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The Taxation of Geothermal Energy Resources

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This article contains a comprehensive discussion of the current federal income tax treatment of geothermal energy projects. Particular attention is given to the post-1977 amendments to the federal tax laws which have affected geothermal energy taxation. The author also discusses the current tax issues in the geothermal energy area.

THE TAXATION OF GEOTHERMAL ENERGY RESOURCES

*Leonard W. Muscelli**

Geothermal energy refers to energy obtained via the exploitation of the natural heat contained in the subterranean portion of the earth. The source of this heat is the earth's natural process of radioactive decay, which produces tremendous amounts of heat energy.[1] For example, as one descends from the surface of the earth the the earth's core, the earth's temperature increases approximately 1° Farenheit per fifty-five feet of descent; this represents an increase of approximately 100° Farenheit per mile.[2] Although this natural reservoir of energy has only recently begun to be developed, geothermal energy has tremendous future potential because of the magnitude of the earth's natural reservoir of heat. It has been estimated that if all of the potential geothermal resources in the United States were fully developed, our nation's energy output would increase by approximately 130 million kilowatts.[3] Since the United States' annual energy production is approximately 850 million kilowatts, geothermal energy can potentially increase the United States' total energy output by about fifteen percent.

Geothermal energy was first developed in Italy in 1812, when geothermal energy was used in the recovery of boric acid.[4] Geothermal energy has been used extensively in Iceland for heating purposes.[5] In the United

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1. Austin, *Technical Overview of Geothermal Resources*, 13 LAND & WATER L. REV. 9, 11 (1977).
2. H. WILLIAMS & J. MEYERS, OIL AND GAS TERMS 257 (4th ed. 1976).
3. Eisenstat, *Tax Treatment of Exploring and Developing Geothermal Resources*, 22 OIL & GAS TAX Q. 76, 76 (1973).
4. Snyder, *Geothermal Sales Contracts*, 13 LAND & WATER L. REV. 259, 260 (1977).
5. Kitchen, *Geothermal Leasing Practices*, 13 LAND & WATER L. REV. 25, 30 (1977).

States, geothermal energy has been moderately developed in many of the Western states, especially Colorado and Oregon.[6]

There are three forms of geothermal energy which are currently being developed: a) dry steam; b) superheated water; and c) ocean thermal energy. The first form, dry steam, is produced either by drilling a well which penetrates a natural reservoir of steam, or by artificially creating steam by injecting water or some other fluid into a well which penetrates deep into the earth. When the water reaches the bottom of the well it is converted to steam by the earth's natural heat. The steam produced is used to drive a turbine located at the mouth of the well. The turbine then converts the heat energy into electrical energy.

The second form, superheated water, refers to "hot springs" flowing beneath the surface of the earth which are capable of being tapped. These springs are generally reached by drilling a well which transports the spring's hot water to the earth's surface. The water is then either artificially super-heated to produce steam, or the heat from the water is transferred to a heat-conductive substance, which, when heated, is converted into gas which is used to drive a turbine.[7]

Ocean thermal energy refers to the conversion of ocean water heated by active volcanoes on the ocean floor into electrical energy.[8] To date, there has been very little development of ocean thermal energy.

Geothermal energy is an attractive resource for many reasons, primarily because the source of geothermal energy, the earth's heat, is virtually inexhaustible. A geothermal well can be recharged an indefinite number of times without depleting the source of the energy. Also, geothermal energy is a much "cleaner" energy source than oil or coal and geothermal wells create few environmental problems, unlike other energy sources.[9]

TAX ISSUES PRIOR TO THE ENERGY TAX ACT OF 1978

Prior to the passage of the Energy Tax Act of 1978,[10] there were no Internal Revenue Code (Code) provisions regarding geothermal energy, and the major tax issue in this area was whether the tax treatment of geothermal wells should be similar to the tax treatment of oil and gas wells.[11] In *Arthur Reich,*[12] the tax court was faced with the issue of whether percentage depletion was allowable with respect to a geothermal steam well. The court concluded that for depletion purposes:

6. Snyder, *supra* note 4, at 260-61.
7. Maxfield, *Income Taxation of Geothermal Resources*, 13 LAND & WATER L. REV. 217, 218 (1977).
8. I.R.C. § 48(*l*) (3) (A) (ix) (1976).
9. Unlike other types of energy (i.e., oil, coal), there is no discharge of noxious gases or solid pollutants from a geothermal well as the energy is converted into heat energy. Also, no residue or waste is created as a by-product of geothermal energy consumption.
10. Pub. L. No. 95-618, 92 Stat. 3174 (1978).
11. Maxfield, *supra* note 7, at 218.
12. Arthur E. Reich, 52 T.C. 700 (1969), *aff'd*, 454 F.2d 1157 (9th Cir. 1972).

a) geothermally-produced steam is a "gas" for purposes of depletion; and

b) the geothermal resource involved is not the earth's inexhaustible heat, but pressurized steam formed by the combination of water and heat (the court considered the steam exhaustible because the reservoir of water which was producing the steam was not being recharged).[13]

Based upon these conclusions, the court determined that the geothermally-produced steam was a "gas" which was depleting, and that, the depletion provisions of the Code would apply to the well. The Ninth Circuit affirmed the tax court's decision without dissent.[14] The Treasury Department disagreed with the decisions of the Tax Court and the Ninth Circuit that geothermally-produced steam is a gas, and informally announced that it would continue to litigate this issue. However, the Energy Tax Act provisions regarding geothermal energy which were added to the Code mooted the geothermal depletion issue.[15]

Another geothermal tax issue prior to the enactment of the Energy Tax Act of 1978 was whether intangible drilling costs of geothermal wells should receive the same tax treatment as intangible drilling costs of oil and gas wells. In *George Rowan,*[16] the tax court relied on its decision in *Reich* and concluded that because geothermal steam is a "gas," the intangible drilling cost provisions of the Code also apply to intangible drilling costs of geothermal wells because geothermal wells are "gas wells" for purposes of the Code.[17] The court's holding in *Rowan* was incorporated into the Code via the amendment of section 263(c)[18] by the Energy Tax Act of 1978.

OVERVIEW OF THE ENERGY TAX ACT OF 1978

In November 1978 Congress passed the Energy Tax Act of 1978. The purpose of the Act was twofold: to encourage energy conservation and efficiency and to increase domestic energy production, thereby reducing United States dependence on imported oil. The impetus for the enactment of the Act was the rapidly-rising world oil prices and the decrease in United States energy production coupled with increased United States energy consumption.[19] Congress saw this trend as a threat to the national economy and national security.

Congress believed that the purposes of the Act could best be achieved by providing tax incentives designed to induce energy conservation, domestic energy production, and the development of new sources of

13. 52 T.C. at 715.
14. 454 F.2d at 1159.
15. *See infra* text accompanying notes 58-61.
16. George D. Rowan, 28 Tax Ct. Mem. 797 (1969).
17. *Id.*
18. All section references in this article are to the Internal Revenue Code of 1954, as amended.
19. In 1940, domestic U.S. energy production was 5% greater than total U.S. energy consumption. In 1969, U.S. energy consumption exceeded U.S. energy production by 9.4%; by 1976, this figure had increased to 24.1%. S. REP. No. 529, 95th Cong., 2d Sess. (1978).

energy. The Energy Tax Act contained tax provisions designed to discourage energy over-consumption (i.e., the "gas guzzler" tax on certain autos, an exemption from fuel excise taxes for alcohol fuels) and tax provisions designed to encourage energy conservation and the development of alternative energy sources. The latter category of provisions included the repeal of federal excise taxes on buses and certain bus parts, the enactment of a special investment tax credit for investments in commuter vans, and the enactment of special business and residential energy tax credits. In addition, certain preferential tax provisions (i.e., depletion and the election to expense intangible drilling costs) were specifically extended to geothermal energy resources.[20]

TAX TREATMENT OF SPECIFIC GEOTHERMAL ENERGY ITEMS

Exploration Costs

There are no Code sections which specifically deal with exploration costs of oil, gas, and geothermal wells. However, the IRS' position on exploration costs, which is contained in Revenue Ruling 77-188, is that exploration costs leading to the acquisition or development of a property must be capitalized, but if the costs do not lead to the acquisition or development of a property, they may be expensed.[21] If an exploration cost other than the cost of depreciable equipment is capitalized, the cost is included in the depletable basis of the well.[22] The cost of depreciable equipment used in exploration activities is recoverable through depreciation of the equipment.

Exploration costs of geothermal wells include items commonly classified as exploration costs of oil and gas wells (i.e., expenditures for surveys and geological opinions[23]), and also include the costs of "core holes" which are drilled to locate and identify a desirable geologic structure.[24]

The tax treatment of development costs is governed by section 263(c), which provides a taxpayer with an option to expense or capitalize the costs.[25] Presumably, the issue of whether a particular expenditure is exploratory or developmental should be evaluated on a well-by-well basis by examining the specific nature of the expenditure. The treatment of development expenditures is discussed in more detail in the following section on intangible drilling and development costs.

20. For an excellent discussion of the tax treatment of geothermal energy resources prior to enactment of the Energy Tax Act of 1978, see Maxfield, *supra* note 7.
21. Rev. Rul. 77-188, 1977-1 C.B. 76. Revenue Ruling 77-188 contains a detailed discussion of how to allocate exploration costs to a taxpayer's properties. Although Revenue Ruling 77-188 does not specifically refer to geothermal well exploration costs, it presumably will continue to apply to such costs until a ruling is issued which specifically applies to geothermal well exploration costs.
22. Treas. Reg. § 1.612-1(a) (1960).
23. Seletha O. Thompson, 9 B.T.A. 1342 (1928).
24. Maxfield, *supra* note 7, at 245.
25. I.R.C. § 263(c) (Supp. V 1981).

Intangible Drilling and Development Costs

A. Generally

Intangible drilling and development costs are expenditures incurred in the drilling or support of a well which does not have a salvage value.[26] Intangible drilling costs generally include all costs incurred prior to capping a well and generally represent approximately 50 to 75 percent of the total cost of a well.[27]

Regulations section 1.612-5 defines intangible drilling and development costs as expenditures made by an operator for wages, fuel, repairs, hauling, supplies, etc., incident to and necessary for the drilling of wells and the preparation of wells, for the production of geothermal steam or hot water.[28] Examples of intangible drilling and development costs contained in section 1.612-5 are the previously mentioned types of expenditures which are incurred:

a) in the drilling, shooting, and cleaning of wells;

b) in such clearing of ground, draining, road making, surveying, and geological work necessary for the preparation and drilling of wells; and

c) in the construction of derricks, tanks, pipelines, and other physical structures necessary for the drilling of wells and the preparation of wells for the production of geothermal steam or hot water.[29]

B. Election to Capitalize or Expense Intangible Drilling and Development Costs

Regulations section 1.612-5 provides, in accordance with section 263(c), that intangible drilling and development costs incurred by an operator in the development of a geothermal deposit may, at the operator's option, be capitalized or expensed.[30] An "operator" is defined by the Regulation as "one who holds a working or operating interest in any tract or parcel of land either as a fee owner or under a lease or any other form of contract granting working or operating rights."[31] The election is available with respect to geothermal wells commenced on or after October 1, 1978, and is made by claiming intangible drilling and development costs as a deduction on the taxpayer's return.[32] Once a section 263(c) election is made it is binding in all subsequent years with respect to all intangible drilling and development costs relating to a particular geothermal property.[33] The election may be revoked prior to the expiration of the statute of limitations for a taxpayer's return.

26. Treas. Reg. § 1.612-5(a) (1982).
27. Gregory, *Industry Investments—Timber, Agriculture and Energy— from Christmas Trees to Geothermal,* NEW YORK UNIVERSITY FORTY-FIRST ANNUAL INSTITUTE ON FEDERAL TAXATION 32-1 (1983).
28. Treas. Reg. § 1.612-5(a) (1982).
29. *Id.*
30. *Id.*
31. *Id.*
32. Treas. Reg. § 1.612-5(d) (1982).
33. *Id.*

Included in the section 263(c) election are all costs of drilling and development undertaken by an operator whether incurred prior or subsequent to the formal grant or assignment of operating rights, except that where any drilling or development project is undertaken for the grant or assignment of a fraction of the total operating rights only that part of the cost which is attributable to such fractional interest is within the option.[34]

The election under section 263(c) does not apply to expenditures for tangible property *ordinarily* considered as having a salvage value. Such costs must be capitalized and are recoverable only through depreciation of the property. Examples of such items are the costs of materials used in structures constructed in a well and on the geothermal property, including drilling tools, pipes, casing, tubing, tanks, engines, boilers, and machinery.[35]

Costs which must be expensed, regardless of the section 263(c) option, are those for labor, fuel, repair, hauling, supplies, etc., which are incurred in operating the well and facilities on the geothermal property which are related to the production of the geothermal steam or hot water.[36]

If a section 263(c) election is available, expensing is nearly always preferable to capitalization because the tax benefits will be realized earlier if the costs are expensed. The only disadvantage to expensing is that taxable net income will be reduced; this reduces the base (taxable net income) for computing percentage depletion on the property. Thus, the tax benefits of expensing the intangible drilling and development costs are reduced by the effect of the election on the taxpayer's percentage depletion computation.

If the operator of a geothermal well has elected to capitalize the intangible drilling and development costs and the well later proves to be nonproductive, the operator has a second option with respect to the well. Regulation section 1.612-5(b)(4) states that if the taxpayer so elects, the capitalized intangible drilling and development costs may be deducted as an ordinary loss in the year in which the nonproductive well is completed. This election is made by filing a statement claiming the election with the taxpayer's original or amended tax return.[37] If the election is not made, the capitalized costs can be recovered only through depletion or depreciation.[38]

The election under section 263(c) for geothermal wells is separate from any available section 263(c) election to expense or capitalize intangible drilling and development costs of oil and gas wells.[39] Thus, if a taxpayer has interests in both oil and gas and geothermal properties, the taxpayer has available two section 263(c) elections—one for his oil and gas expenditures and one for his geothermal expenditures.

34. Treas. Reg. § 1.612-5(a) (1982).
35. Treas. Reg. § 1.612-5(c) (1) (1982).
36. Treas. Reg. § 1.612-5(c) (2) (1982).
37. Treas. Reg. § 1.612-5(d) (1982).
38. *Id.*
39. I.R.C. § 263(c) (Supp. V 1981).

Prior to the enactment of the Tax Equity and Fiscal Responsibility Act of 1982,[40] all owners of geothermal properties had the option of currently deducting all intangible drilling costs associated with a particular property. However, the Tax Equity and Fiscal Responsibility Act of 1982 added section 291 to the Code, which provides that corporate "integrated oil companies"[41] (as defined by section 291(b)(5)) may currently deduct only a portion of their post-1982 intangible drilling costs incurred in connection with geothermal wells. The amount currently deductible under section 263(c) is limited to 85% of the corporation's geothermal intangible drilling costs; the remaining 15% of the costs must be amortized over a 36-month period beginning with the month in which the costs are incurred.[42]

Since foreign geothermal properties owned by a United States taxpayer were not excluded from the section 263(c) election by Regulation section 1.612-5, it appears that the section 263(c) election may be available with respect to foreign geothermal properties owned by United States taxpayers. However, this appears to be inconsistent with the intent of the Regulations, which was to offer, in accordance with the objectives of the Energy Tax Act of 1978, an incentive for the development of domestic geothermal energy. This argument is supported by the fact that section 613(e) specifically restricts the availability of percentage depletion to geothermal wells located in the United States or in a United States possession.

C. Tax Preference Provisions of Section 57

Section 57(a)(11) provides that excess intangible drilling costs are a tax preference item for individuals, Subchapter S corporations, and personal holding companies. The amount of the tax preference is the amount by which all of the "excess intangible drilling costs" for the year of all geothermal properties owned by the taxpayer exceeds the amount of "net income" from the properties.[43]

The term "excess intangible drilling costs" is defined in section 57(a)(11)(B) as the intangible drilling and development costs which the taxpayer elected to expense under section 263(c), less the amount of amortization which would have been allowed if the costs had been capitalized and amortized over a 120-month period in accordance with section 57(d).

The term "net income" is defined in section 57(a)(11)(C) as the gross income (within the meaning of section 613 (a)) from all geothermal properties owned by the taxpayer, less any deductions allocable to these properties, less the amount of "excess intangible drilling costs."

Code section 57(d) provides that individuals may, for purposes of computing their alternative minimum tax, elect to amortize intangible drilling costs over a 10-year period beginning with the year in which the costs are

40. Pub. L. No. 97-248, 96 Stat. 324 (1982).
41. Section 291(b) (5) defines an "integrated oil company" as "any producer (within the meaning of § 4996(a) (1)) of crude oil other than an independent producer (within the meaning of § 4992(b))."
42. I.R.C. § 291(b) (1), (2) (1976). The purpose of the 291(b) deduction limitation is to increase corporate tax revenues.
43. I.R.C. § 57(a) (11) (A) (Supp. V 1981).

incurred. If this election is made, the individual will not have a tax preference item with respect to the amortized costs.

D. Recapture Provisions of Section 1254

If a geothermal property acquired after October 1, 1978 is disposed of, a portion of the intangible drilling costs which were deducted via a section 263(c) election are subject to recapture as ordinary income.[44] Under section 1254(a)(1) these costs are recaptured only if there is a realized gain on the sale of the geothermal property.[45] If there is a sale, exchange, or involuntary conversion of a geothermal property, the excess of the amount realized over the adjusted basis of the geothermal property represents the gain realized in the transaction.[46] If a geothermal property is disposed of by any method other than a sale, exchange, or involuntary conversion, then the excess of the fair market value of the property over the adjusted basis of the interest represents the gain realized in the transaction.[47] The section 1254 recapture rules are separately applied to each geothermal property owned.[48] The aggregation rules of section 614 are relevant when applying the section 1254 recapture rules.[49]

The amount which is recaptured is the lesser of (a) the realized gain on the property disposition, or (b) the total amount of intangible drilling costs pertaining to the disposed property which were incurred after 1975 and which were deducted via a section 263 election by *any* owners of the property.[50] In applying this rule, the total amount of intangible drilling costs which were deducted is reduced by the amount by which prior deductions for depletion would have increased if the intangible drilling costs had been capitalized rather than deducted.[51] The following example illustrates the application of these concepts:

> Example: Assume that a geothermal property with an adjusted basis of $200 is sold for $500. Previously, $150 of intangible drilling costs pertaining to the property were expensed via a section 263(c) election. The gain realized in the disposition is $300 ($500 – $200). The amount subject to recapture is the lesser of $300 (gain realized) or $150 (intangible drilling costs). Therefore, the recapture amount will be $150, less any adjustment for the increase in depletion which would have occurred if the $150 was capitalized rather than expensed.

If only a portion of a taxpayer's geothermal property is disposed of, then all intangible drilling costs relating to the *entire* geothermal property are subject to recapture.[52] The previously mentioned rules regarding the amount of recapture also will apply in this situation. However, if a taxpayer disposes of an undivided interest in a geothermal property which is less

44. I.R.C. § 1254(a) (1) (1976 & Supp. V 1981).
45. *Id.*
46. I.R.C. § 1254(a) (1) (B) (1976 & Supp. V 1981).
47. *Id.*
48. Proposed Treas. Reg. § 1.1254-1(a) (3), 45 Fed. Reg. 39515 (1980).
49. I.R.C. § 1254(a) (3) (Supp. V 1981).
50. I.R.C. § 1254(a) (1) (1976 & Supp. V 1981).
51. I.R.C. § 1254(a) (4) (1976).
52. I.R.C. § 1254(a) (2) (A) (Supp. V 1981).

than the taxpayer's entire interest in the property, then only a proportionate part of the total intangible drilling costs previously deducted with respect to the property are allocated to the disposed interest and recaptured.[53] Irrespective of the aforementioned rules pertaining to the disposition of an interest in a geothermal property, if a taxpayer can establish that his previously deducted intangible drilling costs do not relate to the portion of the property which was disposed, then the costs will not be allocated to the property and will not be subject to recapture.[54]

The concepts contained in the preceding paragraph are illustrated by the following example contained in the proposed section 1254 Regulations:[55]

> Assume that A owns an 80-acre tract of land with respect to which A had deducted intangible drilling and development costs under section 263(c). If A were to sell the north 40 acres, the entire amount of the adjusted intangible drilling and development costs with respect to the 80-acre tract would be treated as allocable to the 40-acre portion sold . . . .
>
> . . . .
>
> [A]ssume that A owns an 80-acre tract of land with respect to which A had deducted intangible drilling and development costs under section 263(c). If A were to sell an undivided 40 percent interest in the 80-acre tract, 40 percent of the adjusted intangible drilling and development costs with respect to the 80-acre tract would be allocable to the transferred 40 percent interest in the 80-acre tract . . . .

As the example above illustrates, there is a tremendous difference in the tax consequences of disposing of an undivided interest, as opposed to a fee interest, in property. It is interesting to note that although the economic substance of these two types of transactions is similar, the tax treatment of the transactions is inconsistent. This appears to be a rare example of form predominating over the substance of a transaction; this dichotomy will be a "trap" for the unwary taxpayer if the proposed Regulation is enacted in its current form.

For purposes of section 1254, a "disposition" includes items considered dispositions under section 1245.[56] Thus, transfers of property by gift, death, tax-free reorganization, or certain involuntary conversions are not considered "dispositions" under section 1254. Proposed Regulation section 1.1254(b)(4) states that a "disposition" does not include financing transactions such as mortgages and production payments which are treated as loans under section 636. Section 1254 applies regardless of any nonrecognition provisions of the Code which may be applicable.[57]

It should be noted that if a partner in a partnership sells or disposes of his partnership interest, any intangible drilling costs subject to recapture

53. I.R.C. § 1254(a)(2)(B) (Supp. V 1981).
54. I.R.C. § 1254(a)(2) (Supp. V 1981).
55. Proposed Treas. Reg. § 1.1254-1(b), 45 Fed. Reg. 39516 (1980).
56. H.R. REP. No. 658, 94th Cong., 2d Sess. 91 (1976).
57. L. FISKE, FEDERAL TAXATION OF OIL AND GAS TRANSACTIONS 9-7 (1981).

are treated as section 751 unrealized receivables.[58] Thus, any gain realized by the partner is treated as ordinary income to the extent of the partner's share of intangible drilling costs incurred by the partnership.

DEPLETION

Prior to October 1, 1978 (the effective date of the Energy Tax Act of 1978 Code amendments), in order to claim a depletion deduction for geothermal property a taxpayer had to show that the following requirements were met:

1) The resource being depleted was "exhaustible";
2) the resource was a "natural deposit" or depletable "waste or residue"; and
3) the taxpayer had an economic interest in the resource.[59]

It was debatable whether geothermal property met the first two requirements listed above. With respect to the first requirement, exhaustibility, a common argument which was made by the IRS was that since the resource being depleted was the earth's heat, which is inexhaustible, depletion of geothermal properties should not be allowed.[60] Taxpayers attempted to refute this argument in the following ways. First, they argued that the earth's heat was exhaustible, even though the heat source would not be completely used up before millions of years had passed. Alternatively, taxpayers argued that the depleting resource was not the earth's natural heat, but rather the fluid in the well which was used to convert the heat energy into electrical energy. Taxpayers reasoned that the fluid, which was actually water, was exhaustible since it was continually being used up during the energy conversion process.[61]

With respect to the requirement that the resource must be a "natural deposit," the IRS argued that if geothermally produced steam was produced by injecting fluids into a well, the requirement was not satisfied because the fluid was being artifically injected into the well and, therefore, the fluid was not a "natural deposit." Taxpayers countered with the argument that the resource involved was the earth's natural heat and not the injected fluid; therefore, the requirement was satisfied because the earth's heat is a "natural deposit."

The Energy Tax Act of 1978 resolved the depletion issue by adding section 613(e) to the Internal Revenue Code. This section allows percentage depletion to be taken on geothermal wells which are commenced after September 30, 1978 and which are located in the United States or in a possession of the United States. Thus, it is now irrelevant whether the geothermal resource is considered renewable or whether the property would otherwise qualify for depletion. Also, the Committee Reports on the

58. PROPOSED TREAS. REG. § 1.1254-1(b), 45 Fed. Reg. 39516 (1980).
59. Maxfield, *supra* note 7, at 218-19.
60. Arthur E. Reich, 52 T.C. 700, 709 (1969).
61. *Id.*

Energy Tax Act of 1978 state that cost depletion is allowable with respect to geothermal wells, and the greater of cost or percentage depletion may be taken on geothermal property.[62]

Section 613 states that for depletion purposes, a geothermal deposit is "a geothermal reservoir consisting of natural heat which is stored in rocks or in an aqueous liquid or vapor (whether or not under pressure)."[63] Section 613 also states that a geothermal deposit shall in no case be treated as a gas well for purposes of sections 613 and 613A; this indicates that the limitations and restrictions on percentage depletion for oil and gas wells which are contained in section 613A are inapplicable to geothermal deposits. Thus, percentage depletion for geothermal properties is available to all producers, including producers who are not eligible for percentage depletion with respect to their oil and gas production.[64]

There are other important differences between the percentage depletion rules for oil and gas wells and geothermal properties. Unlike oil and gas well depletion, percentage depletion of geothermal deposits is not limited to any equivalent number of barrels of oil or cubic feet of gas per day.[65] Further, the sixty-five percent of taxable income limitation imposed by section 613A(d)(1) on percentage depletion of oil and gas wells does not apply to percentage depletion of geothermal deposits.[66] However, the rules under section 613 for determining the taxpayer's gross income from a property are applicable to geothermal deposits, including the rules for allocating income among resources where different resources are recovered.[67] Depletion in excess of adjusted basis is a tax preference item,[68] and percentage depletion of geothermal properties is limited to fifty percent of the taxable income from the property (computed without the depletion allowance).[69]

The aggregation rules of section 614(b) are applicable to geothermal deposits.[70] Thus, unless a taxpayer elects otherwise, operating interests in the same tract or parcel of land are aggregated and treated as a single property.[71] However, the taxpayer cannot have more than one aggregation per tract or parcel.[72]

Prior to October 1, 1978, the percentage depletion rate for geothermal wells was the same as for oil and gas wells—twenty-two percent. The Energy Tax Act of 1978 enacted the following percentage depletion rates for geothermal deposits:

62. S. REP. No. 436, 95th Cong., 2d Sess. 91 (1978).
63. I.R.C. § 613(e) (3) (Supp. V 1981).
64. Arthur E. Reich, 52 T.C. 700, 709 (1969).
65. I.R.C. § 613(e) (Supp. V 1981).
66. I.R.C. § 613(e) (3) (Supp. V 1981).
67. Arthur E. Reich, 52 T.C. 700, 709 (1969).
68. I.R.C. § 57(a) (2) (Supp. V 1981).
69. I.R.C. § 613(a) (1976).
70. I.R.C. § 614(b) (1) (1976 & Supp. V 1981).
71. *Id.*
72. I.R.C. § 614(b) (2) (1976 & Supp. V 1981).

For Taxable Years Beginning in Calendar Year	Applicable Percentage
1978, 1979, 1980	22
1981	20
1982	18
1983	16
1984 and after	15

The legislative history of section 613(c) does not indicate why the percentage depletion rates for geothermal wells are identical to the percentage depletion rates for oil and gas wells. One can speculate that the reason for the similarity was that Congress was following the rationale of the courts' opinions in *Reich* and *Rowan* and was attempting to "fit" geothermal energy into the depletion provisions relating to oil and gas wells. If this premise is true then it is somewhat ironic, since one of the accomplishments of the Energy Tax Act of 1978 was that geothermal energy obtained a niche in the Internal Revenue Code separate from oil and gas wells and mineral deposits.

AT-RISK PROVISIONS

The at-risk rules of section 465 were extended to geothermal deposits by the Energy Tax Act of 1978.[73] Under section 465, geothermal properties are treated as a separate activity; therefore, no aggregation of the taxpayer's geothermal activities with the taxpayer's other investment activities is allowed.[74]

The investment credit at-risk rules, which were added to the Code by the Economic Recovery Tax Act of 1981, apply to business energy tax credits taken for geothermal investments.

TAX CREDITS

Generally

Three types of tax credits are available for investments in geothermal property. First, the regular ten percent investment tax credit is available for investments in geothermal property which is "section 38 property" as defined by section 48(a)(1).[75] Second, an additional credit (the "business energy credit") is available to businesses on the cost of equipment used to produce, distribute, or use energy derived from a geothermal deposit.[76] In the case of electricity generated by geothermal power, the additional credit is available only on the cost of equipment used to produce electricity up to the electrical transmission stage.[77] Third, a residential energy credit is available to individuals on the cost of equipment which transmits or uses energy derived from geothermal deposits for heating, cooling, or providing hot water or electricity for use within a dwelling.[78]

73. I.R.C. § 465(c) (1) (E) (Supp. V 1981).
74. I.R.C. § 465(c) (2) (E) (Supp. V 1981).
75. I.R.C. § 48(a) (2) (B) (1976 & Supp. V 1981).
76. I.R.C. § 48(*l*) (3) (A) (vii) (1976).
77. I.R.C. § 48(*l*) (3) (A) (viii) (1976).
78. I.R.C. § 44C(c) (5) (A) (Supp. V 1981).

Investment Credit

The Internal Revenue Code contains no special investment tax credit provisions for investments in geothermal properties. Therefore, the investment tax credit rules contained in sections 38, 46, and 48 are applicable to both geothermal and non-geothermal properties.

Business Energy Credit

Code section 48(*l*) provides an additional tax credit to businesses for investments in "alternative energy property." This term includes "equipment used to produce, distribute, or use energy derived from a geothermal deposit."[79]

The Regulations define "production equipment" as:

> equipment necessary to bring geothermal energy from the subterranean deposit to the surface, including well-head and downhole equipment (such as screening or slotted liners, tubing, downhole pumps, and associated equipment). Reinjection wells required for production also may qualify. Production does not include exploration and development.[80]

It should be noted that the term "production equipment" does not include the costs of geothermal drilling rigs and related equipment which are used in exploring for a potential geothermal well site. These costs are potentially eligible only for the regular investment tax credit. However, in light of the United States' current energy conservation policy, it appears that the definition of "production equipment" contained in the Regulations is unduly narrow and should be expanded to include drilling rigs and related equipment. Such a change would further Congress' primary objective when it enacted the Energy Tax Act of 1978, which was to encourage investment in alternative energy sources.[81]

"Distribution equipment" is defined as:

> equipment that transports geothermal steam or hot water from a geothermal deposit to the site of ultimate use. If geothermal energy is used to generate electricity, distribution equipment includes equipment that transports hot water from the geothermal deposit to a power plant. Distribution equipment also includes components of a heating system, such as pipes and ductwork that distribute within a building the energy derived from the geothermal deposit.[82]

Equipment which uses energy derived from a geothermal deposit is eligible for the business energy credit only if the equipment exclusively uses energy derived partly from geothermal deposits and partly from non-

79. I.R.C. § 48(*l*) (3) (A) (viii) (1976).
80. Treas. Reg. § 1.48-9(c) (10) (ii) (1981).
81. *See supra* text accompanying notes 18-19.
82. Treas. Reg. § 1.48-9(c) (10) (iii) (1981).
83. Treas. Reg. § 1.48-9(c) (10) (iv) (1981).

geothermal sources.[84] However, the existence of a backup system which does not use geothermal energy and which is designed for use only in the event of the failure of a primary system which provides energy derived from a geothermal deposit will not disqualify the primary system for the business energy credit.[85] If geothermal energy is used to generate electricity, equipment eligible for the business energy credit includes the electrical generating equipment but not equipment beyond the electrical transmission stage such as transformers and distribution lines.[86]

The "exclusive use" requirement discussed in the preceding paragraph is another example of the Regulations regarding Congress' intention in enacting the business energy credits. In order to encourage the development of geothermal energy, the "exclusive use" requirement should be either eliminated or relaxed. For example, the Regulations could be modified to allow the business energy credit to be taken on equipment which obtains greater than fifty percent of its operational energy from a geothermal source. Such a modification would encourage geothermal energy development and, at the same time, it would eliminate the Treasury Department's concern that the business energy credit would be "abused" by taxpayers if the requirement was eliminated.

In order for property to be eligible for the business energy credit, the original use of the geothermal property must either commence with the taxpayer or the property must be constructed by the taxpayer.[87] The amount of the business energy credit is ten percent if the property was acquired between October 1, 1978 and December 31, 1979 and the use of the property begins during this period.[88] Code section 46(a)(2)(C)(i) provides that the amount of the credit will be fifteen percent for expenditures made between January 1, 1980 and December 31, 1985. In the technical explanation of President Reagan's State of the Union message of January 26, 1982, it was announced that the business energy tax credit would be repealed as of December 31, 1982. However, the President's announcement received much opposition by Congress and the repeal has not yet occurred. Opponents of repeal argue that repeal of the credit is inconsistent with the long-term energy conservation policies of the United States and would cause uncertainty over government energy policies, which could hamper long-range business planning and the nation's economy in general. Supporters of the repeal argue that the business energy credits are no longer necessary because of the current state of the world oil market and because there has been little or no evidence that the business energy credits have significantly reduced U.S. energy consumption. At this point, it is impossible to predict the future lifespan of the business energy credits.

Residential Energy Credit

Code Section 44C provides a credit of forty percent (for tax years beginning after 1979) of the first $10,000 of renewable energy source expenditures made by a taxpayer for any dwelling unit located in the United

84. *Id.*
85. *Id.*
86. *Id.*
87. Treas. Reg. § 1.48-2(b) (1981).
88. I.R.C. § 46(a) (2) (C) (i) (Supp. V 1981).

States and used as the taxpayer's principal residence.[89] "Renewable energy source" property includes "geothermal energy property" which satisfies the following requirements:

(i) the original use of the property begins with the taxpayer.
(ii) the property can reasonably be expected to remain in operation for at least 5 years.
(iii) the property meets the applicable performance and quality standards prescribed in [Treas. Reg.] § 1.44C-4 in effect at the time of the . . . acquisition of the property.[90]

"Renewable energy source" property does not include heating and cooling systems which supplement renewable energy source geothermal equipment and which employ a form of energy other than solar, wind, or geothermal energy.[91]

For purposes of the residential energy credit, "geothermal energy property" is defined as: "equipment (and parts solely related to the functioning of such equipment) necessary to transmit or use energy from a geothermal deposit to heat or cool a dwelling or provide hot water for use within the dwelling."[92] Equipment serving both a geothermal function and a non-geothermal function does not qualify as geothermal property.[93] It should be noted that the definition of a "geothermal deposit" for purposes of the residential energy credit is different from the definition contained in the sections of the Code and Regulations. A "geothermal deposit" is defined in Regulation 1.44C-2(h) as:

> a geothermal reservoir consisting of natural heat which is from an underground liquid or vapor (whether or not under pressure) *having a temperature exceeding 50 degrees (Celsius)* (120°F) as measured at the wellhead, or in the case of a natural hot spring (where no well is drilled), at the intake to the distribution system.

The emphasized portion of the above definition has sparked considerable controversy. Critics claim that this provision is arbitrary and unreasonable and retards Congress' intention in enacting the Energy Tax Act of 1978. The Treasury Department has responded to this argument by stating that the temperature requirement is designed to assure that energy from a geothermal deposit is truly derived from underground sources and is not heat energy derived from atmospheric temperatures. The IRS supported the Treasury's position in Revenue Ruling 81-304,[94] in which the Service denied the residential energy credit to a taxpayer whose wells produced water having a temperature of only 56°F. At the present time, it is uncertain if the Treasury Department will modify or eliminate the temperature requirement in order to enable more homeowners to avail themselves of this credit.

89. I.R.C. § 44C(c) (2) (A) (Supp. V 1981).
90. Treas. Reg. § 1.44C-2(e) (1) (1980).
91. *Id.*
92. Treas. Reg. § 1.44C-2(h) (1980).
93. *Id.*
94. Rev. Rul. 81-304, 1981-2 C.B. 7.

Ocean Thermal Equipment

Expenditures made between January 1, 1980 and December 31, 1985 for ocean thermal equipment are eligible for both the 10 percent investment credit and a 15 percent business energy credit. Section 48(*l*)(3)(ix) states that "equipment placed in service at either of 2 locations designated by the Secretary [of the Treasury] after consultation with the Secretary of Energy, which converts ocean thermal energy to usable energy" is considered alternative energy property eligible for the business energy credit. The legislative history of section 46 states that "qualifying ocean thermal equipment includes turbines, generators, and related equipment (such as pumps, piping and heat exchangers) up to, but not including the transmission stage, and also specially designed vessels and structures used to support and house this equipment.[95] The legislative history also states that the credit will be available on ocean thermal equipment which is owned by a United States person and is used outside of the United States.[96] To date, the two locations mentioned in the Code provision have not yet been designated. However, George R. Ariyoshi, the Governor of Hawaii, recently asked the Treasury Department to designate Hawaii as one of the two locations at which ocean thermal energy investments will be eligible for the 15 percent credit.

CURRENT GEOTHERMAL ENERGY TAX ISSUES

Introduction

Prior to the enactment of the Energy Tax Act of 1978, the tax treatment of geothermal energy resources was vague and uncertain.[97] The Code provisions enacted by the Energy Tax Act of 1978 greatly clarified these tax issues by adding sections which deal specifically with geothermal energy to the Internal Revenue Code. Although some unresolved tax issues still remain, the remaining issues are not numerous.

Geothermal Disposal Wells

Most geothermal wells which are currently in operation produce energy by producing steam which is used to turn a turbine. The steam is produced by pumping hot water into the well, where the water is superheated and converted into steam which drives a turbine located at the wellhead. Once water has been used to produce steam, any excess water still remaining must be disposed of. The most common method of disposal is to reinject the water back into the well where it will be naturally re-heated. However, if it is not possible to reinject water into the original well, a separate disposal well may have to be drilled. An unresolved tax issue is whether the intangible drilling and development costs of the disposal well qualify for the section 263(c) election.

The Code states that the section 263(c) election is available only with respect to wells used in the *production* of geothermal energy.[98] Thus, if

95. S. REP. No. 394, 96th Cong., 2d Sess. 125 (1980).
96. *Id.*
97. *See supra* text accompanying notes 10-11.
98. I.R.C. § 263(c) (Supp. V 1981).

disposal wells are not considered production wells, the section 263(c) election would not be available and the cost of the wells would have to be capitalized. To date, the IRS has not issued any rulings on this issue which specifically deal with geothermal disposal wells. However, in Revenue Ruling 70-414,[99] the IRS ruled that in the case of oil and gas wells, the cost of installing salt water disposal equipment was not eligible for the section 263(c) election. Although Revenue Ruling 70-414 supports the proposition that the section 263(c) election is not available with respect to geothermal disposal wells, there has not yet been any litigation or IRS Rulings on this point, so the availability of the section 263 election is uncertain. Once again, Congress' intentions in enacting the Energy Tax Act of 1978 lend support to the argument that the term "production" should be broadly interpreted so as to include the disposal of geothermal well water.

Residential Energy Credit Temperature Requirement

The geothermal tax issue which has sparked the most controversy is the temperature requirement of the residential energy credit contained in Regulation section 1.44C-2(h). This requirement has been attacked on two grounds. First, the Code provisions relating to the residential energy credit contain no temperature requirement. Critics of the requirement argue that the Regulation is invalid because it interprets the Code too broadly and there is no legislative basis to support the requirement. Second, critics argue that the requirement retards Congress' intent in enacting the credit—which was to encourage the development of non-conventional energy resources. The IRS supports the Regulation by arguing that the requirement is necessary in order to protect taxpayers from "taking unfair advantage" of the credit. The Treasury Department has stated that Congress intended to encourage the use of geothermally-produced steam or rocks which are hot enough to generate steam and that a temperature of less than 50° Celsius would not indicate that heat is being generated by the geothermal deposit.

One possible way to settle this controversy is to redefine the definition of geothermal energy by adding a provision to the Internal Revenue Code which explicitly defines a geothermal deposit. Such a definition should concentrate on the source of the energy element, rather than on an arbitrary measure (i.e. the temperature) of the energy output of the deposit.

Such a change would produce the following benefits. First, taxpayers who already have invested in geothermal energy will not be penalized because their geothermal system fails to perform as well as originally anticipated. Since the purpose in enacting the residential energy credit was to encourage investment in alternative energy forms, taxpayers who made such investments should not be penalized financially for making their investment. Rather, the taxpayers would be rewarded for their initiative in taking an economic risk which furthers the long-range policy of the United States. Second, the current taxpayer uncertainty regarding this issue would be eliminated. This should increase the incentive for taxpayers to invest in geothermal equipment.

99. Rev. Rul. 70-414, 1970-2 C.B. 132.