AN INPUT — OUTPUT STUDY OF THE KREMMLING REGION OF WESTERN COLORADO

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CHAPTER 1

INTRODUCTION

The purpose of this report is to provide a description and analysis of a regional economy within the State of Colorado. The intent of the researchers is to provide policy makers with specific information contributing to the decision-making and planning processes and to provide a planning tool having the capability of analyzing a number of alternative development scenarios in the study region.

THE REGION UNDER STUDY

Two counties in Western Colorado make up the study area. Commonly the area is known as the Kremmling region. The counties are Grand and Jackson. The land area contained in these two counties is approximately 1,196,160 acres (4,488 square miles) and is some 1.8 percent of the state total. The federal government owns 806,225 acres or about two-thirds of the region's total land area.[1] Federal ownership is represented in parts of two national forests, and holdings of the Bureau of Land Management and the Bureau of Reclamation. Federal payments in lieu of taxes were $207,000 in fiscal 1979.[2]

The region's 1980 population is estimated at 9,500 inhabitants with an adjusted gross income (state definition) of some $46 million in fiscal 1979.[3]

On balance, the region is a net importing region (where imports/exports are defined in terms of deliveries of goods and services inside/outside the region's boundaries). The major exporting activities are the extractive industries and recreation-oriented activities. Roughly 1.3 percent of the state's total production of extractive goods comes from the Kremmling region of Western Colorado. About 5 percent of Colorado's coal production occurs in the Kremmling

region (Jackson County). Also small amounts of crude oil and natural gas are produced in the region.[4]

The relative abundance of amenity resources has encouraged outdoor recreation activities of all kinds. A major publically owned ski resort is located in Grand county. Big game hunting is an important activity with 5.7 percent, 8.5 percent, and 7 percent respectively, of the state's 1979 total rifle deer, elk, and bear hunting recreation days occurring in the Kremmling region.[5]

STATEMENT OF THE PROBLEM

The natural resource base in the region, while relatively abundant in terms of the capability to satisfy local demands, is nonetheless the focal point for regional and extra-regional economic conflict. Ownership of the large deposits of exploitable resources is vested largely with the federal government and corporations headquartered out of state. Water use is governed by state water law, interstate compacts, and international treaty. Thus, from a regional perspective, policies affecting the disposition of the regional resource base are largely determined outside of the region. From this same perspective, there is a need to develop a detailed description of the economy as it presently exists and an analytical framework which is capable of assessing the direct and indirect consequences of alternative scenarios for resource exploitation proposed by the public and private sectors of the economy. This description and analysis constitutes the major thrust of the research reported here.

THE MODEL USED

A tool particularly adapted to these questions is the comprehensive interindustry production model developed by W.W. Leontief. The strength of this model (often termed the input-output model) lies in its capability not

only to describe the interdependence existing among sectors of an economy but also in the capacity to demonstrate, sector by sector, the total consequences of any number of development scenarios. The model is thus both descriptive and analytical. The descriptive components are accommodated through the collection of extensive primary data, from firms within the region, and subsequent tabulation of the data in a form consistent with the interindustry framework. The analytical phase consists of the impact analysis, development of the various multipliers, and consistent forecasting under alternative resource development scenarios.

OUTLINE OF THE REPORT

The remainder of the report consists of a description of the method of the study which is presented in Chapter 2, and the analysis of the regional economy, which is the concern of Chapter 3.

In addition to the main text of the report, there are several appendices. These contain the input-output tables, the sector identification used in the analysis, and a detailed critique of the data sources used in constructing the model.

NOTES

[1]Colorado State Planning Division, Colorado Year Book, 1962-64, pp. 766-772.

[2]Community Services Administration, Geographic Distribution of Federal Funds in Colorado: Fiscal Year 1979.

[3]Demographic Section, Colorado Division of Planning, Department of Local Affairs, Population Estimates and Projections, August 1979, and Colorado State Planning Office and Colorado Department of Revenue, Annual Report, Fiscal Year Ending June 30, 1979.

[4]Colorado Department of Agriculture, Colorado Crop and Livestock Reporting Service, Colorado Agricultural Statistics - 1979, July, 1980. Colorado Department of Natural Resources, Division of Mines, A Summary of Mineral Industry Activities in Colorado - 1978, June, 1979. Colorado Department of Natural Resources, Division of Mines, Coal - 1976, April, 1977.

[5]Colorado Department of Natural Resources, Division of Wildlife, 1979 Colorado Big Game Harvest.

CHAPTER 2

THE METHODOLOGY OF THE STUDY

INTRODUCTION

The national energy situation has focused an increasing attention on the coal, oil shale, and oil and gas reserves of Western Colorado. Evidence of this fact is the intensive efforts on fee oil shale lands and the Paraho demonstration facility. Additional evidence is found in the increased production of coal from existing operations and proposals for additional leases on federal coal lands.[1]

These activities have generally been viewed as isolated from, or independent of, the remainder of the economic environment. In those cases where an impact statement has been filed,[2] more concern has been given to physical impacts than to social and economic impacts.[3] As a result, the total consequences of such developments have not been thoroughly analyzed.[4] While it is not proposed to perform an ex-post evaluation of the impacts of existing developments, a major product of this research is the provision of the analytical capability for assessing the regional impacts of continued developments.

The interindustry model identifies the interdependent structure of an economy. No producing sector is autonomous (independent of the other sectors); rather, each sector interacts with other sectors (industrial, commercial, labor, government) through the purchases of goods and services and the sale of outputs. Structural interdependence means, quite simply, that the activities of one sector have impacts on others. The identification of the nature and magnitude of this interdependence is one of the most useful results of the interindustry model.

The model is driven by what are termed final demands.[5] Final demands (as opposed to intermediate demands) reflect the demand for goods and services in final form. Thus, final demand sectors use or consume a finished good. Intermediate demands, on the other hand, reflect the demand for goods and services which are processed before becoming available for final consumption. Thus, changes in final demands result in changes in the processing (or intermediate) sectors of the economy. The primary purpose of the interindustry model is to trace these impacts throughout the economy. Tracing these direct and indirect impacts allows the derivation of the multiplier effects on production, income, employment, or water use, and also allows the use of the model in providing consistent forecasts of economic activity.[6]

PROCEDURES FOLLOWED

The discussion of procedures followed in conducting the research may be conveniently condensed into several categories including: the definition of the region, delineation of economic sectors, the data collection effort, selection of the base year, and data processing. Each is discussed, as briefly as possible, in the following pages.

DEFINITION OF THE REGION

The Kremmling region of Western Colorado, for purposes of this study, was defined as Grand and Jackson counties, Colorado. This regional definition allows for an analysis of an area most immediately impacted by potential coal and pipeline development and an area that provides a significant part of the state's developed ski activities.[7]

SECTOR DELINEATIONS

The interindustry model requires the separation of the economy into various economc entities or "sectors." Total output, by interindustry accounting

procedures, is the aggregate value of all sales or purchases that take place, i.e., the total sales or purchases during a year. This total output must be divided up into sectors in order to assess the interindustry structural dependence that prevails. The model structures economic activity into two major components, suppliers (or sellers) and purchasers (or users). Each of these is further subdivided according to the following scheme: Suppliers include: 1) intermediate or processing suppliers who are producers who must purchase inputs to be processed into output which they sell to final users or as inputs to other processors; and 2) primary suppliers whose output is not directly dependent on purchased inputs. This latter category includes non-local suppliers (or imports). Purchasers include: 1) intermediate or processing purchasers who buy the outputs of suppliers for use as inputs for further processing; and 2) final purchasers who buy the outputs of suppliers in their final form and for final use. This latter category includes purchases by non-local users (or sales to exports). The level of demand by final purchasers, and its composition, are determined outside the processing sector. Production to meet the exogenously determined final demands generates intermediate purchases and sales. Primary suppliers and final purchasers may or may not be one and the same. However, in the interindustry model, their activities are treated as if they were completely independent of one another.

In summary, the two major divisions of suppliers are the intermediate suppliers, which are called the processing sector, and the primary suppliers, which are referred to as the final payments sector. (The suppliers are conventionally shown along the left border of an interindustry table.) The two major divisions of the purchasers are the intermediate purchasers, which are labeled as the processing sector (just as with the intermediate suppliers) and the final purchasers, which are labeled final demand. (The purchasers are

conventionally shown along the top of an interindustry or input-output table.) It is within this general framework that a further sector disaggregation must be accomplished.

The ideal sector delineation would allow unique recognition of industries or producer groups which provide a homogenous good or service. This ideal is very difficult to achieve because of the large amounts of time and finances required for detailed disaggregation, disclosure problems, and lack of data. Any of these factors or a combination of them lead to a violation of the homogenous product ideal.[3]

Sector selection, in addition to dependence upon financing, time, and data availability, is determined to a large extent by the objectives of the study. Research objectives can often be achieved without detailed disaggregation in all sectors. Since the purpose here is largely to determine the impacts of energy-related development and other sectors such as ski tows, agriculture, and local government, economic sectors such as trade and services do not require detailed disaggregation. The final delineation of the sectoring plan adopted for this study is shown in Table 2-1. A discussion of the two non-conventional accounting device sectors and how they are used follows. These sectors are the local and county taxes account and the transfer account. There is also an explanation of the profit and depreciation sectors.

The local and county government tax sector is employed as an accounting device, including all building permit fees, franchise taxes, local and county liquor license fees, charges for services, intergovernmental transfers, and fines and forfeitures. All revenues (basically property and sales taxes, though also general occupation license fees) accruing to local and county government entities are shown as being paid to this account (sector). In turn the account distributes the tax monies to the appropriate agencies.

Thus the entries in the row for the local and county government tax sector show the amounts of local sales and property taxes and other charges paid by each respective sector in the region's economy. In turn, the column entries in the local tax account distribute monies for health, education, social services, roads and bridges operation and maintenance, other general government activities, and otherwise unallocated bond indenture sinking funds.

Where enterprise accounting was employed, the profit sector includes after-tax profits, charges to reserves for bad debts, capital loss amortization, and outlays for rents and royalties.[9] Where government fund accounting was employed, the profit sector includes surplus of current revenues over current[10] expenditures,[11] the value of capital expenditures appropriated out of current revenues, contributions to bond indenture sinking funds out of current revenues, net charges out of current revenues to any other reserve fund (e.g., contingency funds), and rent payments.

The depreciation sector includes both depreciation and net inventory depletions. Inventory depletions are, relatively speaking, insignificant and are placed with depreciation charges. Similarly, the net inventory accumulation values were incorporated in the investment sector.

With the exception of the intersection of the household row and the transfer column and the household on household cell, the household row represents wages and salaries paid subject to withholding. In the absence of an adequate source for domestic employment earnings, 23 employees[12] are assumed to be full-time equivalents at $2.75 an hour for 2,000 hours.

QUESTIONNAIRE DESIGN AND USE

Previous experience with questionnaires employed to obtain primary information for interindustry models suggested that a questionnaire, as such, should not be used in the pursuit of primary data. The reason behind this is

that no firm accounts for expenditure and revenue patterns on an SIC basis, the language ultimately employed in an interindustry model. Rather, a firm's books are designed around process or product activities. The use of a questionnaire, either by mail or by interview, presupposes adequate translation from a firm's accounting language into SIC codes. The typical entrepreneur or manager does not ordinarily work with SIC descriptions, a rather precise and technical language.

Accordingly, a determination was made to conduct all interviews in a basic accounting language tailored to the individual firms involved and for the researcher to make the translation to SIC classification. Thus, the questionnaire form which appears in the appendix represents the format for the final translation by the researcher. A large majority of the primary data was originally collected in field notes that described the detail behind profit and loss statements for the firms interviewed.

Not all interviews could, however, be conducted as planned. It was found, for example, that some firms would have to refer for legal advice while others did not want to reveal information in the form desired. Even though it was established that the research should not solicit primary data through the mail, it was necessary to design a questionnaire for use both as an interview focal point and as an item that could be left with an interviewed firm.

The questionnaire was designed to fit three sheets of paper. A cover sheet was used to briefly explain the nature of the research and to solicit information on the nature of the firm's product lines, the number of employees, water use, and level of capacity utilization. Outlay patterns, both of a cash flow and a non-cash flow nature, were the concern of the second sheet; information on sales distribution was solicited on the third. Both sales and outlay patterns were disaggregated by Kremmling interindustry study sector descriptions

and regionalized according to (a) Kremmling, (b) Colorado other than the Kremmling region, and (c) activity outside Colorado. A question on water use was included to provide information on sector-by-sector water withdrawals. The level of production capacity utilization question was used to provide general background information.

SELECTION OF THE BASE YEAR

Other than a consumer price index for the Denver metropolitan area,[13] there is no price index constructed specifically for Colorado. This effectively removes one criterion (relatively stable prices) from consideration when selecting a base year for Colorado economic studies. The 1974 base was selected for the initial survey for the following two reasons.

Interviewing for the Northwestern Colorado interindustry study began in February 1975.[14] Calendar 1974 was the most recently completed accounting cycle for most firms; it was anticipated that the information from this cycle would be, qualitatively speaking, foremost in the command of the interviewees. Also, activities of relatively new firms were automatically incorporated in the primary data base by soliciting what was then the most current information. Later surveying and secondary data sources have been used to adjust the data to a 1978 base.

CONDUCT OF THE SURVEY

Interview schedules were arranged by telephone between three days and a week in advance. Every effort was made to gain an interview with the person who would have immediate authority to release information. The length of time spent on an individual interview varied from firm to firm. Several were conducted in less than an hour; some took place over several days. The interviews were conducted over a fifteen-month period.

PROCESSING THE DATA

Information gathered on the outlay and sales patterns for any given enterprise was tabulated to conform to the sector delineations and regional descriptions as defined in Table 2-1. Care was exercised at this step to assure a balance between outlays and sales. Any anomalies were checked and corrected before proceeding further.

The next step was to aggregate questionnaire forms within a sector and to expand the information to represent gross flows. An iterative process was used to accomplish this so that the relative composition of a given sector delineated for the Kremmling interindustry model would be more truly reflected.[15] The final iteration produced gross flow patterns for the respective sectors delineated in the model.[16] The gross flows identified in this manner provide the border totals for the initial transactions statement.

Reconciling discrepancies in any given transaction cell is to be expected; only if the research yielded perfect knowledge about outlays and sales would this be avoided. A discrepancy can emanate from one of several sources or a combination thereof. The sales or purchases of one industry to or from another industry can be misrepresented, or the total gross output value for individual sectors can be in error. In the latter, there is an aggregate distribution error in both outlays and sales for the sector. Each discrepancy is examined individually and reconciled on a case-by-case basis. Fortunately, the sources of relatively large discrepancies could be isolated and remedied through additional examination. Small discrepancies were reconciled by using imports from and exports to the world other than Colorado as residual accounts.

DATA SOURCES BY SECTOR

Agricultural Production SIC 01,02,07

Colorado. Department of Agriculture. Colorado Crop and Livestock Reporting Service. Colorado Agricultural Statistics. Annual.

Colorado State Universtiy. Cooperative Extension Service Data. Department of Economics.

Industry survey data.

U.S. Department of Commerce. Bureau of the Census. Census of Agriculture: 1974. Volume 1, Area Reports, part 41, Colorado, Section 2, County Data. Washington, D.C.: Government Printing Office, 1972.

Colorado Agricultural Statistics reports crops on a production and market value basis. By contrast the total gross output in the interindustry model is reported on a market receipts basis. The implication of this difference is not too critical when virtually all production is marketed; this is not the case with hay, however, a major crop in the two counties. Thus, to obtain an estimate of the market receipts from hay, the ratio of hay marketings reported in the 1974 Federal Census of Agriculture to the 1974 market value of hay reported in Colorado Agricultural Statistics was applied to the latter's 1978 report.

Data on the value of marketings of livestock are not published on a county basis in Colorado. Thus, the value of the total gross output of the livestock sector in the five counties was determined from information secured from the Cooperative Extension Service. The value of output by agricultural services was estimated by using information gained in surveys conducted during 1975.

Coal Production SIC 12

Colorado. Department of Natural Resources. Division of Mines. A Summary of Mineral Industry Activities in Colorado. Part I: Coal. Annual.

Colorado. Public Utilities Commission. Files.

Hebb, D.H., and Curtin, M.S., "Colorado Coal: A Production and Shipment Directory." (U.S. Department of Interior, Bureau of Mines.) Golden, Colorado: Colorado School of Mines Mineral Economics Institute, 1977. (Photocopy reproduction.)

Industry survey data.

Data on tonnage and labor days are available in the Division of Mines publication on a mine by mine basis. The PUC files, the Hebb-Curtin study, and survey information provided the data used in estimating price.

Metal Mining, Oil and Natural Gas Production, and Nonmetal Mining SIC 10,13,14

Colorado. Department of Natural Resources. Division of Mines. A Summary of Mineral Industry Activities in Colorado. Part II. Metal-Nonmetal. Annual.

Colorado. Department of Natural Resources. Oil and Gas Conservation Commission. Oil and Gas Statistics. Annual.

Industry survey data.

Pederson, John A., and Rudawsky, Oded, "The Role of Minerals and Energy in the Colorado Economy." (U.S. Bureau of Mines Grant No. G-0122090.) Golden, Colorado: Department of Mineral Economics, Colorado School of Mines, 1974. (Photocopy reproduction.)

Total gross output values for metal mining, oil and natural gas production, and nonmetal mining were taken from the State of Colorado publications. Inter-industry flows were estimated by using the Pederson-Rudawsky study adjusted and updated with information gained in independent surveys and using both Nelson and Wholesale Price Indices. It should be noted that the intrasector transaction estimate (essentially operators purchasing from related services) causes the total gross output value of the sectors to be greater than the output value of minerals and fuels.

Also, the market value of stripper wells and natural gas production increased at a greater rate than did input prices from the time of the Pederson-Rudawsky study to 1978. After accounting for increased royalty

values (an estimate based on the United States Government's royalty revenues) and increased input prices, there was still a considerable portion of the regional oil and gas dollar that was unaccounted for. That residual was charged to profits and the imputed federal and state corporate income taxes.

Construction SIC 15,16,17

Colorado. Department of Labor and Employment. Files.

Industry survey data.

Information gained by interviews with contractors was used to calculate a ratio between contract value and outlay for labor on a two-digit SIC level. This ratio was then applied to the annualized employment and wage data for 1977 provided by the Colorado Department of Labor and Employment to estimate total gross output.

Manufacturing SIC 20,24,25,27,28,29,32,33,34,35,38,39

Colorado. Department of Labor and Employment. Colorado Manpower Review. Monthly.

Colorado. Department of Labor and Employment. Files.

Industry survey data.

For those firms not directly surveyed in the two counties, the survey results from the nine county study were used as a proxy. It is inlikely that this method seriously biases the results as the firms involved rely on rather standardized technology, e.g., dairy manufacturing.

Transportation and Communication SIC 40,41,42,45,47,48

Colorado. Department of Labor and Employment. Files.

Colorado. Public Utilities Commission. Files.

Colorado. State Auditor. Files.

Industry survey data.

Information pertinent to railroad and telephone communications was gained from filed PUC reports and survey. Because of the nature of the accounting

systems employed by the firms involved, a significant amount of prorating was required to scale the data to approximate the two county conditions. The methods of prorating, originally developed for 1974 conditions in nine northwestern Colorado counties, were applied to reported 1978 data.

Electric and Natural Gas Utilities SIC 491,492,493

Colorado. Department of Labor and Employment. Files.

Colorado. Public Utilities Commission. Files.

Colorado. State Auditor. Files.

Industry survey data.

A certain amount of prorating and imputation was involved in this sector because of geographic location of activity. This was especially true for activities of the Public Service Company of Colorado and Western Slope Gas as their 1978 PUC reports were used extensively. Electric activities under the control of local public authorities were identified by examining 1978 reports filed with the State Auditor. Finally, information gained from the Colorado Department of Labor and Employment and from interviews provided cross checks throughout the estimation of the activities of this sector.

Wholesale Trade SIC 50,51; also

Retail Trade SIC 52,53,54,55,56,57,58,59

Colorado. Department of Labor and Employment. Colorado Manpower Review. Monthly.

Colorado. Department of Labor and Employment. Files.

Colorado. Department of Revenue. Annual Report. Annual.

Industry survey data.

Interviews conducted for the nine county study in northwestern Colorado with a 1974 base year were used to determine the basic outlay patterns for the trade sectors for the 1978 Kremmling model. Mention is made here of the practice of "margining" the trade account sectors. Convention dictates that the trade

sectors are entered in the interindustry model at the level of gross margins. The reasoning behind this is to facilitate showing the direct economic links between producers and users. In a well developed economy, the absence of margins would interject huge trade dollar turnover between producers and consumers.

In the Kremmling region, however, virtually none of the trade sector sales were supplied by local producers. Thus margining would serve no useful purpose. For this reason, the Kremmling model shows actual sales among all sectors rather than imputing margins to the trade sectors.

Finance, Insurance, and Real Estate SIC 60,61,62,63,64,65,66

Colorado. Department of Labor and Employment. Colorado Manpower Review. Monthly.

Colorado. Department of Labor and Employment. Files.

Colorado. Department of Regulatory Agencies. Division of Insurance. Insurance Industry in Colorado: Statistical Report. Annual.

Colorado. Department of Revenue. Annual Report. Annual.

County Clerk Office, respective counties. Files.

Federal Credit Banks of Wichita. Files.

Federal Home Loan Bank Board. Combined Financial Statements - Member Savings and Loan Associations of the Federal Home Loan Bank System. Annual.

Industry survey data.

Sheshunoff & Company, Inc. The Banks of Colorado. (A private publication.) Annual.

The output value of the finance sector was entered in the two-county interindustry model as the estimated value of interest charges incurred within the region. Interest earnings by commercial banks were readily identified in the Sheshunoff publication; likewise, the Federal Credit Banks of Wichita provided data relevant to the operations of the Production Credit Association

and Federal Land Bank Association. Regional information on the activities of savings and loan associations is not readily available so the data published for Colorado in the Federal Home Loan Bank Board's Combined Financial Statements were prorated by a wage and salary formula for the Kremmling region. Survey date were used both as a cross check to published data and to estimate financing from outside the region, e.g., certain school bonds, Rural Electrification Association loans, insurance company loans, and so forth.

Information gained in interviews with several major insurance companies in the 1974 nine county interindustry study suggested that a precise accounting for insurance premiums paid on per county basis was a near impossibility. Another difficulty observed was with respect to loss claims; specifically, in a small region the losses incurred by any one economic sector cannot be predicted with any certainty. Thus, for the Kremmling interindustry model, the insurance sector was handled as follows.

Gross insurance premiums paid in the Kremmling region were approximated by prorating premiums paid in the State of Colorado by a personal adjusted gross income figure Premiums paid in Colorado are reported in the State Division of Insurance's Statistical Report; personal income is reported in the Department of Revenue's Annual Report. The state loss experience ratio was then used to split gross premiums paid; the loss portion was charged to the transfer account in the Kremmling interindustry model and the balance was charged as gross output of the insurance sector. Accordingly, the transfer row collects the portion of premiums paid that subsequently reimburses for losses and the transfer account column distributes the same to contractors, auto dealers, health practitioners, and so forth. (The reader is alerted to the fact that the transfer account is also used for other purposes in the model; see the section on transfer account.)

Information on documentary fees paid for real estate transactions was secured from the county clerks in the respective counties. The fee information was used to estimate the gross value of transactions, and survey information provided a means to estimate the commissions which make up the gross output of the real estate sector.

Survey information collected for the 1974 nine counties in northwestern Colorado provided the means to make a first approximation distribution of the total gross outlays in the finance, insurance, and real estate sector. Select adjustments were then made to accommodate certain relative price changes such as for utilities, taxes, and wages.

Services SIC 70,72,73,74,75,76,78,79,81,86,89

Colorado. Department of Labor and Employment. Colorado Manpower Review. Monthly.

Colorado. Department of Labor and Employment. Files.

Colorado. Department of Revenue. Annual Report. Annual.

Industry survey data.

U.S. Department of Commerce. Bureau of the Census. Census of Selected Service Industries, 1972: Area Series, Colorado, 72-A-6. Washington, D.C.: Government Printing Office, 1974.

Sales by the hotels and other lodging facilities sector were estimated by annualizing the pertinent information reported in the Department of Revenue's Annual Report.

The ski industry was surveyed for the 1979 season and a separate sector designed accordingly.

Health SIC 80

Colorado. Department of Labor and Employment. Files.

Colorado. Department of Revenue. Annual Report. Annual.

Colorado. State Auditor. Files.

Industry survey data.

Health facilities owned by local public authorities had current financial statements on file with the State Auditor. The deliveries of services in nursing home situations were used as they appeared in the 1974 nine county study. Other components of the health/medical care sector were increased from the estimated 1974 conditions in accordance with population increases as reported in the Department of Revenue's Annual Reports. Further adjustments were made for relative price changes. Information was not available to estimate changes in wage rates from 1974 to 1978 for this sector so the state change in the retail trade sectors was arbitrarily used as a proxy.

Education SIC 82

Colorado. Department of Education. Files.

Colorado. Department of Education. Revenues and Expenditures: Colorado School Districts. Annual.

Industry survey data.

Information on public school districts is published on an annual basis in Revenues and Expenditures.

Water, Sewer, and Trash SIC 494,495,496,497; also

Local and County Roads; also

Local and County Government; also

Local and County Taxes

Colorado. State Auditor. Files.

Industry survey data.

The 1978 audit reports for all local and county government authorities were examined and the data contained therein were aggregated. Information gained in select interviews facilitated the distribution of the various sectors' outlays.

Mention is made of an accounting device in the Kremmling model; namely, the tax account. Conventional interindustry transactions tables charge the local and county government cells in respective columns with the value of taxes paid. The subtle assumption in such a procedure is to the effect that respective sectors "buy" a service from the local and county government authorities. The disaggregation of the local and county government functions in the two county model, if convention were followed, would have required prorating taxes paid by any one economic sector. The procedure would produce rather untenable results, e.g., the agriculture sector would be shown as purchasing from health/medical care, education, and so forth. To avoid this dilemma, the tax account row collects all local and county property, specific ownership, and sales taxes, and the tax account column distributes these monies to the various agencies.

Households

Colorado. Department of Labor and Employment. Files.

Colorado. Department of Revenue. Annual Report. Annual.

Colorado. Public Employees Retirement Association. Files.

Community Services Administration. Federal Outlays in Colorado. Annual. (Prior to fiscal 1975 published by Office of Economic Opportunity.)

Industry survey data.

U.S. Department of Commerce. Bureau of the Census. Census of the Population, 1970: General Social and Economic Characteristics, Final Report, Colorado, PC (1)-C7. Washington, D.C.: Government Printing Office, 1972.

U.S. Department of the Treasure. Internal Revenue Service. Statistics of Income 1969, ZIP Code Area Data from Individual Income Tax Returns. Washington, D.C.: Government Printing Office, 1972.

Household income in the Kremmling interindustry model is shown as emanating from wages and salaries subject to withholding, proprietorship, partnership, and Sub-Chapter S Corporation income, interest, rent, and dividend income, and transfer payments.

The Department of Revenue's Annual Report publishes, on a county basis, personal adjusted gross income figures.

Audit reports for the respective counties provided information on the level of payments made to households by the five counties' departments of social services. An estimate of payments by the Colorado Public Employees' Retirement Association was made based on information provided by the Association. The value of transfer payments made by the U.S. Government was approximated by the reported information in Federal Outlays. Life insurance distributions were estimated in accordance with the procedure described in the insurance section of this writing.

Payments made to the household account by the respective regional economic sectors reflect an estimate of wages paid subject to withholding. For most of the private enterprise portion of the economy, this estimate reflects the place of work data base provided by the Colorado Department of Labor and Employment files. Estimates on the earnings of agricultural, railroad, and government employees reflect the information sources peculiar to those sectors. The household-on-household cell was imputed by taking the domestic employment figure from the Census of Population and annualizing a $2.75 wage rate. The transfer column entry for households is a closing entry that is described in detail in the transfer account section. Essentially it is an entry that brings non-wage and salary income to the household sector.

Households were not surveyed to gain information on their outlay patterns. Rather, there was a reliance on the sales information provided by regional brochures. Accordingly, the import figures, aside from the post marginal trade sector merchandise, for households is largely a residual value.

State Government; also

Federal Government

Colorado. Department of Education. Revenues and Expenditures: Colorado School Districts. Annual.

Colorado. Department of Highways. Colorado's Annual Highway Report. Annual.

Colorado. Department of Natural Resources. Division of Wildlife. Colorado Big Game Harvest. Annual.

Colorado. Department of Natural Resources. State Board of Land Commissioners. Summary of Transactions. Annual.

Colorado. Department of Planning and Budget. Files.

Colorado. Department of Revenue. Annual Report. Annual.

Colorado. State Auditor. Files.

Colorado. Public Employees Retirement Association. Files.

Colorado. Public Utilities Commission. Files.

Community Services Administration. Federal Outlays in Colorado. Annual. (Prior to fiscal 1975 published by Office of Economic Opportunity.)

Industry survey data.

Sheshunoff & Company, Inc. The Banks of Colorado. (A private publication.) Annual.

U.S. Department of the Treasury. Bureau of Government Financial Operations. Combined Statement of Receipts, Expenditures, and Balances of the United States Government. Washington, D.C.: Government Printing Office. Annual.

U.S. Department of the Treasury. Internal Revenue Service. Statistics of Income 1969, ZIP Code Area Data from Individual Income Tax Returns. Washington, D.C.: Government Printing Office, 1972.

Total gross output for the government sectors is defined in terms of the estimate of revenues from all sources. For private enterprise in the endogenous portion of the model, an estimate was made of income and payroll tax liabilities and fees and royalties paid by each respective sector. There is no real cross check against these estimates because neither Colorado nor the

U.S. Government reports business tax liabilities on a county basis. Further, previous research experience has demonstrated that prorating the reported state level of collections (reported in the Treasury's Combined Statement of Receipts, Expenditures, and Balances and the Department of Revenue's Annual Report) by such factors as population or personal income produces questionable results.

Personal tax and fee liabilities were much more readily estimated by using such publications as the Department of Revenue's Annual Report, the Division of Wildlife's Big Game Harvest, and the IRS's ZIP Code Area Data. The exports by the State of Colorado include estimates of sales taxes.

All estimates of government revenues were annualized and put on a 1978 basis. Expenditures were likewise adjusted.

For the U.S. Government, the publication Federal Outlays was used as a first approximation of expenditures. Select interviews with the larger agencies, such as the U.S. Forest Service, Bureau of Land Management, and U.S. Postal Service, provided the information to estimate agency operating expenditure patterns. Information on direct payments for such things as schools, interest on government securities held by commercial banks, highways, and local government activities was taken from the Colorado Department of Education's Revenues and Expenditires, Sheshunoff's The Banks of Colorado, Colorado's Annual Highway Report, and files in the Colorado State Auditor's office.

State of Colorado expenditures were first approximated by information contained in regionalized budgets provided by the Department of Planning and Budget. This information was on a state planning region basis and was designed for state analysis for the fiscal 1978 budget so modification was necessary on an agency by agency basis. Contacts were made with the larger agencies such as the Division of Wildlife and the State Department of Highways to accommodate this requirement.

Survey information was used to estimate the investment column. The value of these investments was then set against the value of the profit and depreciation rows. Out of the net difference, the estimate of entrepreneurial income was taken and closed to households; the residual after accounting for entrepreneurial income was treated as a regional capital shortage.

Imports - Colorado; also

Exports - Colorado; also

Imports - World; also

Exports - World

Imports and exports in the Kremmling interindustry model were estimated by using survey information. Also, in the process of reconciling and balancing the transactions table, the entries in these rows and columns were used as the adjustment mechanism.

Labor

Colorado. Department of Labor and Employment. Colorado Manpower Review. Monthly.

Colorado. Department of Labor and Employment. Files.

Industry survey data.

U.S. Department of Commerce. Bureau of the Cenus. Census of Population, 1970: General Social and Economic Characteristics, Final Report, Colorado, PC (1) - C7. Washington, D.C.: Government Printing Office, 1972.

The labor estimates are annualized full-time equivalents of wage and salaried employees. Further, the estimates refer to work performed within the Kremmling region. The private sector of the economy, with the exception of agriculture, was estimated by using the quarterly report information by place of work submitted to the Colorado Department of Labor and Employment.

No single source or agency seems to be able to provide an adequate estimate of annualized full-time equivalent employment in agriculture.

Consequently, using Colorado State University farm and ranch survey data and wage rates published in the Colorado Agricultural Statistics, full-time employment equivalents were imputed. Employment by government agencies was estimated by using survey information.

Caution is exercised to the fact that employment levels as defined in the Kremmling interindustry model do not approximate employment levels as defined in some commonly distributed publications. The Colorado Manpower Review, for example, publishes county estimates on the resident adjusted labor force. Aside from the definitional difference, and the fact that employment by industry is not reported for low population counties, the current method used to estimate the resident adjusted labor force is extremely questionable. The reader is referred to the January 1977 Manpower Review for a complete discussion on this matter.

NOTES

[1]Colorado Department of Natural Resources, Division of Mines, A Summary of Mineral Industry Activities in Colorado - 1977 (June 1978); and Colorado Department of Natural Resources, Division of Mines, State Coal Mine Inspection, Monthly Report; and Colorado Department of Natural Resources; Oil and Gas Conservation Commission, Oil and Gas Statistics 1977 (1977); and Colorado School of Mines Mineral Industries Bulletin, March 1975; and U.S. Department of the Interior, Bureau of Mines, Subcommittee to Expedite Energy Development. Also, U.S. Environmental Protection Agency, Socio-economic Impacts of Natural Resource Development Committee, "A Listing of Proposed, Planned, or Under Construction Energy Projects in Federal Region VIII" (a joint report prepared to the Committee on Energy and Environment of the Denver Federal Executive Board and the Mountain Plains Federal Regional Council, August 1975), (photocopy reproduction).

[2]U.S. Department of the Interior, Bureau of Land Management, Final West-Central Colorado Coal Environmental Statement, 3 volumes (1979); and U.S. Department of the Interior, Bureau of Land Management, Final Environmental Statement, Federal Coal Management Program (Washington, D.C.: Government Printing Office, April 1979); and U.S. Department of the Interior, Bureau of Land Management, Final Environmental Impact Statement, Proposed Federal Coal Leasing Programs (Washington, D.C.: Government Printing Office, 1975); and U.S. Department of the Interior, Office of the Secretary, Final Environmental Statement for the Prototype Oil Shale Leasing Program, 6 volumes (Washington, D.C.: Government Printing Office, 1973).

[3]Environmental Impact Assessment Project of the Institute of Ecology. A Scientific and Policy Review of the Final Environmental Impact Statement for the Prototype Oil Shale Leasing Program of the Department of the Interior. Edited by Katherine Fletcher and Malcolm F. Baldwin (Washington, D.C.: Environmental Impact Assessment Project, 1973). Researcher's assessment.

[4]Colorado General Assembly, Final Report of the Committee on Oil Shale, Coal, and Related Minerals, Legislative Council Research Publication No. 208, often referred to as the Michael L. Strang Committee Report (December 1974); and Colorado Office of the Governor, Oil Shale Planning and Coordination, Impact: An Assessment of the Impact of Oil Shale Development - Colorado Planning and Management Region II, 5 volumes, often referred to as the Donald A. Rapp Report (December 1974); and U.S. Department of the Interior, Oil Shale Environmental Advisory Panel, First Annual Report (Denver, Colorado: U.S. Department of the Interior, June 1975).

[5]See Chapter 3 for a more complete explanation of the interindustry model.

[6]The projections are consistent but the underlying assumption in the model of fixed production coefficients qualify the results unless some dynamic adjustment of technology is explicitly involved.

[7]1980 estimated population 9,500: Colorado State Planning Office.

[8]Information obtained from the Colorado Department of Labor and Employment cannot be published unless there are at least three firms in a given sector and no two firms account for more than 80 percent of the total employment. Ethical considerations also dictate that the operations of any single enterprise can never be divulged.

[9]Except in the case where rents (e.g., agricultural land leases) and royalties (e.g., oil and gas) were paid to the Colorado and federal governments. In these instances the amounts are shown as being paid directly to the respective governments.

[10]Current in the sense that it occurred in 1978.

[11]An exception to this is in the Colorado and federal government sectors.

[12]U.S. Department of Commerce, Bureau of the Census, Census of Population, 1970: General Social and Economic Characteristics, Final Report, Colorado, PC (1) - C7, Washington, D.C.: Government Printing Office, Table 123.

[13]Colorado Department of Labor and Employment, Division of Employment and Training, Colorado Manpower Review, Monthly.

[14]Gray, S. Lee; McKean, John R.; and Weber, Josepho C., The Economy of Northwestern Colorado: Description and Analysis. (Bureau of Land Management Contract No. 52500-CTS01019.) Fort Collins, Colorado: Department of Economics, Colorado State University, March 1977. This is often referred to as the nine county study and some of its surveys were used in this study.

[15]For example: There were three two-digit SIC classifications incorporated in the sector delineation for construction. Accordingly the questionnaire forms were first aggregated on the basis of the two-digit categories. Regional payroll data from the Colorado Department of Labor and Employment was the aggregated on the same basis. The payroll values on the aggregated questionnaire forms represented a given proportion of the regional payroll in each respective SIC classification; based on this ratio the information on the aggregated two-digit level questionnaire sheets was blown up to represent the total pattern for the two-digit delineation. Subsequently, the computed totals at the two-digit level were aggregated to represent the construction sector in the Kremmling, Colorado interindustry model.

[16]The gross flow patterns were arrived at in either one of two ways. First there was a method that used payroll data (described in the preceeding footnote) when an adequate total gross output value had not been identified. The second method distributed gross flows within the bounds of a total gross output value based on the relative allocation of the flows identified on initially aggregated questionnaire forms.

CHAPTER 3

ANALYSIS OF THE KREMMLING REGION OF WESTERN COLORADO

INTRODUCTION

The results of the descriptive analysis of the Kremmling region's economy are presented in this chapter. The discussion contained in the chapter includes: the description of the economy; an analysis of the nature and magnitude of economic interdependence among processing sectors; the various business activity and income multipliers; and an analysis of employment in the region.

The description and analysis of the economy hinges on three major components of the interindustry model. These are: the gross flows or transactions table; the table of direct production requirements; and the table of direct plus indirect production requirements. These tables are discussed and interpreted in turn. Because of the size of the tables, they are presented in the appendix.

THE TRANSACTION TABLE

The first essential component of any interindustry study is the collection and tabulation of data which serve to describe the flows of commodities from each supplying sector to each purchasing sector. These flows are typically expressed in terms of the dollar value of transactions occurring in a specific period of time, normally one year. The information is arrayed in tabular form with the suppliers (selling sectors) listed at the left of the table and the purchasing sectors listed at the top. The information in this table, termed the transactions table, does two things simultaneously: it identifies the estimated dollar value of sales by each sector to each of the other sectors (thus, the distribution of each sector's output), and it identifies the purchases of

ingredients of production by each sector from each of the other sectors (the distribution of purchases). In essence, the material contained in the transactions table represents a double-entry system of bookkeeping in which every sale is simultaneously described as a purchase. Thus, the system deliberately double counts. The transactions table for the Kremmling economy is found in the appendix. A description of the sector identification labels used throughout the appendix and in the tables of this chapter is also shown in the appendix.

The rows and columns of Table B-1, which are numbered 1-18, identify the processing, or intermediate demand, sectors. Row and column 19 represent subtotals of activities within the processing sector. This portion of the table describes, in dollar terms, the flow of goods and services necessary to satisfy intermediate demands. Final demands, i.e., demands for goods and services that will not be further processed within the region, are indentified in columns 20-23 and 25. Rows 20-24 and 26 identify the final payments sector. Final payments include, then, federal and state taxes, wages, profits, rents, losses, net inventory depletions, and payments for goods and services imported from outside the region. The rows and columns numbered 18 and 25 (the local and county government tax account and the transfer account) are accounting devices as described previously. The last row and column of Table B-1 contain, respectively, total outlay (purchases) and total output (sales) for each sector of the regional economy.

The total distribution of total output of each sector, according to the sectors in which the output is sold, may be readily discerned by reading across the rows of Table B-1. The bill of purchases by each sector is found by reading down any column of the table. These column entries show the allocation of purchases by cost component.

For example, consider sector 2, ALL MINING. Reading across row 2 of Table B-1 shows that the total output of ALL MINING was distributed in the following way: $153,041 worth of output was sold to ALL MINING and the remainder was sold to exports. Total sales by ALL MINING to the processing sector of the economy thus amounted to $153,041. The remaining sales were to the final demand sectors consisting of EXPORTS. Export sales amounted to $140,991,237. Total sales to final demand thus amounted to $140,991,237. The total gross output of the ALL MINING sector is the sum of these individual sales or $141,144,278.

The distribution of purchases by ALL MINING by cost category are shown in column 2 of Table B-1. Purchases by ALL MINING from ALL MINING were estimated at $153,041; from CONSTRCT, at $126,642; from TRAN/COM/UT, $968,024; from WAT/SAN, $10,556; from TRADE-NEC, $254,977; from SERVICE-NEC, $21,113; from LOC-ROADS, $90,793; and property and sales taxes of $1,544,348. Total purchases by coal mines from the processing sector are thus estimated at $3,169,394 for 1978. Final payments made by ALL MINING were estimated at $137,974,884. Final payments were distributed as follows: wages subject to withholding, $3,541,465; taxes and charges of the State of Colorado, $188,630; taxes and charges of the federal government, $886,215; profits, royalties, and rents, $422,262; depreciation, $4,805,384; and imports from outside the Kremmling region of $128,130,928. Total purchases thus amount to $141,144,278 and, as required by the accounting format, equal the value of output.

Other information can be obtained directly from the transactions table. The household row, with the exception of the sale by households to the transfer account represents wages paid subject to withholding. This row shows household income. The ten leading contributors to household income in descending order are: ALL MINING, ALL-MFG, REC-FACIL, EDUCATION, FIN/INS/RE, CONSTRCT, TRADE-NEC,

EAT/DR, FED-GOV, and HOTEL/MOT. Similarly, sector by sector contributions to taxes may be directly obtained from Table B-1. The ten sectors showing the greatest dollar outlay for local and county taxes in descending order are: HOUSEHOLDS, ALL MINING, EXPORTS, AG/LIVESTK, TRN/COM/UT, TRADE-NEC, ALL-MFG, CONSTRCT, FIN/INS/RE, and SERVIC-NEC.

Estimates of gross regional income and gross regional product may be obtained from the final payments and final demands portion of the table. Gross regional product is defined as the sum of deliveries to final demand, net of imports. Traditionally, local and county government activities are included as part of final demand. Because this model treats these accounts as part of the processing sector, an adjustment is required. Also, the transfer and tax accounts cannot be counted in final demand, for to do so would be double counting. Thus, the sum of education; water, sewerage, and sanitation; local roads; local government; households; state government; federal government; investment and inventory accumulation; and exports from the region, less regional imports, yields the estimated gross regional product of $92,028,265. Gross regional income (which must equal gross regional product) is computed as the sum of final payments less imports. Again, the local and county tax account and the transfer account must be excluded to avoid double counting.

While these items, obtained directly from the transactions table, are useful as initial indicators of the relative importance of each sector in the regional economy, the important question of interdependence is not addressed. In order to do so, it is first necessary to isolate the direct production relationships existing in the economy.

DIRECT PRODUCTION REQUIREMENTS

The direct production requirements, or coefficients, represent the second major component of the interindustry analysis. These direct requirements are

presented in the appendix. Computation of the direct production requirements is quite simple, given the transactions table, and requires only that each column entry of the transactions table be divided by the respective column total. The resulting coefficients describe the direct purchases necessary from each supplier (at the left of the table) in order for the purchasing sector (at the head of the column) to produce one dollar's worth of output. The coefficients, then, are interpreted as the direct requirements per dollar of output produced by each sector.

As an example consider the ALL MINING sector, sector 2 (column 2 of the direct requirements table). For every dollar's worth of output produced by mines in the region, $.0001 worth of inputs are required from the ALL MINING and related services sector; $.0008 from CONSTRCT; $.0068 from TRN/COM/UT and so forth. It is obvious from the table that far and away the largest direct purchases made by the ALL MINING sector are those for labor inputs, with a direct outlay of over 2.5 cents per each dollar of output produced. This says that a dollar's worth of production in MINING requires an input of labor services valued at 2.5 cents. Each column of the direct requirements table is interpreted in this manner.

These direct impacts identify only a portion of the total economic impacts that would accompany a change in final demands for the output of a given sector. There are additional, or indirect, impacts which can be quite important. Assessment of all direct and indirect impacts of these exogenous (final demand) changes is made possible through the third analytical component of interindustry analysis. This component is the table of direct plus indirect production requirements.

DIRECT PLUS INDIRECT IMPACTS

The concept of interdependence can be established with a brief example. Suppose that the export demand for coal production increases. There will be

immediate, or direct, responses of the following type: Coal production will have to increase. In order for coal production to increase, inputs must be obtained from sectors such as transportation, utilities for power, and labor. These are direct impacts. As transportation and utilities increase their output to meet the increasing requirements in the coal sector, their own requirements for productive ingredients increase, e.g., services, labor, petroleum and natural gas, and coal. The chain of events goes on. The total impacts are readily estimated through the input-output framework and are presented in the appendix.

Before proceeding to a discussion of the table, a few comments regarding the treatment of households are in order. Households may be treated as either a part of the processing sector of the economy or as a part of the final demand component. In the first instance, households are treated in precisely the same manner as any other production sector. The estimate of the direct and indirect production impacts of a change in final demand which include the induced production impacts which derive from increased household incomes and increased consumption. In the latter, with households a component in final demand, the induced impacts of successive rounds of consumer spending are omitted. For purposes of this report, the discussion of economic interdependencies and the subsequent business and income multiplier analysis is based upon the model which includes households both as a member of the processing sector of the economy and as a final demand sector.

The direct plus indirect coefficients are interpreted as the production required or generated in all sectors of the economy in order to sustain the delivery of one dollar's worth of output to final demand by any single sector. It should be carefully noted that these coefficients reflect production generated per dollar of final demand as opposed to requirements per dollar of

output. This, of course, reflects the fact that the model is driven by changes in final demand.

For purposes of interpretation, consider the coal mining sector. Suppose that the export demand for mined coal increases by $1 million. What is the estimated impact that this increase will have on the entire Kremmling region of the Western Colorado economy? The answer to this question may be obtained directly by reading down Column 2 of the table and summing the individual sector impacts. Thus, the increase of $1 million in the final demand for coal generates a direct plus indirect production valued at $1,000 in ALL-MINING; $2,000 in CONSTRCT; $10,000 in TRN/COM/UT; $1,000 in WAT/SAN; $3,000 in GS/AUT-DLR; $2,000 in EAT/DRNK; $16,000 in TRADE-NEC; $6,000 in FIN/INS/RE; and so on down the column. Any column of this table is interpreted in this same manner. The sum of the entries in column 2 shows the total production generated locally as a result of the increase in export demands for ALL MINING. Thus, the total business activity generated per dollar increase in final demand for coal is 1.11 or, in our example assuming a $1 million increase, 1.11 million worth of business activity results. These column sums are one of the various multipliers concepts which are derived from input-output analysis.

BUSINESS MULTIPLIERS

The column sums of the direct plus indirect requirements table are termed business activity (or production) multipliers. They identify the total value of production in the region which results from a dollar's worth of output delivered to final demand. Table 3-1 presents the business multipliers. These estimates indicate that the greatest business activity generated per dollar of delivery to final demand is by the CONSTRCT sector. The business multiplier for this sector is 2.84 which indicates that, as the "final demand" for local government services increases by $1, a total production of $2.84 is

generated in the Kremmling economy. Other sectors of the economy which have relatively large business multipliers are: AG/LIVESTK, MFG-NEC, and HOTEL/MOT. These sectors show the greatest degree of interdependence with other sectors of the regional economy. At the margin, these sectors generate the greatest business activity per dollar of output delivered to final demand. The phrase, "at the margin," is important as a qualification in the use of these multipliers. It implies a word of caution concerning the implication of the multipliers. In using the business multipliers, the argument should be stated in terms of the impacts of an equal dollar increase in final demands. That is, for an equal increase (in dollar terms) in final demands, local taxes will generate more business activity in the local economy than will any other private sector. However, a large exogenous increase in local taxes is less likely to occur than is a large increase in coal export (which indirectly changes local tax collections). The first column of Table 3-1 shows the business multipliers with households in final demand; the second column shows the business multipliers with households endogenous (part of the processing sector).

INCOME MULTIPLIERS

Other multiplier effects can also be estimated from the interindustry model. For example, there are income multipliers which relate to changes in income paid to the household sector. The following discussion presents what are termed the Type I and Type II income multipliers.

The Type I and Type II income multipliers are estimated ratios: Type I is the ratio of the direct plus indirect income to the direct income paid households; Type II is the ratio of direct plus indirect plus induced income to direct income. Thus, while the business activity multipliers are related to changes in sales to final demand, the income multipliers are related to changes in income paid to the household sector. The Type I multiplier describes the

TABLE 3-1

BUSINESS ACTIVITY MULTIPLIERS, KREMMLING
REGION OF WESTERN COLORADO, BY SECTOR, 1978

(In dollars of business activity generated in the Kremmling region of Western Colorado per dollar of output delivered to final demand.)

Sector	Business Multiplier I	Business Multiplier I *	Business Multiplier II	Business Multiplier II *
1 AG/LIVESTK	2.08	2.08	2.67	2.66
2 MIN/OIL/GS	1.03	1.04	1.07	1.11
3 COAL-MINES	1.08		1.62	
4 CONSTRCT	1.87	1.83	2.84	2.80
5 WOOD-PROD	1.15	1.25	2.34	2.39
6 MFG-NEC	1.71		2.66	
7 TRANS/COMM	1.44	1.22	2.46	1.79
8 ELEC/GS-UT	1.11		1.46	
9 WAT/SAN	1.39	1.39	1.88	1.88
10 GS/AUT-DLR	1.21	1.20	1.52	1.50
11 EAT/DR	1.17	1.18	1.73	1.74
12 TRADE-NEC	1.12	1.12	1.42	1.41
13 FIN/INS/RE	1.28	1.27	2.04	2.03
14 HOTEL/MOT	1.58	1.57	2.58	2.56
15 REC-FACIL	1.12	1.12	1.90	1.90
16 MEDICAL	1.17	1.17	2.19	2.19
17 SERVIC-NEC	1.27	1.26	2.14	2.14
18 EDUCATION	1.16	1.16	2.43	2.44
19 LOC-ROADS	1.21	1.21	2.07	2.07
20 LOC-GOV	1.22	1.21	2.09	2.08
21 LOC-TAXES	-	-	-	-
22 HOUSEHOLDS	-	-	2.31	2.31

*Sectors shown correspond to the aggregation required for the disclosure of the Gross Flows.

TABLE 3-2

INCOME MULTIPLIERS, KREMMLING REGION
OF WESTERN COLORADO, BY SECTOR, 1978

(In dollars of income generated per dollar of direct income paid households.)

Sector	Income Multipliers		Income Multipliers	
	Type I	Type I*	Type II	Type II*
1 AG/LIVESTK	4.12	4.10	4.96	4.93
2 MIN/OIL/GS	1.74	> 1.31	2.09	> 1.58
3 COAL-MINES	1.08		1.30	
4 CONSTRCT	1.82	1.84	2.19	2.22
5 WOOD-PROD	1.07	> 1.12	1.29	> 1.35
6 MFG-NEC	1.56		1.88	
7 TRANS/COMM	1.27	> 1.22	1.53	> 1.47
8 ELEC/GS-UT	1.17		1.40	
9 WAT/SAN	1.65	1.66	1.99	2.00
10 GS/AUT-DLR	1.39	1.35	1.68	1.62
11 EAT/DR	1.16	1.18	1.40	1.43
12 TRADE-NEC	1.37	1.36	1.65	1.63
13 FIN/INS/RE	1.23	1.22	1.48	1.47
14 HOTEL/MOT	1.38	1.37	1.67	1.65
15 REC-FACIL	1.07	1.08	1.29	1.30
16 MEDICAL	1.11	1.11	1.34	1.34
17 SERVIC-NEC	1.17	1.17	1.41	1.41
18 EDUCATION	1.06	1.07	1.28	1.29
19 LOC-ROADS	1.11	1.11	1.33	1.34
20 LOC-GOV	1.16	1.16	1.40	1.39
21 LOC-TAXES	-	-	-	-

*Sectors shown correspond to the aggregation required for disclosure of the Gross Flows.

direct plus indirect income increases emanating from an additional dollar of direct income paid to households. The Type II multiplier takes into account not only the direct plus indirect changes in income, but also the induced income increases generated by additional consumer spending. Accordingly, the Type II income multiplier identifies the direct plus indirect plus induced income generated by an additional dollar of income paid directly to households.

Attention is drawn to the comparatively higher income multiplier value estimates for the agricultural sectors. The reason for this relatively high value is straightforward. The Kremmling interindustry study allocated proprietorship and partnership net incomes to the profit account. As a result, labor inputs (household account) for agriculture and livestock are somewhat understated because this sector is characterized by a relatively high incidence of proprietorship and partnership enterprises with relatively little hired help. By understating the value (contribution) of labor inputs for this sector, the value (contribution) of other inputs, relative to labor, became larger. And, with direct income being the denominator of the Type I and Type II income multiplier ratios, the multiplier estimate for this sector is of the relatively high magnitude observed. By contrast, the relatively high multiplier values for the CONSTRCT, MIN/OIL/GS, WAT/SAN and MFG-NEC sectors exist because these sectors exhibit greater interdependence in the Kremmling economy.

EMPLOYMENT ANALYSIS

Direct employment requirements as is the case with direct business activity and direct income payments are, by themselves, of limited use for assessing the impacts of various changes in economic activity in the Kremmling region. This limitation arises because direct requirements differ from total requirements, the difference being indirect requirements that emanate from sectoral interdependence. The interindustry model provides a framework within which both

direct and indirect employment requirements can be addressed. Basic to the analysis are data on employment levels in the respective sectors and the table of direct plus indirect requirements per dollar of output delivered to final demand.

Before proceeding with the analysis some discussion on the table of direct and indirect requirements per dollar of delivery to final demand is warranted. When the household sector is included as a processing sector in the interindustry model it becomes simply another producer. To treat households in this manner is consistent within the interindustry framework, but it imposes a critical assumption on household purchase patterns. Specifically, household purchases are expressed as a linear function of income; the marginal and the average propensities to consume are assumed to be one and the same. To change this limiting assumption, the household sector has to be treated as a part of final demand.

Treating the household sector in this manner removes the assumption that household purchases are a linear function of income. Specifically, because the interindustry model is a final demand driven model, treating the household sector as any other producing sector implies the level of employment was dependent only on the level of state and federal government expenditures, investment expenditures, inventory accumulation, and exports. By treating households exogenously, this assumption is expanded to include a dependency on the level of household expenditures. Direct and indirect requirements per dollar of delivery to final demand, which are used in the employment analysis for the Kremmling region of Western Colorado, are shown in the appendix. The estimated employment levels and corresponding employment coefficients (expressed as the number of employees per dollar of total gross output) used in the analysis are presented in Table 3-3.

To assess the total employment impacts of exogenous changes in final demand, the respective tables of direct and indirect requirements per dollar of delivery

to final demand were pre-multiplied by a diagonal matrix of direct labor use requirements (where the elements of the diagonal were the employment coefficients shown in Table 3-3). Summing down the respective columns of the resulting matrix yielded the estimates of the direct and indirect labor requirements per dollar delivered to final demand. Table 3-4 presents the estimates.

The interpretation of the entries in Table 3-4 is demonstrated by an example from the COAL MINES sector. As the final demand for the output of coal expands by $1, there will be a direct expansion of employment in that sector as well as those sectors responsible for supplying production ingredients to the mining of coal sector. The sectors supplying ingredients to the mining of coal sector will in turn require production ingredients from others and this will further expand indirect employment impacts; and so forth. The magnitude of the direct and indirect employment impacts, .01001, shows the total employment generated in the entire Kremmling economy as this single sector, coal mining, increases by $1,000 its deliveries to final demand. That is to say that an increase of $1 million in the final demands, e.g., exports to the Front Range or out of state, for coal would result in an estimated additional employment of 10 persons in the Kremmling region. All remaining entries in Table 3-4 have analogous interpretations for their respective sectors. Thus, the leading sectors in terms of direct and indirect employment generation in the Kremmling economy are HOTEL/MOT, LOC-GOV, EAT/DR, EDUCATION and LOC-TAXES. Table 3-4 also shows the total employment impact of exogenous changes in workers hired. This information is found simply by dividing the direct plus indirect labor requirements per thousand dollars of final demand shown in Table 3-3. The workers added per worker hired column shows that for each worker hired by coal mining, 1.18 workers are hired throughout the region's economy. Thus, the multiplier for exogenous changes in coal mine employment is 1.18.

TABLE 3-3

TOTAL EMPLOYMENT AND EMPLOYMENT COEFFICIENTS,
KREMMLING REGION OF WESTERN COLORADO, BY SECTOR, 1978

(In number of workers in the Kremmling region of Western Colorado and workers per thousand dollars of output)

Sector	Total Employment	Workers Per Thousand $ Total Output
1 AG/LIVESTK	81	.01100
2 MIN/OIL/GS	19	.00015
3 COAL-MINES	92	.00851
4 CONSTRCT	215	.02053
5 WOOD-PROD	234	.03975
6 MFG-NEC	33	.02567
7 TRANS/COMM	74	.03256
8 ELEC/GS-UT	35	.00782
9 WAT/SAN	16	.01049
10 GS/AUT-DLR	105	.01271
11 EAT/DR	392	.05327
12 TRADE-NEC	312	.01272
13 FIN/INS/RE	152	.01648
14 HOTEL/MOT	339	.07565
15 REC-FACIL	307	.03287
16 MEDICAL	98	.04172
17 SERVIC-NEC	181	.04605
18 EDUCATION	255	.05010
19 LOC-ROADS	58	.03120
20 LOC-GOV	196	.05530

TABLE 3-4

DIRECT PLUS INDIRECT LABOR REQUIREMENTS PER THOUSAND DOLLARS OF OUTPUT DELIVERED TO FINAL DEMAND AND PER ADDED WORKER HIRED, KREMMLING REGION OF WESTERN COLORADO, BY SECTOR, 1978

Sector	Direct + Indirect Labor Requirement Per Thousand Dollars of Final Demand *		Direct + Indirect Labor Requirement Per Added Worker	
	Type I	Type II	Type I	Type II
1 AG/LIVESTK	.03217	.03794	2.92	3.45
2 MIN/OIL/GS	.00089	.00126	5.93	8.40
3 COAL-MINES	.01001	.01534	1.18	1.80
4 CONSTRCT	.03846	.04798	1.87	2.34
5 WOOD-PROD	.04368	.05545	1.10	1.39
6 MFG-NEC	.04186	.05128	1.63	2.00
7 TRANS/COMM	.04226	.05232	1.30	1.61
8 ELEC/GS-UT	.01026	.01372	1.31	1.75
9 WAT/SAN	.01818	.02307	1.73	2.20
10 GS/AUT-DLR	.01674	.01976	1.32	1.55
11 EAT/DR	.05624	.06175	1.06	1.16
12 TRADE-NEC	.01599	.01889	1.26	1.49
13 FIN/INS/RE	.02290	.03047	1.39	1.85
14 HOTEL/MOT	.08647	.09643	1.14	1.27
15 REC-FACIL	.03523	.04296	1.07	1.31
16 MEDICAL	.04641	.05649	1.11	1.35
17 SERVIC-NEC	.05218	.06086	1.13	1.32
18 EDUCATION	.05367	.06619	1.07	1.32
19 LOC-ROADS	.03482	.04329	1.12	1.39
20 LOC-GOV	.06047	.06908	1.09	1.25
21 LOC-TAXES	-	-	-	-
22 HOUSEHOLDS	-	.02283	-	-

*Type I and Type II Employment Multipliers aggregated to correspond to sectors shown in Gross Flows Table are shown below:

1	.03197	.03772	10	.02263	.03019
2	.00161	.00236	11	.08588	.09575
3	.03830	.04796	12	.03543	.04322
4	.04299	.05430	13	.04635	.05645
5	.02080	.02648	14	.05194	.06060
6	.01832	.02325	15	.05396	.06657
7	.01619	.01913	16	.03495	.04348
8	.05664	.06225	17	.06028	.06889
9	.01583	.01871	18	.05319	.06385
			19		.02288

APPENDICES

APPENDICES

Appendix

APPENDIX A

SECTOR IDENTIFICATION, KREMMLING REGION OF WESTERN COLORADO, 1978

	Sector	1972 SIC Codes
1	AG/LIVESTK	01, 02 (part), 07
2	ALL-MINING	10, 12, 13, 14
3	CONSTRCT	15, 16, 17
4	ALL-MFG	20, 22-25, 27, 29-39
5	TRN/COM/UT	40-42, 44, 45, 47, 48, 491-493
6	WAT/SAN	494-497
7	GS/AUT-DLR	55
8	EAT/DRNK	58
9	TRADE-NEC	52-54, 56, 57, 59
10	FIN/INS/RE	60-67
11	HOTEL/MOT	70
12	REC-FACIL	79 (part)
13	MEDICAL	80
14	SERVIC-NEC	72, 73, 75, 76, 78, 81, 83, 84, 86, 89
15	EDUCATION	82
16	LOC-ROADS	--
17	LOC-GOV	91-96
18	LOC-TAXES	--
19	HOUSEHOLDS	--
20	STATE GOV	91-97
21	FED GOV	91-97

APPENDIX B

INPUT-OUTPUT TABLES FOR THE KREMMLING REGION OF WESTERN COLORADO, 1978

TABLE B-1

Kremmling Region of Western Colorado, Gross Flows Table, 1978 Dollars

GROSS FLOWS TABLE

		1 AG/LIVESTK	2 ALL-MINING	3 CONSTRCT	4 ALL-MFG	5 TRN/COM/UT	6 WAT/SAN	7 GS/AUT-DLR	8 EAT/DR	9 TRADE-NEC	10 FIN/INS/RE
1	AG/LIVESTK	1339000.	0.	0.	0.	0.	0.	0.	58865.	0.	0.
2	ALL-MINING	0.	153041.	0.	0.	0.	0.	0.	0.	0.	0.
3	CONSTRCT	0.	126642.	3356624.	0.	1000.	27480.	6941.	0.	48828.	302324.
4	ALL-MFG	0.	0.	670819.	0.	3964.	0.	57845.	0.	798426.	99371.
5	TRN/COM/UT	255645.	968024.	153115.	342321.	26228.	28455.	219880.	332734.	437734.	162264.
6	WAT/SAN	2256.	10556.	2183.	1798.	3697.	0.	4297.	15452.	23616.	6629.
7	GS/AUT-DLR	207516.	0.	128456.	216211.	205436.	6118.	636303.	5150.	34513.	24884.
8	EAT/DRNK	0.	0.	10737.	0.	787.	0.	826.	0.	74.	24788.
9	TRADE-NEC	1262577.	254877.	780875.	145904.	29364.	128034.	200000.	51507.	164959.	447355.
10	FIN/INS/RE	1021790.	0.	249106.	82877.	203370.	217904.	111560.	345832.	134068.	359440.
11	HOTEL/MOT	0.	0.	2189.	0.	268.	0.	0.	1472.	0.	5725.
12	REC-FACIL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
13	MEDICAL	0.	0.	24272.	0.	0.	0.	0.	8093.	953.	0.
14	SERVIC-NEC	642848.	21113.	45749.	288340.	18800.	60451.	52061.	40470.	76254.	185238.
15	EDUCATION	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
16	LOC-ROADS	0.	90793.	0.	0.	0.	0.	0.	0.	0.	0.
17	LOC-GOV	0.	0.	0.	0.	17407.	1530.	0.	0.	383.	102492.
18	LOC-TAXES	494654.	1544348.	19648.	219734.	396845.	0.	49582.	82411.	384597.	96085.
19	SUBTOTALS	5226286.	3169394.	5443773.	1297185.	907166.	469972.	1339295.	941986.	2104405.	1796595.
20	HOUSEHOLDS	451122.	3541465.	2397732.	3174272.	1368525.	197562.	785049.	1523871.	2271721.	2497293.
21	STATE-GOV	24812.	188630.	29728.	12142.	131053.	2073.	8015.	66223.	96508.	114590.
22	FED-GOV	133645.	886215.	229372.	190544.	183894.	12439.	112220.	339946.	391104.	276491.
23	PROFITS	932694.	422262.	225119.	490188.	703402.	766092.	398309.	537880.	1442294.	736602.
24	DEPREC	403754.	4805384.	106483.	1105054.	670340.	32291.	195022.	200141.	103598.	460346.
25	TRANSFERS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
26	IMPORTS	187027.	128130928.	2038418.	903162.	2783826.	44537.	5425764.	3748070.	18126063.	3342063.
27	TOTALS	7359340.	141144278.	10470625.	7172547.	6748206.	1524966.	8263674.	7358117.	24535693.	9223980.

GROSS FLOWS TABLE

		11 HOTEL/MOT	12 REC-FACIL	13 MEDICAL	14 SERVIC-NEC	15 EDUCATION	16 LOC-ROADS	17 LOC-GOV	18 LOC-TAXES	19 SUBTOTALS	20 HOUSEHOLDS
1	AG/LIVESTK	0.	0.	0.	0.	0.	0.	0.	0.	1397865.	8743.
2	ALL-MINING	0.	0.	0.	0.	0.	0.	0.	0.	153041.	0.
3	CONSTRCT	149031.	113885.	11055.	9872.	0.	42000.	78920.	0.	4274602.	247654.
4	ALL-MFG	0.	15073.	0.	20418.	0.	15630.	12595.	0.	1694141.	130000.
5	TRN/COM/UT	396353.	349946.	60425.	102542.	193424.	38032.	77639.	84810.	4229571.	2466973.
6	WAT/SAN	72568.	16747.	3258.	6056.	23572.	1233.	2097.	304638.	500653.	463308.
7	GS/AUT-DLR	18019.	3349.	8145.	23903.	130957.	103695.	25915.	0.	1778570.	2730332.
8	EAT/DRNK	1134.	5024.	1629.	4157.	0.	114.	1058.	0.	50328.	2019072.
9	TRADE-NEC	525052.	167478.	24531.	265648.	13096.	57292.	55904.	0.	4574453.	16583513.
10	FIN/INS/RE	667928.	0.	89451.	117056.	167363.	35142.	172731.	0.	3975618.	5248362.
11	HOTEL/MOT	0.	0.	3258.	4157.	13096.	0.	1391.	0.	31556.	55000.
12	REC-FACIL	0.	0.	0.	0.	5237.	0.	28209.	0.	33446.	154000.
13	MEDICAL	0.	0.	0.	19280.	0.	0.	6200.	156870.	215668.	1516207.
14	SERVIC-NEC	51567.	125608.	119935.	121142.	18334.	9165.	110767.	0.	1967842.	1860285.
15	EDUCATION	0.	0.	0.	0.	0.	0.	0.	3906498.	3906498.	122460.
16	LOC-ROADS	0.	50243.	0.	0.	0.	0.	0.	280525.	421561.	0.
17	LOC-GOV	0.	0.	0.	0.	112566.	0.	0.	2333586.	2567964.	147000.
18	LOC-TAXES	77141.	0.	0.	87251.	0.	0.	0.	0.	3452296.	2424859.
19	SUBTOTALS	1958793.	847353.	321687.	781482.	677645.	302303.	573426.	7066927.	35225673.	36177768.
20	HOUSEHOLDS	1411014.	2947623.	935416.	1273363.	2622712.	621919.	1150814.	0.	29171473.	131056.
21	STATE-GOV	11203.	137332.	14027.	10527.	327996.	0.	20842.	0.	1195701.	2830832.
22	FED-GOV	98488.	200974.	60018.	185472.	7857.	36287.	80594.	0.	3425560.	6815264.
23	PROFITS	240239.	1108708.	648899.	596252.	0.	658017.	982321.	0.	10889278.	1178206.
24	DEPREC	512784.	1555876.	123043.	152973.	0.	0.	0.	0.	10427089.	0.
25	TRANSFERS	0.	0.	0.	0.	0.	0.	147707.	0.	147707.	0.
26	IMPORTS	248427.	2542402.	245785.	930352.	1452899.	238532.	588147.	0.	170976408.	2171656.
27	TOTALS	4480948.	9340268.	2348875.	3930421.	5089109.	1857058.	3543851.	7066927.	261458890.	49304782.

TABLE B-1

(continued)

GROSS FLOWS TABLE

		21 STATE-GOV	22 FED-GOV	23 INVESTMENT	24 TRANSFERS	25 EXPORTS	26 TOTALS
1	AG/LIVESTK	0.	0.	0.	0.	5952732.	7359340.
2	ALL-MINING	0.	0.	0.	0.	140991236.	141144278.
3	CONSTRCT	431261.	178718.	5233683.	0.	104707.	10470625.
4	ALL-MFG	91275.	3587.	0.	0.	5253544.	7172547.
5	TRN/COM/UT	4820.	46842.	0.	0.	0.	6748206.
6	WAT/SAN	232441.	35139.	293425.	0.	0.	1524966.
7	GS/AUT-DLR	113849.	26578.	2689862.	0.	924483.	8263674.
8	EAT/DRNK	4393.	34300.	0.	0.	5250024.	7358117.
9	TRADE-NEC	434202.	65571.	0.	0.	2877954.	24535693.
10	FIN/INS/RE	0.	0.	0.	0.	0.	9223980.
11	HOTEL/MOT	6589.	0.	0.	0.	4387803.	4480948.
12	REC-FACIL	0.	0.	0.	0.	9152822.	9340268.
13	MEDICAL	0.	617000.	0.	0.	0.	2348875.
14	SERVIC-NEC	13403.	24809.	0.	0.	64082.	3930421.
15	EDUCATION	901245.	158906.	0.	0.	0.	5089109.
16	LOC-ROADS	979497.	456000.	0.	0.	0.	1857058.
17	LOC-GOV	0.	828887.	0.	0.	0.	3543851.
18	LOC-TAXES	655223.	0.	0.	0.	534549.	7066927.
19	SUBTOTALS	3868198.	2476337.	8216970.	0.	175493940.	261458886.
20	HOUSEHOLDS	1312877.	1421752.	0.	17267618.	0.	49304776.
21	STATE-GOV	141709.	3735865.	0.	0.	377156.	8281263.
22	FED-GOV	0.	3000.	0.	0.	0.	10243824.
23	PROFITS	34194.	2831563.	0.	0.	0.	14933241.
24	DEPREC	0.	0.	0.	0.	0.	10427089.
25	TRANSFERS	0.	3943000.	0.	0.	0.	4090707.
26	IMPORTS	2023676.	895662.	0.	0.	0.	176067402.
27	TOTALS	7380654.	15307179.	8216970.	17267618.	175871096.	534807200.

TABLE B-2

Kremmling Region of Western Colorado, Direct Requirements Per Dollar of Output, 1978

DIRECT INPUT COEFFICIENTS (% of purchases by sector at top of table from sectors at the left)

		1 AG/LIVESTK	2 ALL-MINING	3 CONSTRCT	4 ALL-MFG	5 TRN/COM/UT	6 WAT/SAN	7 GS/AUT-DLR	8 EAT/DR	9 TRADE-NEC	10 FIN/INS/RE
1	AG/LIVESTK	0.181946	0.	0.	0.	0.	0.	0.	0.008000	0.	0.
2	ALL-MINING	0.	0.001084	0.	0.	0.	0.	0.	0.	0.	0.
3	CONSTRCT	0.	0.000897	0.320575	0.	0.000148	0.018020	0.000840	0.	0.001990	0.032776
4	ALL-MFG	0.	0.	0.064067	0.	0.000587	0.	0.007000	0.	0.032541	0.010773
5	TRN/COM/UT	0.034737	0.006858	0.014623	0.047727	0.003887	0.018659	0.026608	0.045220	0.017841	0.017592
6	WAT/SAN	0.000307	0.000075	0.000208	0.000251	0.000548	0.	0.000520	0.002100	0.000963	0.000719
7	GS/AUT-DLR	0.028198	0.	0.012268	0.030144	0.030443	0.004012	0.077000	0.000700	0.001407	0.002698
8	EAT/DRNK	0.	0.	0.001025	0.	0.000117	0.	0.000100	0.	0.000003	0.002687
9	TRADE-NEC	0.171561	0.001806	0.074578	0.020342	0.004351	0.083959	0.024202	0.007000	0.006723	0.048499
10	FIN/INS/RE	0.138843	0.	0.023791	0.011555	0.030137	0.142891	0.013500	0.047000	0.005464	0.038968
11	HOTEL/MOT	0.	0.	0.000209	0.	0.000040	0.	0.	0.000200	0.	0.000621
12	REC-FACIL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
13	MEDICAL	0.	0.	0.002318	0.	0.	0.	0.	0.001100	0.000039	0.
14	SERVIC-NEC	0.087351	0.000150	0.004369	0.040201	0.002786	0.039641	0.006300	0.005500	0.003108	0.017914
15	EDUCATION	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
16	LOC-ROADS	0.	0.000643	0.	0.	0.	0.	0.	0.	0.	0.
17	LOC-GOV	0.	0.	0.	0.	0.002580	0.001003	0.	0.	0.000016	0.011111
18	LOC-TAXES	0.067214	0.010942	0.001876	0.030635	0.058807	0.	0.006000	0.011200	0.015675	0.010417
19	HOUSEHOLDS	0.061299	0.025091	0.228996	0.442559	0.202798	0.129552	0.095000	0.207101	0.092588	0.270739
20	STATE-GOV	0.003371	0.001336	0.002839	0.001693	0.019420	0.001359	0.000970	0.009000	0.003933	0.012423
21	FED-GOV	0.018160	0.006279	0.021906	0.026566	0.027251	0.008157	0.013580	0.046200	0.015940	0.029975
22	PROFITS	0.126736	0.002992	0.021500	0.068342	0.104235	0.502367	0.048200	0.073100	0.058784	0.079857
23	DEPREC	0.054863	0.034046	0.010170	0.154067	0.099336	0.021175	0.023600	0.027200	0.004222	0.049908
24	TRANSFERS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
25	IMPORTS	0.025414	0.907801	0.194680	0.125919	0.412528	0.029205	0.656580	0.509379	0.738763	0.362323

		11 HOTEL/MOT	12 REC-FACIL	13 MEDICAL	14 SERVIC-NEC	15 EDUCATION	16 LOC-ROADS	17 LOC-GOV	18 LOC-TAXES	19 HOUSEHOLDS	20 STATE-GOV
1	AG/LIVESTK	0.	0.	0.	0.	0.	0.	0.	0.	0.000177	0.
2	ALL-MINING	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
3	CONSTRCT	0.033259	0.012193	0.004707	0.002512	0.	0.022616	0.022270	0.	0.005023	0.058431
4	ALL-MFG	0.	0.001614	0.	0.005195	0.	0.008417	0.003554	0.	0.002637	0.012367
5	TRN/COM/UT	0.088453	0.037466	0.025725	0.026089	0.038007	0.020480	0.021908	0.012001	0.050035	0.000653
6	WAT/SAN	0.016195	0.001793	0.001387	0.001541	0.004632	0.000664	0.000592	0.043108	0.009397	0.031493
7	GS/AUT-DLR	0.004021	0.000359	0.003468	0.006082	0.025733	0.055838	0.007313	0.	0.055377	0.015425
8	EAT/DRNK	0.000253	0.000538	0.000694	0.001058	0.	0.000061	0.000299	0.	0.040951	0.000595
9	TRADE-NEC	0.117174	0.017931	0.010444	0.067588	0.002573	0.030851	0.015775	0.	0.336347	0.058830
10	FIN/INS/RE	0.149060	0.	0.038082	0.029782	0.032887	0.018923	0.048741	0.	0.106447	0.
11	HOTEL/MOT	0.	0.	0.001387	0.001058	0.002573	0.	0.000393	0.	0.001116	0.000893
12	REC-FACIL	0.	0.	0.	0.	0.001029	0.	0.007960	0.	0.003123	0.
13	MEDICAL	0.	0.	0.	0.004905	0.	0.	0.001750	0.022198	0.030752	0.
14	SERVIC-NEC	0.011508	0.013448	0.051061	0.030822	0.003603	0.004935	0.031256	0.	0.037730	0.001816
15	EDUCATION	0.	0.	0.	0.	0.	0.	0.	0.552786	0.002484	0.122109
16	LOC-ROADS	0.	0.005379	0.	0.	0.	0.	0.	0.039695	0.	0.132711
17	LOC-GOV	0.	0.	0.	0.	0.022119	0.	0.	0.330212	0.002981	0.
18	LOC-TAXES	0.017215	0.	0.	0.022199	0.	0.	0.	0.	0.049181	0.088776
19	HOUSEHOLDS	0.314892	0.315582	0.398240	0.323976	0.515358	0.334895	0.324735	0.	0.002658	0.177881
20	STATE-GOV	0.002500	0.014703	0.005972	0.002678	0.064451	0.	0.005881	0.	0.057415	0.019200
21	FED-GOV	0.021979	0.021517	0.025552	0.047189	0.001544	0.019540	0.022742	0.	0.138227	0.
22	PROFITS	0.053613	0.118702	0.276259	0.151702	0.	0.354333	0.277190	0.	0.023896	0.004633
23	DEPREC	0.114436	0.166577	0.052384	0.038920	0.	0.	0.	0.	0.	0.
24	TRANSFERS	0.	0.	0.	0.	0.	0.	0.041680	0.	0.	0.
25	IMPORTS	0.055441	0.272198	0.104639	0.236705	0.285492	0.128446	0.165963	0.	0.044046	0.274187

TABLE B-3

Kremmling Region of Western Colorado, Direct and Indirect Requirements Per Dollar of Output Delivered to Final Demand (Households in the Processing Sector)

(I-A) INVERSE MATRIX

		1 AG/LIVESTK	2 ALL-MINING	3 CONSTRCT	4 ALL-MFG	5 TRN/COM/UT	6 WAT/SAN	7 GS/AUT-DLR	8 EAT/DR	9 TRADE-NEC	10 FIN/INS/RE
1	AG/LIVESTK	1.223	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.000
2	ALL-MINING	0.	1.001	0.	0.	0.	0.	0.	0.	0.	0.
3	CONSTRCT	0.017	0.002	1.483	0.011	0.008	0.039	0.005	0.008	0.006	0.058
4	ALL-MFG	0.017	0.001	0.108	1.012	0.007	0.012	0.012	0.006	0.036	0.024
5	TRN/COM/UT	0.080	0.010	0.066	0.093	1.029	0.044	0.042	0.068	0.031	0.050
6	WAT/SAN	0.009	0.001	0.008	0.010	0.007	1.004	0.003	0.007	0.004	0.007
7	GS/AUT-DLR	0.063	0.003	0.058	0.075	0.054	0.024	1.095	0.023	0.014	0.032
8	EAT/DRNK	0.013	0.002	0.023	0.025	0.013	0.011	0.007	1.012	0.006	0.019
9	TRADE-NEC	0.339	0.016	0.297	0.237	0.114	0.190	0.083	0.117	1.063	0.198
10	FIN/INS/RE	0.227	0.006	0.105	0.093	0.073	0.186	0.037	0.091	0.027	1.096
11	HOTEL/MOT	0.001	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001
12	REC-FACIL	0.001	0.000	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
13	MEDICAL	0.013	0.002	0.020	0.020	0.011	0.009	0.005	0.011	0.005	0.014
14	SERVIC-NEC	0.131	0.002	0.037	0.071	0.019	0.057	0.015	0.022	0.012	0.040
15	EDUCATION	0.063	0.008	0.025	0.042	0.044	0.013	0.011	0.020	0.016	0.023
16	LOC-ROADS	0.005	0.001	0.002	0.003	0.003	0.001	0.001	0.001	0.001	0.002
17	LOC-GOV	0.043	0.005	0.017	0.028	0.031	0.012	0.008	0.014	0.010	0.027
18	LOC-TAXES	0.113	0.014	0.042	0.073	0.079	0.022	0.019	0.034	0.028	0.039
19	HOUSEHOLDS	0.302	0.040	0.509	0.595	0.299	0.260	0.154	0.295	0.151	0.398

		11 HOTEL/MOT	12 REC-FACIL	13 MEDICAL	14 SERVIC-NEC	15 EDUCATION	16 LOC-ROADS	17 LOC-GOV	18 LOC-TAXES	19 HOUSEHOLDS
1	AG/LIVESTK	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
2	ALL-MINING	0.	0.	0.	0.	0.	0.	0.	0.	0.
3	CONSTRCT	0.067	0.025	0.018	0.014	0.014	0.042	0.043	0.026	0.020
4	ALL-MFG	0.019	0.011	0.011	0.017	0.013	0.020	0.015	0.014	0.021
5	TRN/COM/UT	0.134	0.068	0.066	0.063	0.087	0.056	0.057	0.085	0.083
6	WAT/SAN	0.025	0.007	0.009	0.009	0.014	0.007	0.007	0.054	0.016
7	GS/AUT-DLR	0.044	0.030	0.041	0.039	0.074	0.092	0.040	0.060	0.079
8	EAT/DRNK	0.022	0.018	0.023	0.020	0.028	0.019	0.019	0.024	0.050
9	TRADE-NEC	0.318	0.167	0.206	0.235	0.242	0.196	0.185	0.217	0.427
10	FIN/INS/RE	0.231	0.055	0.110	0.093	0.122	0.080	0.111	0.119	0.152
11	HOTEL/MOT	1.001	0.001	0.002	0.002	0.004	0.001	0.001	0.002	0.002
12	REC-FACIL	0.002	1.001	0.002	0.002	0.003	0.002	0.010	0.005	0.004
13	MEDICAL	0.018	0.014	1.018	0.021	0.022	0.015	0.017	0.041	0.039
14	SERVIC-NEC	0.042	0.034	0.079	1.056	0.037	0.028	0.056	0.045	0.057
15	EDUCATION	0.035	0.017	0.022	0.032	1.026	0.018	0.019	0.576	0.045
16	LOC-ROADS	0.002	0.007	0.001	0.002	0.002	1.001	0.001	0.041	0.003
17	LOC-GOV	0.025	0.012	0.016	0.022	0.041	0.013	1.014	0.359	0.031
18	LOC-TAXES	0.060	0.029	0.037	0.055	0.045	0.031	0.032	1.039	0.075
19	HOUSEHOLDS	0.520	0.410	0.532	0.456	0.664	0.449	0.453	0.561	1.205

TABLE B-4

Kremmling Region of Western Colorado, Direct and Indirect Requirements
Per Dollar of Output Delivered to Final Demand (Households in Final Demand)

INVERSE OF I-A MATRIX AFTER HOUSEHOLDS REMOVED

		1 AG/LIVESTK	2 ALL-MINING	3 CONSTRCT	4 ALL-MFG	5 TRN/COM/UT	6 WAT/SAN	7 GS/AUT-DLR	8 EAT/DR	9 TRADE-NEC	10 FIN/INS/RE
1	AG/LIVESTK	1.222	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.000
2	ALL-MINING	0.	1.001	0.	0.	0.	0.	0.	0.	0.	0.
3	CONSTRCT	0.012	0.002	1.474	0.002	0.003	0.035	0.002	0.003	0.004	0.051
4	ALL-MFG	0.011	0.000	0.099	1.002	0.002	0.007	0.009	0.001	0.033	0.017
5	TRN/COM/UT	0.059	0.008	0.031	0.052	1.009	0.026	0.031	0.048	0.021	0.023
6	WAT/SAN	0.005	0.001	0.001	0.002	0.003	1.001	0.001	0.003	0.002	0.002
7	GS/AUT-DLR	0.044	0.001	0.024	0.036	0.035	0.007	1.085	0.003	0.004	0.006
8	EAT/DRNK	0.001	0.000	0.002	0.000	0.000	0.000	0.000	1.000	0.000	0.003
9	TRADE-NEC	0.232	0.002	0.117	0.026	0.008	0.098	0.029	0.013	1.009	0.057
10	FIN/INS/RE	0.189	0.001	0.041	0.017	0.035	0.153	0.017	0.053	0.008	1.045
11	HOTEL/MOT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
12	REC-FACIL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13	MEDICAL	0.003	0.000	0.004	0.001	0.001	0.000	0.000	0.002	0.000	0.001
14	SERVIC-NEC	0.117	0.000	0.013	0.043	0.005	0.045	0.008	0.008	0.005	0.021
15	EDUCATION	0.052	0.006	0.006	0.020	0.033	0.003	0.005	0.009	0.010	0.008
16	LOC-ROADS	0.004	0.001	0.000	0.001	0.002	0.000	0.000	0.001	0.001	0.001
17	LOC-GOV	0.035	0.004	0.004	0.012	0.024	0.005	0.003	0.006	0.006	0.017
18	LOC-TAXES	0.095	0.011	0.010	0.036	0.060	0.006	0.009	0.016	0.018	0.014

		11 HOTEL/MOT	12 REC-FACIL	13 MEDICAL	14 SERVIC-NEC	15 EDUCATION	16 LOC-ROADS	17 LOC-GOV	18 LOC-TAXES
1	AG/LIVESTK	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	ALL-MINING	0.	0.	0.	0.	0.	0.	0.	0.
3	CONSTRCT	0.058	0.018	0.009	0.006	0.003	0.035	0.036	0.017
4	ALL-MFG	0.010	0.004	0.002	0.009	0.001	0.013	0.008	0.004
5	TRN/COM/UT	0.098	0.039	0.029	0.031	0.041	0.025	0.026	0.046
6	WAT/SAN	0.018	0.002	0.002	0.003	0.005	0.001	0.001	0.046
7	GS/AUT-DLR	0.010	0.003	0.006	0.009	0.030	0.062	0.010	0.023
8	EAT/DRNK	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.000
9	TRADE-NEC	0.134	0.021	0.018	0.074	0.007	0.037	0.024	0.018
10	FIN/INS/RE	0.165	0.003	0.043	0.036	0.039	0.023	0.054	0.048
11	HOTEL/MOT	1.000	0.000	0.001	0.001	0.003	0.000	0.000	0.002
12	REC-FACIL	0.000	1.000	0.000	0.000	0.001	0.000	0.008	0.003
13	MEDICAL	0.001	0.000	1.000	0.006	0.000	0.000	0.002	0.023
14	SERVIC-NEC	0.018	0.015	0.054	1.034	0.006	0.007	0.034	0.018
15	EDUCATION	0.015	0.002	0.002	0.015	1.002	0.002	0.002	0.555
16	LOC-ROADS	0.001	0.006	0.000	0.001	0.000	1.000	0.000	0.040
17	LOC-GOV	0.012	0.001	0.002	0.010	0.024	0.001	1.002	0.345
18	LOC-TAXES	0.028	0.003	0.004	0.027	0.003	0.003	0.004	1.004

TABLE B-5

Kremmling Region of Western Colorado, Sales Coefficients

SALES COEFFICIENTS (% of sales by sector at left of table to sectors at top)

		1 AG/LIVESTK	2 ALL-MINING	3 CONSTRCT	4 ALL-MFG	5 TRN/COM/UT	6 WAT/SAN	7 GS/AUT-DLR	8 EAT/DR	9 TRADE-NEC	10 FIN/INS/RE
1	AG/LIVESTK	0.181946	0.	0.	0.	0.	0.	0.	0.007999	0.	0.
2	ALL-MINING	0.	0.001084	0.	0.	0.	0.	0.	0.	0.	0.
3	CONSTRCT	0.	0.012095	0.320575	0.	0.000096	0.002624	0.000663	0.	0.004663	0.028874
4	ALL-MFG	0.	0.	0.093526	0.	0.000553	0.	0.008065	0.	0.111317	0.013854
5	TRN/COM/UT	0.037883	0.143449	0.022690	0.050728	0.003887	0.004217	0.032583	0.049307	0.064867	0.024046
6	WAT/SAN	0.001479	0.006922	0.001432	0.001179	0.002424	0.	0.002818	0.010133	0.015486	0.004347
7	GS/AUT-DLR	0.025112	0.	0.015545	0.026164	0.024860	0.000740	0.077000	0.000623	0.004176	0.003011
8	EAT/DRNK	0.	0.	0.001459	0.	0.000107	0.	0.000112	0.	0.000010	0.003369
9	TRADE-NEC	0.051459	0.010388	0.031826	0.005947	0.001197	0.005218	0.008151	0.002099	0.006723	0.018233
10	FIN/INS/RE	0.110775	0.	0.027006	0.008985	0.022048	0.023624	0.012095	0.037493	0.014535	0.038968
11	HOTEL/MOT	0.	0.	0.000489	0.	0.000060	0.	0.	0.000329	0.	0.001278
12	REC-FACIL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
13	MEDICAL	0.	0.	0.010333	0.	0.	0.	0.	0.003445	0.000406	0.
14	SERVIC-NEC	0.163557	0.005372	0.011640	0.073361	0.004783	0.015380	0.013246	0.010297	0.019401	0.042041
15	EDUCATION	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
16	LOC-ROADS	0.	0.048891	0.	0.	0.	0.	0.	0.	0.	0.
17	LOC-GOV	0.	0.	0.	0.	0.004912	0.000432	0.	0.	0.000108	0.028921
18	LOC-TAXES	0.069996	0.218532	0.002780	0.031093	0.056155	0.	0.007016	0.011662	0.054422	0.013596
19	HOUSEHOLDS	0.009150	0.071828	0.048631	0.064381	0.027756	0.004007	0.015922	0.030907	0.046075	0.050650
20	STATE-GOV	0.002996	0.022778	0.003590	0.001466	0.015825	0.000250	0.000968	0.007997	0.011654	0.013837
21	FED-GOV	0.013046	0.086512	0.022391	0.018601	0.017952	0.001214	0.010955	0.033185	0.038179	0.026991
22	PROFITS	0.062458	0.028277	0.015075	0.032825	0.047103	0.051301	0.026673	0.036019	0.096583	0.049326
23	DEPREC	0.038722	0.460856	0.010212	0.105979	0.064288	0.003097	0.018703	0.019194	0.009935	0.044149
24	TRANSFERS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
25	IMPORTS	0.001062	0.727738	0.011577	0.005130	0.015811	0.000253	0.030816	0.021288	0.102950	0.018982

SALES COEFFICIENTS (% of sales by sector at left of table to sectors at top)

		11 HOTEL/MOT	12 REC-FACIL	13 MEDICAL	14 SERVIC-NEC	15 EDUCATION	16 LOC-ROADS	17 LOC-GOV	18 LOC-TAXES	19 HOUSEHOLDS	20 STATE-GOV
1	AG/LIVESTK	0.	0.	0.	0.	0.	0.	0.	0.	0.001188	0.
2	ALL-MINING	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
3	CONSTRCT	0.014233	0.010877	0.001056	0.000943	0.	0.004011	0.007537	0.	0.023652	0.041188
4	ALL-MFG	0.	0.002101	0.	0.002847	0.	0.002179	0.001756	0.	0.018125	0.012726
5	TRN/COM/UT	0.058735	0.051858	0.008954	0.015195	0.028663	0.005636	0.011505	0.012568	0.365575	0.000714
6	WAT/SAN	0.047587	0.010982	0.002136	0.003971	0.015457	0.000809	0.001375	0.199767	0.303815	0.152424
7	GS/AUT-DLR	0.002181	0.000405	0.000986	0.002893	0.015847	0.012548	0.003136	0.	0.330402	0.013777
8	EAT/DRNK	0.000154	0.000683	0.000221	0.000565	0.	0.000015	0.000144	0.	0.274401	0.000597
9	TRADE-NEC	0.021400	0.006826	0.001000	0.010827	0.000534	0.002335	0.002278	0.	0.675893	0.017697
10	FIN/INS/RE	0.072412	0.	0.009698	0.012690	0.018144	0.003810	0.018726	0.	0.568991	0.
11	HOTEL/MOT	0.	0.	0.000727	0.000928	0.002923	0.	0.000310	0.	0.012274	0.001470
12	REC-FACIL	0.	0.	0.	0.	0.000561	0.	0.003020	0.	0.016488	0.
13	MEDICAL	0.	0.	0.	0.008208	0.	0.	0.002640	0.066785	0.645503	0.
14	SERVIC-NEC	0.013120	0.031958	0.030515	0.030822	0.004665	0.002332	0.028182	0.	0.473304	0.003410
15	EDUCATION	0.	0.	0.	0.	0.	0.	0.	0.767619	0.024063	0.177093
16	LOC-ROADS	0.	0.027055	0.	0.	0.	0.	0.	0.151059	0.	0.527446
17	LOC-GOV	0.	0.	0.	0.	0.031764	0.	0.	0.658489	0.041480	0.
18	LOC-TAXES	0.010916	0.	0.	0.012346	0.	0.	0.	0.	0.343128	0.092717
19	HOUSEHOLDS	0.028618	0.059784	0.018972	0.025826	0.053194	0.012614	0.023341	0.	0.002658	0.026628
20	STATE-GOV	0.001353	0.016583	0.001694	0.001271	0.039607	0.	0.002517	0.	0.341836	0.017112
21	FED-GOV	0.009614	0.019619	0.005859	0.018106	0.000767	0.003542	0.007868	0.	0.665305	0.
22	PROFITS	0.016088	0.074244	0.043453	0.039928	0.	0.044064	0.065781	0.	0.078898	0.002290
23	DEPREC	0.049178	0.149215	0.011800	0.014671	0.	0.	0.	0.	0.	0.
24	TRANSFERS	0.	0.	0.	0.	0.	0.	0.036108	0.	0.	0.
25	IMPORTS	0.001411	0.014440	0.001396	0.005284	0.008252	0.001355	0.003340	0.	0.012334	0.011494

TABLE B-5

(continued)

SALES COEFFICIENTS (% of sales by sector at left of table to sectors at top)

		21 FED-GOV	22 INVESTMENT	23 TRANSFERS	24 EXPORTS
1	AG/LIVESTK	0.	0.	0.	0.808868
2	ALL-MINING	0.	0.	0.	0.998916
3	CONSTRCT	0.017069	0.499844	0.	0.010000
4	ALL-MFG	0.000500	0.	0.	0.732452
5	TRN/COM/UT	0.006941	0.	0.	0.
6	WAT/SAN	0.023042	0.192414	0.	0.
7	GS/AUT-DLR	0.003216	0.325504	0.	0.111873
8	EAT/DRNK	0.004662	0.	0.	0.713501
9	TRADE-NEC	0.002672	0.	0.	0.117297
10	FIN/INS/RE	0.	0.	0.	0.
11	HOTEL/MOT	0.	0.	0.	0.979213
12	REC-FACIL	0.	0.	0.	0.979931
13	MEDICAL	0.262679	0.	0.	0.
14	SERVIC-NEC	0.006312	0.	0.	0.016304
15	EDUCATION	0.031225	0.	0.	0.
16	LOC-ROADS	0.245550	0.	0.	0.
17	LOC-GOV	0.233894	0.	0.	0.
18	LOC-TAXES	0.	0.	0.	0.075641
19	HOUSEHOLDS	0.028836	0.	0.350222	0.
20	STATE-GOV	0.451123	0.	0.	0.045543
21	FED-GOV	0.000293	0.	0.	0.
22	PROFITS	0.189615	0.	0.	0.
23	DEPREC	0.	0.	0.	0.
24	TRANSFERS	0.963892	0.	0.	0.
25	IMPORTS	0.005087	0.	0.	0.

APPENDIX C

CRITIQUE OF DATA SOURCES

INTRODUCTION

Data gathered for the Kremmling interindustry study were secured from a wide variety of primary and secondary sources. Data from secondary sources were basically used to provide preliminary estimates of total gross output levels for the respective sectors delineated in the study. As the study progressed, it was discovered that particular secondary sources could not be used for such estimation purposes. The reasons for this are quite specific and vary depending on the source. Primary data were used extensively to estimate the gross flows matrix; they were also used to estimate a level of total gross output for several of the sectors. Thus, the purpose of this section is to criticize the various data sources and specifically explain how the data and any attending problems were handled in the study. The discussion commences with an overview of the primary sources. Following this, the section is divided by SIC division descriptions with each containing an identification of relevant data sources, comment on the adequacy of the data for the Upper Main Stem region interindustry study, and mention of how the data were handled.

Following the discussion is a complete listing, in bibliographic form, of data sources cited. Reference numbers in the text of this section refer to the sequence numbers of this list, not the bibliography entries at the conclusion of the report. Following each entry is an abbreviated annotation in brackets. The SIC numbers in the annotation indicate that data pertinent to that respective SIC classification are contained in the source cited; a verbal description is used when SIC numbers are not appropriate.

PRIMARY SOURCES

Data from primary sources can be classified into two categories: first, information obtained directly from economic producers, and second, information obtained from the files of government agencies, trade associations, and others who receive report forms from economic producers. As indicated previously, data obtained directly from economic producers were secured through the interview process; a mail questionnaire was not employed in the study.

Data identifying gross flows for the agriculture and livestock sectors were largely secured from the Cooperative Extension Service, Department of Economics, Colorado State University, and a study conducted at Colorado State University, for Bureau of Land Management and the Forest Services, Effects of Federal Grazing Land on the Economy of Colorado (45) (also see 38). Specifically, the Extension Service data pertained to estimated costs of producing particular crops and animals, not the aggregate expense levels of individual farm operators.

John Pederson and Oded Rudawsky of the Colorado School of Mines had just completed a rather extensive study of minerals and energy in Colorado about the time the research for this inquiry was commencing (41). The decision was made to use the basic findings of Pederson and Rudawsky and limit the interviewing for this sector. The limited interviewing that did occur was highly selective and for the express purpose of securing information necessary for the modification of published results of the Pederson and Rudawsky study.

Special comment on the data secured from the Colorado Department of Labor and Employment is warranted (10). Employment and wage information contained in the reports of each employer in the state is placed on reels of computer tape for processing by the Department. The Colorado Manpower Review (9) publishes a summary of this data for the state and the Denver-Boulder labor market area; detailed information for individual counties does not ordinarily get published.

Accordingly, the information pertinent to employment and earnings in the Kremmling region of Western Colorado had to be obtained directly from the Colorado Department of Labor and Employment.

Serious difficulties were not encountered with the information secured from the files and in-house reports of other government agencies, trade associations, and other organizations (5, 6, 10, 22, 23, 24, 25, 29, 31, 39, 46, 70, and 79). The data were not always in the form requested, but were sufficiently detailed so that, with slight modifications, they were quite useful. Specific comment on these data and others follow in the respective SIC division.

AGRICULTURE AND FORESTRY

Of all economic sectors in the model, agriculture has the most current and detailed secondary data. The most versatile document in terms of securing individual crop data on an individual county basis is the Colorado Agricultural Statistics publication (1). Issued annually by the Colorado Department of Agriculture, it publishes detail on major state crops, and identifies the production levels in respective counties. Specific limitations are nonetheless inherent in tabular presentations. For example, crops are reported on a production and market value basis; and there is a difference between market value and market receipts. The implication of this is not too severe for crops when virtually all production is marketed; but this is not the case with crops such as hay. Total gross output in the model is defined in terms of market receipts; so an adjustment of the value of the hay crop, as reported in Colorado Agricultural Statistics, was made. Specifically, the ratio of hay marketings reported in the 1974 Federal Census of Agriculture to the 1974 market value of hay reported in Colorado Agricultural Statistics was applied to the latter's 1977 report.

The Colorado Agricultural Statistics also has a tendency to aggregate certain "minor" crops not only across crop lines but also county lines. For

example, potatoes are identified for Morgan, Weld, and the respective counties in the San Luis Valley; one value is then reported for the rest of the state. Hence, while potato production is not relevant in the Kremmling region of Western Colorado, precise documentation of that fact is not possible because of aggregated reporting for crops.

Other particular adjustments were not attempted on the irrigated and dry agricultural output as reported by Colorado Agricultural Statistics. The publication is not well enough documented to determine whether or not an adjustment is warranted. Further, all production indices available are for the entire state and are highly aggregated (2).

Procedures employed to secure and report information are not documented in Colorado Agricultural Statistics. A regional analyst must be concerned with the quality of data, but really has no basis for judgment without supporting documentation. For example, onion production is reported in Colorado Agricultural Statistics for the Western Slope (no county delineation); the Bureau of Reclamation also reports onion production in the annual publication of Water and Land Resource Accomplishments for farms served by the Grand Valley and Uncompahgre projects (73) and (74). The Bureau's report suggests there is a definite element of randomness involved, i.e., both acreage planted and production yields vary over time. By contrast, the acreages reported by Colorado Agricultural Statistics are rather consistent. It should also be mentioned that in certain years the Bureau's publication reports considerably more acreage for farms served by the above two projects than the state publication does for the entire Western Slope; and for the counties involved, the authors suggest that it makes a considerable difference in the aggregate value of marketings.

Data on the value of marketings of livestock are reported in Colorado Agricultural Statistics for final marketings only. Further, the data are

reported at the state level. Not only are interfarm transactions not reported, but the relative value of individual county output cannot be directly determined. Thus, the value of the total gross output of the livestock sector in the Kremmling interindustry study was determined from information secured from the Cooperative Extension Service, Department of Economics, Colorado State University.

Determination of the gross flows for agriculture and livestock production was highly dependent on information secured from the Cooperative Extension Service and Federal Grazing in Colorado, an unpublished study conducted at Colorado State University for the Bureau of Land Management and the Forest Service. This was supplemented with data published in Cost of Producing Crops in the Irrigated Souhwest (84) and information supplied by the Northwest Colorado Agri-Business Association (39) and Tri River Agri-Business Farm Management Association (46). Government payments to the agricultural sectors were determined from the Agricultural Stabilization and Conservation Service, Annual Report - Colorado (47).

Data on the employment of labor in the agricultural sectors are not readily available from published sources. The estimate of the dollars paid for wages in each of the sectors was based on the Cooperative Extension Service information and Laing's thesis on the Impacts of Federal Grazing Land (38). Employment levels were then imputed using a 2,000 hour work year. The number of people employed in agriculture as identified in the 1970 Census of Population (61) could also have been used to obtain an employment coefficient, but wasn't. The aggregate value for agricultural services was estimated by using the Cooperative Extension Service informaton and checked for consistency by interview.

In summary, adequate data do appear to exist for the agricultural sectors of the Kremmling economy. However, particular concern is noted for the high level of aggregation in some cases, a lack of published interfarm transaction

values for livestock, and lack of good data on employment. Also, it appears that there is a general lack of documentation; a deficiency which must be overcome in order to judge the quality of the data.

MINING

Publications by the federal government were not considered for inclusion in the mining division of the model. At the national level, and sometimes the state level, information pertaining to mining production quantities and values can be secured. Because of the characteristically small number of operators, information on specific minerals in specific counties is rarely published. Examples of federal publications for which this is largely true are: Census of Mineral Industries (60); Minerals Yearbook (72); Statistical Data for the Uranium Industry (77); and Uranium Exploration Expenditures and Plans (78).

State of Colorado documents were relied upon quite extensively, but not without reservation. The most comprehensive, yet most limiting, state document is A Summary of Mineral Industry Activities in Colorado (13). This publication lists production by mineral value and by county. Listing by mineral value has several very specific limitations. For some outputs the unit price is not always given; thus, quantity calculation becomes difficult, if not nearly impossible. Where unit price is given it is always applied to all production; thus, for example, the market value for metallurgical coal is published as being equal to the market value for other types of coal. The unit price for ores refers to a refined market value; thus, when ore is subject to reduction away from the county in which it was mined, the value accruing to the mining county is overstated. One last criticism is leveled at the practice in the publication of adding nearly $100 million to the value of state mineral production and footnoting it as minerals mined out of, but refined in, the state; no indication is given as to what the minerals are or where they are refined.

Data are available monthly in the Monthly Report (15) and annually in Coal (14) on the production of coal. Tonnage values, labor employed, and days worked are reported for every coal mine in the state. Barrels of oil pumped, cubic feet of gas produced, and the volume of injections are published for every well in the state in Oil and Gas Statistics (17). Thus, the researcher is left with the task of determining a unit value when information on coal, oil, and gas is secured from these sources.

The Pederson and Rudawsky study, "The Role of Minerals and Energy in the Colorado Economy," was used as a data source in the mining division, especially as it related to oil and gas production. A publication that complemented Oil and Gas Statistics when identifying potential interviews for the oil and gas sector was the Rocky Mountain Petroleum Directory (83).

In the final analysis, the total gross output values used in the mining division of the Kremmling study were estimated based on information gained by interviewing. Federal publications fail to publish sufficient information at the county level and state publications leave much to be desired with respect to unit pricing. Furthermore, state documents do not necessarily identify the economic production that takes place in some counties.

CONSTRUCTION

Publications such as the Census of Construction Industries (52) and (53) and the Construction Review (67) aggregate on the state level and hence are inadequate for estimation of activities in individual counties. The publication Construction Reports - Housing Authorized by Building Permits and Public Contracts (65), though county specific, fails to account for permits and contracts authorized during a given period. In a relatively small county there is not necessarily sufficient volume to either avoid "lumpy" reporting or maintenance of the assumption that level of work in a given period is equal to the dollar value of the

authorizations. Finally, the Construction Reports do not suggest how much of the job is involved with various types of contractors so that an estimation of value of intersector transactions can be made. In conclusion, the authors saw no alternative but to estimate total gross output for the construction sector from primary data.

MANUFACTURING

Both the 1972 Census of Manufacturers (59) and County Business Patterns are fairly complete in a broad sense but still quite limited in what detail is published. Disclosure requirments preclude publishing critical information and result in a high degree of aggregation. Even in those sectors where the data are published, restrictions are imposed because seasonal variations (e.g., as in food processing) are not reflected in the first quarter reporting. As a result, neither of these publications was of much use for the Kremmling inter-industry study. In fact, levels of output for the manufacturing sectors had to be estimated from primary data.

The Directory of Colorado Manufacturers (81), published annually by the Bureau of Economic and Business Research (University of Coloado), was used extensively in the determination of which manufacturers to interview. The publication identifies firms by four-digit SIC classification, location, and employment range. Key personalities are also identified. Some information in the Directory of Colorado Manufacturers is quite dated, but the document is nonetheless an invaluable reference.

Before interviewing a given owner or manager, an attempt was always made to gain a "feel" for the type of firm that was involved. For example, secondary research was done on what the output per worker might be and what might be expected in terms of value added. A publication quite often referred to for answers to these types of questions was the Annual Survey of Manufacturers (50).

Though the information contained therein was not directly used in the Kremmling study, it did provide for an ongoing consistency check. Specifically, the document contains, on a four-digit SIC basis, ratios pertaining to inputs and outputs of the manufacturing sectors of the national economy.

In summary, detailed secondary data do not exist for manufacturing activities in the study region. Aggregate levels of economic activity for individual sectors must be determined from primary data and checked for consistency by observing secondary data.

TRANSPORTATION, COMMUNICATING, ELECTRIC, GAS, AND SANITARY SERVICES

Secondary data for the transportation, communications, electric, gas, and sanitary services sectors are quite available and generally speaking, of fairly good quality. Despite this, only a limited amount of them were used in the Kremmling study. The reasons for this are largely in the nature of the filing system at the Colorado Public Utilities Commission (PUC) (23) and methods employed prior to seeking an interview with any given firm. Consequently, before any single interview was conducted, an attempt was made to learn as much as possible about the firm in question. This meant that for firms in the public utilities sectors, the research started with an examination of the reports filed with the PUC. The PUC reports were readily accessible so they were also used to estimate levels of total gross output where applicable. For those cases in which the PUC does not have jurisdiction, because municipal-owned enterprises are involved, estimates were made based on information filed with the Colorado State Auditor (24). Despite the above-mentioned relatively high incidence of direct information, secondary data sources still merit comment.

The Interstate Commerce Commission publishes materials pertaining to various forms of transportation on a regional basis: examples are Transport Statistics in the United States: Pipelines (36) and Transport Statistics in the

United States: Motor Carriers (37). These types of documents were not really helpful in the study because their use necessitates a significant amount of prorating. As a result, the best alternative was to estimate the level of economic activity in the transportation sector from PUC reports and information gained in interviews.

United States Postal Service (U.S.P.S.) revenues were determined by examining postal receipt schedules for each post office in the region. Since Congress created the independent U.S.P.S., postal receipts for individual post offices are no longer published. Accordingly, this information was obtained directly from the Sectional Center Facility (SCF) managers (79). Despite the accuracy of this information, it is suggested that the regional accounting perspective can lead to an erroneous conclusion about the U.S.P.S. This is because the postal sector's total gross output was defined in terms of an expense level rather than a revenue level. The reason for doing this is that the imputed postal revenue for the Kremmling region of Western Colorado is higher than the actual revenue, but it is not known how much higher. For example, Mountain Bell mails statements to local customers from Denver; the actual revenue for the U.S.P.S. is identified with the Denver Post Office, yet a portion of the expenses connected with the handling of those statements is absorbed by the local Post Office. Thus, a portion of the actual Denver revenue imputes to the Kremmling region.

Information on rural telephone systems can be obtained from the Annual Statistical Report: Rural Telephone Borrowers (49). Territorial integrity for rural systems in the region is such that the information is straightforward and does not have to be allocated. Mountain Bell's activities, on the other hand, had to be estimated by prorating the various revenues and charges identified in their annual report to the Colorado PUC. This was greatly

facilitated by having additional information supplied directly by the company. Radio and television activities were estimated by prorating data contained in the Federal Communications Commission's Annual Report (30). Specifically, the data identified revenue for stations outside the metropolitan area. The basis for allocation was the volume of retail sales as identified in the Annual Report (21) of the Colorado Department of Revenue.

Published secondary data were of limited use for estimating electric and gas revenues. For example, examination of Annual Statistical Report: Rural Electric Borrowers (48) sometimes fails to include the operation of electric associations which are headquartered outside the Kremmling region. Information contained in Statistics of Publicly Owned Electric Utilities in the United States (34) is reported on a company basis and the Kremmling region is only part of the territory of the Public Service Company of Colorado. Statistics of Publicly Owned Electric Utilities in the United States (35) does not identify all the municipal operations in the Kremmling region. Thus, the estimation of total gross output for the electricity and natural gas sector was determined by the information obtained from PUC reports, the State Auditor, and interviews.

The water, sewerage, and sanitary services sector is characterized by a high incidence of special tax districts. Complete information on the activities of these districts is not published anywhere. Thus, the audit reports filed with the Colorado State Auditor were examined in detail to secure information for this sector. For those instances where private enterprise is involved, the information was obtaind at the PUC office.

In summary, though considerable information is published for the transportation, communication, electric, gas, and sanitary services sectors, problems associated with excessive aggregation, territorial integrity, and incomplete reporting precluded use of the information in the Kremmling inter-industry study.

Secondary data sources used to estimate the levels of total gross output included the Census of Wholesale Trade (64), the Census of Retail Trade (62), and the Colorado Department of Revenue's Annual Report (21). Both Census publications referred to calendar year 1972, used 1972 SIC classifications, and needed updating to reflect 1977 conditions. Other problems associated with the use of the Department of Revenue report stem from the failure to identify the ratio of tax exempt sales at the county level and what appears to be a rather significant understatement of the volume of wholesale activities. The total gross output values were thus estimated as follows: Mean values were calculated for each trade sector using two annual reports of the Colorado Department of Revenue; the state exemption ratio for each respective sector was used to increase reported county retail sales; output values were shifted to conform to 1972 SIC descriptions by using ratios describing the relationships between Colorado labor data for 1972 and the wholesale and retail census for 1972.

Select interviews were used to gain information relative to what values would be used for regional flows and margining of the trade sectors. Further, information contained in publications such as "Economic Impact of Alternative Energy Supply Policies in Colorado" (26) and "An Interindustry Analysis of the Colorado River Basin in 1960 with Projections to 1980 and 2010" (80) was used to routinely check for inconsistency. Given these limitations, caution must be expressed in regard to the accuracy of the coefficients in the trade sector. It is recommended that an in-depth study of this sector, employing primary data collection techniques, be undertaken in the near future.

FINANCE, INSURANCE, AND REAL ESTATE

Secondary data on the activities of commercial banks are contained in Sheshunoff and Company's The Banks of Colorado (44). This is a privately-printed industry publication that shows the balance sheet and income statement

for each bank in the state. A source such as Bank Operating Statistics (32), published by the Federal Deposit Insurance Corporation, aggregates information by region; none of these regions correspond to the geographic delineation of the Kremmling study. Accordingly, the Sheshunoff data were used to identify the level of economic activity for commercial banks.

Savings and Loan Association data are published in Combined Financial Statements - Member Savings and Loan Association of the Federal Home Loan Bank System (33). Association activities are identified by state total, metropolitan area, and the area outside the metropolitan area. Thus, to estimate total gross output for savings and loan associations, the activity outside the metropolitan area was prorated to the Kremmling region by using the personal adjusted gross income figures reported in the Colorado Department of Revenue's Annual Report (21). Information pertaining to the activities of the Federal Credit Bank's operations was gained from filed reports (31).

Insurance activities were estimated from information gained largely from interview. The Colorado Division of Insurance publishes the Insurance Industry in Colorado: Statistical Report (20). This document identifies, on a company basis and a line basis, premiums earned and losses incurred. As a first approximation, the difference between premiums and losses was prorated by Colorado adjusted gross income to estimate the Kremmling region's insurance activity. This first approximation was then modified based on information gained in interviews.

Real estate activities were estimated by first obtaining the value of documentary fees paid in each of the two counties (29). From the documentary fees paid an estimate was made of the transaction values involved and a six percent commission was allowed on the same. The estimated commissions were used in turn as the approximation for the total gross output of the real estate sector.

In summary, direct information pertaining to finance, insurance, and real estate does not exist in published form for the study region. Estimates must be made using a combination of published secondary data and information gained from primary sources.

SERVICES

Data sources for services are grouped into three categories for discussion purposes. The first part of the discussion will focus on data sources pertinent to the health and medical care field; the second pertains to data sources for the education sector; and final portion comments on data sources for all other services.

Information pertaining to institutional health care was secured directly from the providers of the services. A partial list of hospitals and nursing homes in the region is contained in the Directory-Medicare Providers and Suppliers of Services (68).

The value of services provided by physicians, dentist, optometrists, and others was estimated by using secondary information. For a first approximation, information contained in "National Health Expenditures" (28) was adjusted by using the index values published in Medicare: Health Insurance for the Aged - Geographical Index of Reimbursement by State and County (69). The resulting figure was then adjusted based on information gained in interviews and secured from the Colorado State Department of Health (7), the Colorado Department of Social Services (22), and the Social Security Administration (70).

Data are readily available for education activities in the Kremmling region. Data pertaining to colleges were secured directly from the respective institutions. Revenues and Expenditures: Colorado School Districts (6), published annually by the Colorado Department of Education, was used to identify the level of total gross output for public schools. This document is rather

comprehensive and identifies revenues and expenditures for each school district in the state. Data secured from the CCHE and the Department of Education's revenue and expenditure report were supplemented with information gained in interviews. Because of the high quality data described above, the Bureau of the Census data contained in Finances of School Districts (57) were not used in the Kremmling interindustry study.

The information contained in Census of Selected Service Industries (63) was used as a first approximation of the total gross output for all other services. Colorado Department of Labor and Employment data were used to update the census data to an approximation of 1978 conditions. Concomitantly, the data pertained to dental laboratories in this publication were removed to the health and medical care sector. Estimation of total gross output for ski tows was accommodated by interview.

As with the trade sectors, very little primary information was collected for the services not elsewhere classified sector. Accordingly, given this limitation, caution is expressed with regard to the accuracy of the coefficients in this sector in the Kremmling interindustry study. Further, it is recommended that an in-depth study of the sector be conducted employing primary data collection techniques.

PUBLIC ADMINISTRATION

Rather extensive information on local and county government activities is contained in the Bureau of Census publications, Compendium of Government Finances (54), Finances of County Governments (55), Finances of Municipalities and Township Governments (56), and Compendium of Public Employment (58). Two considerations precluded the use of these documents in the Kremmling interindustry study. First, the desire to have even more detailed data to facilitate the separation of local and county government enterprises. Second, preliminary investigation

suggested that the dollar increase in a number of local and county government budgets was rather significant between 1972 and 1978.

Secondary data published by the state were used extensively during the preliminary stages of the research but were later replaced with primary data. The Local Government Financial Compendium (11) does not list expenditures and revenues for communities under 1,000 people. Further, the publication does not account for special tax districts. The Division of Property Taxation's Annual Report to the Governor and the Legislature (12) identifies valuations, levies, and property tax revenues for every local tax authority. The Colorado Department of Revenue's Annual Report (21) contains information sufficient to estimate local sales tax collections. Though each publication contains good quality data, the Kremmling study eventually used the files of the State Auditor. The audit reports filed here are more complete, more detailed, and more extensive in coverage than the state publication.

Data pertaining to the total expenditures of the State of Colorado were secured directly from the Colorado Department of Planning and Budget (19). A recent executive order had caused all state budgets to be regionalized according to the various planning regions in the state. Though the planning regions do not conform to the delineation of the Kremmling interindustry study, the budget regionalization greatly facilitated the search for data on state expenditures. Information on tax payments to the State of Colorado is contained in the Department of Revenue's Annual Report (21). An estimation of revenues from hunting and fishing licenses was made based on information in Colorado Big Game Harvest (16). Revenue generated because of activities on state lands was estimated by using the State Board of Land Commissioners' Summary of Transactions (18).

Following the collection of the above data, interviews were arranged with the agencies that made significant expenditures in behalf of the State of

Colorado. Scheduling the expense patterns of the Colorado Department of Highways was greatly facilitated by the use of Colorado's Annual Highway Report (8). In summary, the data secured on the State of Colorado pecuniary activities were not difficult to obtain and are rather comprehensive.

Revenues accruing to the federal government account were largely estimated by prorating from a Colorado base. The Treasury publication, Combined Statement of Receipts, Expenditures, and Balances of the United States Government for the Fiscal Year Ended June 30, 1975 (75), identified revenue by state and by category. Thus, the figure published for Colorado was adjusted by using information in the Colorado Department of Revenue's Annual Report (21) and the Treasury's Statistics of Income 1969, ZIP Code Area Data from Individual Income Tax Returns (76). This first approximation was then adjusted by using information gained from the Forest Service, the Bureau of Land Management, the Bureau of Reclamation, and the publication Public Land Statistics (71).

For a first approximation of federal expenditures, data were secured from Federal Outlays in Colorado (39). This publication shows estimates for federal outlays by agency and by county. Many of the estimates are prorated by using standardized criteria. Thus, the research for the Kremmling interindustry study sought to estimate federal expenditures independently. Some documents, such as the Veterans Administration's Annual Report (82) and the Railroad Retirement Board's Annual Report (42), were examined and the data so secured prorated to the Kremmling region of Western Colorado. This practice was too limiting, so more direct information was obtained. Specifically, the major agencies were contacted: these include the Social Security Administration, the Bureau of Reclamation, the Bureau of Land Management, the Geological Survey, the Forest Service, and U.S. Postal Service, and the Department of Energy.

In summary, the data on federal government revenues are approximations derived largely from state totals. The data pertaining to federal expenditures are largely estimations based on information gained from interviews.

Households were not interviewed for the Kremmling study. Further, the data pertaining to household income and expenses are a direct result of the estimations made for the income and expenses of the other sectors in the study.

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APPENDIX D

SURVEY FORM USED FOR THE INTERINDUSTRY STUDY

Colorado School of Mines
golden, colorado 80401 • (303) 279-0300

[illegible] Department

VOLUNTARY QUESTIONNAIRE

Grand and Jackson Counties Inter-Industry Analysis

This questionnaire is designed to enable you to provide us, in as simple a form as possible, a detailed account of your firm's purchases and sales in 1978. The specific focus of the analysis is the component of that activity occurring in Grand and Jackson counties.

This information will be handled in strictest confidence. Your responses will be aggregated with those of other firms in your economy sector, eliminating the possibility that any single firm's responses will be identifiable. Participation on your part is voluntary.

1. We are particularly interested in obtaining data which are a reasonable representation of your firm's current operation. Data for a fiscal or calendar year 1978 or later are preferred. In the event that data are not available in this form, please use any consecutive twelve months since 1977 (please indicate).

2. You may indicate sales and purchases in dollar amounts or percentages.

3. When exact data are not available, please use estimates. If it is not possible to provide information for certain questions, please indicate.

Name of Firm: _____

What is your major product(s) or service(s)? If convenient, list the appropriate SIC classification(s). _____

_____

_____

What was the total number of employees you had at any one time in 1978?

Full Time: _____ Part Time: _____

PURCHASES AND EXPENSE (OUTLAYS) ANALYSIS

SUPPLY SOURCE: SECTORS FROM WHICH YOU PURCHASE OR PAY EXPENSES	PURCHASES IN GRAND & JACKSON COUNTIES $ or % of Total	PURCHASES FROM OTHER COLO. COUNTIES $ or % of Total	PURCHASES OUTSIDE COLORADO $ or % of Total
1. AGRICULTURE, LIVESTOCK, & FORESTRY			
2. MINING, OIL & GAS EXTRACTION			
3. CONSTRUCTION & READY-MIX CONCRETE (Stone, clay, glass & concrete products)			
4. LUMBER & WOOD PRODUCTS			
5. TRANSPORTATION, COMMUNICATION, ELECTRICITY, GAS			
6. WATER, SEWERAGE, & SANITATION SERVICES			
7. AUTO DEALERS & GASOLINE SERVICE STATIONS			
8. EATING & DRINKING PLACES			
9. TRADE - NOT ELSEWHERE LISTED			
10. FINANCE (Interest payments) INSURANCE PREMIUMS REAL ESTATE (Commissions & Management fees)			
11. HOTELS & OTHER LODGING PLACES			
12. RECREATIONAL FACILITIES (Ski tows, golf courses, hunting guides, etc.)			
13. HEALTH AND MEDICAL CARE			
14. SERVICES - NOT ELSEWHERE LISTED			
15. EDUCATIONAL INSTITUTIONS			
16. LOCAL AND COUNTY ROADS			
17. LOCAL & COUNTY GOVERNMENT - NOT LISTED ELSEWHERE			
18. LOCAL AND COUNTY TAXES			
19. HOUSEHOLDS (Payments subject to withholding)			
20. STATE GOVERNMENT (Taxes, permits, license fees)			
21. FEDERAL GOVERNMENT (Taxes, permits, license fees, employer's FICA, unemployment insurance)			
22. RENTS, DIVIDEND PAYMENTS, RETAINED EARNINGS			
23. DEPRECIATION EXPENSE; LOSSES, INVENTORY ADJUSTMENT			
24. TOTALS			

Please indicate the value of your establishment's net inventory change in 1973.
(This may be a positive or negative figure.) NET INVENTORY CHANGE: $_____

SALES ANALYSIS

DEMAND SOURCE: SECTORS TO WHICH YOU SELL	SALES IN GRAND AND JACKSON COUNTIES $ or % of Total	SALES TO OTHER COLO. COUNTIES $ or % of Total	SALES OUTSIDE COLORADO $ or % of Total
1. AGRICULTURE, LIVESTOCK, & FORESTRY			
2. MINING, RELATED SERVICE OPERATORS			
3. CONSTRUCTION & READY-MIX CONCRETE (Stone, clay, glass & concrete products)			
4. LUMBER AND WOOD PRODUCTS			
5. TRANSPORTATION, COMMUNICATION, ELECTRICITY, GAS			
6. WATER, SEWERAGE & SANITATION SERVICES			
7. AUTOMOTIVE & GASOLINE SERVICE STATIONS			
8. EATING & DRINKING PLACES			
9. TRADE - NOT ELSEWHERE LISTED			
10. FINANCE INSTITUTIONS (Banks and S & L's) INSURANCE (Agents, brokers) REAL ESTATE (Owners, lessors, buyers, sellers, developers, agents)			
11. HOTELS & OTHER LODGING PLACES			
12. RECREATION FACILITIES (Ski tows, golf courses, hunting outfitters, etc.)			
13. HEALTH & MEDICAL CARE			
14. SERVICES - NOT LISTED ELSEWHERE			
15. EDUCATIONAL INSTITUTIONS			
16. LOCAL & COUNTY ROADS			
17. LOCAL & COUNTY GOVERNMENT - NOT LISTED ELSEWHERE			
18. LOCAL AND COUNTY TAXES			
19. HOUSEHOLDS (Direct sales for private consumption)			
20. STATE GOVERNMENT			
21. FEDERAL GOVERNMENT			
22. TOTALS			

At what level of output capacity did your establishment operate during 1978?

LEVEL OF CAPACITY UTILIZATION: _____%

What is your estimate of your establishment's total water use for all phases of your operation? (Note: please use any convenient unit of measurement; e.g., gallons per day, 1000 gallons per day, acre feet per year, etc.)

TOTAL WATER INTAKE: _____

APPENDIX E

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