local needs.

State Government--The State of Montana finds itself in a position between the demands of federal policy and national need, and local expansion and development needs; and is involved in the development process of the coal region through state policies and responsibilities to its citizens. The State of Montana has taken an active role in the control of coal development since the magnitude of the development affects the state as a whole. Specifically, in relation to the local communities, the State of Montana has the responsibility to fulfill the role of intermediary between the federal and local governments, and between the coal-using companies and local governments.

Local Government--The new residents in the coal development community are directly responsible through the various entities of local government for the development of their own community facilities. Assignment of responsibility to the industry, and the federal government and the state government diminishes the traditional responsibility role of the community; however it should not wholly supplant the responsibility of the local community. Such a complete denial of local responsibility would be contrary to the entire philosophy of self-destiny which our democratic process adheres to.

Providing means for community facility development should not detract from the local government's role. Capital investment must be channeled through the local governments. The companies and the federal government are all partially responsible for development, and must assist the local governments in funding capital investment for public facilities.

"Front End Money": Alternatives

The communities in Rosebud county may find themselves confronted with a tax base lag if 3 and 4 are built; that is, community expansion may not be reflected through tax expansion for some time hence, though capital investment needs are immediate. To minimize adverse population impacts, capital investment in public facilities must come early and in sufficient amounts.

Since the local governments are least capable of developing the necessary capital, it would be reasonable for the companies and the state and federal governments to meet their share of responsibility during the early stages of development. Alternative means for industry and the state and federal governments are as follows:

Industry -- Two approaches may be taken with reference to company funds for public facilities. The companies' capital investment could include public facilities which establishes a "company town situation" with total responsibility placed on them. Community facility costs would be reflected in the price of the companies' output of power. The second approach would be indicative of more "shared responsibility approach" with company provision of sufficient "front end" money to facilitate immediate capital investment with subsequent tax relief to equate total tax responsibility. At the onset of expansion, community service expenditures will be maximized, while the power companies' tax responsibility will be comparatively low. Tax adjustments may be made allowing increased tax expenditures during the construction period and equal tax relief in the future full productivity period. Tax responsibility over the long run is not increased, but rather adjusted to provide the local governments with maximum tax resources at the time of maximum population increase. In the case of Colstrip Plants 1 and 2, the companies involved have

voluntarily provided temporary educational facilities, and there is no reason to believe similar voluntary contributions could not be expected if needs arose in connection with the proposed plants. The mechanism of tax adjustment, however, makes the arrangement between industry and local government somewhat more predictable, as well as equitable. Industrial revenue bonds could feasibly provide funds to meet an adjusted tax structure; and cooperation between corporation and government levels would be necessary to define and refine resolutions.

Federal Government -- It is recommended that legislation be developed which will allow provision of federal funds in communities with capital investment needs resulting from response to national needs and policies. The precedent for federal provision of impact funds has been established in PL91-511 and PL81-815 for capital investment, and expansion of this concept would provide for national responsiveness to local needs in correlation with local responsiveness to national needs.

State Government -- A program for the designation of development cities or critical areas planning, in the context of large industrial expansion, could provide the state with the mechanism for coordination of priority funding and a more effective, responsive delivery system for community funding. There is a need for state fulfillment of an intermediary,

coordinative role which has not been defined or fulfilled through a state planning policy at the present time. A precedent of action was set by the state in conjunction with PL91-511 which allowed for responsive action to meet community needs and efficiently use funds.

Conclusion

Coal-using companies and government share the responsibility for minimization of the negative consequences of community growth; and policy action and capital investment on the part of these entities must come now if negative impacts are to be avoided.

APPENDIX II

Methodology for Employment Projections
in the Dependent Sectors

I. Introduction

The development of estimates of employment from 1973 to 1981 within the dependent SIC sectors -- Non-Farm Proprietors, Wholesale and Retail Trade, Services, Finance, Insurance and Real Estate, and Total Government -- was dictated somewhat by the availability of employment estimates within the one-digit independent SIC sectors -- Agriculture, Mining, Contract Construction, Transportation, Communications, Public Utilities, and Manufacturing -- for the same time period. Furthermore, since population data and one- and two-digit SIC employment data were available at the county level from 1967 to 1971 an investigation into historical relationships between these variates seemed essential. The foregoing investigation was made slightly perplexing by the enormity of employment data available at the county level. Therefore, the first problem was to analyze all available data in order to "sort out" the data that would be used to develop the dependent employment projections.

Another problem that arose was the alternatives of projecting employment at the one-digit SIC level or at the two-digit SIC level and subsequently summing these two-digit estimates to the one-digit level. Certain advantages existed for both procedures and consequently estimates were developed for each.

The initial data reduction problem and the two alternative projection series are described in the next three sections. These are followed by a concluding section comparing the errors and biases involved in making the employment projections.

II. Data Analysis

As stated in Section I, the availability of employment estimates from 1973 to 1981 for the one-digit independent SIC sectors necessitated establishing a relationship with the dependent SIC sectors. Moreover, since population was thought to be highly correlated with the dependent sectors it was also included as an independent variable. The basis for establishing any relationships between the aforementioned variables was the REIS files where employment data at both the one- and two-digit levels existed together with population estimates at the county level from 1967 to 1971.

Several criteria were set forth at the beginning of the data analysis because of statistical and economic considerations. First, it was desirable to use all Montana counties (56) in the development of any relationship since this would be illustrative of the entire state and thus would not limit the predictions in scope. Secondly, if the choice existed, the principle of using the most recent data available was to be exercised since this would produce the relationships in their most recent light. Thus, these two criteria restricted the choice of data

TABLE I

Partial Correlation Coefficients
Employment Identifications are SIC Codes

POPULATION & EMPLOYMENT VARIABLES		Co Pop	712000	721000	722000	723000	724000	725000	726000	727000	728000	729000
Co Pop	1967 1971	1.00 1.00										
712000	1967 1971	.98 .98	1.00 1.00									
721000	1967 1971	.48 .49	.49 .52	1.00 1.00								
722000	1967 1971	.30 .28	.26 .25	-.11 -.09	1.00 1.00							
723000	1967 1971	.91 .89	.90 .88	.38 .36	.28 .18	1.00 1.00						
724000	1967 1971	.88 .87	.89 .87	.27 .28	.11 .11	.83 .83	1.00 1.00					
725000	1967 1971	.93 .94	.94 .95	.44 .46	.20 .21	.84 .85	.83 .83	1.00 1.00				
726000	1967 1971	.97 .98	.98 .97	.48 .49	.27 .26	.90 .88	.84 .83	.93 .96	1.00 1.00			
727000	1967 1971	.95 .95	.93 .93	.48 .50	.22 .20	.90 .85	.78 .77	.92 .93	.94 .95	1.00 1.00		
728000	1967 1971	.98 .98	.96 .96	.49 .50	.28 .27	.90 .87	.81 .81	.94 .95	.97 .98	.98 .98	1.00 1.00	
729000	1967 1971	.89 .92	.81 .86	.46 .48	.11 .12	.82 .83	.72 .75	.80 .84	.82 .89	.89 .95	.88 .92	1.00 1.00

to a yearly selection for all counties.

At this point it was decided to examine the historical relationships between all variates at least at the one-digit level and the first and last years (1967 and 1971) of the data available. This would allow one to judge whether or not the relationships were changing much over time and if they were not then the second condition for data selection could be exercised and the 1971 data selected. Partial correlation coefficients were computed between each pair of variables for all counties for 1967 and 1971. These coefficients are illustrated in a matrix form in Table I for both years. It is quite obvious on examining the correlation coefficients that, at least at the one-digit level, the basic relationships that existed between the variables at the county level in 1967 were still present in 1971. Consequently, the second criterion for data selection would be met by selecting the 56 data points (counties) for 1971.

The high values of the partial linear correlation coefficients between all one-digit variates, excluding Mining and Agriculture, are somewhat suggestive of using multiple linear regression to estimate employment within the dependent SIC sectors. However, the intercorrelations between the independent variables including population indicate that possibly some would not be needed for predictive purposes. For this reason it was decided to use stepwise multiple linear regression using all independent

variables except Agriculture and Mining because of their weak correlation with all dependent variables.

A correlation matrix similar to the one illustrated in Table I was developed for all two-digit employment data also with the same results. Because of the vastness of the matrix (35 variables) it is not illustrated in this appendix.

III. One-Digit Employment Projections

A stepwise multiple linear regression was performed on the 1971 county population and employment data at the one-digit SIC level. This procedure allows one to examine which of the independent variables -- population, employment in Contract Construction, Manufacturing, Transportation, Communications, and Public Utilities -- are most prominent in explaining variance in the dependent variables and enters each into the regression equation on the basis of whether or not a significant amount of variation is being explained by inclusion. This procedure also involves a re-examination at every stage of the regression of the variables incorporated into the model in previous stages. A variable which may have been the best single variable to enter the equation at an early stage may, at a later stage, be superfluous because of the relationships between it and other variables now in the regression. Thus, every variable at every stage is checked for nonsignificant contribution and removed if necessary.

TABLE II
ONE DIGIT REGRESSION SUMMARY

VARIABLE NO. SIC CODE	REGRESSION EQUATION (X1 = POPULATION)	F VALUE FOR REGRESSION	STANDARD ERROR OF ESTIMATE	MULTIPLE R
Y1 = 712000	Y1 = 112.7+ .03426(X1)	F = 1344.0	127.9	.98
Y2 = 726000	Y2 = -277.9+ .09146(X1)	F = 1315.9	345.1	.98
Y3 = 727000	Y3 = - 57.0+ .01591(X1)	F = 521.3	95.4	.95
Y4 = 728000	Y4 = -166.0+ .06848(X1)	F = 1304.1	259.6	.98
Y5 = 729000	Y5 = - 96.7+ .09422(X1)	F = 314.9	726.8	.92

In all 5 cases of the dependent variables the county population variate had the highest correlation coefficient and therefore it was entered into the regression equation first. Also, in all 5 cases, the only other variates to enter were employment in Transportation and Manufacturing and in no cases were any variates removed because of nonsignificant contribution. However, on close examination of the regression at each stage very little increase occurred in the multiple linear correlation coefficient and very little decrease in the standard error of the estimate occurred. Furthermore, since population estimates from 1973 to 1981 were to be computed directly from employment estimates it was not desirable to include both in the same regression equation, thus eliminating a bias of having several estimates to predict employment. The model finally decided upon then was a simple linear model involving county population as the independent variable.

The simple linear regression equations are summarized in Table II together with their respective F-values, standard errors, and multiple correlation coefficients. Since it was felt that a rise in employment in the dependent sectors generally followed increases in the independent sectors, the population estimate used for estimating the dependent employment figures was based on 1972 dependent employment figures and 1973 independent employment figures. This was accomplished by multiplying the employment totals by 2.33, the mean number of persons per employee, yielding an estimate

of the population of Rosebud County for 1973 which was uncorrected for change in employment in the dependent sectors for 1972 to 1973. This figure was then used in the regression equations to estimate employment in the dependent sectors for 1973 and the process was continued until 1981 for all three scenarios.

In the foregoing process many sources for error and biases in regression estimation are evident and these are discussed in the concluding section. Also, one should note that Table II gives only a brief description of the final results of the process used and that the actual description of the stepwise process is not included because of the restrictive use of this appendix. The next section essentially describes the same process that was used in this section only at the two-digit SIC level.

IV. Two-Digit Employment Projections

A stepwise procedure was also used to develop a model from which to base the two-digit projections. The same independent variables used in the one-digit projections were used to establish multiple linear regression equations for all 35 two-digit SIC sectors. The results obtained at the two-digit SIC level were similar to the one-digit results except for the two-digit sectors of Miscellaneous Business Services (SIC code 728122) and Auto Repair Services (SIC Code 728121). In both of these cases employment within the Transportation

TABLE III
TWO DIGIT REGRESSION SUMMARY

VARIABLE NO. SIC CODE	REGRESSION EQUATION (X1 = POPULATION)	F VALUE FOR REGRESSION	STANDARD ERROR OF ESTIMATE	MULTIPL R
Y1 = 712000	Y1 = 112.7+.03426(X1)	F = 1344.0	127.9	.98
Y2 = 726100	Y2 = -139.4+.02486(X1)	F = 242.5	218.5	.90
Y3 = 726210	Y3 = -14.6+.01647(X1)	F = 2987.3	41.2	.99
Y4 = 726221	Y4 = 6.2+.00376(X1)	F = 194.3	36.9	.88
Y5 = 726222	Y5 = -44.9+.01116(X1)	F = 1373.5	41.2	.98
Y6 = 726223	Y6 = -16.9+.00937(X1)	F = 603.6	52.1	.96
Y7 = 726224	Y7 = -20.9+.01304(X1)	F = 1672.9	43.6	.98
Y8 = 726225	Y8 = -17.4+.00380(X1)	F = 546.4	22.2	.95
Y9 = 726226	Y9 = -11.2+.00262(X1)	F = 779.9	12.8	.97
Y10 = 726227	Y10 = -18.7+.00637(X1)	F = 1701.8	21.1	.98
Y11 = 727100	Y11 = -3.3+.00519(X1)	F = 648.4	27.9	.96
Y12 = 727200	Y12 = -9.3+.00179(X1)	F = 353.8	13.0	.93
Y13 = 727300	Y13 = -4.3+.00058(X1)	F = 71.6	9.3	.75
Y14 = 727400	Y14 = -21.1+.00365(X1)	F = 80.0	55.7	.77
Y15 = 727500	Y15 = -7.7+.00165(X1)	F = 386.2	11.5	.94
Y16 = 727600	Y16 = -9.1+.00227(X1)	F = 571.5	12.9	.96
Y17 = 727700	Y17 = -1.0+.00053(X1)	F = 140.9	6.1	.85
Y18 = 727800	Y18 = -1.0+.00025(X1)	F = 38.4	5.5	.65
Y19 = 728111	Y19 = -2.8+.00647(X1)	F = 211.3	60.1	.89
Y20 = 728112	Y20 = -16.1+.00463(X1)	F = 1059.6	19.5	.98
Y21 = 728121	Y21 = -29.4+.00521(X1)	F = 351.5	38.0	.93
Y22 = 728122	Y22 = -10.0+.00224(X1)	F = 308.1	17.5	.92
Y23 = 728123	Y23 = -6.1+.00136(X1)	F = 194.6	13.3	.88
Y24 = 728131	Y24 = -4.3+.00160(X1)	F = 588.0	9.0	.96
Y25 = 728132	Y25 = -.8+.00105(X1)	F = 220.6	9.7	.90
Y26 = 728140	Y26 = -8.5+.00980(X1)	F = 1153.5	39.5	.98
Y27 = 728211	Y27 = -21.2+.00706(X1)	F = 682.9	36.9	.96
Y28 = 728212	Y28 = -27.8+.01247(X1)	F = 648.0	67.0	.96
Y29 = 728220	Y29 = -2.9+.00118(X1)	F = 1562.5	4.1	.98
Y30 = 728230	Y30 = -7.3+.00305(X1)	F = 57.7	54.8	.72
Y31 = 728240	Y31 = -11.2+.00904(X1)	F = 128.2	109.3	.84
Y32 = 728250	Y32 = .2+.00003(X1)	F = 33.1	0.7	.62
Y33 = 728260	Y33 = -16.8+.00328(X1)	F = 150.4	36.6	.86
Y34 = 729110	Y34 = -32.5+.01925(X1)	F = 337.8	143.3	.93
Y35 = 729120	Y35 = 80.0+.05510(X1)	F = 262.0	465.9	.91

, sector was more highly correlated than population. Nevertheless, when population was "forced" to enter the regression equation first, significant regression still existed and therefore the use of population in a simple linear regression equation was tolerable. The reasons again for dropping of the other variables were similar to those expounded upon in the previous section.

The results of the 35 simple linear regressions are presented in Table III. As illustrated, significant regression exists in all cases and even though the model (simple linear) may not be the best it is at least adequate.

The employment estimates for the dependent two-digit sectors were obtained in the same manner as for the one-digit estimates. A total population estimate was obtained for 1973 by the use of 1972 dependent employment and 1973 independent unemployment. The estimate was then used in all 35 two-digit simple linear equations to obtain employment estimates for 1973. The process was then continued to 1981 for all three scenarios obtaining one-digit employment estimates by summing the two-digit estimates.

A statistical comparison of the regression estimates will be made in the concluding section. Also, sources of error and bias will be discussed with reference to both sets of estimates.

V. Conclusion

Besides the usual errors in regression estimation many other sources for errors existed. The population figures used to develop the regression equations were only estimates of county population, thus introducing the bias of using estimates to obtain the regression equation. Furthermore, the population figures obtained from the dependent and independent employment sectors were developed from two different years and as such were "uncorrected" for any change in dependent employment. Also, these population figures were obtained by using the crude population per employee figure of 2.33; and since the employment figures in the independent sector were also estimates, this introduced a sort of double bias into the regression estimates.

Although the one-digit SIC projections would be more accurate from a statistical standpoint, it was finally decided to use the summed two-digit figures since it was felt that they gave more attention to detail within the one-digit sectors. Nevertheless, the results from both projections were quite close, varying more in the later years.



1875

1875

1875