GL00898

UNITED STATES
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
NEVADA OPERATIONS OFFICE
P. O. BOX 14100
LAS VEGAS, NEVADA 89114

February 24, 1977

Dear Sir:

GEOTHERMAL RESERVOIR ASSESSMENT CASE STUDY, PUBLIC MEETING TRANSCRIPT

We would like to thank those of you who attended the subject meeting last month for your participation. The discussions, and exchange of ideas, will aid in the preparation of a meaningful Request for Proposal.

Enclosed is the transcript of those proceedings prefaced by a brief abstract and a list of the attendees.

The Request for Proposal is scheduled for issuance in two to three weeks. A preproposal conference will follow shortly thereafter. The Request for Proposal transmittal letter will include particulars on that conference as well as detailed proposal preparation instructions.

Sincerely,

D. T. Schueler, Director
Engineering and Construction
Management Division

E&CMD:JNF-286

Enclosure:
As Stated

cc w/Encl:
J. Bresee, Dir., Div. of Geothermal Energy, ERDA/HQ
J. Salisbury, Div. of Geothermal Energy, ERDA/HQ
J. Cummings, OERC, ERDA/NV
J. Marriott, C&P Div., ERDA/NV

ABSTRACT

PUBLIC MEETING - GEOTHERMAL RESERVOIR ASSESSMENT CASE STUDY

January 26, 1977, 1:00 pm
Salt Lake Hilton Hotel, Salt Lake City, UT

A meeting was conducted by the Energy Research and Development Administration (ERDA) to exchange ideas with interested parties regarding a proposed geothermal reservoir case study. This study is to be accomplished on a cost sharing basis between industry and the Federal Government in, and in the vicinity of, three Known Geothermal Resource Areas (KGRA's) in southwestern Utah.

Opening remarks were given by Mr. D. T. Schueler of the ERDA Nevada Operations Office explaining the purpose of the meeting and introducing the government participants.

Dr. James Bresee, Director of the Division of Geothermal Energy, ERDA/HQ, explained the role of the Division and discussed: the status of the geothermal budget, the potential of geothermal energy for both electric and non-electric applications, major obstacles to the development of geothermal energy, the potential of the geothermal resource base in Utah, and the purpose, philosophy, and goals of the ERDA participation in a case study program.

Dr. John Salisbury of the Division of Geothermal Energy, ERDA/HQ, described the type of information desired, discussed the reasons for choosing the Utah KGRA's under consideration and explained the Request for Proposal (RFP) method to be used for acquiring the information, including the contractual relationship envisioned. Four primary parameters to be used for proposal selection were identified as follows: 1. potential interest of the geographic area chosen, 2. cost, 3. timeliness of data publication, and 4. readiness to drill.

Mr. John Marriott of the ERDA Nevada Operations Office then explained the desired contractual relationship under which the study was to be conducted. It was explained that a "cooperative agreement" method as contrasted to the usual procurement contract method would be strongly considered as a vehicle to offer shared costing for data. Principal differences between the two methods were pointed out with emphasis on the higher degree of flexibility available through the "cooperative agreement" method.

A question and answer period ensued with major points discussed as follows: the amount of funding available for this study, potential interagency or state environmental and procedural problems, extent of the government's cost sharing participation, importance of the readiness to drill parameter, types of data most desired, treatment of proprietary data, method of information dissemination, and activities/responsibilities of other federal government agencies.

In closing, Mr. Leon Silverstrom, Chief Counsel of the ERDA, Nevada Operations Office, cautioned attendees about being guided by the verbal discussions on the RFP throughout the meeting because the ultimate "RFP" will be the controlling document as to the final contractural basis, and guidelines for proposal submittal.

The meeting was adjourned at approximately 3:45 pm.

PUBLIC MEETING

GEOTHERMAL RESERVOIR ASSESSMENT CASE STUDY

SALT LAKE HILTON HOTEL, SALT LAKE CITY, UTAH

JANUARY 26, 1977

LIST OF ATTENDEES

	Name	Organization
1.	Dr. James Bresee	ERDA HQ
2.	Dr. Jack Salisbury	ERDA HQ
3.	D. T. Schueler	ERDA NV
4.	J. O. Cummings	ERDA NV
5.	Leon Silverstrom	ERDA NV
6.	John Marriott	ERDA NV
7.	J. N. Fiore	ERDA NV
8.	Bill Adams	EPA-Las Vegas
9.	Barry A. Boudreau	U.S. Geological Survey
10.	Ken Bull	U.S. Geological Survey
11.	Tim Mac Gillvray	U.S. Geological Survey
12.	Sie Ling Chiang	U.S. Geological Survey
13.	Eugene Rush	U.S. Geological Survey
14.	D. L. Mari	Bureau of Land Management
15.	Lewis D. Richardson	U.S. Fish & Wildlife Service
16.	Lilliam Garret	Office of Congressman Marriott
17.	Dee C. Hanson	State Engineer
18.	Douglas Kirk	Utah State Planning Coordinator
19.	Rod Millar	Utah State Science Advisor
20.	Ray Davidson	Western Governors Energy Office
21.	Stanley Green	Utah Division of Water Rights
22.	H. D. Harris	Harris Drilling Company
23.	Q. C. Hebrew	Geological Consultant
24.	A. H. Jones	Terra Tek, Inc.
25.	Sidney Green	Terra Tek, Inc.
26.	G. Martin Booth III	Geological Consultant
27.	T. A. Netelbeek	Kennecott Exploration
28.	Carol Petersen	Utah Geological & Mineral Survey
29.	Howard P. Ross	Kennecott Copper Corp.
30.	Thomas J. Neville	Thermogenics, Inc.
31.	W. F. Bates	McCulloch Geothermal Corporation
32.	Paul T. Walton	American Geological Enterprises, Inc.

Name	Organization
33. C. J. Van Hoene	Thermal Exploration Company
34. K. R. Davis	Thermal Power Company
35. R. C. Skeen	Skeen & Skeen
36. Frank Conforti	Citizen
37. J. L. "Bill" Smith	Republic Geothermal
38. Timothy M. Evans	Republic Geothermal
39. Roger L. Bowers	Hunt Energy Corp.
40. Mario L. Davis	Hydro-Search, Inc.
41. David J. Atkinson	Hydro-Search, Inc.
42. D. E. Pyle	Union Oil Company of California
43. Henry T. Snow	Union Oil Company of California
44. Bob Robinson	Senturion Sciences
45. Clint Warley	Univ. of Salt Lake
46. Dan E. Haymond	University of Utah, Graduate Student
47. Lewis J. Katz	Seismic Exploration, Inc.
48. Steve Bellor	Seismic Exploration, Inc.
49. Dan Sparks	Getty Oil Company
50. Frank G. Metcalf	Geothermal Power Corp.
51. Larry DeVrin	University of Utah, Mechanical Eng.
52. Reporter	Deseret News, Salt Lake City

PUBLIC MEETING

GEOTHERMAL RESERVOIR ASSESSMENT CASE STUDY

SALT LAKE HILTON HOTEL, SALT LAKE CITY, UTAH

The meeting was convened at 1:15 p.m. on January 26, 1977.

SCHUELER:

If you will note, we have set up a voice recording system for our own benefit, not for any legal purposes, but for the benefit of ourselves in developing a full transcript. Secondly, or as a consequence, we feel that for the maximum to be gained out of the meeting will lie with audience participation, because that is one of the purposes of getting together is to get some response from and some inputs from industry and people, and those people interested in the specific areas that we will discuss. Secondly, I'm going to ask Mr. Fiore to start a list, it will start with a blank, but hopefully it will end up to be a list, with your name and your affiliation and your address. In our mailing, we said we would return to you essentially, a transcript of the proceedings for your own information, somewhat as an expression of our gratitude for your participation, and to do so we're going to need some kind of identification of those people that are here; so if you can cooperate in that area, we would appreciate it. Joe, if you want to start the list.

Well, gentlemen, as I said, if I can express my appreciation for your attendance. I realize that there are a couple of other meetings going on here in the building addressing similar subjects. We don't mean to overpower you with numbers or titles. The government operates in strange ways. I would like to introduce myself: I'm Don Schueler, Director of the Engineering & Construction Division of the Energy Research and Development Administration's office in Nevada. We are acting more on behalf of the Headquarters organization of those people that I will introduce to you and will try to act in a coordinating role for this program until directed otherwise, I guess. I would like to introduce the participants that will be available for conversations today or that will be addressing you on behalf of what we are identifying as the government's interest, through ERDA, in data collection and information gathering. The ultimate purpose being a Request for Proposals, an RFP, that will come out of, perhaps, our office and that RFP will be somewhat tailored from its original form by some of the inputs that come from this meeting today. Again, for that purpose, as we get into the question and answer mode, we would appreciate it very much if you would utilize those mikes that are in the middle aisle and it will result in a better documentation.

To my left, I would like to introduce Dr. Jim Bresee. Dr. Bresee is Director of the Division of Geothermal Energy at the Headquarters level

in Washington, D.C. To my right is Dr. Jack Salisbury, who's Chief of the Resource and Reservoir Assessment Branch of that Geothermal Energy Division of Headquarters. Of the NV staff, we have brought with us Mr. John Marriott, who is to my right. John is Senior Contract Specialist in the Contracts and Procurement Division of NV. NV is the Nevada Operations Office. To my far left is Mr. John Cummings, Chief of the Office of Energy Resource Coordination of NV, and to my immediate left is Mr. Joe Fiore, Project Engineer in the Industrial Applications Branch.

The mail-out that we sent to you included a summary of the proposed case history program. Those of you who did not bring it or wish extra copies, there are some handouts here on the front table available for you. The need for the program is somewhat twofold. It's felt that through government assistance, the stimulation of an exploratory drilling program can be implemented and assisted. Secondly, the need for data that can be put into the public channels and public system is significant and necessary and through a program or through this RFP that can be developed, we feel that we can go into a data gathering mode. The proposal as identified in our letter talked about the southern Utah area: the Roosevelt Hot Springs, Thermo Hot Springs, and Cove Fort-Sulfurdale KGRAs. This is proposed as a first step in a program which could well be extended and will be extended into other regions in the west that are considered to be highly desirable from the standpoint of geothermal exploration, geothermal development, and as a test bed for gathering R&D data related with reservoir analysis. To this end, I would like to relieve myself of the responsibility up here, and for a general overview of the geothermal program, I'd like to call on Dr. Bresee to provide you with that background.

BRESEE:

Thanks. I'll just take a few minutes because Jack Salisbury, who is sitting down here on the right, will be discussing, I'm sure, in the kind of detail you really want, the specific proposal that we would like to have your assistance in formulating. But in case many of you don't know too much about ERDA and the Division of Geothermal Energy, let me just describe what we do and what we're hoping to do in the future. ERDA's been in existence just a little over two years and according to the newspapers, we may not have a much greater existence that two and one-half years. But I presume that the function that we provide, which is to work with industry and to try to stimulate the growth of geothermal energy as an alternate source in this country, will be continued even by the Department of Energy, which we would doubtless be incorporated within. So we're going to keep on doing our job as we understand and as we can define it with your help, and assume that somehow or other continuity can be maintained.

The Geothermal Energy Division operates for really three purposes. To assist in the general increased understanding of the resource base. Here we work with the U.S. Geological Survey, with our friends in industry,

through contracts, and by all sorts of modes to try to improve the understanding that the nation has and, of course, specific members of our industrial colleagues, have of the full potential--location, characteristics, and utilization techniques associated with the geothermal reservoir. Now I'm speaking very specifically of the liquid-dominated systems that we feel are quite abundant but have so far not been used in any significant way for commercial applications. As you probably know, there are a number of countries throughout the world in which such systems are commercially used. There are nine countries today that generate geothermal electricity and seven of them depend upon liquid-dominated systems. It's only Italy and the U.S. who happen to be the two biggest producers of geothermal electricity that use exclusively dry steam, and looking at the potential that has already been exhibited in places like El Salvador, I think it's kind of ironic that within a few years when the third unit at Ahuachapan is put on and the power generation rises to 90 megawatts, El Salvador will be the leading geothermal liquid-dominated producer in the western hemisphere and second only to New Zealand in the world. And, I figure if El Salvador can do it, we could probably learn how. So based upon that rather naive approach, we're determined to do what we can in the reservoir area to try to improve our understanding of the technical and economic characteristics of liquid-dominated systems. We're also very concerned with viable geothermal industry, both in the resource companies and in the utilization companies. So we have a wide range of activities, roughly described as research, development and demonstration, in which we sponsor research either directly or through cost sharing at various scales of engineering studies all the way from fairly basic studies of heat transfer involving two dissimilar liquids through to (starting this year) a major geothermal power plant joint construction, called a demonstration program, which is contained in the 1978 budget. And over that wide spectrum of subcomponents and basic systems development all the way to full integrated commercial scale facilities, we expect to play a role through risk sharing and, as much as we can, through the technology support. This broad program could be variously described as hydrothermal energy development and it is one of the central features of our activity. And then, finally, we have a longer-range responsibility where we don't expect any significant contribution finacially from the industrial community and that is to investigate the potential of the very large resources which are probably many years away from commercialization, such as geopressure or hot dry rock. Here we expect to carry the load to develop the technology and to cooperate at the point when it's near commercialization with various industrial firms. So, roughly speaking, we have a threefold purpose: to work vigorously on improving our understanding of the resource, to help develop a hydrothermal industry, and to do advance research as is necessary to characterize the next generation of resource types which could have significant potential.

As I said, the program has been in existence only two years, but it's very gratifying to see a lot of support within the government and within the industry for the efforts that we have been engaged in. On the

government's side, we've had an increasing amount of financial support and that's always a nice shape of the curve. We started the first year in which we operated, fiscal '75, at an annual budget rate of $25 million and outlays of $20 million. The following year, fiscal '76, our rate was above 30, this year it's above 50, and the present budget puts us up near 90. We think this is a large amount of money and we feel responsible for investing it carefully. One of the ways we don't want to invest it is in an extensive program of government-funded drilling operations to explore and characterize geothermal resources. That's expensive and it has many handicaps from our standpoint. We're certainly not an organization that is designed to do effective geothermal drilling per se; we're interested in improving the technology, but we're certainly not interested in becoming a series of drilling experts and geothermal resource development organizations. We intend to stay out of that activity and, where we are engaged in exploratory drilling, it will be confined to those areas which could be called precommercial, which are regions in which there hasn't been much commercial interest and where we hope a few exploratory wells can help stimulate some commercial interest. Case in point, the big island of Hawaii, where many of us felt that there was probably a fairly low chance that that basaltic system would contain a hydrothermal reservoir of any significance and we were pleasantly surprised to find otherwise this past year. But that's the kind of exploratory activities we will be continuing.

In the areas of prime commercial interest, we wish to cooperate with industry and to stay out of the drilling business and to concentrate on trying to improve technology. It's in this area that Dr. Salisbury's industry coupled reservoir program which will be described today may, I think, play a significant role. We would like to hope so and with the help of you present, I think we may be able to tailor it toward something which would be not only useful to the government in its role but also highly supportive of the very industrial sector that we're seeking to provide support to.

Any general questions about geothermal energy? That is, as far as the federal program is concerned? I've only talked about ERDA; I've ignored some obvious correlated programs: U.S. Geological Survey's program at about 10 million a year in broad regional assessment and methodology, Bureau of Reclamation has a small effort in desalting, Bureau of Mines does some work in development of material and in mineral recovery, Bureau of Land Management, of course, plays an important role in terms of handling the federal lands, and U.S. Department of Agriculture, through the Forest Service, has a similar responsibility. There are a lot of agencies of government which work in the geothermal business. In fact, within ERDA, there is an environmental and safety program which broadly across all the energy spectrum has been providing some very useful work, I think. For example, it's funded and is sponsoring the environmental baseline study, geothermal environmental baseline study, in the Imperial Valley and that's outside of the division but we're very pleased that it's going on. There's also a physical reseach division

that sponsors some fundamental studies of physical properties of matters that relate to the geosciences. But I think by and large I've fairly well covered the activities of our division. Yes, sir?

BILL ADAMS, ENVIRONMENTAL PROTECTION AGENCY, LAS VEGAS:

I'd like to ask you two questions, if I may. One is what is ERDA's view on the potential of geothermal energy with respect to the development for the generation of electricity and, secondly, what do you see as the greatest hindrance today toward that development?

BRESEE:

Okay. Very broad questions. We've tried to be realistic about what the growth might be in electric generation. As you probably know, there have already been programmed at The Geysers, a growth from the present level of a little over 500 megawatts to over 900 megawatts. So you are looking at a growth over the next 10 years of an amount almost equivalent to 1,000 megawatts of dry steam. The big uncertainty, of course, is the growth of the liquid systems for power generation, similar to the Cerro Prieto plant near Mexicali and El Salvador. Our best estimate is that we'll be looking at 3,000 or maybe 4,500 megawatts by '85, with a vigorous cooperative program with industry. That type of investment represents an industrial investment of many billions of dollars and anytime a federal agency attempts to sit and say, well, industry will do this, as long as the economy does operate as a free economy, it becomes a little naive, so we recognize there are great uncertainties in those numbers but what we've done is to look at the possible growth in places like Utah, north-central Nevada, Imperial Valley, Long Valley, Surprise Valley, the Snake River plains, and so forth. There are many interesting areas that look like they are ripe for commercialization during that time frame and we've tried to be realistic about how long it's going to take to do the exploratory work and I think these are doable numbers. They'll still tax everybody's energy, the private sector as well as government. We also intend, and I've emphasized, I'm afraid, too much the technical side, to do what we can to help clear away needless roadblocks, institutional barriers which serve no specific purpose except either to harass or to reflect the general confusion of government. There is a meeting down the hall addressed specifically to trying to improve the coordination between the state and federal government in the general permitting process.

Okay, I've said what I can about what sort of growth we may expect from today, which is 500 megawatts in all The Geysers, to the middle '80s. Beyond that, I'm optimistic enough to think geothermal can supply a very significant amount of energy, many tens of thousands of megawatts during the period '85 to 2000 and maybe even beyond if some of these larger resources such as geopressure and hot dry rock prove out. But I see it as a very significant resource base never really being able to supply more than a few percent, perhaps, of the energy requirements of the

nation. But if those of you remember, way back in '73, a cutoff due to an oil embargo of a few percent of the total energy available to the country can be very disruptive, and so to the extent that geothermal energy can supply indigenous energy, both electrical, which we've talked most about, and nonelectrical, I think really the growth of nonelectrical could, obviously, in percentage, be much larger. In terms of oil equivalent, I suspect it will stay small compared with electrical for quite a while. I'll give you some figures to base this on. The total nonelectrical use of geothermal energy in this country, we think, is on the order of 20 megawatts. The heat flow rate at The Geysers right now is 4,000 thermal megawatts. So between 20 thermal megawatts total nonelectric everyplace in the country and 4,000 at one site, you get a feeling for the disparity in the use. One potential program at Boise involving the state government could double the nonelectric use of geothermal energy in the country. So there is, I think, a tremendous growth potential there but whether it will be equivalent total size in terms of imported oil to electrical I seriously doubt, at least over the next decade or two.

Okay, the biggest handicap. It's hard to be very specific. I know of institutional barriers all the way from the problems of environmental impact assessment, leasing, permitting, a whole collection of problems such as difference in tax treatment of drilling done for geothermal as contrasted with oil and gas. All these slow the development of that resource. You are probably aware that we have recently undertaken a loan guarantee program. This is specifically aimed toward stimulating the growth by helping to share financial risks. There are also technical problems in the way. We cannot pick up foreign technology and plunk it down in this country and pass the NEPA standards, let alone the state standards. We simply can't operate the way power plants are operating in New Zealand, for example, where the waste brine is discharged to the river and there's some real concern about arsenic levels resulting. These are things that we must improve upon so there are many things that must be done to try to solve these technical problems. I say it's a combination of institutional and technical problems and yet I don't know of any insurmountable problems. I see all these as capable of solution by coordinated government and industrial research, development, demonstration, and cooperation. Any other? Yes, sir?

QUESTION:

What type of loan guarantee or risk sharing is available to utility companies?

BRESEE:

The use of the loan guarantee program is what is sometimes described as venture capital, I guess is one example and there are others. The program we're going to be talking about today is a direct attempt to do two things. First of all, to allow the government to provide more

information through technical publications on improved methods of reservoir assessment. And that's a sort of a background responsibility we have which we hope to carry out through this program. On the other hand, we hope it will also provide a direct stimulus through risk sharing in terms of exploratory drilling. And, as we discuss it more, I think you will see ways in which that can be done. The demo program, which is the biggest new addition to our geothermal budget this fiscal year, is a clear example of risk sharing. We have a feeling that the reason why the loan guarantee has not attracted any power plant construction proposals, the reason why there aren't any firm plans to build liquid-dominated power plant systems in this country, is largely technical risks associated with reservoir performance and large integrated systems. The demonstration program and the present budget is an attempt to cost share in order to risk share and also to provide mechanisms for direct technology support activities. The best example I can give you in miniature of that type of thing is the thermal loop running at Niland, California, which is a fifty-fifty cost sharing program between San Diego Gas and Electric and ERDA. This has a high salinity brine, 20 percent brine. It offers some very significant technological problems. It was not something that looked like it could be handled directly by industry; it looked like a natural place for risk sharing and technology support, both of which are incorporated in that activity. I'm happy to report, in case you haven't heard, that that system is running very well. It's been on line since last May and it had an 80 percent availability during the month of December. It's a modest success at this point. But those are three or four examples of ways in which we hope to provide risk sharing. I don't know whether that is a complete answer.

QUESTION:

Do you think that this, that the nation can meet this objective of 3,000 to 4,500 megawatts by '85 if the large oil companies should be required to divest.

BRESEE:

Oh boy, there's a loaded question. I can say this, it would be harder. That's an easy answer but that's a complicated question, certainly, and I would like an easier question. Has anybody got an easier question? Way in the back?

QUESTION:

What kind of potential do you see for Utah?

BRESEE:

The reason we're here is that it seems to me that the potential is really very significant. The decision to come to you and ask for your comments on our program and to try to institute it first in Utah was not

by random selection. It looks to us like the work that's been done at Roosevelt Hot Springs is very exciting and indicates that that whole area down there might have a tremendous potential for near-term electrical and nonelectrical applications. So we're very excited about the future here and delighted to have a chance to talk to you about it. Yes, sir?

MR. RICHARDSON, FISH AND WILDLIFE REPRESENTATIVE:

Is the state of Utah ready, by virtue of coordination groups and committees, to accept geothermal development? Are there state people here?

BRESEE:

We certainly invited state people. I hope that if they're not here they will soon be and maybe that question could be directed to them. There's a lot of state interest in the other meeting, the parallel meeting, so we may not have as many state officials as I would like, but perhaps I can drag one down later to talk about just where the integration of energy programs rests. Any other questions? Yes, sir?

QUESTION (NAME UNKNOWN):

Do you think the Geothermal Steam Act of 1970 is an incentive to private industry to seek geothermal development on Federal lands?

BRESEE:

It certainly was designed to be. I think it has some problems and we have been working with EPA and with our good friends in the Bureau of Land Management who have the major responsibility for administering that program to try to make the program operate a little more effectively. As you know, there was a long hiatus between the passage of the bill and the first leases under it. Understandable, because within the middle of that, the NEPA system arose and there was an awful lot of delays built into environmental impact statements. And then serious questions about whether they could be generic would have to be by reservoir. In spite of that, it has gone slowly, and a lot of the problem is lack of resources within some of the federal agencies that work with it. For example, the Department of Agriculture administers through the Forest Service a leasing program which I think has essentially not leased at all in California, Washington, and Oregon, the three westernmost states. Somebody can correct me if I'm wrong, but I think that's about right. There's been a little activity in the mountain states, but I believe on the Pacific coast there's been almost no Forest Service leases yet. The major problem is inadequate budget and staff and naturally, within a huge department like Agriculture, a fairly low priority in terms of this particular energy activity.

We have a thing which used to be called the Geothermal Advisory Council in Washington, chaired by my boss, Assistant Administrator Bob Hirsch

and made up of assistant secretary level people within the federal establishment, and we try to have as memberships on that Council, representatives of every agency that has a significant role in geothermal. And in recognition of that special problem of slow leasing under the Geothermal Steam Act of '70 in the Forest Service we had recently had an Assistant Secretary of Agriculture appointed to that committee and we have Forest Service representatives coming quite regularly. We sympathize with the problems that agency has had and ERDA and other parts of the government are trying to help, at least trying to spotlight on some of the budgetary problems that will help get more emphasis on that process. We've also provided some direct funding in some instances to get certain specific leasing activities off the dime such as Long Valley. I think that the Act can be improved and we're trying to work to improve it, particularly the regulations under it rather than the basic law. No further questions?

Okay, the important stuff comes now. So I'm here to listen and I thank you.

SALISBURY:

As Jim said, the function of ERDA, particularly when we're talking about hydrothermal resources, is to foster a viable geothermal industry. And that makes us quite a bit different from other government agencies you may be familiar with. For example, when NASA put a capsule on the moon, it didn't have to be cost effective, it only had to work. We're talking about fostering a geothermal industry that works in the marketplace. That's quite a different thing. We have then, not the government itself as the customer, as in the case of NASA, but industry, local and state governments as the customers in trying to produce a viable geothermal industry. And that's why we are here today--to try to find out ways in which we can help produce that industry.

As a background for reasons for the program, I can say that we sought out what could be done to help by finding out what the problem was. And Dr. Bresee has talked about institutional problems and environmental problems and they're very real. Of course, my area is resource and reservoir assessment, and so I try to seek out the problems in that area. And we found that there are two classes of problems: one class was the lack of knowledge and the other a lack of money. The lack of knowledge extends all the way from what geophysical techniques work in different geological environments to discern a reservoir depth to tell you where to drill, to a certain amount of confusion about geological models of these reservoirs at depth. There is considerable argument in that area to, and Jim alluded to this, i.e., the uncertainty of reservoir engineering. Reservoir engineering techniques from the oil patch cannot be applied directly to geothermal problems in most cases. We have fracture permeability dominating a geometry of reservoir that's quite different from an oil reservoir. And as a result, even if one has a hole in the ground blowing steam, it's difficult to make money off of it

because it's difficult to know how long it will flow steam, at what volume, and at what temperature. So this lack of knowledge means uncertainty. Uncertainty and risks. And uncertainty and risks, of course, are very poor foundations upon which to build a viable industry. So our first effort is to reduce uncertainty and risks by increasing the knowledge base upon which the industry is built. I'm speaking of the knowledge of geophysical techniques, i.e., which ones will work in different environments; knowledge of geological models of the reservoirs at depth and knowledge of reservoir engineering techniques and methodology.

I said the other lack was money. In talking to people and saying, you know you have that beautiful lease, why haven't you drilled it? They say, well, you know the first hole is a high risk hole and it's very hard to get the capital necessary to drill it. And so we came up with the program, the proposed program that we're describing today, which involves our participation in a sense with industry in the drilling of holes and in the acquiring and dissemination of information. The concept is akin to one used in the industry called bottom-hole money, and this is for the benefit of those of you who are not in the industry itself, this is a contractual relationship in which if Company A is drilling an interesting hole or a hole at an interesting site, Company B will offer a consideration, say $5 a foot, for information on that hole. And then both companies keep that information proprietary. Now we're talking about trying to establish the same sort of cooperative relationship. Offering a certain amount in the case of a new hole, offering a certain number of dollars per foot, not only to acquire the information, but also to reimburse the driller for his proprietary position and make that information public to increase the knowledge base. We want to extend this concept of bottom-hole money to include not only the geological information in a hole, but also to include the reservoir engineering data, the surface data, the geophysics and the geology that helped site that hole in the first place. That is, we're trying to then bring together, a case study of different reservoirs, and different geothermal systems. In this way, not only do we hope to acquire knowledge, but we also hope through the contribution of our funds to stimulate additional exploratory drilling.

Because, as it has already been indicated, it's important to acquiring any kind of capacity, including electrical power capacity, that we have sufficient exploratory drilling to prove large reserves. You can't have 4,000 megawatts, or 6,000, or even 2,000, without the reserves proven in the ground. And for that, there has to be good deal of exploratory drilling. And it's necessary for us to somehow accelerate the current rate of exploratory drilling if we hope to see any significant amount of power on line by 1985 or by the year 2000. So, knowledge and accelerated exploratory drilling are important.

Now, of course, because we've started with the concept of bottom-hole money, one tends to think of purchasing just well information and just information on new wells. I want to emphasize that we're interested in

all kinds of information. If we're going to draw together a good case study, we need information from wells that are already drilled. It doesn't have to be a new exploratory well, even though we want to stimulate the drilling of such wells. We're also interested in the purchase of information from old wells. We're interested in surface data, subsurface data, reservoir engineering data; we're interested in any kind of data you want to sell. Because that's necessary if we want to pull together a complete picture.

Now why did we pick Roosevelt Hot Springs, Cove Fort-Sulfurdale, and Thermo Hot Springs, those three KGRAs? An analysis of the potential in various states and the potential of various geothermal systems that had been identified led us to believe that this area in southern Utah has one of the largest potentials in the country, we think. We'd like to verify that. In addition, it's a very interesting area geologically. There are other areas in the country like it and so information derived in this area may be applicable to accelerate the development of geothermal resources elsewhere in the country. So we have chosen Roosevelt as a first test. If things work well here, we will extend the program elsewhere. But in order for things to work well, we need this kind of meeting and need your input.

Now before getting into the contractual details, although I shouldn't say contracts because we're not talking about contracts, I'd like to emphasize that I'll leave the exact terminology of what we are talking about to John Marriott because we're trying to talk about a relationship with industry that's a little new and different. I'd like to tell you the general mechanics of how we would work this solicitation. If we go forward, we would come out with a Request for Proposal, an RFP, which is something that's been seen before, despite the fact that we would try to arrive at a different legal agreement about how our transaction might be carried out. I'm not trying to confuse you, I'm trying to leave the detailed explanation to John. But we would start out with the typical, traditional RFP and request proposals from industry for information. Now because I've said that we would accept any kind of a proposal, if you have data you feel is interesting, whether it's new data that you are going to acquire or old data that you have, we are interested in it. That means that the proposals will be very different, one from the other. And it's going to be a difficult job then to select the ones to fund. We recognize this. It's going to be a problem of comparing apples and oranges, or perhaps apples and lemons. And the difficulty then is to pick the best one in a meaningful way.

I want to explain that we will have a review panel which will judge these proposals based on some, I think, pretty obvious parameters. For example, the first one would be potential interest. And if it isn't of high potential interest, why, of course, we don't want it. The second would be cost. Clearly, if two proposals are of equal interest, the one who wishes to charge the government the least would be considered first. Third consideration would be the timeliness with which we can publish

the data. We understand that some people in industry, those who are proposing to drill new exploratory wells, might not want the data published immediately. So we're willing to negotiate a delay, a publication delay, in order, so that their competitive position won't be too badly injured by the publication of the data acquired from the well. But naturally, the length of this publication delay is a negative factor. Since one of our purposes is to get the information out in front of the public, a long delay would be counterproductive. By long, I mean two years. That would be an unconscionable period from the point of view of trying to help the industry with the information derived. Fourth parameter might be, I've forgotten the fourth parameter for the moment, but it will come to me. Oh yes, readiness, that's another one. Readiness to drill. If we're going to drill a new well, for example, the person who offers the proposal should be ready to drill. He should have gone through the environmental process and permitting process. We aren't anxious to couple ourselves and tie up our funds with people who really won't be ready to drill for two or three years. I think these are pretty obvious parameters. One is balanced off against another. We will come up with a numerical rating for each parameter and others that we can think of at the time and arrive at a numerical rating for the proposals and hopefully we'll wind up with a series of proposals that we can fund which will provide a meaningful case study.

In summary, I've tried to tell you the background of how we got into this program and why we're here at Roosevelt and how we hope to accomplish it. But I would like to emphasize again that this program, like the rest of our programs, is not meant just to work like the Apollo capsule, it's supposed to be helpful. And it can only be really helpful if we have the input from the people who are most concerned--the industry people, state and local officials so that we can design a program to provide the maximum benefit from the dollars we invest in it. I would like to answer questions now, but I think perhaps it might be better if we hold the questions until John has discussed the legal aspects of the proposed program. John Marriott.

MARRIOTT:

I guess I'll have to restate my name. My name is Marriott and it isn't often that you find a Marriott in a Hilton hotel. Dr. Salisbury may have led you to believe that I was an attorney, but since Leon Silverstrom, our Chief Counsel from the Nevada Operations Office, came in the back door a few moments ago, I'll have to deny that I'm an attorney. In any event, I would like to talk to you about what we envision as far as the--have to be careful about this--it's normally called a contractual arrangement. I think it's more in line of an agreement that we envision as a result of the proposals received in response to the RFP that will be issued. And, in essence, we feel that it will qualify for what is called the cooperative agreement arrangement.

Now,I was going to say, substantially all of ERDA activities, even in the energy field, until recently have been accomplished by the procurement contract arrangement. Now this is subject to the full range of the Federal Procurement Regulations as well as our own ERDA Procurement Regulations; and as in many cases, we found quite a bit of objection from industry, and rightfully so. These objections come primarily from government interference with what is supposed to be the contractor's project, and the use of the standard forms and terms for the procurement of supplies and services does not seem to be appropriate for these hopefully cost sharing arrangements. Now, at Nevada, we've had some success in the energy field related to fossil energy with the procurement-type contract which resulted in an agreement on a cost sharing basis. But we did find a degree of reluctance on the part of the contractor or proposer to accept all the resultant terms and conditions that the federal bureaucracy and the procurement regulations placed upon them. Now that the cooperative agreement has recently been developed, we feel it will be more readily acceptable to you and industry. The authority for the cooperative agreement, I guess, has been with ERDA ever since it was born a couple of years ago, and I think it really only recently has been used. This will be primarily of interest to those people who have been exposed to the full procurement terms and conditions in a contract. And I'll attempt to run through what we envision in the line of a cooperative agreement that will in many ways relieve, we hope, your problems with the procurement-type contract.

What the cooperative agreement envisions is a partnership or joint venture relationship with the participant. Now this differs from the procurement action which is sort of an arm's-length arrangement. The government's the government and the contractor's the contractor and the burden of everything appears to be on the contractor. The government, in a procurement action, has certain rights that don't seem appropriate for the type of agreement we envision in response to this particular RFP to be developed. For example, in the normal government contract you will find a clause that says "Termination for Convenience of the Government." Unilaterally the government can do this. Under the cooperative agreement, this will be changed to have a mutual understanding on when either party can terminate. This would be written up specifically for each cooperative agreement. The "Termination for Default" article that you normally find in the government contract will not be in the cooperative agreement. The default termination article in the contract gives the government the right for repurchase and damages in the event that the contractor doesn't perform. Well, in these cases we would assume that termination again would be by mutual agreement as to when either party can get out from under. In the government contract, the "Changes" article can unilaterally direct changes that the contractor has to perform. Under the cooperative agreement, there is a mutual understanding that the program will be the participant's or the proposer's program and we'll participate in it on a cost sharing basis, but either party could propose changes and they would have to be more or less mutually agreed upon. Under the normal government contract, the government has the right to stop work, i.e., issue a stop work order. Under the

cooperative agreement, this wouldn't be solely the government's prerogative. Many of the other articles are the same. Responsibility for performance under a government procurement-type contract is usually totally on the contractor. In connection with a cooperative agreement as we see it being formed, ERDA would conceivably be responsible for a portion of the work and the participant for a portion of the work and you have joint responsibility then for the performance.

In the financial side with cost sharing under cooperative agreements, we have much more flexibility in funding. Those of you who are familiar with negotiated federal contracts have run into the "Cost Accounting Standards" article, where you run into the cost or pricing data requirements, audit rights, all these things. Under the cooperative agreements, it's my understanding, they don't apply. Period of performance is another example. In a procurement-type contract, the contractor is responsible to perform on such and such a date or by such and such a date. Under the cooperative agreement as we see it, the period of performance can be extended by mutual agreement. Under the procurement-type contract the contractor is responsible for project management and under the cooperative agreement we mutually develop a plan as to who does what to whom. Project reports, normally under the procurement-type arrangement are the contractor's responsibility. Now, under the cooperative agreement that we envision, this would work both ways. The participant would report to the government on those things that he does, the government would report to the contractor on those things that are our responsibility. Same thing is true as far as liability insurance, and other types of insurance. Under the procurement rules, it's the contractor's risk and the government is self-insured. Under the cooperative agreement, we have the feeling that perhaps the government would ask the participant to include the government's responsibility under his insurance plan as part of the negotiated agreement. Also, under normal government procurement rules, the government gets patent rights in total. We would assume under the cooperative agreement that the other party has a substantial investment in some of these items and the government may under these circumstances waive patent rights.

Now let's talk about the "boiler plate," these are the 50 articles which you normally find in the procurement-type document or the negotiated contract. These can conceivably be reduced to the neighborhood of 18 clauses that either by congressional actions require including it any agreement that we have, or perhaps by policy we may feel should be a part of the agreement. In the procurement-type contract, you have to spell out in specific details all of the requirements that the contractor has to provide. In a cooperative agreement, you sit down when drafting the cooperative agreement and both sides can give and take and agree on what should be done.

Now I'd like to be able to tell you exactly what a cooperative agreement will look like. Unfortunately, it can't be done. Each cooperative agreement, it's my understanding, has to be tailored to each individual proposal that you are negotiating. The only thing that I can say is that it obviously has many advantages on both sides of the fence. Now

one of the problems that I understand that has been discussed with many of the oil companies at a Houston meeting is to what extent is the "boiler plate" of a procurement contract negotiable. In most cases, it's as we say "cast in bronze." There's not much you can do about the "boiler plate" under the procurement-type action. But with the cooperative agreement, there is much flexibility and even those articles that seem to be standard and almost mandatory as to text can be mutually agreed upon to the satisfaction of both parties. And I guess that's about all I have to say.

BRESEE:

As John has indicated, there is a great deal of flexibility potentially here. We'll learn as we go along. But in my earlier comments, I emphasized why it was in general that government, and particularly ERDA, did not want to be in the drilling business. And so the one thing that we are striving for is a relationship, cooperative agreement, or whatever term is ultimately derived, by which the government does not take title to anything except information. We're very much aware of problems associated with becoming coowners of casings and things like this and we simply want to avoid any relationship which ends up in transferring title to hardware. We are very much interested in cooperation and information transfer under the terms of the arrangement, but we wish to stay away from direct participation in that sense. I guess questions for either one of us.

QUESTION:

I wonder if you could give us a general idea of the extent of the scope of the program that you have in mind, amount of money available, and the time frame for issuance of the RFP.

SALISBURY:

The money that we have available in the current budget to apply to this program is 1.4 million dollars. This is a test program. We anticipate that it will be followed by other programs that would also be funded in a substantial way. And, in fact, if this is successful, we might even come back for a second solicitiation in the same area. But this first solicitation is of the size I indicated. The timing, I'm sorry, you also asked about the timing. Thank you, Jim. We would hope to get the RFP out very shortly after this meeting if the input is positive and we don't have to rethink the whole thing. Yes?

QUESTION:

I want to ask you by what manner is this information you could gain going to be disseminated?

SALISBURY:

In government reports.

QUESTION:

What type of input are you looking for? I don't understand. You are giving it a broad brush. But you mean you want specifics?

SALISBURY:

I guess it's been confusing because of the variety of input that we would like. Well, I'll go back over a little bit. We would like information from new holes to be drilled in any of these KGRAs. The idea is to acquire the subsurface geological information, the temperatures and flow rates. But it is to stitch this information into an overall case study of the entire area with a view, for example, of toward saying, "Are these three KGRAs related genetically?"

QUESTION:

This question would be in response to your RFP?

SALISBURY:

Yes, that's correct. So that's new hole. We'd like to participate by offering money for information in the drilling of new holes, exploratory holes, so we can get information in parts of the KGRAs not yet drilled, for example, Cove Fort-Sulfurdale. And I think that the stimulation might be necessary considering Union's experience there last summer, which was not a pleasant one and wouldn't lead to a lot more drilling, I think, unless we can help out. Question down here?

QUESTION:

Yes, this may be a philosophical question, but what assurance does industry have, does the private sector have, that this cooperative information might not eventually be used against you. And let me illustrate what's happening in the coal on federal lands and increasingly the oil and gas situation on federal lands by which you spend a certain amount of money for explorations, you take valid leases, and at some point you want to drill your prospect and it's impossible to develop it to that point. You cannot get permits, Forest Service particularly. The private sector has been effectively eliminated from the coal under federal lands now. Perhaps it has been changed, but even under the lifting of the moratorium it's impossible for the private sector to develop coal on federal lands. Now if the private sector cooperates and you go on with this effort, what assurance do we have that eventually as more and more information is gained and you finally reach that point at which you want to be able to develop production, you might not reach

this same dead end that we are with coal mining and, in part, oil and gas?

SALIBURY:

Well, I think that I'm not familiar with coal and the problems you refer to with coal. I am familiar with the problem that often arises in geothermal in which if private industry develops information on an unknown prospect, that shows it's a hot prospect, that it may be labeled a KGRA. That certainly is the kind of "gotcha" that I think you are referring to. Because these are all KGRAs now, I don't think there is anything else we can do to them in terms of federal regulations to give industry a hard time. And I'm sure that isn't the purpose of KGRAs by the way, but it has that effect I understand. I think that the information is going to be used in a positive way to make possible more efficient and more successful exploitation of these KGRAs by industry. That's the purpose. In referring to information, I should mention one thing which I forgot to mention before, which is that in your proposal in which you propose to offer information to the government, whether it's information from a new hole, information from an old hole, reservoir engineering information, or surface geophysical information that might be of interest in putting together a case study; and to answer your question a little further, any kind of information is welcome which might be, or which you consider might be, of interest in putting together a good case study of these three KGRAs. But any information offered in your proposal that you identify as proprietary will be held proprietary. That is, these proposals will be evaluated by federal employees and the information, although we may have a consultant from the academic world, specifically Stan Ward from the University of Utah, who is an honorable fellow and would agree to hold the information proprietary. It means that this information, if your proposal is not accepted, will not be used against you; it will be returned to you and never referred to by us. So, we have taken whatever steps we could to make sure that this is helpful. As I started out saying, we're trying to be helpful and we would welcome any safeguards you might suggest that would make sure that we are indeed helpful and not a hindrance in some way.

BRESEE:

It's a broad question, though, and it goes all across the board. How do you ensure that the government, who says they are trying to be helpful, isn't hurting you even though they think they are trying to be helpful you know, that kind of question. Aside from the malicious intent not to do something to a person as a result of his attempt to be cooperative, there's no guarantee that can be provided. There are liability acts which allow a government if it damages a private person to be sued. The real question is what might become of this information which would be potentially damaging. We can't provide assurance; as Jack says, we welcome suggestions on how to make the agreements better from the standpoint of industry in just that way. But we will be talking to Congress.

I'll be appearing before Congress in February, March, and in April; and we'll be talking to them about this program and other activities we have going on.

One obvious thing that each of you should keep in mind is that through your local, state, and federal representatives, you have ways of making your wishes known and making your specific complaints known. If we are not responsive, and I will promise you that we will be as responsive as we can, but if we're not, I would strongly recommend that you use all of the methods you have available to you to be sure that we are. And we welcome it. As Jack says, we're trying to develop something through this meeting and through the responses to the RFP which will be mutually beneficial, and we would like to take advantage of all the information you can give us to avoid damage that we might be causing which we're not aware of.

SALISBURY:

That is, after all, the purpose of this meeting, a meeting, by the way, which was Jim Bresee's idea to achieve just that end. Yes?

QUESTION:

When we consider new projects, new holes, new wells, something like that, we talk about it in light of a joint venture partnership; what is your feeling at this stage of the game as to the level of ERDA's participation? Are you talking about something in round numbers, like a fifty-fifty cost sharing, or what do you think is the general level on this?

SALISBURY:

I would prefer not to be specific. I would say that the forces in the marketplace will operate. As part of the rating process, the proposals that ask for the least support, will receive the most favorable attention, all other things being equal. And I wouldn't want to prejudice those proposals by naming a specific number. I would think, however, that we would expect to reimburse industry for any loss of proprietary position, so that if one could receive bottom-hole money contributions from two or three offerors who would agree to keep the information proprietary, then we would expect to offer a little extra to make it public; and how much it is, we don't know. Yes?

QUESTION:

Have invitations been sent out from ERDA to BLM and Phillips and Chevron and the rest of private enterprises to work with them and share what information they would like to share?

SALISBURY:

We have had a steady dialogue with people like Bill Berge at Phillips to obtain information that he's willing to give freely, which is what you mean, I believe--yes. And certainly some of that information has been forthcoming. But I think that we, like most of you, subsist mostly on rumor and that's not satisfactory if you want to turn out an accurate case study.

BRESEE:

Would it be useful to know the people invited to this meeting, is that the gist of your question? Because we could provide that list. It included all those you mentioned plus everyone else we could think of who might be interested.

SALISBURY:

He wanted to know specifically, Jim, had we tried to obtain information free. He nodded when I said that, so I believe . . .

BRESEE:

And let me assure you, anyone who has any free information, we'd love to have it.

SALISBURY:

Yes, in the back.

QUESTION:

I think we'd love to have some free information too. I was just wondering--this free information that you've already received or are receiving, how do you propose to index the information; how soon will this information be ready?

SALISBURY:

Well, we've received so little free information that I don't think that . . . I can put it on the back of a small card and send it to you. Of course, that's a little separate, but I think that you may be aware Stan Ward at the University of Utah has been been doing surface geophysical and geochemical studies and you are aware of his publications, I assume. But that's not from industry.

QUESTION:

Will interim information be available, or will we have to await completion of the entire program before seeing completed reports?

SALISBURY:

I would hope that we would have progress reports, that we would not wait until we totally understood the geothermal system before issuing a report because, as you say, we might be old men by then.

QUESTION:

I'm talking of the situation where we come to your office and ask you for one particular segment of the information that's available?

SALISBURY:

I see where you're headed. It's a good point. The custom, not custom, the method that we've used with Stan Ward is a good example of what we would do. It is that information he derives and that his subcontractors derive on the geothermal system is made simultaneously public to all users and a letter is sent to all interested parties of whom he is aware would like the information, including where the information is on file, and he has a public file. We would intend to do the same thing; that is, when a piece of information is obtained, we would put it on public file and notify people where it might be looked at. If it is sufficiently easy to reproduce, we would reproduce it and send it out in a series of progress reports. If it were something complex like a color map, we would have it on open file.

BRESEE:

(first few words not clear) . . . Although I'm not positive, I assume that we would use the Nevada Operations Office since it has, at Las Vegas, some relatively central position as one repository. Anyway, if you're not familiar with this, open file data is available for anyone who wants to come in and look at it and write down anything. And then there's a nominal charge for Xeroxing on a page-by-page basis. It's all free to the public except for the Xerox cost.

QUESTION:

Will that information also be on file at Lawrence Livermore Laboratories as well as the Nevada Operations Office?

SALISBURY:

If there were a demand. I think that we are still feeling our way looking for an input and if there were sufficient demand, we would open file it wherever there were sufficient demands.

QUESTION:

Doesn't that laboratory at this time maintain a geothermal data collection system?

SALISBURY:

That's Lawrence Berkeley Laboratory.

BRESEE:

Yes, that's a good suggestion. There is this so-called GRID system and the advantage there is that we might be able to store the information on computer tapes and make it available to people who want to process it that way. The open file in the San Francisco area, though, would be the Oakland office of ERDA, the San Francisco Operations Office.

SALISBURY:

I always hesitate to put anything on a computer. Never sure you'll get it back. Yes?

QUESTION:

You've mentioned a number of times that you are interested in any information, but I get the feeling that you're stressing bottom-hole information and known geophysical data. Is ERDA looking for a client for a new geophysical survey or would it have to go through a company? Or how would it be done?

SALISBURY:

We would be interested in new geophysical surveys where they might fill a gap in available data. Because in this program we're trying to cooperate with industry, we would probably go through industry rather than to individual clients. We would only contract for that geophysical survey directly if our industrial participants wished it to be that way.

QUESTION:

Like the company I'm with, a geophysical contractor, we've done a lot of work in the area, but from our point of view, we feel additional work needs to be done. It would be a lot easier to sell you than trying to go through another company. That might take a hundred years, but if we could go to you . . .

SALISBURY:

I don't know what that says about us. I'm afraid to ask. (General laughter and some word covered up.) I think that that's a reasonable

thing to discuss. Again, if it involved somebody else's well. A geophysical survey doesn't. But if it were reservoir engineering work, or logging work or if we involve somebody else's well or property, we want to obviously get their agreement that this was a good thing to do. A wide area geophysical survey is something that, yes, we would pursue directly if we felt it filled some need in making a good case study.

BRESEE:

I'd like to make a comment on that. As far as the USGS is concerned, if that geophysical program was conducted in an area which is not classified as a KGRA and the information became public knowledge, the USGS, in reviewing that data once it became public information, may very well go along with the interpretation that there is indeed potential there and classify it as a KGRA, which would mean no noncompetitive leases, of course.

SALISBURY:

Good point. Of course we anticipate working within the present KGRAs, but you're right. If we ever stray outside, we have to be aware of that. Good point.

QUESTION:

Will any of this money be going outside of the KGRA areas?

SALISBURY:

I think that the RFP will read in the vicinity of, it should, because I'm a little nervous of where those borders were drawn. I think that a proposal would have to indicate why you think it's important for the case study to go outside the KGRA, of course, but I don't see why we would have to stick within them. We just want to be sure not to, if we went outside, not to cause difficulty by getting the conservation division involved in declaration of another KGRA.

BRESEE:

If exploratory drilling in an undesignated area is successful and the information gets out for one reason or another, it can result in the same thing, i.e., reclassification. (More words from questioner but not discernible--two people talking at once.) In terms of KGRA designation, that's independent of the lease position. It's simply a sort of a statement of being a KGRA. But we would try not to be the prime cause, as this gentleman said, of hurting the very people that we are trying to help. But I guess that a good point would be to be sure, John, that we do say vicinity of in indexing the areas.

QUESTION:

In the spirit of encouraging geological, geophysical, and drilling activity, has any thought been given to perhaps say bonus, work bonus, type situation, or refund of bonus money as work is accomplished on the acreage?

SALISBURY:

This is drilling. Are you referring only to drilling?

SAME SPEAKER:

Right now, of course, you go into a KGRA and you put up hole dollars up front and you bid on the acreage. I'm talking about bidding a work program on the acreage rather than just hole dollars up front.

BRESEE:

This lies outside of the issue here today. But I wanted to tell you that that particular concept has been worked on through the Geothermal Advisory Council which is renamed the Interagency Geothermal Coordinating Council. And I would invite you to contact Randy Stephens in my office, Branch Chief, Policy Research, and discuss that question with him. He can bring you up to date on just where we are in terms of interagency discussions on that very subject. He happens to be in the hotel today at the other meeting. If you don't catch him there, call him in Washington, ERDA Headquaters, 20 Massachusetts Avenue, Washington, D.C.

STANLEY GREEN, STATE OF UTAH, DIVISION OF WATER RIGHTS:

One of the things that we are concerned about in the development of KGRAs in the area is the interrelationship between the various sources of water and where the water is coming from, where it goes to, and so forth. Would this be something that would be of interest to ERDA?

SALISBURY:

Only insofar as we would want to satisfy the environmental considerations. Jim, do you have something you want to add to that?

GREEN:

Once again, it's a very important aspect of this, and that is the appropriation of the water for these purposes and what effect it has upon the existing water right structure in the state of Utah. And it becomes one of the more significant aspects of whether the development will go ahead or not.

BRESEE:

Again, I think the question is directed more toward the types of problems that Randy Stephens has been working with state officials from Utah on and again there is that meeting going on simultaneously with this one elsewhere in the hotel. If you can't contact Randy there, please try to reach him at his office. (Comment in the background--not understandable.) Okay, good. It's critically important to the development of geothermal energy in Utah. It's a little bit outside of the realm of this particular meeting, but it's one we're concerned with and I'd love to have your assistance on it.

QUESTION:

Is ERDA more interested in the drilling phase of this program than in early studies? That is, are the early surface explorations also important?

SALISBURY:

We do not eliminate an interest in the siting of drill holes because that's clearly one of the elements of risk that we would like to reduce. We would like to come up with a complete case study all the way from the geophysical, surface geophysics, and geochemistry right through reservoir engineering. We have a particular interest in stimulating the new exploratory drilling because that's how we are going to achieve larger reserves of the resource, but we have an interest in the whole spectrum because it is all necessary to produce energy. And as far as geophysical studies are concerned, where these are lacking, we would be willing to consider providing them ourselves, paying to have industry provide it, or working any cooperative agreement. I can't think of any other possibilities right now, but I'm sure there are an infinite number of possibilities and we'd be happy to consider any kind of a cooperative agreement that would provide missing information.

QUESTION:

Would ERDA consider paying for an entire phase of a program?

SALISBURY:

We might foot the bill for an entire geophysical survey either before or after drilling, but we would always hope not to. We would hope that it is in the interest of the industry to have this information and that we would simply participate in some way in the cost of it. Yes?

QUESTION:

In trying to put this program in perspective with the ERDA loan guarantee program, I appreciate that this is an outright expenditure from ERDA. In the case a company was funded under a guaranteed loan and say three

or four or more wells were planned, would that same company then qualify for bottom-hole money from ERDA? I can see some conflicts here.

BRESEE:

Like I said earlier, I want an easier question. One of the attractive features of the loan guarantee program, we think, is that it is a proprietary system and it's as close to normal banking relations as we can get right now in order to get the industry moving all the way from exploratory drilling to applications. And so the law was written and the regulations are written in such a way that there are no required publications that would lead to a publication of the characteristics of reservoirs. So to some extent, we see these programs as complementary, depending upon the particular interest of the industrial joint venturer. You raised the question of mixed systems. I agree with you. I can see some possibilities of some conflicts arising between the procedures under the RFP and the regulations for the loan guarantee. We can struggle with it. If we meet the case, we'll do the best we can with it, but it looks hard. The only comparable thing I can give you is we have already decided that it did not seem appropriate to have a demonstration program and a loan guarantee program running simultaneously. Let me try to give you that for instance. If we're going to fifty-fifty cost share the building of the first commercial scale, 50-megawatt, liquid-based system, it didn't seem appropriate that the other 50 percent of that program would be loan guaranteed, in other words we'd have a "mix." In fact, the law specifically says thou shalt not cost share in a demo program if the same plant could be built under loan guarantee. And this kind of thing tries to keep them separate. So I'd like to leave your question but we will address the problem if it comes up.

QUESTION:

In the case of the company that did qualify for bottom-hole money on existing drill holes or existing data, would that deteriorate their changes then for a loan guarantee later?

BRESEE:

Loan guarantee later? I see no problem there at all. Again the concept of this is ERDA purchases the information and at an agreed upon delay it's published. At that point, the agreement ends. The work is fulfilled on both sides, money changes hands, information is finished, work is over. At that point, it might actually make it easier if the case were an attractive one to qualify under loan guarantee. If we're sucessful and we really do get good case histories and get reservoir information which really shows that there is the life that we need in order to get the kind of investment, then it seems to me that loan guarantee might be a very logical follow-up.

QUESTION:

Yeah, I think that the problem is that on that guaranteed loan program, it says that you can only go up for 75 percent. And that includes any money, separate government money, you get for grants or anything like that. What I'd like to know is would that bottom-hole money then count in the 75 percent? Because they say grants, they don't say anything at all about, you know, ventures or partnerships, or participation, or anything like that, 'cause it's still counted as 75 percent.

BRESEE:

The regulations do say that there must be 25 percent from the participant in the loan guarantee. The other 75 percent is available as a guaranteed loan. What you're saying is might it be reduced, might that amount be reduced by mutual agreement through some sort of bottom-hole contribution which would result in open publication rather than closed files as in the case of loan guarantee? It's conceivable. Again, we'd like to look at a special case and then talk it over and I'd definitely need to get hold of my legal counsel. You've raised some tricky problems which involve the law 93410, the regulations and procurement problems. It's a tough question but we'll address it if there's a specific case raised.

QUESTION:

I think what should be pursued and addressed is whether the contribution from ERDA for this program be allowed as part of the 25 percent contribution.

BRESEE:

I'm convinced that rules on the regulations come from the law itself. That's not just a regulation; the law itself says that the industrial participant on a loan guarantee shall fund 25 percent and it shall be funded in parallel. You know, it's 25 cents out of every dollar expended. But let me pursue that. The intent of Congress is clear. We looked through the background. And that was so that someone in a loan guarantee had a stake in it and the lower below 25 percent approaching zero, this thing gets, the more it becomes a total federal risk. As I think in terms of intent of Congress, the 25 percent seems to me to be fairly sacrosanct, but the question was really at the other end. In the guarantee portion, might a portion of it come in the form of loans and grants and other such things? And I think that's worth pursuing further. I'll need some legal help, but I think it's possible. I don't see how it can reduce the 25 since it was the intent of Congress that there be a stake by the partner in a loan guarantee to aid its success, to ensure good management, prudent selection of projects, and so forth.

QUESTION:

Well normally, though, if you took contributions, would that result in data on the outside? For instance, if a well cost you five hundred thousand dollars, you would take on a loan guarantee, and say I put up five hundred dollars, I would like to borrow a million five. Now you may sell data for a hundred thousand dollars . . .

BRESEE:

Well, to some extent you're talking about almost a joint venture among private parties. I guess I'm convinced from the law and regulations and intent of Congress that one of those private parties could not be the government in this instance because the intent of Congress is that the government not take a greater risk than 75 percent of the total project cost. That seemed to me to be an outer limit. Let's address the subject if there's a specific case that somebody wants to talk over. You know, if there is a particular project that's being considered for loan guarantee, let's address it and I'll get the experts together and we'll see what we can work out.

QUESTION:

If some geophysical contractor has done quite a bit of work in the Roosevelt Hot Springs area with unique seismic techniques for several clients, can they be reimbursed for work already performed for them?

BRESEE:

I didn't quite understand that last.

QUESTION:

Well, we've already performed surveys for several clients. Can they, under this program, if they decide to drill on this information, be reimbursed for work already done for them by us?

BRESEE:

Yes. We are willing to purchase old information, I mean just because it's old, if it's proprietary and valuable to the case study, we're quite willing to purchase it even if it were obtained years ago, as long as it is not in the public domain. And if they own it, they can be reimbursed.

QUESTION:

In regard to your parameter of readiness to drill, are you going to look at this the same way you're looking at the ERDA loan guarantee? In other words, all permits acquired, all environmental work completed. If

you are, then you're not going to award a proposal for seven months or so.

SALISBURY:

No, I think it's exactly the way I said--that the longer it will take somebody to drill, the less attractive their proposition becomes.

QUESTION:

Well in other words, if someone comes in with everything filed and normal lead time is six months, then you would consider it definitely.

BRESEE:

We would consider the six-month lead time, on a par with somebody who wanted a six-month delay in publication. Naturally we would prefer to go sooner.

QUESTION:

If someone was prepared today, had the geophysics ready and ready to drill a deep exploratory well today and started their institutional approvals and it was on federal land, it would be seven months before they acquired the approvals.

SALISBURY:

Yes, I agree.

QUESTION:

You're not then saying that we should wait seven months and then begin negotiations with you. Start today?

SALISBURY:

No. Yes. Start when the RFP is issued. By the way, that delay is something that our institutional barriers panel is working on to reduce. (Comments in the background.) Yes, and that's why our institutional barriers panel is working on it. USGS is represented on the panel.

(several minutes of general conversation)

SALISBURY:

As Don points out, the money that we have available has to be obligated by September 30. It doesn't have to be spent by September 30; you know what I mean by obligated. The agreement has to be signed by September 30. Of course, there's next year's money. Hopefully, we could do it with this year's money, however.

BRESEE:

(first few words missing) The program is being expanded in the fiscal '78 fund request before Congress now. There is a continuation of this program so we hope it will be successful and that it can be expanded.

QUESTION:

It seems like a lot of the things you are trying to do are closely akin to the responsibilities of the USGS. I just wondered, I know that a lot of them aren't, but isn't there some overlap in personnel and staff?

BRESEE:

We've been cooperating with the U.S. Geological Survey in designing this program. They, however, steer clear of industry and industrial interests, or commercial interests in an area. And the heavier the commercial interest, the less likely that GS is to get into it. USGS has all the information. It's already been accumulated in these KGRAs, because most of these KGRAs are comprised of government lands. As Jack said very well at one previous discussion of the same program, proprietary data that's in the government's hands through the USGS is presumably available to ERDA as proprietary data which we must guard under the law. And so to some extent you might ask the question, why are we doing this at all? The answer is twofold. First of all, we deliberately stay away from that proprietary data because we handle a lot of information. It's complicated and difficult to have green money and blue money. So you just stay away from it in the first place. Second, we're, of course, looking for publication and not proprietary data, so proprietary data that's in the hands of the USGS through the Conservation Division, for example, will remain confidential and is not the subject of this meeting. We don't want to mix the functions up. You had a great term the other day. Jack said something about if we just wanted to sit and chortle over the data, we could. You know, we can go in and get the files out and look at it and say hot dog. But, that's not our function.

QUESTION:

You can't do anything with it though, can you?

BRESEE:

Beg your pardon?

QUESTION:

You're just not able to do anything with the data that's already been turned in to USGS because it's proprietary, right?

BRESEE:

We can't publish it and as a consequence we stay away from it because it's too easy to get yourself in a position where you've got . . .

QUESTION:

But if you were in agreement with an operator that had already submitted his data to the GS and had requested that it be held proprietary, are you making any deals like that with other operators that might release this data?

BRESEE:

Well, the data that is proprietary, although it may be on file because of Conservation Division responsibility, is data that the person that we're discussing this program with would have title to. And it's the purchase of that information we're talking about. I guess I didn't quite understand the gist of your question, but the question is if data has already gone to the government through the Conservation Division, is that information part of that which we'd like to purchase? Yes, yes. It's purchased for purposes of release that makes the whole thing go.

ANOTHER SPEAKER:

He may possibly be referring to information that is acquired by the Geologics Division of USGS. Geophysical information that they do for resource assessment. That is acquired by the USGS geologic division and after it's analyzed, it's published in open file reports. That's not the same thing as the information that the Conservation Division gets under the proprietary statute.

BRESEE:

That's correct. And that's what I thought he was referring to which is why I said that the GS stays as far removed as they can from areas where there's very active commercial interest. Maybe there's a GS person who would like to comment.

SPEAKER:

Well there's been a lot of data acquired on Long Valley by industry and redone by the Geological Division in that open file. There's a great duplication of effort there. The reason that it is proprietary is that it was obtained or given to the government by private industry and what you're trying to do is to release that. Once that is released, the industry can tell us it is no longer proprietary. And then it is taken

out of our files as proprietary. And that would eliminate files completely. I'd love to see that. (Much laughter.)

QUESTION:

Does ERDA require interpreted data or will you accept raw data?

SALISBURY:

We will accept a proposal for either kind of data. Clearly, we want to wind up with a meaningful case study however we can do it, whether we have to have other people interpret the information or use interpreted information, either way. But if we did have interpreted information, we would want the raw data, too.

BRESEE:

Just to repeat what Jack said early on for those of you who may have come in late, this get-together and discussion of a program we propose for Utah area is what we hope will be the first of a series of programs which will address other KGRAs in other parts of the country and we're using the service of the USGS. They are working with us in terms of determining a priority and we will be working our way down this list of priority areas. But most particularly, we look to this discussion today and with our efforts in issuing an RFP which is useful to industry as well as the government as a kind of model, a first cut. Reactions to it will be incorporated in future dealings so that we can try to make it more and more attractive from your viewpoint.

SCHUELER:

If there are no more further questions from the floor, I'd like to . . . Leon? Let me introduce Leon Silverstrom, Chief Counsel, Nevada Operations Office.

SILVERSTROM:

A good deal has been said in give and take here about what we are looking for, what we are going to be requesting, and so forth. While hopefully all of that would be helpful to people who would be submitting responses to the RFP, let me caution you that it is the RFP that should be your controlling guide in what we're looking for when it is issued. Hopefully, that RFP will say exactly what we're trying to look for and the same answers that you have heard today should be in that RFP. But whatever is issued is the final controlling thing. Presumably, we would also have another meeting after the RFP is issued to talk about that or answer specific questions about the RFP. But watch that RFP when it is issued rather than just recalling answers that you might have heard today. They should be the same, but the RFP is what we say to the world officially.

SCHUELER:

Thank you, Leon. For those of you who may have come in late, I'd like to remind you that there is a roster sign-up that's currently on the communications coordinator's desk in the back. If you are interested in receiving copies of the proceedings or further information, please put your name and address and agency affiliation or organization affiliation on that. Are there any other questions from the floor? If there are later questions or later considerations, don't hesitate to contact me at the Nevada Operations Office or I'm sure Jack Salisbury at Headquarters, 20 Massachusetts Avenue, Washington, D.C., and we would be happy to get back to you. We do intend to get copies of the proceedings out at the earliest opportunity and we will get them out back to your office. Thank you again for your attendance and we appreciate it very much.