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**PRIMARY DATA ON
ECONOMIC ACTIVITY AND WATER USE
IN PROTOTYPE OIL SHALE DEVELOPMENT
AREAS OF COLORADO:
AN INITIAL INQUIRY**

by

S. Lee Gray

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ENVIRONMENTAL RESOURCES



CENTER

**Colorado State University
Fort Collins, Colorado**

**Completion Report
No. 58**

PRIMARY DATA ON ECONOMIC ACTIVITY AND WATER USE IN PROTOTYPE
OIL SHALE DEVELOPMENT AREAS OF COLORADO: AN INITIAL INQUIRY

Completion Report

OWRR Project No. A-024-COLO

by

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submitted to

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ABSTRACT

PRIMARY DATA ON ECONOMIC ACTIVITY AND WATER USE IN PROTOTYPE OIL SHALE DEVELOPMENT AREAS OF COLORADO: AN INITIAL INQUIRY

Potential impacts of oil shale development on the economies of certain Western Slope communities in Colorado are quite large. These impacts will likely exert a substantial pressure on the land and water resource base of the area in addition to the effects upon community development, regional income, income distribution, and a changing mix of business activity. In order to approach future research on these issues this "seed" research effort was designed to (1) promote interaction and interchange of ideas among researchers and members of the affected communities, (2) to identify important areas of research needs in the oil shale region, and (3) to initialize the collection of primary data depicting the economic structure of the oil shale communities.

Gray, S. Lee

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COMPLETION REPORT
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This research project was conceived as an initial or "seed" research effort to promote further inquiry into the socio-economic impacts of oil shale development on the Western Slope of Colorado. This report thus represents a progress report as well as a completion report. The initial thrust was to have been directed toward the collection of primary data on the economic activity of Mesa, Rio Blanco and Garfield Counties, Colorado. Such data are necessary in order to provide a basis for monitoring changes subsequent to oil shale development in the area. The accuracy of the primary data, and thus its usefulness, depends largely upon the cooperation of influential citizens and businessmen within the economy under study. Without this cooperation such efforts are subject to failure.

The initial contacts which were made with community leaders and businessmen on the Western Slope reflected a very definite reluctance, indeed sometimes open antagonism, toward additional studies proposed in the area. This attitude prompted a reformulation of the specific data collection objective towards one of establishing the confidence of, and close interaction with, members of the affected communities. The reformulation of objectives in no way detracts from the general purpose of encouraging subsequent research in the region.

The approach adopted in this initial inquiry is the following:
(1) The researchers selected one community in the oil shale counties

to serve as a test for research procedures to be employed in other communities. The community selected was Meeker in Rio Blanco County, Colorado. This selection was largely due to previous contacts established in Meeker through Colorado State University personnel.¹

(2) The second step was to identify and establish close working relationships with key persons in the community. The persons with whom the research team has been working are: Laurel Covington, County Extension Agent, Rio Blanco County; Ed Jirak, former mayor and member of the local planning commission; Russ McDaniel, mayor, member of the local planning commission, and Director of the Meeker Hospital; Frank M. Cooley, attorney and long-time leader in the oil shale issue; Robert King, Superintendent of Schools in Meeker; Joe Sullivan, rancher and chairman of the local planning commission; William Brennan, rancher, Chairman of the Council of Governments, and Rio Blanco County Commissioner; Duane Rehborg, Rio Blanco County Planner; and the Meeker Planning Commission. (3) The final step was to identify the research needs as expressed by members of the community.

Our group meetings and subsequent individual discussions with these people resulted in a concensus that in terms of research as a single entity, the local communities are not interested in "another study." The opinion conveyed to the research team was that previous studies which have been made were simply "dropped on a shelf" and left unattended, unexplained, and unused. The evident conclusion which the members of the community reached was that the researchers

¹Particularly Dr. D. M. Sorensen and Dr. L. M. Hartman, Department of Economics, Colorado State University and Ms. Laurel Covington, County Extension Agent, Rio Blanco County, Meeker, Colorado.

involved in these prior studies have not maintained communicative interaction with the communities involved and that the existing studies have, therefore, not proven to be useful as planning aids.

As a result of these initial responses, the research effort has been organized more along the lines of community development. In essence, this means that our attempts have been to establish effective interchanges of ideas and information through face-to-face, personal relationships with key members of the community. By proceeding in this manner, it has been possible to determine what the community sees as its needs and its objectives and, simultaneously to identify for the community the expertise which is available to the community from Colorado State University. The approach satisfies both the social science research and extension functions of the University, not as separate entities, but rather as an integrated whole.

The research needs which emerged as a result of the discussions in Meeker fall broadly into the classification of identifying and projecting the socio-economic impacts of oil shale development on the Western Slope communities likely to be most heavily effected by such developments. Within this broad classification are several researchable problems. These include:

1. The development of a benchmark set of economic data from which to monitor changes in the economies subsequent to oil shale development. Ideally, these data would reflect the extent of economic interdependences existing between the various sectors of the regional economy as well as the extent to which the regional economies are dependent upon

import and export markets. The benchmark description requires also that the existing requirements of the economies for land and water be fully reflected, both in terms of quantities of the resources used and the existing mix of productive activities to which they are applied.

2. Once the primary data on economic activity and resource use have been obtained, the problem of projecting the impacts of oil shale development on the regional economies can be addressed. Essential to the process of forecasting the impacts of oil shale development is the development of accurate estimates of the oil shale technology, i.e., an explicit statement of the nature and magnitude of various factors of production used in the oil shale process and determination of the factors supplied locally or from imports. The degree of interdependence that exists between the oil shale firms and local industries will have a dramatic influence on the projected impacts.
3. One of the most frequently expressed concerns of people on the Western Slope relates to the potential demands for water, and the related question of water quality impacts, given that oil shale development becomes a reality. It is our contention that water resource questions may not be viewed independently of the question of economic impacts. It is a well-established fact that the impacts on water use, as a result of particular economic changes, are both direct and indirect in nature. Thus, expansion of production in existing economic sectors, or the emergence of new sectors, such as oil shale, will exert some direct influence on the requirements for water. Depending upon

the degree of interdependence between the expanding sectors and other existing water users, there may also be an indirect requirement which in some cases may be many times larger than the direct effect. In order to fully assess all such impacts it is necessary to view the changes in the complete economic structure rather than in isolated sector analysis.

4. Closely related to the problem stated in (3) above is that of assessing trade offs between existing water use and water use in emerging economic sectors. The assessment of such trade offs presupposes two things: first, scarcity of the resource in question; and second, the existence of appropriate value estimates attaching to water used in alternative purposes. The absence of any generally effective market mechanism for determining water value in alternative uses precludes the normal means of transferring water among different users and geographic locations according to market prices. Hence, it becomes necessary to provide surrogate market value estimates (shadow prices) for water in order to assess the trade offs between users. The problem on the Western Slope is compounded by the fact that one major water use is for outdoor recreation purposes, including the scenic attraction, a use for which accurate value estimates are extremely difficult to obtain. Nonetheless, reallocation of water to other purposes may have sizable economic, and other impacts which must be addressed.

In addition to these issues which might be classified as longer run economic research problems, there are several items of immediate concern to the effected communities. First, members of the test

community expressed a need for help in obtaining oil shale development funds from the state. The argument presented to the researchers was basically that the potential impact of oil shale development has already begun. People are moving into the area with the expectation of finding employment in oil shale. The construction phase of development, assuming it actually occurs, has not yet begun, and as a result there is unemployment and a noticeable increase in welfare rolls. The existing water supply and sanitation facilities are already nearing capacity and will have to be expanded to accommodate any noticeable influx of population. Land and property values are increasing and taxes are expected to rise rapidly. The expected increases in population will place increasing demands on educational facilities, hospital services, transportation and communication systems, all of which may require substantial development funds over and above funds which may be provided from the local tax base.

A second problem area related to the impact of increasing prices and taxes on the fixed income recipients of the area, a problem which members of the community feel is not receiving adequate attention in the discussions of oil shale development. Closely associated with this is the question of who will bear the costs and who will receive the benefits of the proposed developments. A great deal of concern was expressed on this issue, not only as regards actual income distribution, but also in regard to the question of environmental impact and effect on the general quality of living in the area. The question of income distributional consequences is one which has plagued economists as a welfare issue since the inception of the discipline, and is a problem which the research team feels merits a good deal of future consideration.

Third, there was virtually unanimous agreement on the need to obtain a specific statement as to what the development plans of the oil companies are. The community is understandably reluctant to proceed with planning and plan implementation without some reasonably firm idea of the plans of those companies involved in the oil shale development. Aligned with this question is the long-run concern of eventual decline of the economies following rapid development.

These questions represent the areas of inquiry in which the researchers are currently involved as a direct result of our initial efforts under the present project. The progress made in establishing the critical working relationship with the community of Meeker is rather difficult to document. However, there are several items which are indicative of such progress. First, the people with whom the research team has been working are beginning to recognize the researchers as persons having a long-term interest in, and commitment to, problems facing the oil shale region. Second, we believe that participants in the local planning process have begun to recognize that the University has expertise to offer in areas outside traditional agriculture and the hard sciences. Third, and largely indicative of the first two, members of the research team have been invited to participate in both the local planning commission meeting and the county planning commission meeting during the week of July 8. Finally, the business community has accepted an invitation to participate in the primary data collection effort. The project team has contacted, personally, most of the business firms in Meeker and has explained the nature of the research effort. Similar efforts are underway in the community of Rangely, Colorado. Actual data collection will begin

July 8. The approach taken here is time consuming, but for the purpose of obtaining the best results, has been quite necessary. To the extent that we have been able to overcome the reluctance to additional studies in the area, this pilot project has been successful.²

As a direct result of the seed money upon which the initial effort was based, Colorado State University researchers are currently beginning examinations in several related areas. Members of the departments of economics, political science and sociology are engaged in researching the socio-economic impacts of oil shale development in the areas of identifying the legal and institutional processes through which oil shale development funds are allotted. We are also identifying, as nearly as possible, the development plans of the oil shale companies and their production techniques. And finally, we are developing the means for forecasting the major impacts of oil shale development on the economic structure, land and water resource base and quality of living in the oil shale region.

While the original objective of collecting all primary data on the relevant economies has not yet been met, we feel that the progress made in establishing an interchange of ideas and effective communications towards the end of performing future research and extension activities in the area has been a most beneficial use of the OWRR seed money. The experience and knowledge gained in this initial effort will enable our researchers to now proceed quite rapidly in broadening the geographic area of subsequent research and in extending the research into data collection, analysis and prescriptive policy recommendations.

²For additional evidence of the prevailing attitudes in the study community see the Meeker Herald, June 20, 1974, and the Denver Post, June 26, 1974.