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COOPERATIVE EFFORTS BY INDUSTRY AND GOVERNMENT
TO DEVELOP GEOTHERMAL RESOURCESDavid R. Butler
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The Federal government's current plans for participation in the geothermal field appear to affect four major areas of interest: (1) resources exploration and assessment, (2) resources utilization projects, (3) advanced research and technology, and (4) environmental, legal, and institutional research. Private industry is also actively involved in these same areas of interest. Because of lack of coordination and communication between the private and public sector, it appears that there will be considerable duplication of effort, and, in some cases, serious conflict. It is also likely that this lack of coordination and communication may result in lack of effort in some key areas. Close coordination and communication between government and industry may resolve some of the major problems that are clearly evident.

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- (2) Resource utilization projects.
- (3) Advanced research and technology.
- (4) Environmental, legal, and institutional research.

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There is cause for concern when the objectives of the Federal program conflict with, and deter, private industry's efforts to find and develop geothermal resources. The "resources exploration and assessment" portion of the Federal program is an example of this conflict. Fiscal year 1975 programs of the United States Geological Survey, the Atomic Energy Commission, and the National Science Foundation all include plans to conduct or sponsor exploration for geothermal resources under the "resources exploration and assessment" effort. Exploration programs are purportedly to develop and improve geothermal exploration techniques or, in the case of the Atomic Energy Commission, to locate test well sites for demonstration plants.

Programs to collect and systematize basic data on a regional basis are projects that could be undertaken by Federal agencies to complement efforts of industry. These programs would include such things as regional geological mapping, systematic compilation of hot spring data, and hydrologic studies. However, Federal programs to develop and evaluate site-oriented exploratory techniques, such as certain geophysical methods, should be limited to those areas where geothermal resources have been proven to exist by previous drilling. It is a waste of tax dollars for the Federal government to gather a mass of exploratory data when these data cannot be related to the actual existence of a geothermal reservoir.

For competitive reasons, industry is forced into this risk-oriented realm. We have to extend geophysical exploration techniques into unproven areas where we may not be certain that our data indicate the presence of a geothermal reservoir. In many instances, the future may well prove that this was also a waste of dollars but these will have been private dollars spent with the full knowledge of the risks involved.

The proof of any exploratory program, be it oil and gas or geothermal, is exploratory drilling which has always been, and will continue to be, a risk venture. The Federal government should not spend tax dollars to participate in high-risk exploratory drilling when there is an industry that will do this job if given the chance.

One example of a government program that is in direct conflict with the exploratory efforts and objectives of private industry is in Nevada, where the Atomic Energy Commission has requested that the Bureau of Land Management withdraw 86,000 acres of Federal land for up to two years while site-oriented geophysical exploration is being conducted in this unproven area. At the end of two years, if geophysical results are favorable, the Atomic Energy Commission will retain a maximum of 5000 acres for up to five years. One or more test wells will be drilled on the retained lands in the hope of discovering a geothermal reservoir of sufficient quality and capacity to furnish the energy necessary for a demonstration power plant.

Any geologist or geophysicist will admit that an exploratory well drilled on the basis of geological and geophysical data and interpretation has some chance, greater or lesser, of failure. In the Nevada example then, what happens if the well or wells drilled on the 5000 acres retained prove to be a failure? Will the Atomic Energy Commission then request that the Bureau of Land Management withdraw another 86,000 acres to do the same thing again? Then, again and again, until statistical success is achieved? It would not take many withdrawals of this size to put Nevada's geothermal prospects out of the reach of private industry on a serial basis. And while the Atomic Energy Commission is trying to find a geothermal reservoir to power a demonstration plant, private industry that wants to get a commercial plant built is forced to stand idly by.

It is significant to note that on the date that the Atomic Energy Commission requested the 86,000 acre withdrawal in Nevada, at least one private company had a geophysical crew at work in the area of requested withdrawal. This company was evaluating whether or not they would file in this area for some of

the 20,480 acres of Federal lands that a private company is allowed to have leased at any one time in Nevada.

In summary of objections to the Atomic Energy Commission's activities in this particular instance, attention is directed to the "Geothermal Energy Research, Development, and Demonstration Act of 1974" just enacted, particularly Conference Report 93-1301 which accompanied the final draft of the bill. Regarding "Resource and Inventory Assessment Program," this report notes that:

"The conference substitute is the same as the House bill, with the following changes: (1) the heading for section 104 of the House bill is changed to reflect the approach taken by the Senate amendments; and (2) the nature of drilling techniques to be used is modified by the conference substitute, to clarify the intent that this research should be to establish the extent and nature of geothermal resources, and should not involve any exploratory drilling which is and should remain the province of private industry."

If the Atomic Energy Commission proceeds with its stated program in this area of withdrawal, there is not only conflict with private industry but with the intent of Congress as well.

Hopefully, this Nevada problem is a symptom of lack of communication between government and industry. Perhaps some in industry were privy to the plans that conflict with industry's aims — others were not. Broader interaction between industry and government in the future will help prevent recurrence of such conflicting situations.

There are ways for industry and government to cooperate in all phases of the proposed Federal program — even in the Resources and Exploration Assessment phase, short of exploratory drilling.

Resources Utilization Projects is an area where Federal programs can aid the efforts of industry. At present, industry intends to explore for, and produce, the natural resource. Public or private utility companies will utilize the resource to produce power. By and large, utility companies are not set up to undertake massive R&D programs to develop new utilization techniques which have some risk of failure. Assistance in this area is vital. However, these efforts to prove utilization concepts should be undertaken in proven reservoir areas. The Federal government should not compete with private industry and hold back industry's efforts by exploring and drilling to find the right area to build demonstration facilities.

Advanced Research and Technology is another area where industry would welcome Federal participation. This is particularly true in the hardware area. Development of hardware in the resources field has traditionally been a service company activity. The service company industry has not been quick to develop geothermal hardware and for good reason. At the present rate of geothermal drilling and development, service companies cannot see that there will be enough demand to justify expenditure of the necessary research funds. The

same principle applies to a great extent in industry research laboratories. Infusion of Federal funds and research at this stage would be most beneficial. As the industry develops and expands, Federal assistance can be phased out as service companies increasingly assume their traditional role.

The Federal government can play an extremely important part in helping industry in the area of environmental, legal, and institutional research. Attempts by private industry to develop geothermal power are encumbered by a bewildering array of environmental, legal, and institutional problems. These problems are not environmental, legal, or institutional per se because there has to be a framework in which we all operate within existing laws and regulations. The problems arise from such things as the lack of pertinent laws and regulations and administrative overlap and duplication. Industry can operate in any fair environmental, legal, and institutional framework as long as we all know the rules. A Federal program of research, education, and aid in implementation could go a long way toward establishing coherent rules.

In summary, industry objects to Federal programs that compete and conflict with their own efforts. On the other hand, industry looks forward to Federal programs which will complement and speed efforts to develop the resource.