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Geothermal Resources Joint Ventures

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Mr. Schlauch first examines how joint venturing for geothermal resources is both similar and dissimilar to joint venturing for other resources. He then discusses significant variables in determining the form of the business arrangement selected by the parties and special features which should be kept in mind in preparing a geothermal joint venture agreement.

GEOTHERMAL RESOURCES JOINT VENTURES†

*Paul J. Schlauch**

Given a topic of such extraordinary breadth, it would be tantamount to heresy not to begin this discussion with a disclaimer concerning its scope, followed quickly by an analogy comparing a joint venture to a marriage. This time-tested formula has served numerous authors well, and might fit nicely here. But braving the label "heretic," I will do neither. The disclaimer seems unnecessary because the reader will soon see for him or herself what this discussion is not about. The marriage analogy will be forsaken in the hopes of emphasizing, in a backhanded way, the author's message, namely, that there is (or ought to be) something different about joint venturing for geothermal resources. I am not suggesting that this area is radically different from the more familiar mining and oil and gas joint ventures. It is not. It is, however, sufficiently different to merit some special consideration. The remainder of this paper is an attempt to identify and analyze the more important of those differences.

THE UNIQUE AND THE COMMONPLACE

To determine how geothermal resource joint venturing might differ from joint venturing for oil and gas or minerals,

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it is logical to begin by examining the resource itself. In simplest terms, a geothermal resource is a source of energy, generally in the form of heat. Thus, where oil and gas and mining joint venturers seek to find and exploit substances, geothermal joint venturers seek energy. Einstein's famous equation, $E = mc^2$, reveals that at speeds approaching the speed of light, matter and energy are interchangeable. However, this interchangeability does not exist at the speeds at which we encounter oil, gas and mineral resources in terrestrial exploration and exploitation activities. Many of the differences between geothermal resource venturing and oil, gas and mineral venturing exist because the resource is energy rather than substance. For example, ownership of the resource, marketing of the resource and the potential for multiple use and recycling of the resource are substantially different in the geothermal resource industry than in the oil, gas and minerals industries.

In circumstances where more than one party can assert an ownership interest in geothermal resources, questions concerning ownership of, and the ability to explore for and produce, the resource are largely unanswered. Such circumstances may arise where the mineral and surface estates to a particular piece of property have been severed somewhere in the chain of title. The situtation is further complicated if the mineral estate has been somehow subdivided, for example, by the conveyance or lease of oil, gas and associated hydrocarbons with the reservation or retention by the grantor or lessor of the "other minerals." In many cases, the patent, certificate or grant from the sovereign which originated the private title to the lands involved may contain a reservation which is broad enough in its terms to include some geothermal resources.[1] The water law of the state in which the geothermal resource property is located may also affect the ownership and right to use that resource.[2] This is particularly true in states which utilize an appropriative, rather than a riparian, water system. Finally, the answers to questions of ownership

1. For example, the Stockraising Homestead Act of 1916, 43 U.S.C. §§ 291-301 (1970) provides that all patents issued pursuant to that Act "shall be subject to and contain a reservation to the United States of all coal and other minerals in the lands. . . ."
2. *See* Schlauch & Worcester, *Geothermal Resources: A Primer for the Practitioner*, 9 LAND & WATER L. REV. 327, 360-61 (1974).

and the right to utilize geothermal resources may well depend upon the type of geothermal resource involved. In other words, given the same circumstances of grant from the sovereign, private severance of mineral and surface estate and water law and ownership, it is entirely conceivable that one party might be held to own and have the right to develop a hydrothermal convection system, while another party might be held to own and have the right to develop a hot igneous system, and still another party be held to own and have the right to develop a conduction-dominated system.[3] Pending litigation will resolve some of these ownership issues,[4] and legislation may resolve still others.[5] However, it is unlikely that definitive answers concerning the fundamental questions of ownership and right to develop geothermal resources under circumstances of conflicting claims will be resolved in the immediate future. The answers to these questions will most likely evolve on a state-by-state basis through the common law process of case-by-case analysis.

Geothermal resources have been aptly described as "wrong place resources." Unlike the resource which is a substance and may be readily transported from its place of production to its place of utilization, geothermal resources must generally be used at the point of production. There is currently no commercially feasible system of technology which will allow heat energy to be transported significant distances. Thus, if a geothermal resource is to be exploited for the production of electrical power, the generating facility must be located at the geothermal resource field. While this requirement has not imposed insurmountable problems for power applications of geothermal resources, it may present significant problems for other uses of geothermal energy. The use of geothermal resources to generate electrical power is the principal means of

3. For a discussion of the nature of these various systems, *see* ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION, GEOLOGICAL SURVEY CIRCULAR 726, ASSESSMENT OF GEOTHERMAL RESOURCES OF THE UNITED STATES 1975, at 1-84 (1975) [hereinafter cited as CIRCULAR 726].
4. *E.g.*, United States v. Union Oil Co., 549 F.2d 1271 (9th Cir. 1977, *rev'g*, 369 F. Supp. 1289 (N.D. Cal. 1973); Pariani v. State of California (Superior Ct. San Francisco County).
5. *E.g.*, The Colorado Geothermal Resources Act amended the conveyancing provisions of the Colorado statutes by creating a presumption that in all instruments conveying title to real property or an interest therein which were executed prior to May 17, 1974, a reference to "minerals or mineral rights" does not include geothermal resources unless such resources are specifically mentioned. In instruments executed after that date, a reference to "minerals or mineral rights shall not include geothermal resources unless specifically mentioned." COLO. REV. STAT. § 38-35-122 (1975 Cum. Supp.).

exporting geothermal resources today. However, it has been suggested that in the future the use of geothermal energy for heating and as a source of industrial process heat will be of far greater significance than will be the use of this resource to produce power.[6] The overall efficiency of the direct use of geothermal energy for heating is greater than for generating electricity for the same purpose.[7] Many industries which require process heat may be able to directly utilize geothermal energy for some or all of that heat. The Energy Research and Development Administration (ERDA) has designed, and is now attempting to implement through participation by private industry, a project in Idaho's Raft River Valley which would utilize geothermal resources for potato, manure and sugar beet processing, aquiculture, grain drying, fish farms and greenhouses. The water and other by-products of this project would be available for irrigation and other agricultural uses.

ERDA's Raft River Valley project illustrates another important difference between geothermal resources and oil, gas and mineral resources. That project is designed so that the first application of the geothermal resource after it is produced from the ground is for the industrial need requiring the highest temperature application. After the resource is put to this first use, it will then be transferred to an adjacent processing facility which will use some of the heat remaining in the resource, and then pass it along for another use. Through a series of sequential uses, all of the usable heat in the geothermal resource could be extracted, and the final product (surface temperature water) would be available for industrial or agricultural use. Thus, a geothermal resource may well be capable of multiple sequential uses. This presents potential benefits and complications which are without an analogue in the oil, gas or minerals industries.

Although the geothermal resource industry differs in these and other significant respects from the oil, gas and mineral industries, it utilizes much of the technology and many of the business approaches developed in those industries. Our knowledge of the extent and recoverability of the resource is

6. *See* CIRCULAR 726 *supra* note 3, at 153.
7. *Id.*

still limited. Nonetheless, it is clear that the potential domestic supply of geothermal resource energy is enormous.[8] The technology which will be necessary to exploit this resource is in its infancy, and many difficult technological problems will have to be overcome before the resource can be fully developed. However, exploration and production drilling for geothermal resources employs techniques developed by the oil and gas industries. To date, the maximum depth to which a geothermal resource well has been drilled is approximately three kilometers, whereas oil and gas wells have been drilled to a depth of approximately ten kilometers.[9]

The desire by public and private utilities to secure an adequate supply of uranium for nuclear power generators has resulted in a number of alliances between mining companies and utilities. The potential use of geothermal resources for power generation, the similarities in exploration and production techniques between the geothermal and oil and gas industries, and the expertise which utilities possess in power generation, all suggest similar alliances for geothermal resource exploration and development between utilities and the extractive industries.

THE VENTURE VEHICLE

For purposes of this discussion, any business arrangement, other than a corporation, involving two or more parties, will be considered a "joint venture." Thus, the label joint venture will be used broadly to describe general partnerships, limited partnerships, classic joint ventures,[10] mining partnerships, co-ownership with operating agreements, farm-out and farm-in agreements, bottom hole agreements, trusts and contracts for the sale of geothermal energy. This broad use of the term may be offensive to purists and is therefore further heresy; but it is not without precedent.[11] Moreover, it seems to be the only convenient term available to describe this broad class of joint business arrangements. The use of the term

8. *Id.* at 5-84, 147-55.
9. *Id.* at 2.
10. The term "joint venture" has been defined in a myriad of ways. The basic elements and attributes of a joint venture are specified in 2 WILLISTON ON CONTRACTS § 318A, at 562-66 (3d ed. 1959).
11. Bloomenthal, *The Evolution of the Uranium Joint Venture*, in ROCKY MTN. MIN. L. FDN., URANIUM EXPLORATION AND DEVELOPMENT INSTITUTE, paper 8, pp. 1-2 (1976).

"joint venture" in this expansive manner, however, should not be read as a suggestion that there are not important differences and distinctions between the various types of arrangements included within the term as it is used here. Those distinctions exist and are particularly important in determining the income tax consequences and potential liability of the business arrangement.

The advantages and drawbacks of the various joint business arrangements have been thoroughly discussed in the literature.[12] Each of the possibilities has some advantages and some disadvantages. Generally, the more management participation available to the venturers, the greater the potential liability of those venturers. On the other hand, the greater the protection against liability afforded to the venturers, the more likely the entity involved will be taxed as a corporation, making the proceeds of the venture subject to double taxation. The limited partnership, and to a lesser extent the classic joint venture, provide reasonable protection against unlimited liability while at the same time providing desirable tax consequences. However, inherent in both these venture vehicles are limitations concerning rights in management, transferability of interests, continuity of existence, flexibility and fiduciary obligations which may make them undesirable business arrangements in a given context. Moreover, each one of these business arrangements will present its own peculiar problems. For example, at English common law a joint venture was not an entity capable of holding title to real property.[13] Thus, a grant purporting to convey title to a joint venture was deemed void for want of a grantee. It has been suggested that this disability exists today in certain American jurisdictions.[14] Similarly, the regulations concerning the leasing of Federal lands for geothermal resources pursuant to the Geothermal Steam Act of 1970 can be read to preclude the issuance of a lease to a joint venture, while allowing leases to issue to partnerships.[15] On the other hand, it has been suggested that although a corporation can participate in a joint venture, it

12. *See, e.g.*, Stott, *Legal and Tax Consequences of Mining Joint Venture Agreements*, 18 ROCKY MTN. MIN. L. INST. 189 (1973); Reymond, *Selection of Form of Organization for Oil and Gas Ventures*, 19 INST. MIN. L. 27 (1972). *See generally* Bloomenthal, Keller & Lohf, *Mining Companies*, in 4 AMERICAN LAW OF MINING, § 23 (1975).
13. 2 WILLISTON, *supra*, note 10 at § 318.
14. Stott, *supra*, note 12, at 207-08.
15. 43 C.F.R. § 3202.1 (1976) specifies that citizens, associations of citizens, domestic

cannot become a partner in a partnership.[16] While these positions may be extreme, and do not represent the general rule of law, they are illustrative of the types of considerations which must be carefully examined in selecting a form of joint business arrangement.

In most circumstances, the tax consequences and potential liability to third parties of the various alternatives will be the overriding considerations in selecting the venture vehicle. Moreover, there is probably little the parties can say in an agreement which will allow them to escape full joint and several liability to third parties if in fact they are jointly conducting a business. Thus, tax considerations characteristically become tantamount in the selection process. The United States of America, through its Internal Revenue Service, is a "silent partner" in all joint business arrangements. This is one circumstance, however, where the normal rules concerning fiduciary duties between partners do not apply, and it is fair game to attempt to maximize the losses and minimize the gains attributable to this partner. However, because of the uncertain applicability of key provisions of the Federal income tax laws to geothermal resources,[17] the task of selecting a venture vehicle which will maximize the tax benefits for parties participating in joint geothermal resource exploration, development or exploitation becomes even more difficult than usual.

SIGNIFICANT BUSINESS VARIABLES

The identity of the parties, their business objectives, the contributions each can make, the time the venture is created and the scope of its proposed activities will all play a significant role in determining both the form of business arrangement selected by the parties and the principal features of the agreement. These factors are by no means unique to the geothermal resource industry. To the contrary, these factors dictate the details of most joint venture arrangements. What appears to be different about geothermal resource joint ventures

corporations and governmental units are qualified to hold federal geothermal leases. The term "association" is defined to include partnerships, but no mention is made of joint ventures.

16. Stott, *supra*, note 12, at 200.

17. *See, e.g.*, Reich v. Commissioner, 454 F.2d 1157 (9th Cir. 1972).

is the wide range of possibilities presented by each of these variables.

The Parties. Potential geothermal resource joint venturers come from a number of sources in addition to private industry. Governmental entities which require or generate electrical power are potential joint venturers. Rural electric cooperatives and private and public utility companies are also likely geothermal resource joint venturers. In each case, the consumer of electric power will have to be sufficiently motivated by the desire to insure a supply of power at a reasonable cost to assume some of the risks associated with exploration and development for geothermal resources. There is evidence that sufficient concern about these matters exists so that geothermal resource joint ventures involving municipalities and utilities will become more commonplace. Recently, eight Northern California cities and a rural electric cooperative entered an agreement with a private company for the exploration and production of geothermal resources.[18] Under the agreement, the cities and the cooperative will share in the cost of exploration and development of property at the Geysers in Lake County, California, and in return will receive the right to purchase steam produced from the property at one-half of the market price.

Municipal governments and business entities subject to special state or federal laws, such as a rural electric cooperative or a public utility, may be subject to constitutional or statutory limitations which restrict their ability to contract. In general, these restrictions may affect the right of a municipality, cooperative or utility to hold title to real property, to incur debt, to submit disputes to arbitration or to enter into a long-term contract. Before a private company enters into a joint venture with this type of organization, it should assure itself of the capacity of the organization to enter into the arrangement contemplated. Of course, the private company should also require the standard acts of contractual approval and ratification from the municipality, cooperative or utility and receive an opinion of counsel from the entity confirming the validity and enforceability of the joint venture arrange-

18. The Geyser (1976).

ment. If there is a possibility that a provision of the arrangement contemplated by the parties may prove unenforceable, and it is impossible or inconvenient to obtain a final determination of the enforceability of that provision by declaratory judgment or otherwise, the parties should specify what the consequences will be if the provision is held unenforceable, and provide for an alternative arrangement, if possible.

Joint venturing with entities other than private companies, such as those discussed above, may afford a private company the opportunity to obtain tax advantages which would not be available in ventures with other private companies. The tax consequences of all such ventures should be carefully scrutinized.

In an indirect way, the federal government has made itself available as a joint venturer for the exploration and development of geothermal resources. Pursuant to the Geothermal Energy Research, Development, and Demonstration Act of 1974 (Public Law 93-410) and the Energy Reorganization Act of 1974 (Public Law 93-438), the Energy Research and Development Administration administers a program of federal guarantees of loans related to commercial development of energy from geothermal resources.[19] The announced objectives of this program are to encourage and assist the accelerated development of geothermal resources with environmentally acceptable processes by using a federal loan guarantee to minimize the financial risk associated with a loan relating to the development of geothermal resources and technology, and to develop normal borrower-lender relationships which in time will encourage the flow of credit to assist the development of geothermal resources without the need for further federal assistance.[20] Under this program, the federal government will guarantee up to seventy-five percent of the estimated aggregate cost of the project, and thus one hundred percent of the loan may be guaranteed if private capital supplies the remaining twenty-five percent of the project cost. However, the amount of a guarantee for any loan for a project may not exceed $25,000,000 and the total amount of guarantees made for any combination of loans to a single qualified borrower

19. 10 C.F.R. § 790 (1977).
20. 10 C.F.R. § 790.2 (1977).

may not exceed $50,000,000. The borrower must submit to ERDA proof that the project is technically feasible and uses environmentally acceptable processes, a plan of operations and proof that the borrower is capable of completing the project.[21]

Objectives of the Parties. Historically, joint ventures were used to spread risks and to raise capital. In more recent times, joint ventures have been used to accomplish a number of other objectives as well. Today, power consumers are seeking through the use of joint ventures with extractive industry companies to guarantee a future supply of fuel at a reasonable cost. Thus, the last decade has seen a growing number of business arrangements between utility companies and mining companies for the exploration and production of coal and uranium. Similar arrangements are now being made with respect to geothermal energy. It would not be surprising if in the future analogous business arrangements were made between geothermal resource producers and other entities seeking a guaranteed source of energy for heating or processing. The risk sharing and capital raising features of joint ventures are particularly attractive to companies which desire to enter the geothermal resource business for reasons of diversification or in order to maintain a defensive position with respect to the industry. Companies concerned with maintaining a defensive position desire to be assured through limited participation in the development of the fledgling geothermal resource industry that they are not left out in the cold in the future because of a lack of resource ownership or inadequate technical expertise. From the producer's point of view, a joint venture with an energy consumer guarantees a market for production, and may also provide a ready source of inexpensive capital.

Federal law prohibits any person, association, corporation or governmental unit from owning, directly or indirectly, any interest in federal geothermal leases in any one state exceeding 20,480 acres.[22] In computing the acreage holdings attributable to parties participating in a business association, the accountable acreage of each participant is that party's pro-

21. 10 C.F.R. § 790.6 (1977).
22. 43 C.F.R. § 3201.2 (1976).

portionate part of the association's accountable acreage; provided that no participant shall be charged with its pro rata share of any acreage holdings of any association or corporation unless it is the beneficial owner of more than ten percent of the association. The use of several joint ventures to acquire federal leases will permit the joint venturers to each own an interest in a number of federal leases which aggregate more than the permissible acreage limitation. This is not to say that the acreage limitations of the applicable regulations may be circumvented through the use of joint venturers, although that may be possible under the current regulations.[23] The suggestion here is that through the use of joint ventures, each of the venturers will be able to hold an interest in a larger number of leases than would be possible if that party were the sole lessee. Even though the interest of the party in each lease will obviously be less than if the party were the sole lessee, the use of joint ventures to acquire federal leases will allow the participants to create more baskets in which to place their eggs. Given the embryonic state of development of the geothermal resource industry, this may be a very desirable circumstance for many potential joint venturers.

Contributions by the Parties. Traditionally, joint venturers contribute assets or management to the joint venture. In the oil, gas and mineral industries, the asset contributed may be cash or a land position. In this regard, geothermal resource joint ventures will probably most often involve contributions by the joint venturers of cash, a fee, leasehold or other interest in geothermal resources or management expertise. However, as with other variables considered, the geothermal resource venture has the potential for an additional array of contributions. Because geothermal resources must be used at the site of their production, a program to exploit geothermal resources for power generation or any other purpose will require technical expertise in production beyond that normally possessed by oil, gas or mining companies. If the objective of the geothermal resource joint venture is to produce energy for power generation, a logical source of the expertise needed to produce that power would be a utility company, a rural

23. The regulations specify that no person shall be charged with his prorata share of any acreage holdings of any association or corporation unless he is the beneficial owner of more than ten per centum of the stock of other instruments of ownership or control of that association or corporation. 43 C.F.R. § 3201.2(b) (1976).

electric cooperative or a municipality engaged in power production. Thus, it would be reasonable to anticipate that in a joint venture between a producer of geothermal energy and a utility, cooperative or municipality, the latter would supply the expertise necessary to generate power and the former would be responsible for production of the resource. This approach is typical of uranium joint ventures between mining companies and utilities, in which the utilities are normally responsible for upgrading the product beyond yellowcake. What may be different about geothermal resource joint ventures is the possibility that the resource may still have economic value after it is used for the production of power. Therefore, joint ventures between power producers and geothermal energy producers may involve the sale of the resource after it has been first used for the production of electrical power and thus create broader commercial overtones to the venture relationship.

Expertise in geothermal resource development and exploitation is not widely held. Smaller companies may thus be able to joint venture with larger companies under circumstances where the smaller company provides the technical expertise and the larger company provides the capital.

Point of Venture Formation. Joint ventures may be created under a variety of circumstances. Most mining joint ventures are formed for purposes of exploration and contemplate additional agreements if promising prospects are discovered by the initial exploration effort. Other ventures are created to prove up and develop a promising mineral target. Still other joint ventures are created for the purpose of exploiting known reserves. In each of these situations, the nature of the business relations between the parties is governed in large measure by the degree of risk associated with the proposed joint venture operation. Characteristically, a party which has undertaken high risk expenditures prior to the formation of the joint venture is somehow rewarded for undertaking those risks. That reward may be in the form of control of the venture or it may be a requirement that the other joint venturers contribute more than the amount initially expended by the risk-taking venturer in order to acquire an equal interest with that party.

Most geothermal resource joint venturers will probably contemplate exploration, development and exploitation activities. Such ventures will most likely be conducted on a phased basis, with options afforded to the parties upon the completion of various phases. Because of the differing risks involved in participation in exploration, development and exploitation activities, the consequences of electing not to participate in the next phase of the proposed joint venture will probably vary, depending upon the point at which that election is made.

As a practical matter, if the geothermal resource joint venture is not formed to exploit a proven target or system, it may be impossible at the outset to define the terms and conditions under which the parties will participate in the development and exploitation phases of the venture. Under these circumstances, a number of possibilities and practices exist. On one end of the spectrum, the parties can simply agree that writing a definitive or even useful agreement concerning the development and exploitation of an unknown geothermal resource is a waste of time and money, and therefore simply "agree to agree" in the event that their exploration efforts are successful. This approach requires good faith on both sides and considerable confidence in the other joint venturers. In practice, many parties find this approach unacceptable. In these circumstances, to avoid drafting agreements which may not fit the resource which is discovered, parties often agree to enter into an operating agreement which is "standard" or "usual" in the industry in the event a resource to develop and exploit is discovered. It is questionable whether in the mining or oil and gas industries such a "standard" or "usual" agreement exists.[24] It is plain, however, that such an agreement does not exist in the geothermal resource industry. Therefore, to go beyond an agreement to agree, the parties to a geothermal resource exploration joint venture must necessarily specify the essential provisions or principles which would be included in a development and exploitation (operating) agreement. Matters which should be included in such a list of essential provisions should include, at a minimum, a specification of who will operate the property, the contributions

24. Young, *Oil and Gas Operating Agreements*, 20 ROCKY MTN. MIN. L. INST. 197 (1975).

which can be demanded by the joint venture, the term of the agreement, the consequences of nonparticipation and a method for resolving disputes. At the other end of the spectrum of approaches to operating agreements drafted at the exploration stage is the preparation of a detailed operating agreement which attempts to specify all the conditions under which the resource will be developed and exploited. Drafting this type of definitive operating agreement for geothermal resource joint ventures is complicated by the existence of several different types of geothermal resource fields and by a myriad of potential uses for the energy. Of course, if the geothermal resource joint ventures involves a utility company or other power consumer which intends to use the geothermal energy to produce electrical power, many questions concerning the development and exploitation of the resource may be specified at the outset. However, even under these circumstances, it is possible that the joint venturers will discover a valuable geothermal resource which is not suitable for power production. It seems likely that under a great many circumstances it will be impossible to write a truly definitive operating agreement at the outset of a geothermal resource joint venture, but that for a number of reasons the parties will desire to do more than merely agree to agree concerning the development and exploitation of the resource. In these circumstances, it would be appropriate to specify as many of the terms and conditions of the development and exploitation as may be reasonably set forth at the time the joint venture is executed.

The question of "how much" agreement is enough at the outset of an exploration venture is one that has plagued the extractive industries for years. There is no universal answer. Rather, the question is generally answered by the proclivities of the individuals negotiating the agreement.

Nuclear physicists assign a "strangeness factor" to describe a characteristic of subnuclear particles which is otherwise inexplicable. It seems appropriate to borrow the term, but not the concept, here. The need for a definitive agreement concerning the development and exploitation of geothermal resources may depend principally on the "strangeness factor" of the transaction. The "stranger" of the transaction, *i.e.*, the

more unusual the parties, their objectives, the contributions each intends to make and the scope of the venture, the greater the need for a definitive agreement at the outset. Paradoxically, it may also be true that the stranger the transaction the more difficult it will be to create a definitive agreement at the outset.

Scope of the Venture. Mining joint ventures are characteristically limited in scope by duration (or maximum contribution by the venturers), by geographical area or province and by the minerals covered. It seems unlikely that limitations on the scope of geothermal resource joint ventures arising from the first two considerations identified above will vary greatly from those imposed on mining joint ventures. However, the third category of scope limitation poses some additional considerations for geothermal resource joint ventures.

In any joint venture limited to geothermal resources, it is essential that the term "geothermal resources" be defined. This is not quite as simple as it sounds. There is currently no generally accepted definition of the term. The definition of geothermal resources contained in the Geothermal Steam Act of 1970 and pertinent Department of the Interior regulations is often used. The Act and its implementing regulations define geothermal resources to include: (1) all products of geothermal processes, embracing indigenous steam, hot water and hot brines; (2) steam and other gases, hot water and hot brines resulting from water, gas or other fluids artificially introduced into geothermal formations; (3) heat or other associated energy found in geothermal formations; and (4) any byproducts derived from them.[25] In turn, "byproduct" is defined as any mineral, except oil, hydrocarbon gas and helium, which is found in solution or association with geothermal steam and which has a value of less than seventy-five percent of the value of the geothermal steam or is not because of quantity, quality or technical difficulties in extraction and production of sufficient value to warrant production in and

25. 30 U.S.C. § 1001(c) (1970); 43 C.F.R. § 3200.0-5(c) (1976). Whereas the Act applies the definition set forth in the text to the phrase "geothermal steam and associated geothermal resources," the regulations use the same definition to define the term "geothermal resources."

of itself.[26] The term "byproduct" is also defined by the regulations (but not by the Act) to mean "commercially demineralized water."[27] For many purposes, this is an adequate definition of geothermal resources. However, it is important to note that the federal act and regulations are open ended in that the term "geothermal resources" is defined so as to "include" certain specified substances and energy, but the definition is not all inclusive. It should also be noted that if geothermal resources are defined in an agreement between joint venturers by incorporation of the definition contained in the federal statute and regulations then presumably the definition of the term "byproduct" is also incorporated by reference. This may be of special significance because "commercially demineralized water" is defined as a byproduct. If the definition of geothermal resources contained in the federal act and regulations is utilized in a geothermal resource joint venture not by reference to the Act and regulations, but by setting it forth in the agreement, consideration should be given to also including the definition of the term "byproducts" contained in the Act and regulations or otherwise defining the term.

The definition of "geothermal resources" contained in the federal act and regulations is purely qualitative. In other words, any geothermal resource, regardless of its commercial potential is within the ambit of the definition. For purposes of limiting the scope of a geothermal joint venture, it may be appropriate to add a quantitative factor to the definition. Geological Survey Circular 726, "Assessment of Geothermal Resources of the United States — 1975" defines the term in a qualitative and a quantitative manner as follows:

> Geothermal resources are defined as stored heat, both identified and undiscovered, that is recoverable using current or near-current technology, regardless of cost. Geothermal resources are further divided into three categories based on cost of recovery:
>
> (1) Submarginal geothermal resources, recoverable only at a cost that is more than two times the current price of competitive energy systems;

26. 30 U.S.C. § 1001(d) (1970); 43 C.F.R. § 3200.0-5(d) (1976). The regulations do not define the term "geothermal steam" which is used in the definition of "byproduct." Presumably, the former term is intended to be synonomous with the term "geothermal resources" for the purpose of this definition.
27. 43 C.F.R. § 3200.0-5(d) (1975).

(2) Paramarginal geothermal resources, recoverable at a cost between one and two times the current price of competitive energy; and

(3) Geothermal reserves, consisting of those identified resources recoverable at a cost that is competitive now with other commercial energy resources.[28]

This type of definition might provide an appropriate limitation on the scope of a geothermal resource joint venture where the nonmanaging joint venturers are concerned that the manager's efforts be concentrated on resources which are capable of current profitable production, (*i.e.*, "geothermal reserves"). The use of the definitions contained in Geological Survey Circular 726 may also be appropriate in defining phase commencement and termination points and in providing participation elections for the joint venturers.

Finally, for purposes of limiting the scope of a joint venture, it may be appropriate to add to the definition of geothermal resources a factor which is based on suitability of the resource for a particular use. Thus, for one type of joint venture it might be appropriate to limit the definition to include only those geothermal resources which are suitable for power production. In another context, it might be appropriate to define the term so that it meant those geothermal resources capable of delivering process heat at a given quantity and rate, and which contain no more than a specified amount of certain contaminants. Under other circumstances, it might be appropriate to limit the scope of the joint venture to hydrothermal convection systems or to hot igneous systems or to conduction-dominated systems, or to some combination of these systems. Similarly, it might be appropriate to limit the scope of the venture to certain strata or formations or to operations which require drilling to no greater than a specified depth.

In any event, if the scope of the venture is to be limited in any way by reference to materials or energies covered, some provision should be made to cover the eventuality that a valuable "byproduct" (including water) is discovered in the course of exploration, but that "geothermal resources" however defined, are not.

28. CIRCULAR 726, at 1.

THE JOINT VENTURE AGREEMENT

Any geothermal resource joint venture agreement worth its salt will cover far more than can be conveniently discussed here. Many of the provisions of a good geothermal resource joint venture agreement may aptly be described as "boilerplate," and the use of a good oil, gas or mining joint venture as the source of these provisions should suffice for most purposes. The majority of the difficulties which will arise in drafting a good geothermal resource joint venture agreement will stem from those special features of the geothermal resource industry which have been previously discussed. The manner in which those items are resolved will depend on the context of the particular agreement. There are, however, a number of additional considerations which should be kept in mind in preparing a geothermal resource joint venture agreement.

Given the uncertain state of ownership of geothermal resources, parties should be particularly careful in making representations or warranties concerning ownership of geothermal resources in property contributed to or acquired by the joint venture. For the same reason, a party which contributes property for exploration to a geothermal resource joint venture should pay particular attention to any lesser interest provision contained in the agreement. It may be that because of the current uncertainty surrounding ownership of geothermal resources it would be unfair to impose on the contributing party the traditional penalties or reductions in interest provided by most lesser interest clauses. The joint venture agreement should prohibit partition of the joint venture property, since it is not clear that merely by signing such an agreement the party waives its right to partition real property subject to the venture.[29]

The geothermal resource joint venture will probably be limited to a particular geographical area, commonly referred to as an "area of interest." It is important that this area be clearly defined so that the parties will be free to engage in other activities outside the area of interest. If the parties intend to be free to engage in activities involving resources other than "geothermal resources" within the area of interest, it

29. Young, *supra*, note 24, at 220.

is important that this right be clearly set forth in the joint venture agreement. This is particularly important where the area of interest is large and the joint venturers are natural resource concerns which may well desire to explore for and develop other mineral resources within the area of interest, or may already be engaged in such activity. Absent a clear delineation of the right to engage in these "competitive" activities within or outside of the area of interest, the fiduciary obligation imposed by courts on parties jointly conducting a business may well be applied so as to restrict the activities of the joint venturers both inside of and beyond the area of interest of the joint venture.[30]

The "typical" geothermal resource joint venture will probably provide for various phases of activity, with specified contributions required at the commencement of each phase. The agreement may also give the parties the option of concentrating their efforts on certain areas or prospects, with different provisions for contributions, nonconsent operations and dilution applicable to those areas than are applicable to the remainder of the area of interest. The agreement may also provide for a change in operators as the venture proceeds from the exploration to the development and production stages. Provision may be made for multiple operators, each with responsibility for a particular development prospect, or for one operator for exploration and another for development and production.

The joint venture agreement should specify any limitations on the transferability of interests in the venture. Such limitations include a requirement of notification prior to transfer, a requirement for consent by the other joint venturers to any proposed transfer, which consent may either be withheld for any reason or which "may not be unreasonably withheld," a right of first refusal and a buy-sell arrangement.

Because a geothermal resource joint venture is likely to involve parties with disparate objectives and financial ability, some of which may be subject to special statutory or constitutional constraints, it is crucial that the geothermal resource joint venture provide some means of resolving the impasse

30. Stott, *supra*, note 12, at 210.

created when some of the joint venturers desire to proceed with exploration, development or exploitation operations and others of the joint venturers do not. This type of impasse may be resolved by the use of a nonconsent provision. Numerous nonconsent and dilution provisions are used in mining and oil and gas joint ventures. Generally, they become applicable when all of the parties cannot agree on a proposed course of action. Under these circumstances, the operator, or in many cases any joint venturer, is free to propose a program in which the other parties can participate. If the nonproposing parties elect not to participate in the program, the proposing party and any other parties electing to participate are free to proceed with the proposed program. Parties who elect not to participate in the program are generally penalized by dilution of their ownership interests or through a "back in" payment provision. Some dilution provisions specify that if a party's ownership interest is reduced below a specified amount, that interest is converted into a carried interest, a net profits interest or a royalty interest. The possible variations and combinations in dilution and nonconsent clauses are almost too numerous to mention. What is important is that this aspect of the joint venture agreement receive careful attention. Having opted not to use the marriage analogy to characterize the joint venture, fair play precludes me from using the analogy of a divorce here. But were that option available, I would suggest that this area of the joint venture agreement serves the same purpose as an antenuptial agreement. It tends to keep the parties involved "honest," and provides a mechanism designed to prevent the wasting of assets when they are not.

Some geothermal resources may be subject to multiple use and to recycling. Therefore, a joint venture agreement should clearly specify the ownership rights in the resource after its first use. This is particularly important if the resource will be first used by one of the venture participants (such as a utility company) and in effect represents that venturer's return on its investment. Under these circumstances, the parties, if they consider the matter at the outset, will probably conclude that after the initial use of the resource it should once again belong to all of the venturers in proportion to their interest in the venture.

OTHER MATTERS

The potential impact of the antitrust laws is something that is characteristically alluded to in discussions concerning joint venture arrangements. Typically, the allusion consists merely of an admonition to keep the antitrust laws in mind when considering the joint venture activities. The implication seems to be that those laws can safely be kept in the very back of one's mind when considering extractive industry joint ventures. Lawyers who worry about the application of the antitrust law to ordinary joint venturing activities in the extractive industries tend to be regarded by their peers as excessively fussy or academic. Recent developments, however, indicate that in the future the federal government may well take a much harder look at the antitrust law implications of any joint ventures between parties with substantial assets.

The premerger notification provisions of the Hart-Scott-Rodino Antitrust Improvements Act of 1976[31] became effective on February 27, 1977. Those provisions apply to acquisitions by firms with net sales or total assets of at least $100,000,000 or firms with net sales or total assets of $10,000,000 or more, under circumstances where the acquiring party acquires an ownership interest of fifteen percent or more, or stock or assets totalling $15,000,000.[32] The law requires that the acquiring party notify the Federal Trade Commission and the Antitrust Division of the Department of Justice of the proposed acquisition, and imposes a thirty-day waiting period after notification before the proposed transaction can be closed. In the event either agency disapproves of the proposed action, it can institute an action against the parties under the federal antitrust laws, coupled with a request for a preliminary injunction to prevent the proposed transaction. Failure to file the required premerger notice subjects a violator to a civil penalty of not more than $10,000 for each day of violation.[33] The Federal Trade Commission plans to have a full-time office within its Bureau of Competition devoted to premerger notifications. The 1976 Act does not change the

31. This Act amends Section 7A of the Clayton Act (15 U.S.C. § 184) by adding provisions pertaining to "Premerger Notification," and will hereinafter be cited by reference to the Clayton Act.
32. Clayton Act, § 7A(a), 15 U.S.C. § 184 (1970), *as amended by* Pub. L. No. 94-435.
33. Clayton Act, § 7A(g) (1), 15 U.S.C. § 184 (1970), *as amended by* Pub. L. No. 94-435.

standards by which the legality of merger and acquisitions are to be judged. However, it would be naive in the extreme to conclude that the Act's notification provisions will not result in increased antitrust enforcement activity by the federal government.

The Antitrust Improvements Act empowers the FTC, with the concurrence of the Department of Justice, to define the terms of the Act, to provide for additional exemptions and to specify the information which should be provided in the premerger notification. The FTC has taken the position that the premerger notification and waiting provisions of the Antitrust Improvements Act apply to joint ventures.[34] The Commission views the parties forming the venture as "acquiring persons" and the venture to be formed as the "acquired person." Unless a joint venture is otherwise exempted from the application of the rules, if the joint venturers (the acquiring persons) and the venture (the acquired person) meet the statutory criteria, the transaction is subject to the premerger notification rules. Therefore, once the Commission's rules become effective,[35] before a joint venture transaction under either of the following circumstances could be consummated, the parties would be required to notify the FTC and the Department of Justice and wait thirty days:

> (a) One of the joint venturers has annual net sales or total assets of $100,000,000 or more, at least one other joint venturer has annual net sales or total assets of $10,000,000 or more, and the joint venture will have assets of $10,000,000 or more; or
>
> (b) Two or more of the joint venturers have annual net sales or total assets of $10,000,000 or more, and the joint venture will have total assets of $100,000,000 or more.[36]

The first set of proposed premerger notification rules, promulgated by the FTC on December 20, 1976, raised a

34. The Commission cites as authority for its position the Supreme Court's decision in United States v. Penn-Olin Chemical Co., 378 U.S. 158 (1964). *See* Fed. Reg. 39042 (1977).

35. On February 2, 1977, the Commission promulgated a "Transitional Rule," which became effective on February 27, 1977. 42 Fed. Reg. 6366 (1977). The Transitional Rule exempts from the premerger notification and waiting provisions of the Antitrust Improvements Act all acquisitions made on or after February 27, 1977, and before the effective date of the Commission's premerger notification rules.

36. 42 Fed. Reg. 39039 (1977) (Proposed Rule, 16 C.F.R. § 801.40).

substantial hue and cry, particularly from industries which characteristically engage in a significant amount of joint venture activity. The proposed comment period was extended for an additional thirty days, and the Commission received over 120 separate comments on its proposed rules. On August 1, 1977, the Commission promulgated a revised set of proposed premerger notification rules.[37] The revised rules are substantially longer and more complex than the rules originally promulgated by the Commission.[38] Moreover, notwithstanding a significant number of adverse comments on the joint venturer portion of the proposed rules, the revised rules evidenced no change in basic policy with respect to the premerger notification requirements to be imposed on joint ventures. However, the revised rules may ultimately sweep in significantly fewer joint venturers than would the originally proposed rules, by virtue of the clarified definition of the terms "net annual sales" and "total assets." Under the most recent proposal, these terms are defined to be those sales and assets shown on the most recent financial statement of the "person" involved, provided that such figures are stated in accordance with generally accepted accounting principles.

Having suggested that most discussions of joint ventures pay mere lip service to the impact of the antitrust laws, I will do precisely that with respect to the securities and blue sky laws. These laws can have significant impact on joint venture activities, and their potential application to a proposed joint venture should be analyzed by someone knowledgeable in the field *before* the joint venture is created.

CONCLUSION

The principal purpose of this paper is to identify a number of matters which should receive special attention in structuring a geothermal resource joint venture. Although many of the approaches and provisions developed in mining and oil and gas joint ventures are applicable to geothermal resource joint ventures, it is difficult to conceive of circumstances under which a good geothermal resource joint venture agreement could be prepared by using an "off the shelf" oil and

37. 42 Fed. Reg. 39039-80 (1977).
38. The proposed rules and reporting forms, combined with the Commission's explanatory comments, occupy forty pages of the Federal Register.

gas or mining form. The lawyer who attempted to prepare a geothermal resource joint venture by "adapting" an oil and gas or mining form by inserting the term geothermal resources everywhere the term oil, gas or minerals appears in that form would be committing a substantial disservice to his or her clients. The lawyer can best serve his or her clients by recognizing the differences between geothermal resource exploration, development and exploitation and similar activities conducted for oil, gas or other minerals, determining which of those differences are significant from a legal or economic viewpoint and suggesting mechanisms to deal with the problems presented. It may well be impossible to write a geothermal resource joint venture agreement which adequately deals with all the various problems and circumstances which may arise during the term of the venture. Nonetheless, it is important to identify as many potential concerns as possible at the outset, even if the only consequence of the identification of these areas is an agreement by the parties that they cannot then agree on how to resolve them. Ultimately, the success of a geothermal resource joint venture will depend on the good faith of the participants to a much greater degree than on the language chosen by the parties to define their agreement. Any good joint venture agreement will provide some flexibility for the parties, and the geothermal resource joint venture agreement will necessarily provide more flexibility than most. The venturers will ultimately determine whether this flexibility proves to be a bane or a boon.