GEOTHERMAL LEASING

FROM THE LESSOR'S POINT OF VIEW

William Byrd

The basic document utilized in the geothermal industry for the acquisition of the resource is the geothermal lease. For a variety of reasons geothermal lease practices which are presently in use have originated in and in many respects parallel oil and gas leasing practices. In many respects the nature of the resource and its development have parallels with the oil and gas industry, but in other respects it is markedly different and more closely parallels the mining industry. An interesting comparison of the geothermal industry with the mining and petroleum industry is made in a chart which was prepared by Gerald Kitchen of AMAX Exhibit I.[1] In the center of the chart the author compares those facets of the geothermal industry which most nearly resemble the petroleum industry which includes: prospect size, property acquisition, overall exploration costs, exploration and production drilling, and production engineering. On the other hand, geologic occurrence, capital requirements, expenditure timing, development and production timing, and among others, productive life and marketing, more nearly resemble the mining industry. The environmental impact appears to be more nearly related to the problems encountered in the production of petroleum.

Most of the problems encountered in geothermal leasing arise out of the conflicting interests of the lessor and the lessee.

The basic interests of the landowner are:

1. Immediate exploration and rapid development of the resource which produces royalties for the landowner;
2. In lieu of, or perhaps in addition to drilling and development, the payment of money in the form of bonus, rent, delay rentals, in lieu royalties, minimum and advance royalties;[2]
3. Retaining the maximum utilization of surface rights which is compatible with the development of the resource; and
4. Protection of present and future uses of the property for the landowner.

Both 3 and 4 above frequently involve the public interest.

Some of the basic interests of the Lessee are:

1. To secure and keep the lease with the smallest capital investment possible;
2. To have a lease term long enough to provide for exploration and development of the resource within:
   a. Budget and personnel constraints; and,
   b. Other development commitments;
3. To have unrestricted use of surface rights in order to develop the resource;
4. To keep the lease as long as it has productive, or has speculative, value; and,
5. To terminate the lease without liability if it is unprofitable.[3]

Historically, in the development of real property leases, a number of complex and relatively tough provisions have been developed for the protection of the landowner. An examination of any standard commercial

lease will disclose many provisions which are designed for the primary protection of the landowner. Although such provisions are common in commercial leases, they seldom appear in the printed oil and gas or geothermal lease. At least one reason for the inclusion of such provisions is based on the fact that when a lease is made the lessor has in effect conveyed an estate in the land to the lessee for the term of the lease and any restrictive or protective provisions must be incorporated when the lease is made if the lessor is to have their benefit.

By way of comparison, the usual California geothermal lease presented by lessees is at the opposite extreme. The geothermal leases which I see are basically variants of commonly used oil and gas leases which have been refined from time to time by some of the more sophisticated operators in the industry.

From an industry point of view the usual company printed form no doubt has much in its favor. Because it has been drafted by lawyers and others who represent the working interest, it is not surprising that it has been drawn in favor of and to protect the lessee.

From a landman's point of view use of such forms tends to reduce the immediate and future work load because many of the problems have been resolved to the satisfaction of the lessee in the printed lease form.

Keeping in mind the summary of a landowner's basic interests, let us consider some of those matters which concern the landowner.

I

THE GRANTING CLAUSE & TITLE

Although geothermal leases do not usually make provision for it,

general conveyance practice would require that the granting clause be made specifically subject to any mortgages, liens, leases, conveyances, covenants, conditions, reservations, restrictions, rights or rights-of-way of record (or rights-of-way acquired by prescription in Imperial Valley) in order to limit possible claims for breach of warranty.

The problem is highlighted by the usual geothermal lease supplied by industry which contains express warranties of title and an agreement to defend the title as to the ownership of the land and geothermal resources. Further provision is made for the reduction in rents, royalties and other payments in the proportion which the lessor's interest bears to the whole and undivided fee. They often contain further provisions authorizing payment at the lessee's option of any lien, mortgage or tax and in such event further provision is made to subrogate the lessee to the rights of the holder of the mortgage or lien and to reimburse itself from any rentals, royalties or other sums which are due the lessor.

The principal concern from the landowner's point of view is that there may be uncertainties as to the ownership of the resource of which the lessor may be unaware. Presumptively, the lessor should be aware of any conveyance or reservation of minerals in the chain of title or of any conveyance or reservation of the fee interest in the chain. However, it is possible that an implied reservation to the United States may exist as to lands which were acquired by patent from it. In the latter respect, one might note the rather extensive argument advanced by Professors Sato and Crocker[4] in which they contend that because of the unique nature of the geothermal resource title has been retained by implication to the United States. It is

conceded that the case is difficult because the Geothermal Steam Act of 1970 indicates a belief that the Federal Government no longer has an interest in geothermal resources except where a reservation has been made by statute.

A similar situation existed in the Geysers as to leases made with landowners who had acquired a patent pursuant to the Stock Raising and Homestead Act of 1916.

In some of those instances, and in other cases today, I am advised that the lessee has made an agreement with the landowner providing for an overriding interest of say 2-1/2 percent as consideration for use of the surface of the land.

In some instances title may have been derived from state lands and the landowner may not be aware of the state's claim to the resource. In another instance of which I am aware the mineral estate was reserved but right of entry above 500 feet also was granted to the purchaser as a requirement of the lender. This all occurred prior to execution of the lease. As a result we understand the lessee now claims a breach of warranty leaving to the owner of the mineral estate the task of gaining entry at his expense.

In view of the fact that the lessee ordinarily makes some examination of the record and obtains a title guarantee he may be the first to be fully aware of a defect of this kind. As a consequence the landowner may wish to disclaim any warranty of title or interest as to such matters and relieve itself of any obligation for breach arising out of a failure of title to the resource and liability for payments made before discovery.

II

RESERVATIONS - SURFACE USE & OPERATIONS

The effect of the usual printed lease is to subordinate the owner's present and future use of the surface to the lessee's uses and rights under the lease. From the landowner's point of view the need, of course, is for accommodation, and less restrictive drafting. To avoid misunderstandings and problems it is important for the owner to clearly express the reservations which he intends. In that respect, if one flies over or drives through the Geysers area it is surprising to see how little of the surface is being used for geothermal operations. As development proceeds in the Geysers we find drilling islands supporting multiple drill sites with consequent use of a lesser amount of the surface for each unit.

From an economic and environmental point of view much can be said in favor of this approach. In some areas such as Imperial Valley where good farm land is highly productive, the matter of feeding the nation and supplying commodities for export provides public policy as well as economic reasons for using as little of the surface as is reasonably required to develop the resource and to interfere as little as is possible with the agricultural productivity of the land.

When the resource has been developed and the area required for such purposes has been determined there is probably little reason to burden the surface of the land outside of the area required for geothermal development with the usual lease provisions relating to surface use.

With the passage of time, uses may change and some areas which were strictly agricultural may be needed for commercial, residential or industrial development. Certainly one of the concerns of the landowner should be to protect such rights and appropriate reservations and

reasonable conditions relating to use should be included in the lease on his behalf.

The objective of both the landowner and developer should be an agreement which will permit development of the resource in an orderly manner. After the lease is signed, if the operator is dealing with responsible business people under a reasonable lease little difficulty is normally experienced in developing the lease. On occasion the operator may be faced with the problem of dealing with some person who lacks such experience or simply may not be able to respond rationally. In that event the agreement must provide the operator with a method by which development may continue without undue delay. Among the topics which might be considered by a landowner when he enters into a geothermal lease are the following:

a. Location of facilities, wellsites, etc., consultation and approval, arbitration if no agreement;
b. Well sites, area required;
c. Drilling and construction near residence or other structure;
d. Requirement to seal off subsurface waters and protect ground waters;
e. Noise levels, compliance with environmental standards;
f. Damage to crops;
g. Drilling islands, directional drilling, and plant sites;
h. Location of drill sites and other facilities on perimeters and on corners of fields;
i. Lessee to keep roads free of dust to prevent injury to crops;
j. Use and maintenance of existing roads;
k. Fencing of sump holes;
l. Use of water on the premises, ground, irrigation and

produced water;

m. Liability for destruction of property;

n. Damage to land;

o. Payment for land used;

p. Surrender, use of easements when not in default;

q. Payment for easements, conditions of use;

r. Subsidence; and

s. Restoration.

III

ROYALTIES

In some oil and gas leases the lessor is entitled to take his royalty share in kind at the delivery point specified in the lease. Theoretically, in a geothermal lease one could take leased substances in kind at the well head, or at some other point, but because of the nature of geothermal steam and hot water it is not generally considered feasible to do so.

As an alternative, payment of the royalty share may be specified in the lease as the applicable percentage of gross proceeds calculated at the delivery point specified in the lease. Where the resource or leased substance is sold by the working interest at the wellhead to a third party in a bonafide sale the calculation of royalties should be fairly straight forward. Recent developments indicate that the lessee may be put in a position where he is required to construct a power plant in order to properly utilize the resource. As the result of regulatory problems encountered by the utility industry in establishing rates which are adequate, the utility may find itself short on capital for plant construction, but because of the growth of its service area it finds itself in need of power. As a consequence it may very well be interested in buying electric power rather than steam or hot water. At least traditionally resource developers have been reluctant to

participate in such developments because of the danger of being classified as a utility rather than as a provider of fuel.

Nevertheless, that approach has been taken, as in the case of Magma Power and its East Mesa Power Plant where a subsidiary has been formed and a power plant constructed. In those cases where the resource developer is dealing with itself some lease forms contain provisions which are of concern to the landowner. One of the provisions often found in geothermal leases provides for the free use of leased substances used in Lessee's operations. What that entails is far from certain; and under some leases the literal language is such that the use of steam and hot water to run a power plant would be free. If the electric power were then used in a mineral extraction plant, even the electric power could be consumed without payment of royalties. Coupled with such provisions may be others which provide for deduction of the costs of "transporting, processing and manufacturing or conversion" to another form, from the sales price or market value, including the "cost of the facilities and equipment used" and "overhead and amortization charges computed and allocated in accordance with lessee's standard accounting practices".

Presumably the lessee will have engaged in such activities because he expects them to be profitable and if the lessor were to receive the additional increment in value when royalties are computed he too might gain from the transaction. However, with the type of language quoted, the net effect of such a provision is to put the landowner in a position where at best he has an interest in the net profit of the operation rather than a royalty, and at worst something less. Not all leases are drawn in this fashion. From the landowner's point of view the objectives should be to avoid such situations and to provide for royalties in the more traditional sense, since it is doubtful that the lessor will want

to be exposed to management risks or the need to examine the lessee's cost calculations.

IV

ASSIGNMENT

In the ordinary commercial lease one generally finds a provision which prohibits assignment or subletting without first obtaining the lessor's consent, which may be arbitrarily withheld. The basic rationale is that the lessor has entered into a lease which is personal in nature and is made in reliance on the integrity and the financial statement of the lessee. Without such controls the lessee might assign or sublet to a person who is not financially responsible. As you know, the usual printed form supplied by the lessee provides for free assignability. From an operator's point of view there are many reasons for such provisions. The basic problem still remains, however, in that the lessor is willing to enter into a lease with one operator and perhaps not another. The problem is highlighted when:

a. The lessee's interest is assigned in fractions to different persons, or

b. An assignment of different parcels within the lease is made to a different person or persons who may be unsatisfactory to the lessor.

In some cases a result of such assignments has been to cause title problems which have involved considerable legal expense to the landowner clearing the title.

It is recognized that the operator often enters into a joint venture with another party for the purpose of developing the resource and that the lessee may wish to assign a leasehold interest as security in a bonafide financing transaction where the proceeds are

to be used for leasehold development.

In such instances, if the lessee retains a substantial interest, or is the operator and in any event remains responsible for performance of the lease, assignment should be expressly permitted. Normally assignment for security should also be permitted under the circumstances mentioned above on the proviso that on default by the lessee and foreclosure by the lender that sale can be made only to a responsible and reputable geothermal developer.

V

DEVELOPMENT OF THE RESOURCE

There is a fairly strong argument to be made for the landowner who signs a relatively unfavorable lease with a lessee who proceeds to develop the property and pay royalties early on. The argument is that even though the holdout may eventually obtain a better lease, he may not fare as well as his neighbor who signed early and had his land developed much sooner. On the other hand, a lessor who signs a lease, which provides for a low royalty rate, a minimal rent, and a long primary term with an equally long "hookup" clause, and his lessee is one who does nothing but sit on the lease, is not in a happy position.

Since development of the resource results in the payment of royalties, the major concern of the landowner should be to structure his lease in a manner which insures early development or surrender of the lease. Many factors have a bearing on the landowner's ability to accomplish that result. Among them are:

1. The existence of a viable prospect and market;

2. The operator's willingness and ability to develop the resource in the landowner's area;
3. The acreage which is offered and its relationship to the prospect and other lands.

If such favorable factors exist what can be expected? In most cases the lessor should be interested in a development program which is something more than the rather vague agreement to drill a well on or in the vicinity of the leased land or drop the lease. Since the development of a program is dependent on the capability of the operator, it is he who must decide what can be reasonably accomplished. For the operator's protection, reasonable safeguards should be included to protect the lease where unreasonable delays or technical problems occur which he cannot control, especially where there has been substantial investment by the lessee. We are all aware of the unseemly delays which have occurred in California in the permitting of power plants.

Conceptually, if there is sufficient acreage I can see it being developed in drillable blocks. One approach would be to provide a reasonable time frame for various "milestones" - to borrow a phrase - such as:

1. Exploration prior to drilling;
2. Drilling for discovery and production;
3. Additional drilling to confirm the reservoir;
4. The making of a contract;
5. Actual delivery of leased substances.

Provision to extend the lease where the lessee is drilling at the expiration of the primary term and a continuous drilling clause should be acceptable to the lessor as well as the usual cessation of production or work-over clause.

Perhaps the best approach is simply to provide for a reasonable primary term followed by a reasonable period to hook up or actually sell and deliver the product. Looking at Union's operations in North Brawley it appears that six years from inception to actual production of power is about the shortest time which can be expected. However, with the resolution of technical problems that period should be shortened. Even so, a longer lead is required for field development. If the North Brawley anomaly produces 800 m/w and development occurs at the rate of 100 m/w per year commencing in 1983, it appears that full field development will occur in 1991, but if the rate is 200 m/w per year we may be looking at 1987. The shortest possible period is desirable for everyone.

Where fairly long lead times are provided in the lease a strong argument can be made for the inclusion of express covenants to diligently drill, to develop the resource if found, and to develop a market. In lieu of the implied covenant to protect against drainage, the lessee should be willing to expressly covenant to do so. In this vein the role of public policy will play a stronger part in the future.

The courts have already begun to develop an implied covenant for further exploration in which the lessee may be given the option of giving up the lease or engaging in additional exploratory operations.[5] For public policy reasons we can expect the further development of this covenant especially in long term leases which have not been reasonably explored.

VI

TAXES

Of special concern to the landowner is Proposition 13 and the

attitude of the State Board of Equalization which has taken the position that drilling a geothermal well is "new construction" which will cause reassessment of the leased land.[6]

Beyond that, the Board has also stated that a 10 year lease, or a lease for 5 years with an option for 5 additional years, constitutes a transfer which will trigger a reassessment of the leased land.

Coupled with this general problem is the fact that the usual lease provides for a grant of the mineral estate for the term of the lease. As a consequence the question arises as to whether the making of a geothermal lease containing a primary term of 10 years is a transfer which will cause reassessment and whether a geothermal lease for 5 years and so long thereafter as leased substances are produced will result in reassessment. These questions have not been fully settled.

To compound the problem instances have been reported where the County Tax Assessor has levied an ad valorem tax on the minerals in place even though production had not actually commenced on the parcel but because of other development the reservoir had been determined. The result was a sharp increase in taxes and an income stream which was too small to pay for the increased taxes and as a consequence a severe hardship was imposed on the landowner and developer.[7]

Where these problems can be forseen it is often possible for the landowner to negotiate a provision which will defer the payment of taxes arising out of levies on the mineral estate, or Proposition 13 reassessments arising out of leasing and drilling activities, at least until the royalty stream has increased sufficiently to absorb the tax burden.

In some leases the owner has agreed to pay as his share of the taxes an amount not exceeding the royalty share of actual money

received under the lease, whether in the form of rent, minimum, advance or earned royalties.

Since the mineral estate may not be separately assessed arbitration may be required if the lessor and lessee are unable to agree on the relative value of the mineral estate.

VII

RENT

Between inception of the lease and sale the lease may provide for the payment of rents, minimum royalties which may or may not be recoverable by the lessee from earned royalties, or advance royalties which may be recovered against future production.

Rental clauses - varieties:

a. Often, as noted above, a delay rental is paid to avoid termination of the lease for failure to drill;

b. However, the lease can provide for the payment of rent even though the lessee has satisfied the drilling commitment;

c. In some cases the lessee will guarantee the payment of rent (or a minimum or advance royalty) for an agreed period, such as:

    1. A definite number of years; or,

    2. Until and so long as earned royalties exceed the rent payment; or,

    3. The lessee quitclaims the lease

        a. In its entirety, or there is

        b. A partial surrender when the rent may be reduced, depending upon the terms of the instrument.

    4. Some leases contain escalation clauses which

automatically increase the rent by the percentage increase of the cost-of-living index for the wholesale price index or other similar index.

VIII

AFFIRMATIVE COVENANTS

Among other covenants an agreement to hold the lessor harmless with respect to injuries to person or property arising out of operations is of importance to the lessor. Similarly protection of the lessor's land from liens arising out of the lessee's activities deserve careful consideration and drafting.

IX

BREACH

A provision found more frequently in later versions of the printed lease form is one which provides that notwithstanding a default on the part of the lessee he may retain each well site and an area around it which varies from 5 to 80 acres depending on the lease, all facilities and all rights of way.

From the landowner's point of view such provisions are particularly objectionable and perhaps unenforceable in the broadest form.

X

CONCLUSION

The art of successful negotiation rests on knowing what is possible. For the landowner and his counsel each lessee with whom he deals may have a different concept as to what it can or will do. The financial strength of the lessee and the emphasis which it places on geothermal operations will vary, and what may be possible for one may not be possible for another. Frankness as to what is possible on the part of both the lessor and lessee can aid substantially in

concluding lease packages. With an exchange of such information making the lease becomes a business decision which can be made in a rational manner without substantial delay. Concluding viable lease arrangements is the objective of all concerned.

FOOTNOTES

1. Gerald Kitchen, General Counsel, AMAX, Geothermal Leasing (Paper, presentation meeting of the Rocky Mountain Mineral Law Foundation, Jan. 27-28, 1977, Salt Lake City, Utah).

2. Williams & Meyers Oil & Gas Law - §601.

3. Williams & Meyers Oil & Gas Law - §601.

4. 6 Ecology Law Quarterly 250.

5. Williams & Meyers Oil & Gas Law, §841-846.

6. Article XIII A, Section 2, California Constitution.

7. A Review of Western State Tax Law Applied to Geothermal Development, Sharon C. Wagner, Commercialization of Geothermal Resources, Nov., 1978.

CATEGORY	INDUSTRY	
	Mining	Petroleum
Geologic Occurrence	0	
Hydrothermal Characteristics	0	
Alteration	0	
Geochemistry	0	
Geophysics	0	
Frequency of Viable Occurrences	0	
Prospect size		0
Property Acquisition		0
Overall Exploration Costs		0
Exploration & Production Drilling		0
Production Engineering		0
Capital Requirements	0	
Expenditure Timing	0	
Development & Production Timing	0	
Productive Life	0	
Marketing	0	
Environmental Impact		0

Exhibit I

G.R.I.P.S. COMMISSION

2628 MENDOCINO AVENUE, SANTA ROSA, CALIFORNIA 95401 (707) 527-2025

GEOTHERMAL WELL PERMITTING PROCEDURES
GEYSERS-CALISTOGA, CALIFORNIA KGRA

Attached are the results of a survey about the geothermal well permitting prcoedures of G.R.I.P.S. member counties Lake, Mendocino, Napa and Sonoma.

This information is in summary form and the actual processes may prove to be more detailed than shown here but the costs and time schedules are as reported by each county.

If you need more specific information you may contact:

Napa County

Jim O'Laughlin
Napa County Planning Department
1121 First St.
Napa, CA 94558
Phone: (707) 253-4416

Mendocino County

Jay McKeeman
Mendocino County Planning Department
880 North Bush
Ukiah, CA 95482
Phone: (707) 468-4281

Lake County

Don Pape
Lake County Planning Department
2555 North Forbes
Lakeport, CA 95453
Phone: (707) 263-2213

Sonoma County

Ray Krauss
Sonoma County Planning Department
2555 Mendocino Avenue
Santa Rosa, CA 95401
Phone: (707) 527-2958

COUNTY USE PERMIT INFORMATION

ACTIVITY COVERED	REVIEWING AGENCIES	DECISION MAKING TIME	COST	SPECIAL PROVISIONS
MENDOCINO				
SHALLOW TEMP. GRADIENT TESTING THROUGH UTILIZATION AS SPECIFIED ALSO FOR TEST WELLS AND FIELD DEVELOPMENT	PLANNING COMMISSION; PLANNING DEPARTMENT; PUBLIC HEALTH; PUBLIC WORKS; BUILDING DEPARTMENT; ARCHEOLOGICAL COMM.	15 - 45 DAYS WITHOUT E.I.R. PREPARATION 7 - 10 MONTHS WITH E.I.R. PREPARATION	$50 + COST OF E.I.R.	
NAPA				
SHALLOW TEMP. GRADIENT TESTING THROUGH UTILIZATION AS SPECIFIED	CONSERVATION, DEVELOPMENT AND PLANNING COMMISSION; PLANNING DEPARTMENT	8 - 9 MONTHS WITH E.I.R. PREPARATION	INCLUDED IN E.I.R. COSTS	PERFORMANCE BOND BETWEEN $200,000 AND $600,000 PER EXPLORATION AND DEVELOPMENT WELL.
SONOMA				
INDIVIDUAL WELLS, PIPELINE OR OTHER CONSTRUCTION	BOARD OF ZONING ADJUSTMENTS; PLANNING DEPARTMENT; HEALTH DEPARTMENT; WATER AGENCY; BUILDING INSPECTION; SANITATION; FIRE DISTRICT; NORTHERN SONOMA COUNTY AIR POLLUTION CONTROL DISTRICT; PUBLIC WORKS	60 - 90 DAYS PLUS 4 - 6 MONTHS FOR E.I.R. PREPARATION	$344* + E.I.R. COSTS. *INCLUDES $54 HEALTH DEPT. FEE AND ENV. REVIEW FEE $100.	THESE PROCEDURES REFER TO ACTIVITY IN THE PRIMARY ZONE DESIGNATED BY SONOMA COUNTY GENERAL PLAN. SECONDARY ZONE NOT OPERATIONAL.
LAKE				
EXPLORATORY WELL THROUGH UTILIZATION AS SPECIFIED	PLANNING DEPARTMENT; BUILDING DEPARTMENT; PLANNING COMMISSION; COUNTY COUNSEL, PUB. WORKS; HEALTH DEPT.; AGRICULTURAL DEPT.; FIRE DEPARTMENT; FLOOD CONTROL/WATER CONSERVATION; L.C.A.P.C.D.; SHERIFF DEPT.; SOIL CONSERVATION DEPT.	3 MONTHS BEFORE PLANNING COMMISSION HEARING. APPROX. 6 MONTHS FOR E.I.R. PREPARATION	$300 FILE FEE. IF E.I.R. NEEDED $2600 REVIEW + $300 FILE FEE + CONSULTANT FEE FOR E.I.R.	

COUNTY E.I.R. REQUIREMENTS - C.K.G.R.A.

COUNTY	PREPARATION BY	REVIEWING AGENCIES WITHIN COUNTY	DECISION MAKING TIME	E.I.R. COST	COMMENTS
MENDOCINO	CONSULTANT CONTRACT WITH COUNTY.	PLANNING COMMISSION; PLANNING DEPARTMENT; PUBLIC WORKS DEPT.; BUILDING INSPECTION; ENVIRONMENTAL HEALTH; MENDOCINO APCD.	15 - 45 DAYS TO POINT OF NEGATIVE DECLARATION, 3 - 6 MONTHS FOR PREPARATION PLUS 3 MONTHS FOR FINAL DECISION, TOTAL 7 - 10 MONTHS.	$100 FOR COUNTY ADMINISTRATION; FEE FOR PREPARATION DETERMINED THROUGH CONTRACT SOLICITATION PROCESS. APPLICANT PAYS ALL COSTS INCLUDING E.I.R.	TWO GEOTHERMAL E.I.R.'S HAVE BEEN DONE TO DATE.
NAPA	CONSULTANT CONTRACT WITH COUNTY.	PLANNING COMMISSION; CONSERVATION, DEVELOPMENT AND PLANNING DEPARTMENT; BAY AREA APCD; PUBLIC WORKS; MOSQUITO ABATEMENT CONTROL DISTRICT; ENVIRONMENTAL HEALTH; AG. COMMISSION; COUNTY ADMINISTRATOR.	UNSPECIFIED TIME FOR INITIAL STUDY TO DETERMINE NEGATIVE DECLARATION/E.I.R. 8 - 9 MONTHS INCLUDING E.I.R. PREPARATION.	$125 FOR INITIAL STUDY ISSUANCE OF NEG. DEC. IF APPROPRIATE. $650 E.I.R. CONTRACT NEGOTIATION. $250 CONTRACT NEGOTIATION. $1,500 FOR ADMINISTRATION AND REVIEW PLUS FEE DETERMINED BY CONSULTANT (SECTION 3504, NAPA COUNTY E.I.R. GUIDELINES) APPLICANT PAYS ALL COSTS INCLUDING E.I.R.	
SONOMA	CONSULTANT CONTRACT WITH COUNTY.	BOARD OF ZONING ADJUSTMENTS; PLANNING DEPARTMENT; HEALTH DEPARTMENT; WATER AGENCY; BUILDING INSPECTION, SANITATION; FIRE DISTRICT, NORTHERN SONOMA COUNTY AIR POLLUTION CONTROL DISTRICT; PUBLIC WORKS	8 - 9 MONTHS INCLUDING E.I.R. PREPARATION	$100 MINIMUM, 8% OF CONTRACT PRICE FOR E.I.R. APPLICANT PAYS ALL COSTS INCLUDING E.I.R.	

COUNTY E.I.R. REQUIREMENTS G-C K.G.R.A. CONTINUED

COUNTY	PREPARATION BY	REVIEWING AGENCIES WITHIN COUNTY	DECISION MAKING TIME	E.I.R. COST	COMMENTS
LAKE	CONSULTANT CONTRACT WITH COUNTY.	PLANNING DEPARTMENT; BUILDING DEPARTMENT; PLANNING COMMISSION; COUNTY COUNSEL; PUBLIC WORKS; HEALTH DEPT.; AGRICULTURAL DEPT.; FIRE DEPARTMENT, FLOOD CONTROL/WATER CONSERVATION; L.C.A.P.C.D.; SHERIFF DEPT.; SOIL CONSERVATION DEPT.	APPROXIMATELY 9 MONTHS INCLUDING E.I.R.	$2,600 FILING FEE + E.I.R. CONTRACT PRICE. APPLICANT PAYS ALL COSTS INCLUDING E.I.R.	

COUNTY ENERGY REGULATIONS

COUNTY	ENERGY REGULATION	DATE	COMMENTS
NAPA	ORDINANCE #499 OIL, GAS, AND GEO-THERMAL RESOURCE EXPLORATION AND DEVELOPMENT ORDINANCE.	MAY 4, 1976	ORIGINALLY PASSED WITH 4 MONTH DURATION; SUBSEQUENTLY APPROVED ON MAY 4, 1976. REGULATES ALL FACILITIES FOR PRODUCTION, GENERATION, OR TRANS-PORTATION OF GEOTHERMAL POWER. ALLOWS SURFACE EXPLORATORY WORK. ADVISES OF SIGNIFICANT CONCERN OVER LACK OF SCIENTIFIC RESEARCH AND ADEQUATE ENVIRONMENTAL CONTROLS. USE PERMIT WILL COVER UP TO 3 TEMPORARY EXPLORATORY WELLS. TEMPORARY EXPLORATORY WELLS (LESS THAN 152 METERS - 500 FEET) SHALL BE DRILLED AND SEALED WITH 42 MONTHS OF PERMIT APPROVAL. REQUIRES NOISE ATTENUATION PROGRAM. REQUIRES EXPLANATION OF WATER NEEDS, SOURCE(S) AND DISPOSAL. EXPRESSES CONCERN OVER POTENTIAL ACID RAINFALL, SMOG, EFFECTS OF INCREASED LEVELS OF NONCONDENSIBLE EMISSIONS, PREVENTION OF THUNDERSTORMS. USE PERMITS WOULD REQUIRE A 60-DAY COMMENCEMENT TIME AND 3-YEAR LIMIT ON PERMIT. INSURANCE ON EXPLORATORY HOLES NOT LESS THAN $1,000,000. REQUIRES SUBMISSION OF PROOF OR MEMORANDUM OF LEASE.
MENDOCINO	NONE TO DATE		
SONOMA	NONE TO DATE		
LAKE	NONE TO DATE		

GEOTHERMAL PERMITTING IN NEW MEXICO

by

Dan Nutter, Chief Engineer

New Mexico Oil Conservation Division

This paper concerns the drilling for and production of geothermal resources in the State of New Mexico, and the laws, regulations, and procedures relating to permitting for the geothermal industry.

We can divide the state permitting process into four areas for discussion:

1. The permitting process for actual drilling of geothermal wells
2. The permitting process for the production of water
3. The permitting process for environmental effects, including possible impact on water quality, air quality, and historic, cultural, and archeological features
4. The permitting of geothermal utilization facilities, including power plants, etc.

DRILLING

The Oil Conservation Division of the New Mexico Energy and Minerals Department is the agency charged with the responsibility of overseeing the development of our geothermal resources and the

prevention of waste thereof. As such this agency issues permits for the drilling for and production of geothermal producing and disposal wells on state and fee lands.

Either the Bureau of Land Management or the United States Geological Survey issues the drilling permits for wells on federal or Indian lands. This discussion of drilling permits will therefore not concern these lands.

Two prerequisite requirements must be met before the Oil Conservation Division will process a permit for a geothermal well: first the operator must file a Designation of Agent, naming a resident of the state who will act as the repository for all well records of wells drilled by the operator, and second, a proper plugging bond for the type of well contemplated, issued by a responsible surety company licensed to do business in the state, must be approved. (These bonds vary from $2000 to $10,000.) If the operator is a corporation, the corporation must be authorized to do business in the state by the State Corporation Commission before the bond can be approved.

Once these prerequisites are met the operator files Form G-101, Application for Permit to Drill, and Form G-102, Well Location and Acreage Dedication Plat. On the G-101 the operator states his proposed depth and casing and cementing program and certain other information, and if this and all other features of the proposed well are acceptable and in accordance with the rules and regulations, the permit will be approved in a matter of days. Certain other

forms are used during the course of drilling the well and afterward to report progress, change of plans, well potential, etc. These other forms are covered in detail in our Rules and Regulations for Geothermal Resources, and are numbered from G-103 through G-112.

At this point let us discuss why we have that "Designation of Agent" mentioned above. We recognize that certain of the information on wells is of proprietary nature and should be guarded, especially considering the long lead time necessary for evaluation and completion to fruition of a major geothermal effort. However, our state laws do not allow public records to be withheld except in a very few limited areas, mostly of personal nature, and any information filed on a well becomes part of the public record. For this reason, our rules on filing of certain forms on geothermal wells permit a delay for as long as five years before certain data must be submitted. In the meantime our geothermal office must know whether a well is to be, or has been, plugged properly, or whether a shut-in well has an adequate casing and cementing program or wellhead to withstand pressures and conditions encountered. To know this, we must have access to the well data. If these data have been deposited with the Designated Agent and are accessible to our people, they can make the above determinations without the information actually coming into our hands, and all interests are protected. Many companies name their resident attorney or their corporate agent in the state as their designated agent.

PRODUCTION OF WATER

Perhaps the most confusing aspect of geothermal drilling and

production in New Mexico, as in certain other western states, is the apparent jurisdictional overlap between the geothermal division of state government and the state's water resources agency, in New Mexico the State Engineer Office.

New Mexico, as do many other western states, goes under the doctrine of prior appropriation in allocating water supplies. Under the New Mexico Constitution, the surface water and the underground water of the state belong to the public and are subject to appropriation in accordance with state law. The State Engineer holds that before water, either in the gaseous or liquid state, may be withdrawn from a geothermal well, it is necessary to obtain a permit from the State Engineer to drill the well and appropriate public waters. The State Engineer by law may issue such a permit only if he makes a finding that the water will be put to beneficial use, and that such withdrawal will not impair existing water rights. Fortunately the reinjection of produced water back into the ground will usually count against the volume withdrawn and only the actual depletion considered in determining effect on existing water rights. For geothermal development, it is usually going to be necessary to acquire an existing water right by purchase from the present owner and transfer the point of diversion of that water and its purpose of use.

Incidentally, the New Mexico State Engineer has also determined that since geothermal wells are water wells, and his regulations require that water wells may be drilled only by water well drillers that he has licensed, then geothermal wells may be drilled only by

drillers that he has licensed. The result is that most companies get their field engineer or tool pusher licensed as a water well driller.

ENVIRONMENTAL PERMITS

Insofar as permitting for environmental control is concerned, air, water, and cultural considerations appear to require the most attention.

As far as air quality is concerned, total suspended particulates and hydrogen sulfide are the substances that geothermal operators will have to give most attention to.

Our air quality standards limit the maximum allowable concentrations of total suspended particulates in the ambient air to the following:

24-hour average	150 $\mu g/m^3$
7-day average	110 $\mu g/m^3$
30-day average	90 $\mu g/m^3$
annual geometric mean	60 $\mu g/m^3$

except where the following elements are present, in which case the maximum concentration of the elements involved, based on a 30-day average, may not exceed:

beryllium	0.01 $\mu g/m^3$
asbestos	0.01 $\mu g/m^3$
heavy metals (total combined)	10.00 $\mu g/m^3$

Our air quality standards for hydrogen sulfide limit the maximum allowable concentration for most of the state to 10 parts per billion as a 1-hour average.

State law and the Environmental Improvement Division's regulations require that prior to construction or modification of any new source of air contaminants which, if it were uncontrolled, would result in an emission of the contaminant of more than 10 pounds/hour or 25 tons/year, or would result in the emission of a hazardous air pollutant, must obtain a permit prior to such construction or modification. Application for such permit is to the Director of the Environmental Improvement Division who will grant the permit, grant a conditional permit, or deny the permit. The Director may deny the permit if, among other things, it appears that a federal or state ambient air standard will be exceeded or that a hazardous air pollutant in excess of a federal standard or a state regulation will result. Such denial may be appealed to the Environmental Improvement Board or a hearing for a variance to the regulations requested. Decisions of the board may be appealed to the New Mexico Court of Appeals.

Disposition of produced geothermal waters is under the jurisdiction of the Oil Conservation Division and the state's Water Quality Control Commission, of which the Oil Conservation Division is a member agency. While the statutes give the Oil Conservation Division exclusive control over brines produced with oil and gas, and the Water Quality Control Commission has delegated certain

other areas of petroleum-related water discharge responsibility to the Oil Conservation Division, it is uncertain at this time to how control over geothermal water disposition or plant effluent disposal will be shared by the two agencies. It is believed, however, that the Oil Conservation Division will probably end up having final jurisdiction over disposal and/or reinjection of geothermal waters.

The state's Cultural Properties Act makes it illegal for any person to appropriate, excavate, injure or destroy or cause to be appropriated, excavated, injured or destroyed any historic or prehistoric ruin or monument, or any object of historical, archeological, architectural or scientific value situated on lands or in places owned or controlled by the state or its institutions without a valid permit issued by the Cultural Properties Review Committee. It is therefore suggested that before dirt work is commenced on drilling pads, pipe lines, plant sites, etc., an inspection be made to determine if any of the aforementioned objects may be present lest you not run afoul of this law.

PERMITTING OF GEOTHERMAL UTILIZATION FACILITIES

Permitting for construction of utility-type geothermal facilities such as power plants or heat distribution systems is by the New Mexico Public Service Commission. Such permits will usually require a hearing before a Certificate of Public Convenience and Necessity will be issued. In some cases, franchises must also be obtained from the appropriate local governing body.

SUMMARY

While at first glance it would appear that there is indeed an "Institutional Maze" in New Mexico through which the geothermal entrepreneur must wend his way, the process here is still much simpler than in many states.

There are no state environmental impact statement requirements.

The Oil Conservation Division, through many years' experience permitting oil and gas wells, has developed a prompt and efficient system for issuance of drilling permits.

Certain proprietary information remains in the developer's files for up to five years and is not in the public record.

And our air quality and water quality standards, though strict and rigidly enforced, are reasonable.

Perhaps the biggest problem at the present time appears to be the matter of water rights and the split jurisdiction by the Oil Conservation Division and the State Engineer Office. However the National Conference of State Legislatures in the interest of uniformity of state laws and the resolution of this problem which is common to a number of western states, is working on proposed legislation which may be introduced in 1981. It is hoped that an amicable solution can be worked out to the benefit of all, so that New Mexico's great potential as a geothermal state can be realized.

OVERVIEW OF WESTERN STATES LEASING REGULATIONS

Presented by

Jack R. Ekstrom

Petroleum Information Corp.

STATE ACREAGE

ALASKA

LEASE LIMITATIONS - 640 acres minimum.

2,560 acres maximum.

Leases of less than 640 acres may be granted for non-contiguous acreage.

640 acres minimum (excepting non-contiguous acreage) and 5,760 acres maximum for tidal or submerged land.

Total state holdings not to exceed 25,600 acres. The total holdings may be increased by regulation to 51,200 acres at any time until August 15, 1986.

PRIMARY LEASE TERM - Geothermal leases are issued for a primary term of 10 years.

If, during the primary term, commercial production is established, the lease may be continued for the duration of the resource or byproduct production up to an additional 40 years.

LEASE RENEWAL - Lease may be renewed for a second 40-year term if commercial production continues and the land is not required for other uses, but cannot exceed a total of 99 years cumulative.

LEASE EXTENSION - Leases being "diligently" drilled prior to the termination of the primary term, will be extended for five years and for the duration of commercial production up to 35 years. The lease may be extended for a second term beyond the extension if commercial production continues and land is not required for other uses.

Leases no longer capable of commercial production may be extended up to five years but only while one or more valuable byproducts are being produced in commercial quantities.

RENTAL - $1 minimum per acre annually.

PRODUCTION ROYALTIES - 10 per cent minimum and 15 percent maximum of the gross revenue from geothermal sales without mineral extraction.

Two per cent minimum and 10 percent maximum of the gross revenue "received from the sale of mineral products or chemical compounds recovered from geothermal fluids in the first marketable form."

Minimum royalties of $2 per acre annually after commercial production is established.

READJUSTMENT OF LEASE TERM - 10 year intervals 10 years after the establishment of geothermal production.

READJUSTMENT OF RENTALS AND ROYALTIES - 20 year intervals 35 years after the establishment of geothermal production. Rentals and royalties under the readjustment are not to be raised in excess of 50 percent from the previous lease period and are not to exceed 22½ percent.

ARIZONA

LEASE LIMITATIONS - 2,560 acres maximum.

PRIMARY LEASE TERM - Geothermal leases are issued for a primary term of 10 years and for the duration of commercial production.

LEASE CONTINUATION - Leases being "diligently" drilled upon termination of the primary term will be extended for two years and for the duration of commercial production.

RENTAL - $1 minimum per acre annually.

PRODUCTION ROYALTIES - 12½ percent minimum of the gross value of well-head production.

CALIFORNIA

LEASE LIMITATIONS - 640 acres minimum.

2,560 acres maximum.

Leases of less than 640 acres may be granted for non-contiguous acreage.

Total state holdings not to exceed 25,600 acres.

640 acres minimum (excepting non-contiguous acreage) and 5,760 acres maximum for tidal or submerged land.

PRIMARY LEASE TERM - Geothermal leases are issued for a primary term of 20 years and for the duration of production and utilization or capability of production and utilization in commercial quantities but not to exceed 99 years.

RENTAL - $1 minimum per acre annually.

PRODUCTION ROYALTIES - 10 percent of the gross revenue from the sale of the resource without mineral extraction.

Two percent minimum and 10 percent maximum of the gross revenue from the sale of associated byproducts.

Minimum total annual royalty of $2 per acre after commercial production is established.

READJUSTMENT OF RENTALS AND ROYALTIES - 10 year intervals following expiration of the primary term.

COLORADO

LEASE LIMITATIONS - 40 acres minimum.

PRIMARY LEASE TERM - Geothermal leases are generally issued for a primary term of 10 years.

LEASE EXTENSION - A geothermal lease may be extended for a second term the same length as the primary term and for twice the rent, but such an extension is the option of the Colorado State Board of Land Commissioners.

RENTAL - $1 per acre annually.

MINIMUM ROYALTY - Minimum annual guaranteed royalty may be required by the Colorado State Board of Land Commissioners regardless if production exists or not. The Board will review the minimum royalties every five years and establish the amount to be paid.

PRODUCTION ROYALTIES - 10 percent of the gross value of all geothermal steam at the point of origin.

Five percent of the gross value of all associated byproducts.

HAWAII

LEASE LIMITATIONS - 100 acres minimum.

5,000 acres maximum.

2,560 acres of "contiguous land if that area's longest dimension is six times greater than its narrowest dimension..."

Total state holdings not to exceed 80,000 acres of undeveloped land.

PRIMARY LEASE TERM - Geothermal leases are issued for a primary term of 10 years.

LEASE CONTINUATION - Leases may be continued for up to 65 years from the effective lease date.

If commercial production or utilization of the resource or byproduct is established during the primary term, the lease may be continued for the duration of commercial production up to 65 years from the effective lease date.

Leases being drilled below 1,000 feet or in a "diligent manner" upon termination of the primary term will be extended for five years and for the duration of commercial production up to 65 years from the effective date of the lease.

Leases with shutin production because of unavailable markets may be continued for the remainder of the primary term or for five years following shutin.

RENTALS - Annual per acre rentals are set at public auction bid price or established by the Hawaii Board of Land and Natural Resources.

PRODUCTION ROYALTIES - 10 percent minimum and 20 percent maximum of the gross value of the resource produced and sold at the wellhead.

Five percent minimum and 10 percent maximum of the gross value of all geothermal byproducts produced and sold at the wellhead.

READJUSTMENT OF ROYALTIES - 15 year intervals 35 years after the effective lease date. Royalty under readjustment is not to be raised in excess of 50 percent from previous lease period. Royalty is not to exceed 20 percent; geothermal byproduct is not to exceed 10 percent.

IDAHO

LEASE LIMITATIONS - 40 acres minimum.

640 acres maximum.

Total state holdings not to exceed 50 townships and ranges (1,152,000 acres).

PRIMARY LEASE TERM - Geothermal leases are issued for a primary term of 10 years.

LEASE CONTINUATION - Leases being drilled 1,000 feet or deeper upon termination of the primary term may be continued for as long as operations are "diligently" pursued.

If commercial production is established within the primary term, the lease may be continued for the duration of commercial production up to an additional 40 years.

If commercial production continues, the lease may be renewed for a second 40-year term with a 15 percent maximum production royalty.

Leases with shutin production may be continued for the remainder of the primary term or for five years from the date of shutin. Leases may be continued for an additional five years if it is determined that the lessee is diligently attempting to sell or utilize the resource.

Leases no longer capable of commercial production may be extended five years but only if one or more valuable byproducts are being produced in commercial quantities.

RENTAL - $1 per acre annually for the initial five years.

$2 per acre annually for the second five year period.

$3 per acre annually for all subsequent periods.

PRODUCTION ROYALTIES - 10 percent of the value of the resource sold or utilized.

Five percent of the value of all byproducts sold or utilized.

LOUISIANA

LEASE LIMITATIONS - Minimum lease size of 5,000 acres.

PRIMARY LEASE TERM - Geothermal leases are issued for a primary term of 10 years and for the duration of commercial production and utilization or geothermal operations.

RENTAL - $1 per acre annually or one-half of the cash bonus, whichever is the greater.

PRODUCTION ROYALTIES - 10 percent minimum of "the price received for all geothermal resources produced and saved or utilized..."

Five percent minimum "of the value of any byproduct produced and saved or utilized..."

(10 percent on gas dissolved in the formation water; one-eighth on all oil and gas produced and saved).

MONTANA

LEASE LIMITATIONS - 640 acres maximum.

An area of non-contiguous subdivisions is not to exceed one square mile.

PRIMARY LEASE TERM - Geothermal leases are issued for a primary term of 10 years and for the duration of commercial production.

LEASE CONTINUATION - Leases being "diligently" drilled upon termination of the primary term may be continued. If there is resource recovery subsequent to the termination of the primary term, the lease may be continued for the duration of commercial production.

If, upon termination of the primary term, a geothermal electrical generating plant is under construction, the lease may be continued for so long as that construction is "diligently" pursued. Upon completion of the plant, the lease will be continued for the duration of commercial production.

RENTAL - $1 minimum per acre annually.

PRODUCTION ROYALTIES - 10 per cent of the gross revenue from the sale of the resource without mineral extraction.

Two percent minimum and five percent maximum of the gross revenue from the sale of associated byproducts.

Minimum royalty on shutin wells to be established by the Montana Board of Land Commissioners.

NEVADA

Note: Nevada may only lease lands to which it has title, a total of only two-tenths of one percent of all the land area in the state. Leases will be negotiated "upon such terms and for such rent and royalty as are most favorable to the state and not less favorable than similar leaseholds in the vicinity."

LEASE LIMITATIONS - 1,280 acres maximum (Leases are required to conform to governmental subdivisions).

PRIMARY LEASE TERM - Negotiated.

RENEWALS - Negotiated.

RENTALS - $1 minimum per acre annually.

PRODUCTION ROYALTIES - 15 percent of the gross value of all hydrocarbons produced.

10 percent of the gross value of geothermal production sold or utilized.

Five percent of the gross value of all byproduct production sold or utilized.

NEW MEXICO

LEASE LIMITATIONS - 640 acres minimum.

2,560 acres maximum.

Leases of less than 640 acres may be issued for non-contiguous acreage.

Total sale holdings are not to exceed 51,200 acres.

PRIMARY LEASE TERM - Geothermal leases are issued for a primary term of five years and for the duration of production or utilization or capacity of production or utilization in commercial quantities.

LEASE CONTINUATION - If no production is established during the primary term, the lease may be continued for a second five-year term and for the duration of commercial production or utilization with an annual rental of $5 per acre.

RENTAL - $1 per acre annually for the secondary term.

PRODUCTION ROYALTIES - 10 percent of the gross revenue from the sale of geothermal resources (steam, brines or hot water) without mineral extraction.

(10 percent minimum and 15 percent maximum for leases issued pursuant to Section 19-13-11.1 of the New Mexico Geothermal Resources Act of 1978 on lands classified as a "known geothermal resource field.")

Two percent minimum and five percent maximum of the gross revenue from recovered mineral products or chemical compounds sold in first marketable form, except geothermal byproducts.

Eight percent of the net revenue from a generating plant.

Two percent minimum and 10 percent maximum of the gross revenue from recreational, space heating or health uses.

Minimum total annual royalty of $2 per acre after the establishment of commercial production.

RENEGOTIATION OF ROYALTIES - 10 year intervals 20 years after the effective lease date. Royalties under readjustment are not to be raised in excess of 50 percent from the previous lease period. Total royalty of five percent minimum and 22½ maximum.

OREGON

LEASE LIMITATIONS - 40 acres minimum.

No limitation imposed on maximum lease size or total state holdings.

PRIMARY TERM - Geothermal leases are issued for a primary term of 10 years.

LEASE RENEWAL - Lease may be renewed for up to an additional five years if a geothermal discovery has been made nearby or a discovery is deemed by the director to be imminent.

LEASE CONTINUATION - A lease may be continued by production of an amount at least equal to the annual rental up to 50 years from the effective date of the lease.

RENTAL - $1 per acre for the fourth year of the lease.

$3 per acre for the fourth year of the lease.

One section maximum.

No limit imposed as to the number of leases held.

PRIMARY LEASE TERM - Five year exploratory term.

LEASE CONTINUATION - Preferential right up to an additional 20 years.

RENTAL - $3 per acre annually.

PRODUCTION ROYALTIES - A minimum of $10 per acre or 10 percent of the gross revenue.

Four percent minimum of the net smelter return received from minerals or chemicals in first marketable form.

WYOMING

LEASE LIMITATIONS - 640 acres.

2,560 acres maximum.

Leases of less than 640 acres may be issued for non-contiguous acreage.

PRIMARY LEASE TERM - Geothermal leases are issued for a primary term of 10 years and for the duration of production and utilization or the capability of commercial production and utilization in commerical quantities.

RENTAL - $2 per acre annually.

PRODUCTION ROYALTIES - 10 percent of the gross revenue from the sale of the resource without mineral extraction.

Five percent of the gross resource without mineral extraction.

Five percent of the gross revenue from recovered mineral products or chemical compounds sold.

RENEGOTIATION OF ROYALTIES - 10 year intervals 10 years after the effective lease date.

STD. 400 (REV. 1/79)

Pwright

FACE SHEET
FOR FILING ADMINISTRATIVE REGULATIONS
WITH THE SECRETARY OF STATE
(Pursuant to Government Code Section 11380.1)

UNIVERSITY OF UTAH
RESEARCH INSTITUTE
EARTH SCIENCE LAB.

RECEIVED FOR FILING

SEP 1 1979

Office of Administrative Hearings

ENDORSED
APPROVED FOR FILING
(Gov. Code 11380.2)
SEP 17 1979
Office of Administrative Hearings

DO NOT WRITE IN THIS SPACE

Copy below is hereby certified to be a true and correct copy of regulations adopted, or amended, or an order of repeal by:
STATE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION
(Agency)

Date of adoption, amendment, or repeal:
July 11, 1979

By: [signature]
Chairman
(Title)

ENDORSED FILED
SEP 17 3 [illegible] PM 1979
[illegible]

DO NOT WRITE IN THIS SPACE

The attached regulations which are being adopted, amended or repealed are contained in Title 20 of the California Administrative Code.

(Optional): Division, Part, Chapter, etc., affected by this order: Chapter 2, Subchapter 5

(Check as applicable:)
TYPE OF ORDER:

___ Emergency
___ Certificate of Compliance
___ Certificate of Non-Compliance
X Regular
___ Procedural and Organizational

(Check One:)
EFFECTIVE DATE:

___ On filing with Secretary of State
___ On _____ (designated effective date)
___ On _____ as specified by Statutes
X On 30th day after filing

(Check all:)
CHECKLIST OF MANDATORY REQUIREMENTS

X Eight copies of order or Certificate attached.
X Original signature on at least one copy.
X Regulation Summary (Form 690 or equivalent) attached (1 copy).
X Publication date (in Notice Register) of notice for attached order or Certificate of Compliance is 1/12/79.
X Authority and reference citation placed beneath each section in attached order.

(Check one:)
REIMBURSABLE COSTS:

X These are "no cost" regulations under Revenue and Taxation Code Section 2231, and State Administrative Manual Section 6052.1.
___ These are "disclaimable cost" regulations under Revenue and Taxation Code Section 2231. A clarifying disclaimer statement is attached, pursuant to State Administrative Manual Section 6052.2.
___ These are "cost" regulations under Revenue and Taxation Code Section 2231. This agency has followed the provisions of State Administrative Manual Section 6052.1.

(Check one:)
COSTS/SAVINGS TO LOCAL, STATE AND FEDERAL GOVERNMENT

X These regulations involve no costs or savings to local, state or federal government under Government Code Section 11421.
___ These regulations do involve costs or savings to local, state or federal government under Government Code Section 11421. An estimate of those costs or savings is attached to this order.

(Check one:)
BUILDING STANDARDS

X These regulations contain no building standards under Health and Safety Code Sections 18900-18915.
___ These regulations do contain building standards under Health and Safety Code Sections 18900-18915. The date of approval by the Building Standards Commission is _____

(Check one if attached are Conflict of Interest Regulations)
CONFLICT OF INTEREST

The attached Conflict of Interest Regulations contain the FPPC approval stamp and:

___ Are to be published in full in the Administrative Code.
___ Are to be codified by appropriate reference in the Administrative Code, and include a statement as to where the full text may be obtained.

(Check if emergency Campaign Disclosure Regulations)
CAMPAIGN DISCLOSURES

___ These are emergency regulations pertaining to campaign disclosure law and were adopted by unanimous vote of all board or commission members present at the regulation adoption proceeding.

DO NOT WRITE IN THIS SPACE

COMPLETE REVERSE SIDE IF THESE ARE EMERGENCY REGULATIONS

(1) Repeal Articles 1 and 4 of Subchapter 5.

(2) Adopt new Articles 1, 2, 3, 4, and 5 of Subchapter 5 to read:

SUBCHAPTER 5. SITE CERTIFICATION

Article 1. General Provisions Applicable to Nongeothermal Notices and Applications

Appendix A. Information Requirements for a Nongeothermal Notice of Intention

Appendix B. Information Requirements for a Nongeothermal Application

Article 2. Procedures for Considering Notices of Intention to File an Application for Certification

Article 3. Procedures for Considering Applications for Certification

Article 4. Additional Provisions Applicable to Geothermal Notices and Applications

Appendix A. Information Requirements for a Geothermal Notice of Intent

Appendix B. Information Requirements for a Geothermal Application for Certification

Appendix C. Information Requirements for a 12-Month Geothermal Application.

Article 5. (Reserved)

Article 6. Claims of Exemption

Article 7. Small Power Plant Exemptions

DO NOT WRITE IN THIS SPACE

CONTENTS

Article 4. Additional Provisions Applicable to Geothermal Notices and Applications

A. General Provisions

B. Delegation of Geothermal Power Plant Siting Authority to Local Government

31919-780 3-75 20M Δ-051

SUBCHAPTER 5. SITE CERTIFICATION

Article 1. General Provisions Applicable to Nongeothermal Notices and Applications

A. Scope and Definitions

1701. Scope of Regulations.

(a) Except as provided in article 4, the provisions of articles 1, 2, and 3, of this subchapter shall apply to the consideration of all notices and applications for any thermal electric power plant, appurtenant facility, or electric transmission line within the jurisdiction of this commission.

(b) The provisions of article 2 of this subchapter shall not apply to any site and related facility subject to the provisions of sections 25540.2 and 25540.6 of the Public Resources Code.

NOTE: Authority cited: Sections 25216.5 and 25218(e) of the Public Resources Code. Reference: Sections 25502 et seq, Public Resources Code.

1702. Definitions.

For purposes of this subchapter and unless otherwise indicated, the following definitions shall apply.

(a) "Applicant" means any person who submits a notice of intention or an application for certification pursuant to this subchapter.

(b) "Application" means an application for certification of a site and related facility submitted to the commission pursuant to the provisions of this subchapter and of chapter 6 (commencing with section 25500) of Division 15 of the Public Resources Code.

(c) "Coastal zone" means the area designated by the Legislature in section 30103 of the Public Resources Code.

(d) "Committee" means the committee of the commission appointed pursuant to section 1204 of these regulations to conduct proceedings on a notice or application.

(e) "Facility" means any electric transmission line or thermal power plant, or both electric transmission line and thermal power plant, under the jurisdiction of the commission.

(f) "Feasible" means capable of being accomplished within a reasonable period of time, taking into account economic, environmental, social, and technological factors.

(g) "General counsel" means the general counsel of the commission.

(h) "Hearing officer" means any person designated pursuant to section

1205 of these regulations to assist the presiding member in conducting the proceeding.

(i) "Intervenor" means any person who has been granted leave to intervene in notice or application proceedings pursuant to section 1712 of these regulations.

(j) "Modification of an existing facility" means any alteration, replacement or improvement of equipment that results in a 50-megawatt or more increase in the electric generating capacity of an existing thermal power plant or an increase of 25 percent in the peak operating voltage or peak kilowatt capacity of an existing electric transmission line.

(k) "Notice" means a notice of intention to file an application for certification of a site and related facility, which states the intention of an applicant to file such application and is submitted to the commission pursuant to the provisions of this article and of chapter 6 (commencing with section 25500) of Division 15 of the Public Resources Code.

(l) "Party" means the applicant, the staff of the commission, and any intervenor.

(m) "Presiding member" means the presiding member of the committee appointed to conduct proceedings on a notice or application.

(n) "Public adviser" means the public adviser of the commission appointed pursuant to section 25217.1 of the Public Resources Code to assist the public in participating in a notice or application proceeding.

(o) "Site" means any location on which a facility is proposed to be constructed or on which a facility that is proposed to be modified is located.

NOTE: Authority: Sections 25216.5 and 25218, Public Resources Code. Reference: Sections 21061.1, 25101, 25102, 25103, 25106, 25107, 25110, 25113, 25114, 25119, 25123, 25211, Public Resources Code.

B. Filing and Information Requirements For Notices and Applications

1703. Requirement to File.

(a) Notice. Except as otherwise provided by law any person proposing to undertake construction or modification of any site and related facility shall submit a notice pursuant to these regulations.

(b) Application. Any person proposing to undertake construction or modification of any site and related facility, shall submit to the commission an application for certification of such site and related facility. Except as otherwise provided by law, such application shall be for a site and related facilities which have been found acceptable by the commission pursuant to section 25516 of the Public Resources Code.

NOTE: Authority: Sections 25216.5, 25218, 25539, Public Resources Code. Reference: Sections 25502, 25517, 25519, Public Resources Code.

1704. Information Requirements for Notices and Applications.

(a) General requirements. All notices and applications shall conform to the following requirements:

(1) Except where otherwise indicated, any descriptions, statements, analyses, and discussions required in the notice or application shall extend to the power plant and associated facilities, including but not limited to, transmission lines, water intake and discharge structures, major access roads, storage sites, switchyards, waste disposal sites, and all other structures or improvements which are appurtenant to the power plant or transmission lines.

(2) An applicant, in fulfilling the requirements of this section, may incorporate by reference any information developed or submitted in any previous commission proceeding, provided that the notice or application contains a summary of the referenced material, identifies the proceeding in which it was submitted, and explains the relevance of the material to the information requirement. To the extent possible, the applicant should rely on findings, conclusions, analyses, policies, and other guidelines adopted or established in the most recent Biennial Report in order to satisfy the information requirements.

(3) The notice or application shall include or reference the following:

(A) Descriptions of all significant assumptions, methodologies, and computational methods used in arriving at conclusions in the document;

(B) Descriptions, including methodologies and findings, of all major studies or research efforts undertaken and relied upon to provide information for the document; and a description of ongoing research of significance to the project (including expected completion dates);and

(C) A list of all literature relied upon or referenced in the document, along with brief discussions of the relevance of each such reference.

(4) Each principal subject area covered in a notice or application shall be set forth in a separate chapter or section, each of which shall identify the person or persons responsible for its preparation.

(b) Information requirements for notices. The notice shall contain all the information specified in Appendix A to this article for a nongeothermal site and related facilities, and in Appendix A of article 4 for a geothermal site and related facility.

(c) Information requirements for applications. The application for certification shall contain all the information required by Appendix B of this article (for nongeothermal projects) or Appendices B or C of article 4 (for geothermal projects) and any information required by the decision on the notice (see section 1805, article 4 for geothermal requirements).

NOTE: Authority: Sections 25216.5, 25218, 25218.5, 25539, 25514.5, Public Resources Code. Reference: Sections 25504, 25511, 25519, 25520, Public Resources Code. Additional reference: Sections 21080.5, 25502 through 25528, Public Resources Code.

1705. Form of Submissions.

Notices and applications, and any other documents attached thereto, submitted pursuant to this article, shall conform to the requirements of section 1209 of these regulations; provided, however, that such notices, applications, and other documents shall be submitted in a three-ring binder in a loose-leaf fashion, and that pages shall be numbered by chapter.

NOTE: Authority: Sections 25216.5, Public Resources Code. Reference: Sections 25502 and 25519, Public Resources Code.

1706. Number of Copies.

(a) The applicant shall submit to the commission one hundred fifty (150) copies of any notice or application and of all drawings, photographs, maps, diagrams, charts, graphs, and other documents attached to the notice or application.

(b) In addition to the materials submitted pursuant to subsection (a), the applicant shall submit five (5) copies of all documents cited in the notice or application which are not available at public libraries or other governmental agencies in the City or County of Sacramento. For each document which is so available, the filing shall state where the document can be found.

(c) Notwithstanding subsection (a), the executive director may waive the requirement for submission of the number of copies specified by subsection (a) for any document for which reproduction and submission of that number of copies would constitute an unreasonable burden to the applicant. A written request for a waiver may be submitted to the executive director at any time prior to the filing of a notice or application. The request shall include a description of each such document and a discussion of the reasons why reproduction and submission of that number of copies is unreasonable. An applicant may not file a notice or application while such request is pending. If a request is granted, the executive director shall specify the number of copies of the document to be submitted. The executive director shall act on all such requests within 15 days.

(d) Upon filing a notice or application pursuant to this article, the executive director may require the submission of additional copies of the notice or application and associated documents, if necessary, to satisfy the requirements of interested agencies, the parties, and the public.

NOTE: Authority: Section 25218 Public Resources Code. Reference: Sections 25216.5, 25218, 25505, 25539, Public Resources Code.

1707. Authority and Verification.

Every notice and application shall be dated and signed by each applicant attesting under penalty of perjury to the truth and accuracy of such notice or application. If any of the applicants are corporations or business associations, it shall be dated, signed, and attested to by an officer thereof. Where a notice or application is filed on behalf of a joint venture or proposed joint venture, all members of the joint venture or proposed joint

venture shall date, sign, and attest to the notice or application; provided, however, that no more than one member of said joint venture or proposed joint venture need attest as to the entire notice or application, but that each joint venturer or proposed joint venturer shall attest to the notice or application with respect to the information required by section 1704 regarding need for the project and financial impacts of the proposal.

NOTE: Authority: Sections 25218 Public Resources Code. Reference: Sections 25216.5, 25502, 25519, Public Resources Code.

1708. Fees.

(a) A cashier's check in the proper amount of the fee shall be prepared by the applicant and shall accompany the notice.

(1) If the notice is for a proposed new generating facility, the fee shall be one cent per kilowatt of the net electric generating capacity of the alternative site and related facility with the highest proposed net generating capacity. For the purposes of this subsection, the net electric generating capacity is the designed maximum capacity less the electrical requirements of auxiliary equipment necessary for the operation of the proposed electric generating facility. No fee shall be less than $1,000 nor greater than $25,000.

(2) If the notice is for any other facility, the fee shall be $5,000, which need only be paid for one of the alternate proposed facility sites.

(b) Upon the demand of the executive director, the applicant shall pay additional fees to the commission in the amount of any reimbursement made to local agencies by the commission pursuant to section 1715 of this article.

NOTE: Authority: Sections 25218, 25538, Public Resources Code. Reference: Section 25802, Public Resources Code.

1709. Submittal of Notices and Applications; Data Review and Docketing.

(a) Upon the submission of any notice or application, all submitted documentation shall be reviewed by the commission staff to determine whether the documents substantially comply with section 1704. The staff may consult the Air Resources Board, local air pollution control districts, and other agencies prior to the executive director's determination of whether the documents substantially comply with section 1704.

(b) No later than 30 days after receipt of the notice or application, the executive director shall do one of the following:

(1) If the documentation substantially complies with the information requirements for a notice or application, the executive director shall formally file and docket the notice or application, in which case the date of filing shall relate back to the date the notice or application was submitted.

(2) If the documentation does not substantially comply with the information requirements, the executive director shall so notify the applicant and

the commission, in which case the executive director shall recommend that the notice or application be returned with a statement of its defects or be conditionally filed with a written assurance from the applicant that the missing information will be submitted within a specified period. The executive director shall include in the recommendation a statement of what is necessary to bring the document into compliance with these regulations.

(c) Except as provided in subsection (d), the commission shall act within 10 days on the recommendations of the executive director, and shall order one of the following:

(1) That the notice or application be returned, in which case the order shall include a statement of what is necessary to bring the document into compliance with these regulations, and the document shall be returned within 10 days of the order (unless other arrangements are agreed to by the applicant);

(2) That the notice or application be docketed and filed as of the date of the submission;

(3) That the notice or application be docketed and filed as of the date of the submission, on condition that the applicant correct the deficiencies within a specified time.

(d) The commission shall return any notice or application which fails to comply substantially with the air quality information requirements in Appendices A or B, respectively.

(e) If the notice or application is returned, the executive director shall concurrently transmit to the applicant a list of the information required to bring the document into substantial compliance with section 1704. The applicant may correct the defects and resubmit the notice or application at any time.

(f) The commission may suspend the proceedings on the notice or application if the applicant fails to correct the deficiencies specified in any order pursuant to subsection (c)(3) of this section.

(g) For purposes of this section, information requirements shall be as set forth in section 1704 of these regulations and all appendices referenced therein.

(h) Upon filing of a notice or application, the chairman shall appoint a committee and designate a presiding member to conduct proceedings on the notice or application.

NOTE: Authority: Sections 25218, 25539, Public Resources Code. Reference: Sections 25216.5, 25502, 25503, 25504, 25511, 25519, 25520, Public Resources Code.

DO NOT WRITE IN THIS SPACE

1709.5. Prefiling Review.

(a) A potential applicant may request the executive director to conduct a prefiling review of existing environmental and other documentation relevant to a proposed notice or application. The purpose of such a review shall be to determine the extent to which information contained in the existing documents is sufficient to meet the information requirements for a notice or an application.

(b) Any request pursuant to this section shall be in writing and shall be accompanied by at least six (6) copies of each document which the potential applicant requests to have reviewed. The executive director may recommend that additional documents known to the commission staff be included in the document review. Potential applicants may, and are encouraged to, submit documents in the form of a draft or proposed notice or application.

(c) If the executive director determines that a pre-filing review is appropriate, the executive director shall, by such time as may be mutually agreed upon by the potential applicant and the executive director, determine whether the information provided is sufficient to meet the information requirements of a notice or application and, where appropriate, shall provide the potential applicant with a list identifying the additional information necessary to comply with the information requirements.

(d) The potential applicant may request a meeting with the commission staff to discuss any matter relevant to the preparation of a notice or application. The public shall be notified at least 10 days in advance of any such meeting.

NOTE: Authority: Section 25518, Public Resources Code. Reference: 25216.5, Public Resources Code.

C. Public and Agency Rights and Responsibilities; Provisions Applicable to Notices and Applications

1710. Noticing Procedures; Setting of Hearings, Presentations, Conferences, Meetings, Workshops, and Site Visits.

(a) All hearings, presentations, conferences, meetings, workshops, and site visits shall be open to the public.

(b) Notice of the initial public hearing on a notice or application shall be mailed or otherwise delivered approximately thirty (30) days prior to the first such hearing to the applicant, intervenors, and to all persons who have requested notice in writing. Except for continued hearings, notice of each and every subsequent hearing, presentation, conference, meeting, workshop, or site visit shall to the extent possible be mailed at least ten (10) days in advance, and in no case less than seven (7) days in advance.

(c) The public adviser shall be consulted in the scheduling of locations, times, and dates for all hearings, presentations, conferences, meetings, workshops, and site visits so as not to preclude maximum public participation.

(d) Notice of hearings, conferences, and meetings shall be signed by a member of the committee.

(e) The public adviser shall be afforded a reasonable opportunity to review all notices of hearings, presentations, conferences, meetings, workshops, and site visits for timeliness, completeness, clarity, and adequacy of dissemination.

NOTE: Authority: Section 25216.5, 25218, 25539, Public Resources Code. Reference: Section 25214, 25222, 25509, 25509.5, 25521, Public Resources Code.

1711. Right of Any Person to Comment.

Any person interested in a notice or application proceeding shall be given an opportunity to make oral or written comments at any hearing or information meeting on any matter relevant to a hearing held on a notice or an application. The presiding member may specify such conditions on the right to comment as are reasonably necessary for the orderly conduct of the proceeding, and may request that written comments be submitted in advance of any hearing.

NOTE: Authority: Sections 25216.5, 25218, 25539, Public Resources Code. Reference: Sections 25214, 25509, 25509.5, 25513, 25515, 25521, Public Resources Code.

1712. Right to Become a Party; Rights and Duties.

(a) Any person may petition to intervene pursuant to section 1207 of these regulations. Any person whose petition is granted by the presiding member shall have all the rights and duties of a party under these regula-

tions. Petitions may be filed at any time, provided however, that no person who becomes a party shall be permitted to reopen matters dealt with in the proceeding prior to the time when such person became a party, without a showing of good cause.

(b) Each party shall have the right to present witnesses, to submit testimony and other evidence, to cross-examine other witnesses, to obtain information pursuant to section 1716, and to file motions, petitions, objections, briefs, and other documents relevant to the proceeding. Each party shall be provided with a copy of the notice or application.

(c) Each party shall have the responsibility to comply with the requirements for filing and service of documents, the presentation of witnesses and evidence, and any other reasonable conditions which may be imposed by order of the presiding member.

NOTE: Authority: Sections 25216.5, 25218, Public Resources Code. Reference: Sections 25114, 25218, Public Resources Code.

1713. Summary of Notice or Application; Distribution.

(a) Upon filing of the notice or application, the executive director shall prepare a summary of such notice or application. The summary shall be concise and understandable, shall fairly describe the content of the notice or application using the applicant's own words whenever possible, and shall include a description of the commission's procedures concerning proceedings on the notice or application, as appropriate.

(b) As soon as practicable after its preparation, the executive director shall cause a copy of the summary to be mailed or otherwise delivered to public libraries in communities near the proposed sites, including the main branch of a public library in each county in which a facility is proposed to be located in whole or in part; to libraries in Eureka, Fresno, Los Angeles, San Diego, and San Francisco; and to all members, to the ex officio members, to the public adviser, to the hearing officer, to the general counsel, to the applicant, to any person who requests such mailing or delivery, and to all parties to the proceeding.

(c) As soon as practicable after its preparation, the executive director shall cause the summary to be published in a newspaper of general circulation in each county in which a site and related facility, or any part thereof, designated in the notice or application, are proposed to be located.

NOTE: Authority: Sections 25216.5, 25218, Public Resources Code. Reference: Sections 25505, 25519, Public Resources Code.

1714. Distribution of Copies to Public Agencies; Request for Comments.

(a) As soon as possible after receipt of the notice or application for a site and related facility requiring a certificate of public convenience and necessity, the executive director shall transmit four copies thereof to the Public Utilities Commission and shall request the Public Utilities Commission to perform an analysis and to offer comments and recommendations regarding the

DO NOT WRITE IN THIS SPACE

economic, financial, rate, system reliability, and service implications of the design, construction, operation, and location of the site and related facilities.

(b) The executive director shall also transmit a copy of the notice or application to the Coastal Commission for any site located in the coastal zone, to the Bay Conservation and Development Commission (BCDC) for any site located in the Suisun Marsh or the jurisdiction of the BCDC, to the Attorney General, to all federal, state, regional, and local agencies which have jurisdiction over the proposed site and related facility, or which would have such jurisdiction but for the commission's exclusive authority to certify sites and related facilities pursuant to chapter 6 (commencing with § 25500) of Division 15 of the Public Resources Code, and to any other federal, state, regional, or local agency which has been identified as having a potential interest in the proposed site and related facility, and shall request analyses, comments, and recommendations thereon.

(c) The executive director shall transmit a copy of the notice or application to any Indian tribe, band, or community having an interest in matters relevant to the site and related facilities proposed in the notice or application provided the Indian tribe, band, or community has a governing body recognized by the Secretary of the Interior of the United States or the Indian tribe, band, or community has otherwise requested in writing to receive a copy of the notice or application.

(d) The commission shall request any Indian tribe, band, or community covered under subsection (c) to make comments and recommendations regarding the design, operation, and location of the facilities proposed in relation to the environmental quality, public health and safety, and other factors on which they may have expertise. To the extent that the Indian tribe, band, or community has land use and related jurisdiction in the area of the proposed sites and related facilities, the commission shall request the Tribe to review and comment upon the land use and related aspects of the proposed sites and related facilities. For purposes of this article, an Indian tribe, band, or community shall not be considered a "local agency" within the meaning of section 25538 of the Public Resources Code.

(e) Upon receiving a copy of the notice or application, each agency requested to submit comments shall inform the presiding member (or the executive director if no committee has been appointed yet) of when such comments can be submitted to the commission. Unless otherwise specified by law or by order of the presiding member, all such comments shall be submitted prior to the conclusion of the hearings held pursuant to sections 1723 and 1748 on the notice or application.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25539, Reference: Public Resources Code Sections 25216.3, 25505, 25506, 25506.5, 25507, 25519.

1714.3. Agency Comments on a Notice; Purpose and Scope.

Any agency requested, pursuant to section 1714 of this article, to transmit its comments and recommendations to the commission on a site and

related facility proposed in the notice shall be requested to do each of the following:

(a) Identify each aspect of the proposed site and related facility for which the agency has land use or related jurisdiction or would have such jurisdiction but for the exclusive authority of the commission to certify sites and related facilities;

(b) List and summarize the nature of the laws, regulations, ordinances, or standards which the agency administers or enforces and which are applicable to the proposed site and related facility or would be applicable but for the commission's exclusive authority to certify sites and related facilities pursuant to section 25500 of the Public Resources Code;

(c) Describe the nature and scope of the information requirements which the applicant must eventually meet in order to satisfy the substantive requirements of the agency; summarize the agency's procedures for resolution of such requirements and indicate the amount of time necessary to do so; describe any other studies, analyses, or other data collection which the applicant, agency, or commission should perform in order to resolve each substantive or permit requirement of the agency;

(d) Based upon available information, conduct a preliminary analysis and provide comments and recommendations to the commission regarding the design, operation, and location of the facilities proposed in the notice, in relation to environmental quality, public health and safety, and other factors on which the agency has expertise or jurisdiction. The preliminary analysis shall be limited to that necessary to advise the commission on whether there is a reasonable likelihood that the proposal will be able to comply with the agency's applicable laws or concerns. The analyses should identify aspects of the proposed site and facilities which are likely to disqualify a proposal as an acceptable site and related facility; and

(e) Submit to the commission, and upon request of the presiding member, present, explain, and defend in public hearings held on the notice, the results of the agency's analyses, studies, or other review relevant to the notice.

NOTE: Authority: Public Resources Code Sections 25216.3, 25216.5, 25218, 25539. Reference: Public Resources Code Sections 25505, 25506, 25509.5.

1714.5. Agency Comments on an Application; Purpose and Scope.

Any agency requested, pursuant to section 1714 of this article, to submit its comments and recommendations to the commission on any aspect of the application shall be requested to do each of the following:

(a) Update as necessary the information requested or submitted by the agency during the notice proceedings;

(b) Perform or conduct such analyses or studies as needed to resolve any significant concerns of the agency, or to satisfy any remaining substantive requirements for the issuance of a final permit by the agency which would

have jurisdiction but for the commission's exclusive authority, or the certification by the commission for the construction, operation, and use of the proposed site and related facilities; and

(c) Submit to the commission, and upon request of the presiding member, present, explain, and defend in public hearings held on the application, the results of the agency's analyses, studies, or other review relevant to the application. The agency may submit comments and recommendations on any aspect of the application, including among other things, the design of the facility, architectural and aesthetic features of the facility, access to highways, landscaping and grading, public use of lands in the area, and other aspects of the design, construction, or operation of the proposed site and related facility.

NOTE: Authority: Public Resources Code Sections 25216.3, 25216.5, 25218, 25539. Reference: Public Resources Code Sections 25519(f)(g)(j).

1714.7. Air Quality Report on the Notice; Preparation; Contents; Testimony.

(a) Upon filing of a notice, the local district (or the Air Resources Board if the local district fails to participate) in which a site is located shall prepare and submit a report prior to the conclusion of the nonadjudicatory hearings held pursuant to section 1723. Each agency submitting a report shall testify in support of the report at hearings on the notice. The report shall include, but not be limited to:

(1) A preliminary specific definition of best available control technology (BACT) for the proposed facility;

(2) A preliminary discussion of whether there is a substantial likelihood that the requirements of the applicable new source review rule and all other applicable air quality regulations can be satisfied by the proposed facility; and

(3) A preliminary list of conditions which the proposed facility must meet in order to comply with the applicable rules and regulations.

(b) The ARB shall review and submit written comments on each report. After considering each of the local district reports, if the ARB is of the opinion that none of the proposed sites has a substantial likelihood of meeting the requirements of the applicable air quality regulations (including emission limitations), the ARB and commission staff, in consultation with the local districts and prior to the conclusion of the nonadjudicatory hearings, shall propose an alternative siting area, in or near the applicant's service area, which might have a greater likelihood of meeting the applicable air quality regulations and which merits further study. The proposal shall include the reasons therefor. If such a proposal is filed, the presiding member may direct the applicant to evaluate major siting constraints of the proposed alternative for presentation at the adjudicatory hearings held pursuant to section 1725. Each air pollution control district and the ARB shall supplement their reports as necessary in response to changes in the applicant's proposal which may occur during the notice proceeding.

NOTE: Authority: Public Resources Code Sections 25216.3, 25216.5, 25218, 25539. Reference: Public Resources Code Sections 25505, 25506, 25509.5.

1714.9. Determination of Compliance; Preparation by Local Air Districts.

(a) Within 240 days after filing of an application (or within 180 days for any facility applied for under section 25540.6 of the Public Resources Code), the local district's air pollution control officer (APCO) shall submit to the commission a determination of compliance on whether the proposed facility meets the requirements of the applicable new source review rule and all other applicable district regulations.

(b) If the proposed facility complies, the APCO shall specify what permit conditions, including BACT and mitigation measures, are necessary.

(c) If the proposed facility does not comply, the APCO shall identify the specific regulations which would be violated by the proposed facility and the basis for determining such violation. The APCO shall also identify those regulations with which the proposed facility would comply, including BACT and mitigation measures.

(d) At the request of the presiding member, the APCO and ARB shall make available a witness at the hearings on the application to explain the determination of compliance.

(e) Any amendment to the applicant's proposal related to compliance with air quality laws shall be transmitted to the APCO and ARB for consideration in the local district's determination of compliance.

NOTE: Authority: Public Resources Code Sections 25216.3, 25216.5, 25218, 25539. Reference: Public Resources Code Sections 25519, 25521.

1715. Reimbursement of Local Agencies.

Local agencies shall be reimbursed for the actual and added costs reasonably incurred in complying with requests for comments on any notice or application as provided in section 25538 of the Public Resources Code. The Commission shall promulgate reimbursement guidelines specifying the manner and conditions under which reimbursement shall occur. Reimbursement shall not be authorized for any costs incurred by a local agency for the presentation or defense of positions not reasonably related to the matters on which the agency is requested to comment.

NOTE: Authority: Public Resources Code Sections 25516.5, 25218. Reference: Public Resources Code Section 25538.

1716. Obtaining Information.

(a) The executive director or the general counsel shall have authority to request or otherwise obtain from the applicant such information as is necessary for a complete staff analysis of the notice or application.

(b) Any party may request from the applicant any information reasonably available to the applicant which is relevant to the notice or application proceedings or reasonably necessary to make any decision on the notice or application. All such requests shall include the reasons for the request.

(c) Any public agency which is not a party and which has been requested to provide comments on the notice or application shall have the same rights as a party to obtain information necessary to comply with the commission's request for comments. To the extent practicable, the staff shall coordinate requests from agencies to the applicant to avoid duplicative requests.

(d) Any party may request from a party other than the applicant information which is reasonably available to the responding party and cannot otherwise be readily obtained, and which is relevant to the proceeding or reasonably necessary to make any decision on the notice or application. All such requests shall state the reasons for the request.

(e) Any party requested to provide information pursuant to this section shall, within 15 days of receiving the request, notify the requesting party and the presiding member in writing if it is unable to provide the information requested of it. Such notification shall state the reasons for the inability.

(f) If the requesting party or agency is unable to obtain information as provided in this section, such party or agency may petition the presiding member for an order directing the responding party to supply such information. The presiding member shall set a hearing to consider argument on the petition, and shall, within a reasonable period, either grant or deny the petition, in whole or in part. The presiding member may direct the commission staff to supply such of the information requested as is available to the staff.

(g) All information requests and responses shall be served on all parties to the proceeding by the requesting and responding parties respectively; provided, however, that requests for information made orally at a public meeting or hearing authorized by the presiding member need not be made in writing or served unless otherwise required by the presiding member. The presiding member may set reasonable time limits on the use of, and compliance with, information requests in order to avoid interference with any party's preparation for hearings or imposing other undue burdens on a party. No information requests shall be submitted by any party after release of the presiding member's hearing order except upon petition to the presiding member.

(h) Any witness testifying at a hearing shall to the extent that it does not unduly burden the witness, make available to any party on request copies of any work papers relied upon in the preparation of the testimony. If a witness for the applicant sponsors any portion of the notice or application for inclusion in the hearing record, the applicant shall make available, on request, all work papers relied upon in the preparation of the sponsored portion.

(i) Upon filing of the notice or application, the presiding member may, pursuant to sections 1722.5 and 1746, authorize the commission staff

and applicant to hold workshops, informal conferences, site visits, and other meetings designed to solicit or exchange information related to the proceeding. All such meetings shall be open to the public. The direct participation or presence of a member of the commission shall not be required at such meetings.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25218.5, 25502, 25511, 25519, 25539. Reference: Public Resource Code Sections 25216.5, 255218, 25502 through 25539.

1717. Distribution of Pleadings, Comments, and Other Documents.

(a) Any party or agency who submits petitions (except petitions to intervene), motions, briefs, comments, written testimony or exhibits, shall file twelve (12) copies with the dockets unit of the commission, or with the presiding member if presented during a hearing, as well as serve the document upon all parties and all other persons designated by the presiding member. Proof of service on such parties and other designated persons shall be filed with the twelve (12) copies provided to the commission. The presiding member may direct the executive director to provide such copies and their service upon all parties on behalf of any party for whom compliance with this section would impose an undue hardship.

(b) Upon receipt of any agency comments and recommendations, and unless such service is already provided by the agency, the executive director shall immediately serve such comments and recommendations on the applicant and all parties to the proceeding and to any other person who requests a copy of such comments and recommendations.

(c) During the course of the proceedings under this article, the presiding member shall periodically cause to be distributed, to all parties and to any persons so requesting, a list of all materials and documents introduced into the record of the proceeding. Such list shall be kept up to date on at least a weekly basis by the dockets unit and kept on file with the record of the proceeding.

(d) The executive director shall cause a copy or summary of materials and documents introduced into the record of the proceeding to be placed in a public document room in each county in which a proposed site and related facility or any portion thereof is located.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218. Reference: Public Resources Code Section 25216.5.

1718. Suspension of Proceedings. (deleted)

1719. Consolidation of Proceedings.

(a) Upon motion of a member of a committee or of any party, and for good cause shown, the commission may order the consolidation of part or all of any notice or application proceeding with any other notice or application proceeding if reasonably necessary to ensure the complete, fair, or timely consideration of any siting proposal.

(b) The commission may order the severance of any proceedings which have been previously consolidated, and upon agreement of the applicant may sever into a separate notice proceeding any site and related facility proposed in a notice.

(c) A decision on any site and related facility shall not be delayed beyond the maximum time specified in these regulations for that site and facility by any order issued under this section, unless agreed to by the applicant.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218. Reference: Public Resources Code Sections 25216.5, 25516.6.

1720. Reconsideration of Decision or Order.

The commission, pursuant to section 25530 of the Public Resources Code, may order a reconsideration of all or part of a decision or order on its own motion or on petition of any party.

NOTE: Authority: Public Resources Code Section 25218. Reference: Public Resources Code Section 25530.

APPENDIX A: Information Requirements for a Nongeothermal Notice of Intention.

(a) In a section entitled "Project Description", the notice shall contain:

(1) A brief, summary description of the alternative site and related facility proposals, including the general location of each site or potential transmission corridor; the type, size, and capacity of the generating or transmission facilities; fuel, water supply, pollution control systems and other general characteristics. The description shall indicate precisely what sites and related facilities the applicant proposes to have approved by the commission.

(2) A proposed time schedule outlining the applicant's estimates for obtaining regulatory approvals, starting and completing construction, initial start up, and full-scale operation of the proposed facilities.

NOTE: Authority: Public Resources Code Sections 25216.5, 25518, 25502. Reference: Public Resources Code Section 25504.

(b) In a section entitled "Need for Facilities," the notice shall contain:

(1) A summary description outlining the reasons why the applicant believes that new or additional facilities should be added to the applicant's electrical system, indicating whether the facilities are being proposed to meet projected capacity or energy deficits, to displace existing units scheduled for retirement, to meet requirements for additional reserves, or other justification for proposing new or additional capacity.

(2) A table showing the expected capacity and energy levels, adopted by the commission pursuant to section 25309 of the Public Resources Code, for the general period in which the facilities are proposed. Where appropriate, include a table of, and explanation for, any adjustments to the adopted capacity and energy levels which are necessary to derive the applicant's service area requirements.

(3) A discussion indicating the amount or percentage of reserve capacity which the applicant believes is appropriate, including a description of the controlling criterion for determining the reserve margin, a discussion of why the applicant believes the indicated reserve margin is appropriate, and a discussion of how the indicated margin was derived.

(4) A table and summary description of the generating resources and electricity supplies which are likely to be available to the applicant's service area in the general time period proposed for initial operation of the facilities, including an explicit identification of transfer capabilities from outside the service area, and a summary of facilities operated or proposed by the applicant or by other entities within the service area.

(5) A discussion identifying and explaining any major uncertainties, such as delays in the construction or licensing of major planned resources or uncertainty with respect to contractual arrangements for transfer capabilities, which may affect the need for the proposed facilities.

(6) Tables showing the capacity and energy balances, projected deficits or excesses, and resulting reserve margins which reflect the applicant's expectations for electricity supply and demand within the general period for which the facilities are proposed.

(7) If the need is based in whole or in part on the proposed retirement or displacement of existing facilities, a discussion identifying such facilities and briefly explaining the reasons for their proposed retirement or displacement.

(8) If the need is based on factors other than projected capacity or energy deficits (taking into account reserve requirements), a discussion of the basis for the need and its conformance with the forecast assessment and any other criteria for determining need adopted in the most recent biennial report. If the need is based upon contingency planning, an explicit discussion of the nature and impact of the possible contingencies and their likelihood, an indication of when it may be determined whether the contingencies will or will not occur, and a schedule showing the earliest (or latest, if appropriate) date on which the proposed facilities should be operating given the possible contingencies.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25502. Reference: Public Resources Code Sections 25309, 25504, 25514.

(c) In a section entitled "Selection of Facilities", the notice shall contain:

(1) A discussion of the reasons why the principal generating technology was chosen from among commercially available technologies. Indicate the effect, if any, of the following factors on the selection of the facility type: comparative economics, comparative reliability, comparative health and safety aspects or environmental impacts, availability of appropriate sizes, comparative operating flexibility, lead time for approval and construction, and any other factor considered important by the applicant in making the selection.

(2) A discussion of the reasons for selecting the size of the facilities proposed in the notice. Indicate the effect, if any, of the following factors on the selection of facility size: need for capacity or energy; comparative reliability of different sizes, overall impact on system reliability, or reserve requirements of different sizes; comparative safety of different sizes; economies or diseconomies of scale associated with different sizes; commercial availability of different sizes; and other factors considered important by the applicant in the selection.

(3) A summary description of the preliminary design of the proposed facilities, specifically including the power generation, cooling, pollution control, fuel handling, water supply and treatment, safety, emergency, and auxiliary systems; and a summary of the proposed methods of construction and operation.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25502. Reference: Public Resources Code Sections 25309, 25504, 25514.

(d) In a section entitled "General Acceptability," the notice shall contain:

(1) For any technology not previously found to be commercially available, a discussion of the reasons why the applicant expects the technology to be available in the time period proposed for the facility.

(2) A discussion of the economic comparability of the proposed facilities based on information available to the applicant on comparative costs of commercially available generating technologies.

(3) A discussion of any significant unresolved technical, environmental, or health and safety or other issues, affecting the ability to use the proposed technologies at each of the sites, which have been identified in the most recent biennial report, or which are otherwise known to the applicant. The discussion should include or refer to any information which the applicant believes is relevant to resolving the question or issues identified.

(4) A summary discussion explaining (with reference to parts (1) through (4) above) why the applicant believes the facilities proposed should be found acceptable.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25502. Reference: 21080.5, 25309, 25504, 25514.

(e) In a section entitled "Transmission Needs," the notice shall contain:

(1) A description in general terms of any new or additional transmission facilities, powerlines, substations, switchyards, or other transmission equipment, whether or not within the exclusive permit authority of the commission, which the applicant believes will be required to carry electrical power from the proposed power plant at each of the sites presented in the notice to the principal load centers to be served by the new power plant. The information should include all potential corridors under consideration, approximate lengths of each corridor being considered, and a summary of the preliminary estimates of the costs of lines, stations and other equipment that are being considered.

(2) A discussion of the analyses, load-flow studies, or other considerations which the applicant believes justify the need for the additional transmission equipment under consideration, the relative merits of the alternative principal points of junction with the existing transmission system being considered, and the relative merits of the alternative capacity or voltage levels being considered for the proposed power lines.

(3) A discussion of the extent to which the consideration of alternative corridors or proposed capacity and voltage levels has taken or will take into

account the future transmission needs created by additional generating facilities planned by the applicant or any other entity proposing generating facilities in the same general area.

(4) A discussion summarizing the principal advantages and disadvantages to the environment of each of the alternative transmission proposals under consideration by the applicant. The discussion shall extend only to the functional point of delivery of the power to the interconnected system, and should include an identification of areas in the vicinity of the proposed corridors where important social, aesthetic, historical, or recreational resources, or scarce, unique, or specially protected resources (including archaeological sites, endangered species, unique recreational areas, and protected biological areas) may be adversely affected. The discussion should indicate the measures being considered by the applicant to avoid or mitigate the principal adverse effects identified in the discussion.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25502, 25541.5. Reference: Public Resources Code Sections 21080.5, 25504.

(f) In a section entitled "Safety and Reliability," the notice shall contain:

(1) A preliminary description of any fuels, emissions (except for air quality emissions), wastes, or other toxic or hazardous substances associated with the proposed facility which may have an effect on safety and reliability; a discussion of the principal adverse effects of such substances on safety and reliability; and a discussion of the measures proposed or being considered by the applicant to ensure the safe handling, control, storage, removal, or disposal of such substances.

(2) A discussion of the likelihood that the measures described in part (1) will be able to comply with existing health and safety standards.

(3) A report which describes the seismic, other natural hazards, and man-made hazards associated with each of the proposed sites, discusses the degree to which such hazards could cause secondary hazards at the proposed facilities (e.g., fuel spills, structural collapse, increased emissions including radiological, explosions, etc.) and discusses the alternative levels of design being considered to safeguard safe and reliable operation in light of such hazards. The report should describe special design features being considered to protect against seismic and other potential natural hazards and indicate the relative degrees of safety from such hazards that can be achieved by the design features being considered.

(4) A description of the principal emergency systems and safety precautions proposed or being considered by the applicant, and a discussion of the nature of the hazards for which the systems or precautions are provided. The description need not duplicate the discussion of special design features in part (3) or measures discussed in other parts.

(5) If a nuclear power plant is proposed:

(A) A description of the methods proposed or being considered to prevent illegal diversion of nuclear fuels and waste, and to control density of population in areas surrounding each proposed site.

(B) A description of the facilities upon which the applicant proposes to rely for reprocessing or storage of spent nuclear fuel rods from the nuclear reactor. This description shall include an estimate of the volume of spent fuel generated by the reactor over its design life, the particular technology likely to be utilized for such storage or reprocessing, the anticipated on- or off-site facilities to be utilized, the date on which those facilities have been or are likely to be licensed and in operation, and the anticipated means of transporting and storing the spent fuel rods after removal from the reactor.

(C) A description of the emergency response capabilities that would be required of local communities surrounding each of the proposed sites in order to comply with any provisions of federal or state law in the event of an accidental release of radioactivity from the facilities.

(6) A description of the principal adverse effects on safety and reliability associated with other aspects of the fuel cycle, and which are directly traceable to the proposed facilities.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25502, 25541.5. Reference: Public Resources Code Sections 21080.5, 25504, 25511, 25514.

(g) In a section entitled "System Reliability", the notice shall contain:

(1) A discussion indicating the degree of reliability which the applicant believes the proposed facilities are capable of achieving. The discussion should include an estimate of the expected annual capacity factor for the initial operating years of the facilities and an estimate of the average annual capacity factor over the expected life of the facilities. Estimated capacity factors may be supported by information on forced outage rates and capacity factors actually experienced by comparable facilities elsewhere (if any) or by a discussion of other factors which support the applicant's expectations on reliability where data from actual operating experience of comparable facilities is not readily available. For purposes of this subsection, "comparable facilities" means facilities whose principal generating technology and fuel type, generating capacity, and mode of operation is similar to those of the proposed facilities. The discussion should indicate the basis for reliability expectations for any new or innovative pollution control, cooling water or other principal systems, even where the reliability of the principal generating technology is considered proven, and should identify any major uncertainties or unproven aspects of such new or innovative systems.

(2) An assessment of the long-term availability of the fuel or fuels proposed for the facilities, at prices consistent with those assumed in subsection (h), and a discussion of the principal uncertainties in providing assurance of a reliable supply of fuel over the expected operating life of the

facility. If the facilities are capable of using multiple fuels, the extent of such fuel flexibility should be discussed, along with its impact on long-term reliability. The applicant may discuss the relative merits, costs, and difficulties in initially designing the facility to accept multiple fuels versus modifying the facility for such purposes at a later time.

(3) A discussion of the probable effect of the proposed facilities, including transmission facilities, on the overall reliability of the applicant's service system. The discussion should indicate the effect of the alternative plant sizes or transmission voltage levels being considered on the applicant's determination of "loss of load probability", "largest contingency", or any other reliability criterion or determinant of needed reserve margins.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25502. Reference: Public Resources Code Sections 25504, 25511.

(h) In a section entitled "Financial Impacts", the notice shall contain:

(1) A discussion of the financial requirements for constructing and operating the proposed facilities, and a table summarizing capital requirements and operating expenses, and their principal components. The discussion should indicate and explain the basis for any assumed escalation rates and costs of capital, fuel, or other principal components. Significant cost differences between alternative sites and facilities should be identified.

(2) A summary of the cost of the installed generating capacity (expressed in $/KW) and of the cost of supplying energy at the busbar (expressed in ¢/Kwhr.); a list of principal cost components, an explanation of the source or derivation of each, and the calculations used to arrive at the summary costs above; a discussion of any major uncertainties in the cost figures used or assumptions relied upon.

(3) A discussion of proposed methods for financing the proposal.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25502. Reference: Public Resources Code Sections 25504, 25506.5, 25509.5, 25514.

(i) In a section entitled "Proposed Sites", the notice shall contain:

(1) The location of each site and related facility proposed in the notice on a location map and described by sections, range, township, and county. The map should also indicate the various transmission corridors under consideration by the applicant and the location of other transmission facilities and equipment being considered and identified pursuant to subsection (e)(1).

(2) Photographic representations adequately depicting the visual appearance of each power plant site and its immediate surroundings.

(3) A brief description of the applicant's legal interest in each power plant site proposed.

(4) A description, including artists drawings, of the proposed location of facilities and structures on each site.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25502, 25541.5. Reference: Public Resources Code Sections 21080.5, 25502, 25504.

(j) In a section entitled "Site Suitability", the notice shall contain (separate sections may be submitted for each alternative site proposed):

(1) A brief description of the environmental setting for each site, a summary discussion of the general suitability of each alternative site to accommodate the facilities proposed in the notice, and a summary of the principal environmental, economic, and technological advantages and disadvantages of each alternative site.

(2) A preliminary statement of the principal environmental impacts of the proposed facilities at each site on areas of special environmental concern, including, but not limited to areas prohibited as power plant sites pursuant to section 25527 of the Public Resource Code, areas designated by the Coastal Commission or BCDC or within their jurisdiction, areas identified for potential wilderness designation or other protective designation, and agricultural areas; and a preliminary statement of the principal environmental impacts on biological resources, including especially rare and endangered species, livestock, and crops.

(3) A preliminary statement of the principal environmental impacts on human health which may result from air and water pollutants discharged from the facility, toxic and other hazardous materials stored or used at the site, wastes created by the facility, or any other substance associated with the facility. The statement shall include all regulated pollutants and substances; for nonregulated pollutants and substances, the statement shall include a summary of any findings and conclusions made by the commission in any generic assessment of the health effects of such substances.

(4) A preliminary discussion of the principal impacts on human resources, including major impacts on aesthetic, historical, cultural, archaeological, and recreational resources.

(5) A discussion of the principal social and economic impacts of constructing and operating the facilities at each site on the surrounding communities. The discussion should include anticipated impacts on public institutions such as schools, and on public services, housing, employment and other community resources during construction, and the impact on tax bases and other community aspects after construction.

(6) A preliminary discussion indicating the extent to which various measures being considered by the applicant are likely to mitigate the impacts identified under parts (2) through (5).

(7) A general discussion of the compatibility of the proposed facilities with present and expected land uses at each site, including conformity with

any long-range land use plans adopted by any federal, state, local, or regional planning agency. The discussion should identify the need, if any, for variances at any of the sites, or any measures that would be necessary to make the proposals conform with permitted land uses.

(8) A description of the principal and alternative (if any) sources of water proposed or being considered by the applicant for power plant cooling and other purposes; a description of the quality of water being considered and a general description of any treatment processes which may be necessary to make the water suitable for cooling or other uses at the site; a description of total amounts of such water that will be required each year and on any given day; a general description of any conveyance systems that will be required to carry the water from its source to the site and return it to a disposal or discharge area; the location and identity of any area being considered for disposal or discharge of water from the site; and a description of any treatment processes that may be necessary to make the water acceptable for discharge or disposal. The applicant should also describe any other major water facilities, including coolant outfalls, ponds, lakes, or towers, that may be associated with the proposed facilities, and discuss the principal impacts, if any, of these facilities on the physical and human environment.

(9) A land use map which indicates noise sensitive receptors or groups of receptors in the vicinity of the proposed site and related facilities, including anticipated receptors based on future land uses identifiable from public documents at the time of submission.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25502, 25541.5. Reference: Public Resources Code Sections 21080.5, 25502, 25503, 25504, 25506, 25507, 25508, 25511, 25526, 25527.

(k) In a section entitled "Applicable Standards," the notice shall contain:

(1) A list of federal, state, regional, and local agencies and their standards, ordinances, or laws, including long-range land use plans adopted by the state or by any local or regional planning agency, that are applicable to each site and related facility, including those which would be applicable but for the exclusive authority of the commission to certify sites and related facilities. The list should include a brief description of the applicability of such standards, ordinances, laws, or plans for each agency, and citations for each.

(2) To the extent not discussed in previous sections, discussion of the likelihood of the conformity of the proposed facilities with remaining laws, regulations, ordinances and standards of particular importance in assessing the acceptability of the sites and related facilities. Indicate those areas for which conformity with applicable standards cannot be determined at this time and provide a preliminary schedule for the resolution of such remaining issues.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25502, 25541.5. Reference: Public Resources Code Sections 25504, 25506, 25511, 25514.

DO NOT WRITE IN THIS SPACE

(1) In a section entitled "Air Quality", the notice shall contain:

(1) A project description including typical fuel type and characteristics (BTU content, maximum sulfur and ash content), design capacity, proposed air emission control technologies, stack parameters (assumed height, diameter, exhaust velocity and temperature) and operational characteristics (heat rate, expected maximum annual and daily capacity factor). This information may be based upon typical data for a facility of the proposed type and design.

(2) A description of cooling systems, including approximate drift rate, water flow and water quality (TDS content).

(3) A projection of facility-related emissions from the stack and combustion system, from cooling towers and from associated fuel and other material handling, delivery and storage systems to the extent that the applicable new source review rule requires attributing these sources to the proposed project. The emissions discussion should include a discussion of the basis of the estimate, such as test results, manufacturers' estimates, extrapolations and all assumptions made.

(4) A list of all applicable air quality rules, regulations, standards and laws.

(5) A statement, including the reasons therefor, of what the applicant considers best available control technology as defined in the applicable district's new source review rule.

(6) Existing baseline air quality data for all regulated pollutants affected by the proposed facility including concentrations of pollutants, an extrapolation of that data to the proposed site, and a comparison of the extrapolated data with all applicable ambient air quality standards. This discussion should include a description of the source of the data, the method used to derive the data and the basis for any extrapolations made to the proposed site.

(7) Existing meteorological data including wind speed and direction, ambient temperature, relative humidity, stability and mixing height, and existing upper air data; and a discussion of the extent to which the data are typical conditions at the proposed site. This description should include a discussion of the source of the data and the method used to derive the data.

(8) A worst case air quality analysis for each proposed site and related facility to determine whether the plant may cause or contribute to a violation of each applicable ambient air quality standard. Such analysis shall include a description of the methodology employed and the basis for the conclusions reached, and shall consider topography, meteorology and contributions from other sources in the area.

(9) A discussion of the emission offset strategy or any other method of complying with the applicable new source review rule. The emission offset strategy shall be designed to show whether there are sufficient offsets

available (contracts are not required). Offset categories (e.g. dry cleaners, degreasers) and an inventory of potential reductions may be used unless most of the potential offsets come from a very small number of sources. In the latter case, the offset sources should be more specifically identified. Potential offsets may be aggregated by geographic location as appropriate under the applicable rule. The offset discussion should also include a brief description of the emissions controls to be used for each offset category and should account for applicable rules requiring emission reductions. In the event there is no emissions inventory available from the ARB or from the applicable local district, the applicant may propose an alternative method for complying with this requirement.

(10) Based upon worst case data for analysis for short-term averaging times and typical data for analysis for annual averaging times, a discussion of whether the proposed facility will be within PSD Class I or Class II increments.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25502, 25541.5. Reference: Public Resources Code Sections 21080.5, 25504, 25506, 25514.

(m) The notice shall designate an individual or individuals authorized to receive pleadings, briefs, comments, and other documents for the applicant.

NOTE: Authority: Public Resources Code Section 25216.5. Reference: Public Resources Code Section 25502.

(n) The notice may contain any other pertinent information that the applicant desires to submit.

NOTE: Authority: Public Resources Code Sections 25216.5, 25502. Reference: Public Resources Code Section 25504.

APPENDIX B: Information Requirements for a Nongeothermal Application

(a) In a section entitled "Project Description", provide the following information:

(1) A general description of the proposed site and related facility, including the location of the site or transmission routes, the type, size and capacity of the generating or transmission facilities, fuel characteristics, water supply, pollution control system, and other general characteristics.

(2) A schedule outlining the applicant's proposal for the dates of initiation and completion of construction, initial start-up, and full-scale operation of the proposed facilities.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25520, 25541.5. Reference: Public Resources Code Sections 21080.5, 25520.

(b) In a section entitled "Need for Facilities", provide the following information:

(1) A discussion of the conformity of the proposed facilities with forecast and assessment adopted by the commission pursuant to section 25309 of the Public Resources Code. The discussion shall include all the information required by Appendix A, part (b), updated as necessary to incorporate changed circumstances, the most recent Biennial Report, new or resolved uncertainties, and any other matters which may affect the need for the facility. The discussion may include any findings and conclusions on need adopted in the commission's final report and decision on the notice.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25520, 25541.5. Reference: Public Resources Code Sections 21080.5, 25309, 25520, 25523, 25524.

(c) In a section entitled "Proposed Facilities", provide the following information:

(1) A detailed description of the design, construction and operation of the facilities, specifically including the power generation, cooling, water supply and treatment, waste handling and control, pollution control, fuel handling, and safety, emergency and auxillary systems.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25520, 25541.5. Reference: Public Resources Code Sections 21080.5, 25520 25523.

(d) In a section entitled "Transmission Lines", provide the following information:

(1) A description of the proposed transmission lines and other transmission equipment including:

(A) A map in suitable scale and other visual depictions of the proposed transmission line route(s), showing details of the rights-of-way in the vicinity of settled areas, parks, recreational areas, and scenic areas; and existing transmission lines within one mile of the proposed route(s).

(B) A description of any new or additional transmission facilities such as powerlines, substations, switchyards, or other transmission equipment, which will be required.

(2) A justification for the route and additional facilities proposed, including a discussion of the effects of the towers, lines, and other related equipment on the environment, and scenic, historical, economic, and recreational values and uses of the areas proposed to be traversed; and a discussion of natural hazards within the corridors or which could affect the proposed transmission lines.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25520, 25541.5. Reference: Public Resources Code Sections 21080.5, 25520, 25523.

(e) In a section entitled "Safety and Reliability", provide the following information:

(1) An update of all information required by Appendix A, part (f), for the site and facility applied for, taking into account specific design characteristics of the facilities, information developed in the notice proceeding, and findings and conclusion of the commission in the final report and decision on the notice.

(2) If a nuclear power plant is proposed, a description of the following:

(A) The methods proposed to prevent the illegal diversion of nuclear wastes and fuels;

(B) The measures proposed to control the density of population in areas surrounding the site, and the effect of the criteria used by the U.S. Nuclear Regulatory Commission in determining the control area;

(C) The volume of spent fuel to be generated by the facility over its design life;

(D) The off-site facility(s) proposed to be relied upon for the storage or reprocessing of spent fuel rods, the actual or expected date by which such facilities will be in actual operation, and the estimate of the date by which such facilities will be needed to store or reprocess spent fuel rods from the proposed generating facility;

(E) The means proposed by which spent fuel will be transported from the site to the place of storage or reprocessing; and

(F) The proposed means for decommissioning the facility after its operating life, including methods of dismantling, entombment or disposal, interim security, potential costs, and associated institutional requirements.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25520, 25541.5. Reference: Public Resources Code Sections 25511, 25520, 25523, 25528.

(f) In a section entitled "Reliability", provide the following information:

(1) A discussion of the anticipated service life and degree of reliability anticipated to be achieved by the proposed facilities, based on a consideration of:

(A) Expected annual and lifetime capacity factors.

(B) The design criteria proposed for critical systems and components.

(2) A discussion of the sources and availability of the fuel or fuels to be used, and their expected prices, over the estimated service life of the facilities.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25520. Reference: Public Resources Code Sections 25511, 25520, 25523.

(g) In a section entitled "Financial Impacts," provide the following information:

(1) A statement of the cost of the installed generating capacity and of the cost of supplying energy at the busbar. The statement should identify all principal cost components and explain the source or derivation and the underlying assumptions for each component.

(2) A discussion of the anticipated costs of fuel or fuels to be used over the service life of the facilities, including an explanation of underlying assumptions.

(h) In a section entitled "Site Description," provide the following information:

(1) A description of the location of the proposed site and related facility by sections, range, township, and county.

(2) A map in suitable scale and photographic representations adequately depicting the visual appearance of the site and its immediate surroundings.

(3) A description, including artists drawings, of the proposed location of facilities and structures on each site.

(4) A brief description of the applicant's legal interest in the site and adjacent areas.

DO NOT WRITE IN THIS SPACE

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25520, 25541.5. Reference: Public Resources Code Sections 21080.5, 25520.

(i) In a section entitled "Environmental Information," provide the following information:

(1) A detailed description and discussion of the environment of the area affected by the facility, including information of geological, meteorological, hydrological, ecological, social, economic and demographic characteristics of the site area.

(2) A detailed description and discussion of any significant adverse impacts on the environment which would result from the construction and operation of the proposed facilities. The description and discussion shall include all impacts required to be identified by Appendix A, part (j) or identified in the notice proceeding, final report, and decision; all other significant adverse impacts, and cumulative impacts from other planned developments, if any.

(3) A description and discussion of the immediate and long-term land uses or land use plans for the area which will be affected by the facility, and the compatibility of the facilities with such uses and plans.

(4) A description and discussion of possible measures proposed to mitigate the adverse impacts identified in (2) or to make the facilities compatible with land uses and plans identified in (3), and a discussion of the effectiveness of such measures.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25519, 25520, 25541.5. Reference: Public Resources Code Sections 21080.5, 25519, 25520, 25523.

(j) In a section entitled "Compliance with Applicable Laws," provide the following information (to the extent not provided in other sections):

(1) A list of every federal agency from which any approval or authorization concerning the proposed site is required, specifying the approvals or authorizations obtained at the time of the application and the schedule for obtaining any approvals or authorizations pending.

(2) A list of federal, state, regional, and local agencies whose standards, ordinances, regulations or laws, including long-range land use plans adopted by the state or by any local or regional planning agency, are applicable to the site and related facility. This list should include a brief description of the applicability of such standards, ordinances, regulations, laws, or plans for each agency, and citations for each.

(3) A discussion of the conformity of the proposed site and related facilities with the applicable standards, ordinances, regulations, laws, and plans.

DO NOT WRITE IN THIS SPACE

(4) A discussion of all compliance monitoring programs planned by the applicant.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25520. Reference: Public Resources Code Sections 25520, 25523, 25525.

(k) In a section entitled "Air Quality," provide the following information:

(1) All the information typically required by the air pollution control district in the area of the site, and required by the district's rules and regulations. The applicant need not submit information that requires final plant design or selection of equipment vendors.

(2) Where the applicable new source review requires the applicant to obtain emissions tradeoffs from other sources to offset the emissions from the proposed facility the applicant shall not be required as a condition for meeting the information requirements of an application to obtain or include evidence of contracts or other agreements with the owners of such sources.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25520, 25541.5. Reference: Public Resources Code Sections 25520, 25523, 25525.

(l) In a section entitled "Water Supply and Quality," provide the following information:

(1) A description of the sources of water proposed by the applicant for power plant cooling and other purposes; a description of the quality of water proposed and a description of any treatment processes and equipment necessary to make the water suitable for cooling or other uses at the site; a description of total amounts of such water that will be required each year and on any given day; a general description of any conveyance systems that will be required to carry the water from its source to the site and return it to disposal or discharge area; the location and identity of the area to be used for disposal or discharge of water from the site; and a description of any treatment processes that will be necessary to make the water acceptable for discharge or disposal. The applicant should also describe any other major water facilities, including coolant outfalls, ponds, lakes, or towers, that may be associated with the proposed facilities, and discuss the principal impacts, if any, of these facilities on the physical and human environment.

(2) A discussion of the conformity of the water supply and discharge system with applicable water quality standards.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25520, 25541.5. Reference: Public Resources Code Sections 25520, 25523, 25525.

DO NOT WRITE IN THIS SPACE

Article 2. Procedures for Considering Notices of Intention to File an Application for Certification.

1721. Purpose of Notice and Notice of Intention Proceeding.

(a) The purpose of a notice, and such supporting documentation as may be filed concurrently with the notice, is to provide the commission, interested agencies, and interested members of the public with an informative document which does all of the following:

(1) Accurately describes the nature, size, and location of the sites and related facilities proposed by the applicant;

(2) Fairly identifies and explains the principal environmental, economic, and technological advantages and disadvantages of each siting proposal in the notice;

(3) Identifies measures which the applicant is considering to mitigate the principal disadvantages of each siting proposal in the notice;

(4) Explains the need for the proposed facilities;

(5) Describes the commercial availability of the generation technologies proposed in the notice (if not already determined to be commercially available by the commission); discusses the economic comparability of the proposals based upon comparative generation costs available to the applicant; and explains the impact of the proposed facilities on the overall reliability of the service area system;

(6) Specifies the measures proposed or being considered by the applicant to ensure public health, safety, and reliability during construction and operation of the proposed facilities at each site; and

(7) Indicates the degree to which the proposed facilities can be constructed and operated at each site in conformity with applicable federal, state, and local standards, laws, ordinances, and regulations, including any long-range land use plans or guidelines adopted by any federal, state, regional, or local planning agency.

(b) The purpose of notice of intention proceedings shall be to engage the applicant, the commission, interested agencies and members of the public in an open planning process designed to identify sufficient acceptable sites and related facilities to meet the need for electricity determined pursuant to section 25309 of the Public Resources Code. To this end, each notice of intention proceeding shall be conducted in order to determine the technical, environmental, public health and safety, economic, and social and land use acceptability of alternative sites and related facilities, by accomplishing each of the following:

(1) To make findings on the need for the proposed facility in terms of its conformity with the forecast and assessment of electricity demand adopted pursuant to section 25309 of the Public Resources Code;

(2) To provide information on the nature of the siting proposals to interested agencies and members of the public, and to actively solicit their assessments, comments, and recommendations on any aspect of the sites and related facilities proposed in the notice, including recommendations for modification in the location, design, construction or operation of the proposed facilities, or alternatives to the proposal;

(3) To determine whether there is a reasonable likelihood that the facilities will comply with applicable federal, state, regional and local standards, laws, ordinances, regulations, and plans;

(4) To attempt to resolve critical issues affecting the ability to employ the proposed technology at each of the sites and to determine the feasibility of any conditions or modifications necessary to make any site and related facilities proposed acceptable;

(5) To determine whether the proposed facilities can be designed, constructed, and operated in a manner which ensures public health, safety, and reliability, by evaluating the adequacy of the measures proposed by the applicant, assessing their conformity with applicable standards, and where appropriate, determining the necessity, feasibility, and relative costs and benefits of additional measures;

(6) To identify the most serious environmental impacts and assess the feasibility of mitigating such impacts;

(7) To consider alternatives to the proposal, including feasible alternative sites, facilities, or sites and related facilities which may substantially lessen any significant adverse effects which the applicant's proposals may have on the environment or which may better carry out the policies and objectives of the Act;

(8) To consider the economic, financial, rate, system reliability, and service implications of the proposed facilities, in coordination with the Public Utilities Commission (for facilities requiring a certificate of public convenience and necessity) or with the board of directors or other appropriate body of a municipal utility (for all other facilities); and

(9) To prevent any needless commitment of financial resources and regulatory effort prior to a determination of the basic acceptability of, and need for, the proposed facilities, and the suitability of proposed sites to accommodate the facilities; and to elimininate from further consideration and commitment of resources any site and related facility found to be unsuitable, unneeded, or otherwise unacceptable.

(c) In assessing the proposed sites and related facilities, the commission shall defer until the formal application stage (1) a detailed scrutiny of engineering and design aspects, (2) a detailed identification and analysis of significant adverse environmental impacts, or (3) a precise analysis of need for new generating facilities; provided, however, that issues relating to such matters may be considered where resolution of such issues will not unduly

hinder or burden the parties and the proceeding and evidence for the resolution of such issues is readily available, or where resolution of such issues is necessary to determine the acceptability of one or more of the sites and related facilities proposed.

(d) It shall be the responsibility of the presiding member to ensure that the notice proceeding is conducted in a manner consistent with the purposes of this article and to ensure that the needless expenditure of time, effort, and financial resources in considering matters more appropriate for the formal certification stage is avoided.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25539. Reference: Public Resources Code Sections 25502 through 25516.6.

1722. Public Information Presentations.

Within 45 days after a notice has been filed pursuant to section 1709, a commission committee shall provide for public informational presentations on the notice in communities as close as practicable to each of the proposed sites. Such presentations shall be made by the applicant and, where appropriate, by the commission staff in order to set forth the need for the proposed facilities and to provide knowledge and understanding of the proposed sites and facilities. Such presentations shall provide for informal questions to the applicant and staff from local residents and other interested persons regarding the proposed sites and facilities.

NOTE: Authority: Public Resources Code Sections 25516.5, 25518. Reference: Public Resources Code Section 25509.

1722.5. Prehearing Meetings; Purposes.

(a) No sooner than 30 days after the notice is filed, the presiding member may authorize the staff to initiate informal voluntary meetings with the applicant, other parties, and interested agencies on matters relevant to the notice. Such meetings may include workshops, site visits, or other information exchanges.

(b) All such meetings shall be noticed pursuant to section 1710 of these regulations and shall be open to the public. The notice shall list the topics and purposes of the meetings. Where such meetings are intended to discuss social, economic, or other impacts on communities surrounding a proposed site, they shall be held in or near the communities affected.

(c) Such meetings may be held for any of the following purposes:

(1) To allow parties to solicit and exchange information relevant to the notice;

(2) To allow parties to identify areas of factual and legal agreement;

(3) To allow parties to identify areas of disagreement, to refine issues, and to develop the positions and contentions of the parties; or

(4) To allow members of the public to recommend areas of inquiry to the parties; to identify relevant topics and issues; and to ask questions of the applicant, staff and parties concerning each siting proposal, the commission's siting procedures, and potential positions of the parties.

(d) The public adviser, and in the adviser's absence, the staff counsel, shall ensure that all persons are provided a reasonable opportunity to participate in the discussions at each meeting.

(e) The presiding member may require the parties to report periodically on the scope, purpose, and progress of meetings. Any person dissatisfied with the manner in which such meetings are being conducted may petition the presiding member to take remedial action.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25539. Reference: Public Resources Code Sections 25216.5, 25518, 25539.

1722.9. Prehearing Conferences; Hearing Order.

The committee shall hold one or more prehearing conferences with all parties and interested agencies to establish procedures, identify relevant topics and issues, and set schedules for the nonadjudicatory hearings on the notice.

(a) The applicant shall indicate when it will be prepared to present its case, and the staff and each participating agency shall indicate when each will be prepared to present the results of its assessments to the commission.

(b) Parties who have agreed on statements of facts shall make such statements and lists of probable sponsoring witnesses available to all interested persons at the prehearing conference. To the extent practical, such statements should be served on all parties five days prior to the prehearing conference. Such statements shall not be binding on the committee and may be challenged by any person.

(c) Parties who have agreed on a statement of issues requiring adjudication shall submit such statements at the prehearing conference. The presiding member may direct the staff to present at the conference a statement of issues which the staff believes must be resolved in the applicant's favor before approval is granted. The staff statement shall not be binding on the committee.

(d) The presiding member, in consultation with other committee members shall prepare a hearing order to guide the nonadjudicatory hearings. The order shall set forth the schedule and procedures for the hearings, indicate the order of presentation of the parties and interested agencies, and identify the topics or issues to be addressed in the hearings.

(e) This section shall not preclude parties from agreeing to and offering additional statements of facts and issues during the hearings.

NOTE: Authority: Public Resources Code Section 25218. Reference: Public Resources Code Sections 25211, 25509.

1723. Nonadjudicatory Hearings; Purposes and Procedures.

The committee shall commence nonadjudicatory hearings on the notice pursuant to the hearing order issued by the presiding member.

(a) The hearings shall be used to provide information on the proposed sites and facilities to the public. The presiding member shall reserve a portion of each hearing to permit members of the public to question the applicant and staff about the proposals or about each party's contentions. Both parties shall make qualified persons available to answer questions on the matters scheduled for consideration at each hearing. The presiding member shall limit questions to the applicant and staff to those necessary to identify issues or solicit relevant information on the proposals and shall defer adjudication of identified issues until hearings held under section 1725.

(b) The hearings shall be used to develop an evidentiary basis for the findings and conclusions required for a decision on the notice. The applicant, staff, and other parties shall present evidence in the hearings pursuant to section 1723.5 and the hearing order. Testimony or evidence based upon statements of facts agreed to by the applicant or staff which set forth the ultimate positions of either party on need, public health and safety, and environmental acceptability may be admitted into evidence without the necessity of reading the entire statements into the record only if the supporting witnesses present an informative summary of the facts and evidence at the hearing and any person so requesting is provided a reasonable opportunity to ask relevant, nonrepetitive questions of the sponsoring witnesses. The presiding member may require oral summaries of other joint statements of facts offered into evidence where the subject matter is in dispute or is of significant interest to persons present at the hearing.

(c) The hearings shall be used to solicit the views and comments of the public, parties, and governmental agencies on the environmental, public health and safety, economic, social, and land use impacts of the facilities at the proposed sites.

(d) The hearings shall be used to identify issues which require adjudication, issues which may be deferred to the certification stage, and issues which may be eliminated from the proceeding. Issues may be raised by submitting comments or testimony which dispute the contentions of the applicant or staff, or by asking questions of witnesses at hearings. The presiding member may permit a party to present evidence to show that an apparently disputed matter presents no issue of fact, or may defer such evidence until the adjudicatory hearings. The presiding member shall determine whether the evidence presented on each matter is sufficient to raise a genuine, relevant, factual issue appropriate for adjudication in subsequent hearings.

(e) The presiding member shall conclude the hearings under this section whenever he or she is satisfied that the purposes of this section have been achieved and that the evidentiary record and issues are sufficiently developed to prepare the summary and hearing order required by section 1724.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218. Reference: Public Resources Code Sections 25509.5.

1723.5. Presentation of Evidence; Burdens of Producing Evidence; Burdens of Proof.

(a) The applicant has the burden of proof and of producing evidence on each of the following:

(1) The probable need for the proposed facilities;

(2) A substantial likelihood that the principal adverse impacts on the environment can be mitigated or avoided;

(3) A substantial likelihood that the facilities can be constructed and operated safely and reliably;

(4) The suitability of the sites to accommodate the facilities;

(5) The reasonableness of the likely financial impacts of constructing and operating the facilities; and

(6) A substantial likelihood that the construction and operation of the proposed facilities will comply with the federal, state, regional, and local laws, standards, ordinances, and land use plans which are applicable to the proposals.

(b) The staff shall present its independent assessment of the need for the facilities and of the adequacy of the measures proposed by the applicant to protect environmental quality and to protect public health and safety. The staff may also present evidence on any other matter relevant to the proceeding and shall present evidence on such matters and issues as the presiding member directs.

(c) Any party or person may propose modifications in the design, construction, location, or other conditions to protect public health and environmental quality, to ensure safe and reliable operation, or to meet the standards, policies, and guidelines established by the commission. If the proponent of any such modification or condition demonstrates its apparent reasonableness, the presiding member may direct the applicant and/or staff to examine and present further evidence on the need for and feasibility of such modification or condition.

(d) The staff shall conduct an independent environmental assessment of the applicant's proposals and present a report on its findings at the hearings. The report shall summarize the principal adverse environmental effects of the applicant's siting proposals, evaluate the potential mitigation measures available to the applicant, and assess the feasibility of reasonable alternative sites and facilities other than those proposed by the applicant, which the staff believes may substantially lessen or avoid the principal adverse effects of the applicant's proposal. Any person may suggest one or more of such alternatives to the staff and committee for consideration in the staff report.

(e) Any party or person may propose that the commission approve any alternative site and related facility in lieu of or in addition to the applicant's proposals. The proponent of such alternative siting proposal has the burden of presenting evidence to establish the suitability and acceptability of such proposal as set forth in subsection (a) of this section. The presiding member may also direct the staff to investigate any alternative siting proposal.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25539, 25541.5. Reference: Public Resources Code Sections 25502, 25504, 25506, 25506.5, 25507, 25509.5, 25511, 25514, 25541.5.

1724. Summary and Hearing Order; Preparation; Contents; Distribution.

(a) After the conclusion of the hearings, and no later than 150 days after filing of the notice, the presiding member shall prepare and publish a summary of the hearing record and a hearing order to guide subsequent adjudicatory hearings.

(b) The hearing order shall identify issues to be adjudicated in subsequent hearings, issues which have been eliminated, and issues which should be deferred to the certification proceeding. To the extent permitted by the record, the summary shall also include proposed findings on matters relevant to the final report.

(c) Based upon information presented in the hearings, the summary and hearing order shall summarize the principal significant environmental effects of each siting proposal and shall describe reasonable alternatives and mitigation measures which could substantially reduce the adverse effects. The summary and hearing order shall list environmental issues regarding potential adverse effects, mitigation measures, and alternatives which require resolution in the subsequent adjudicatory hearings. The summary should briefly describe and discuss those environmental issues important to a decision on the notice.

(d) Upon publication, the summary and hearing order shall be distributed within 15 days to interested governmental agencies, parties, and to any person who requests a copy.

(e) The presiding member shall provide all parties with a reasonable opportunity to submit comments, recommendations, and proposed findings and conclusions for the summary and hearing order prior to its preparation. The presiding member may hold a public conference to consider amendments to the hearing order after its publication.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25539. Reference: Public Resources Code Sections 21080.5, 25510, 25512, 25541.5

1725. Adjudicatory Hearings.

No earlier than 30 days after distribution of the summary and hearing order the committee shall commence adjudicatory hearings pursuant to the hearing order.

NOTE: Authority: Public Resources Code Section 25218. Reference: Public Resources Code Section 25513.

1726. Final Report; Preparation; Distribution.

(a) Upon conclusion of the hearings, and no later than 300 days after filing of the notice, the presiding member shall prepare a final report on the notice, as provided in section 25514 of the Public Resources Code. The report shall propose such findings and conclusions as are warranted by the record of the proceeding; shall recommend either approval or disapproval of the notice and the reasonable conditions, if any, which must be satisfied before certification is granted; and shall contain a proposed decision on the notice.

(b) The final report shall contain the committee's responses to significant environmental points raised in the notice proceeding, including findings and conclusions on each of the environmental issues in the summary and hearing order or otherwise important to a decision on the notice. The report shall include findings on the need for and feasibility of any mitigation measures or alternatives considered in the hearings. The report shall include findings and conclusions on the relative merits and acceptability of each alternative site and related facility proposed and considered in the proceeding.

(c) The final report shall be distributed in the same manner as the summary and hearing order.

NOTE: Authority: Public Resources Code Sections 25516.5, 25218,, 25539, 25541.5. Reference: Public Resources Code Sections 21080.5, 25514, 25541.5.

1726.5. Request for PUC Comments.

If the final report recommends any modifications, conditions or criteria for any site and related facility requiring a certificate of public convenience and necessity from the Public Utilities Commission, the presiding member shall request the comments of the PUC on the economic, financial, rate, system reliability, and service implications of such modifications, conditions, or criteria.

NOTE: Authority: Public Resources Code Section 25218. Reference: Public Resources Code Section 25514.3

1727. Final Report Hearings.

(a) Within thirty (30) days after the distribution of the final report, hearings on the final report shall be held before the full commission. The hearings shall be conducted for the purpose of considering final statements of the parties on the report and on the proposed decision, and for the purpose of considering final comments and recommendations of interested agencies and members of the public. Such statements may contain recommendations for amendments to the proposed decision.

DO NOT WRITE IN THIS SPACE

(b) The chairman may require that all statements by parties and other persons be submitted in writing in advance of the hearings. The commission shall not consider new or additional evidence at the hearings under this section unless the commission adopts a motion to reopen the evidentiary record. In such case, the commission shall afford such notice to the parties as appears fair and reasonable under the circumstances, but in no event shall such notice be given less than seven days prior to the hearings.

(c) Any member may propose an alternative decision, including supporting findings and conclusions. Such proposed decision may also be considered at the hearings under this section but need not be acted upon until the commission makes its decision on the notice. The commission shall provide any party with a reasonable opportunity in the hearings or prior to adoption of the final decision to comment on any proposed decision.

NOTE: Authority: Public Resources Code Section 25218. Reference: Public Resources Code Section 25515.

1728. Decision.

(a) The commission shall hold a final meeting for the purpose of adopting, or amending and adopting, any proposed decision considered in the hearing on the final report.

(b) The commission shall issue its decision on the notice within twelve months of the date the notice is filed. The decision shall be based exclusively on the evidentiary record of the proceedings on the notice. The decision shall conform to the requirements of sections 25516, 25516.1, and 25516.5 of the Public Resources Code.

NOTE: Authority: Public Resources Code Section 25218. Reference: Public Resources Code Sections 25516, 25516.1, 25516.5.

1729. Nonapprovable Sites.

(a) The commission shall not find a site and releated facility acceptable where the site is in a location designated by the California Coastal Commission or the San Francisco Bay Conservation and Development Commission, as provided in section 25526, or any area specified in subdivisions (a) and (b) of section 25527 of the Public Resources Code, unless the following conditions are satisfied:

(1) For any site designated by the Coastal Commission, the Coastal Commission has made a finding in its report submitted pursuant to section 25507 that the use is not inconsistent with the primary use of such lands;

(2) For any site designated by the Bay Conservation and Development Commission, the BCDC has made a finding in its report submitted pursuant to section 25507 that the use is not inconsistent with the primary use of such lands; or

DO NOT WRITE IN THIS SPACE

(b) The applicant shall be required to comply with the following requirements of sections 25526 and 25527 at the application stage:

(1) For a site in an area designated by the Coastal Commission, the applicant shall demonstrate to the Coastal Commission that the proposed facilities will cause no substantial adverse environmental effects on any designated area. The Coastal Commission shall submit its findings to the Energy Commission prior to the conclusion of the hearings held under section 1748 of these regulations.

(2) For a site in an area designated by the BCDC, the applicant shall demonstrate to the BCDC that the proposed facility will cause no substantial adverse environmental effects on any designated area. The BCDC shall submit its findings to the Energy Commission prior to the conclusion of the hearings held under section 1748 of these regulations.

(3) For a site in an area listed in section 25527, the applicant shall demonstrate to the Energy Commission that the proposed facility will cause no substantial adverse environmental effects on any such area. The commission's findings shall be contained in the proposed decision on the application.

(4) For a site in any area covered by this section, the applicant shall demonstrate prior to the conclusion of hearings held under section 1748 that the approval of any public agency having ownership or control of such lands has been obtained.

NOTE: Authority: Public Resources Code Sections 25518, 25541.5. Reference: Public Resources Code Sections 25526, 25527, 25541.5.

1730. Approval; Required Finding for Air Quality.

The commission shall not approve any site and related facility unless it determines that there is a substantial likelihood that it will meet the applicable air quality regulations; provided, however, that if the commission determines that the facility is urgently needed, the applicant has made a good faith effort to find acceptable alternative sites and related facilities, and no otherwise approvable site has a substantial likelihood, it may approve the single site and related facility that is otherwise acceptable and that is most likely to meet all applicable air quality regulations. In such event, the commission shall request the ARB and local districts to appear at the hearings on the final report and advise the commission on which site is most likely to meet the requirements.

NOTE: Authority: Public Resources Code Sections 25518, 25541.5. Reference: Public Resources Code Sections 21081, 25516.

1731. Environmentally Unacceptable Sites.

(a) Where the commission finds at least two sites and related facilities acceptable, other sites and related facilities which have major unmitigable adverse impacts shall not be found acceptable.

DO NOT WRITE IN THIS SPACE

(b) This provision shall not apply to any notice for which only one site and related facility is required.

(c) This provision shall not enlarge the scope of environmental review required by sections 1723 through 1726.

NOTE: Authority: Public Resources Code Sections 25218, 25539, 25541.5. Reference: Public Resources Code Sections 21080.5, 21081, 25516, 25541.5.

Article 3. Procedures for Considering Applications for Certification

1741. Application Proceeding; Purpose and Objectives.

(a) The purpose of an application proceeding is to ensure that any sites and related facilities certified provide a reliable supply of electrical energy at a level consistent with the need for such energy, and in a manner consistent with public health and safety, promotion of the general welfare, and protection of environmental quality.

(b) The application proceeding shall be conducted in order to accomplish all of the following objectives:

(1) To ensure that no facility is certified unless it is found to be in conformity with the 12-year forecast of electric demand adopted pursuant to section 25309(b).

(2) To ensure that the applicant takes all measures that can be shown to be feasible, reasonably necessary, and available to substantially lessen the significant adverse environmental effects, and to ensure safe and reliable operation of the facility.

(3) To ensure that the applicant takes all measures that can be shown to be feasible, reasonably necessary, and available to comply with applicable governmental laws and standards; to ensure that any facility certified complies with applicable federal law; and to ensure that any facility which fails to comply with an applicable local or state law or standard is certified only if such facility is required for public convenience and necessity and there are not more prudent and feasible means of achieving such convenience and necessity.

NOTE: Authority: Public Resouces Code Sections 25216.5, 25218, 25539, 25541.5. Reference: Pubilc Resources Codes Sections 21002, 25002, 25523, 25524, 25525.

1742. Review of Environmental Factors; Staff and Agency Assessment.

(a) Information on the environmental effects of the proposed facility and mitigation measures proposed by the applicant shall be provided in the application as specified in the appropriate appendix.

(b) Upon filing of the application pursuant to section 1709, the commission staff and all concerned environmental agencies shall review the application and assess whether the report's list of environmental impacts is complete and accurate, whether the mitigation plan is complete and effective, and whether additional or more effective mitigation measures are reasonably necessary, feasible, and available.

(c) The applicant shall present information on environmental effects and mitigation and the staff and concerned agencies shall submit the results of their assessments at hearings held pursuant to section 1748. The staff's assessment shall focus on those environmental matters not expected to be considered by other agencies, in order to ensure a complete assessment of significant environmental issues in the proceeding.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25539, 25541.5. Reference: Public Resources Code Sections 21080.5, 25519, 25520, 25521, 25541.5

1743. Review of Safety and Reliability Factors; Staff and Agency Assessment.

(a) Information on safety and reliability of the proposed facility, describing in detail the measures proposed to ensure the safe and reliable operation of the facility shall be provided in the application as specified in the appropriate appendix.

(b) Upon filing of the application, the commission staff and interested agencies shall assess the completeness and adequacy of the measures proposed by the applicant in terms of applicable health and safety standards and other reasonable requirements. The staff shall consult with other agencies with special expertise or interest in safety and reliability matters. The staff's assessment shall focus on those safety and reliability matters not expectd to be considered by other agencies. The staff may recommend additional measures which are economically and technically feasible and can be shown to be effective in ensuring safe and reliable operation.

(c) The applicant's information on safety and reliability, the results of the staff's assessment, and any additional agency comments and recommendations shall be presented and considered at hearings on the application held pursuant to section 1748.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25539. Reference: Public Resources Code Sections 25519, 25520, 25521, 25523.

1744. Review of Compliance with Applicable Laws.

(a) Information on the measures planned by the applicant to comply with all applicable federal, state, regional, and local laws, regulations, standards, and plans shall be provided in the application as specified in the appropriate appendix. Such information shall not duplicate information contained in environmental, safety and reliability, and air quality sections of the application.

(b) Upon filing of the application, each agency responsible for enforcing the applicable mandate shall assess the adequacy of the applicant's proposed compliance measures to determine whether the facility will comply with the mandate. The commission staff shall assist and coordinate the assessment of the compliance plan to ensure that all aspects of the facility's compliance with applicable laws are considered.

(c) The applicant's proposed compliance measures and each responsible agency's assessment of compliance shall be presented and considered at hearings on the application held pursuant to section 1748.

(d) If the applicant or any responsible agency asserts that an applicable mandate cannot be complied with, the commission staff shall independently verify the non-compliance, and advise the commission of its findings in the hearings.

DO NOT WRITE IN THIS SPACE

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25539. Reference: Public Resources Code Sections 25519, 25520, 25523, 25525.

1744.5. Air Quality Requirements; Determination of Compliance.

(a) The applicant shall submit in its application all of the information required for an authority to construct under the applicable district rules, subject to the provisions of Appendix B, part (k) of these regulations.

(b) The local air pollution control officer shall conduct, for the commission's certification process, a determination of compliance review of the application in order to determine whether the proposed facility meets the requirements of the applicable new source review rule and all other applicable district regulations. If the proposed facility complies, the determination shall specify the conditions, including BACT and other mitigation measures, that are necessary for compliance. If the proposed facility does not comply, the determination shall identify the specific regulations which would be violated and the basis for such determination. The determination shall further identify those regulations with which the proposed facility would comply, including required BACT and mitigation measures. The determination shall be submitted to the commission within 240 days (or within 180 days for any application filed pursuant to sections 25540.2 and 25540.6 of the Public Resources Code) from the date of the filing.

(c) The local district and the Air Resources Board shall provide a witness at the hearings held pursuant to section 1748 to present and explain the determination of compliance.

(d) Any amendment to the applicant's proposal related to compliance with air quality laws shall be transmitted to the APCD and ARB for consideration in the determination of compliance.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25539. Reference: Public Resources Code Sections 25519, 25520, 25521, 25523, 25525.

1745. Location of Hearings, Conferences, Workshops.

Any hearings, or formal conferences held pursuant to this article, shall be held in either Sacramento, San Francisco, Los Angeles, or San Diego, whichever is nearest the proposed site. Such proceedings may, in addition, be held in the county or counties in which the proposed site and related facilities are to be located.

NOTE: Authority: Public Resources Code Section 25218. Reference: Public Resources Code Section 25521.

1746. Prehearing Meetings; Purposes.

(a) No sooner than 30 days after the application is filed the presiding member may authorize the staff to initiate informal, voluntary meetings with the applicant, other parties, and interested agencies on matters relevant to

the application. Such meetings may include workshops, site visits, or other information exchanges.

(b) All meetings shall be noticed pursuant to section 1710 of these regulations and shall be open to the public. The notice shall list the topics and purposes of the meetings. Where such meetings are intended to discuss social, economic, or other impacts on communities surrounding a proposed site, they shall be held in or near the communities affected.

(c) Such meetings may be held for any of the following purposes:

(1) To allow parties to solicit and exchange information relevant to the commission's review of the application;

(2) To allow parties to identify areas of factual and legal agreement;

(3) To allow parties to identify areas of disagreement, to refine issues, and to develop the positions and contentions of the parties; or

(4) To allow members of the public to recommend areas of inquiry to the parties, to identify issues, and to ask questions of the applicant, staff and parties concerning the siting proposal, the commission's siting procedures, and possible positions of the parties.

(d) The public adviser, and in the adviser's absence, the staff counsel, shall ensure that all persons are provided a reasonable opportunity to participate in the discussions of topics at each meeting.

(e) The presiding member may require the parties to report periodically on the scope, purpose, and progress of such meetings. Any person dissatisfied with the manner in which such meetings are being conducted may petition the presiding member to take remedial action.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25539. Reference: Public Resources Code Sections 25216.5, 25519, 25539.

1747. Prehearing Conferences; Hearing Order.

The committee shall hold one or more prehearing conferences with all parties and interested agencies to establish procedures, identify issues, and set schedules for hearings on the application.

(a) The presiding member shall request the applicant to indicate when it will be prepared to present its evidence in support of certification, and shall request the staff and each participating agency to indicate when each will be prepared to present the results of its assessments to the commission.

(b) Parties who have agreed on statements of facts shall make such statements, and lists of probable sponsoring witnesses, available to all interested persons at the prehearing conference. To the extent practical, such statements should be served on all parties five days prior to the prehearing conference.

DO NOT WRITE IN THIS SPACE

(c) Parties who have agreed on a statement of issues requiring adjudication shall submit such statements at the prehearing conference. The presiding member may direct the staff to present at the conference a statement of issues which the staff believes must be resolved in the applicant's favor before certification is granted. The staff statement shall not be binding on the committee.

(d) The presiding member, in consultation with other committee members, shall prepare a hearing order to guide the hearings. The order shall set forth the schedule and procedures for hearings on the application, indicate the order of presentation of the parties and interested agencies, and identify the issues to be addressed in the hearings.

(e) This section shall not preclude parties from agreeing to and offering additional statements of facts and issues during the hearings.

NOTE: Authority: Public Resources Code Sections 25516.5, 25518, 25539. Reference: Public Resources Code Sections 25210, 25211, 25521.

1748. Hearings; Purposes; Burden of Proof.

No earlier than ninety (90) days after the filing of the application, the committee shall commence hearings on the application.

(a) The hearings shall be used to identify significant adverse impacts of the proposal on the environment which were not identified in proceedings on the notice of intention and shall assess the feasibility of measures to mitigate the adverse impacts. The applicant's environmental information and staff and agency assessments required by section 1742 shall be presented.

(b) The hearings shall consider whether the facilities can be constructed and operated safely and reliably and in compliance with applicable health and safety standards, and shall assess the need for and feasibility of modifications in the design, construction, or operation of the facility or any other condition necessary to assure safe and reliable operation of the facilities. The applicant's safety and reliability information and staff and agency assessments required by section 1743 shall be presented.

(c) The hearings shall consider whether the facilities can be constructed and operated in compliance with other standards, ordinances, regulations and laws and land use plans applicable to the proposed site and related facility. The applicant's proposed compliance measures and the staff and agency assessments required by section 1744 shall be presented. The determination of compliance required by section 1744.5 shall also be presented.

(d) The hearings shall consider whether the proposed facilities are in conformity with the level of electricity demand adopted pursuant to section 25309(b) of the Public Resources Code. The applicant and staff shall both present evidence in support of their positions on this issue.

(e) Except where otherwise provided by law, the applicant shall have the burden of presenting sufficient substantial evidence to support the findings and conclusions required for certification of the site and related facility.

(f) The proponent of any additional condition, modification, or other provision relating to the manner in which the proposed facility should be designed, sited, and operated in order to protect environmental quality and ensure public health and safety shall have the burden of making a reasonable showing to support the need for and feasibility of the condition, modification, or provision. The presiding member may direct the applicant and/or staff to examine and present further evidence on the need for and feasibility of such modification or condition.

(g) Any member or any party may move the presiding member to incorporate any part of the evidentiary record of the notice proceeding or to take official notice of the final report and decision of the commission during the notice proceeding. Any party to the application proceeding shall be provided a reasonable opportunity to present arguments for or against any such motion.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25539, 25541.5. Reference: Public Resources Code Sections 21080.5, 25519, 25521, 25525, 25541.5.

31919-750 3-79 2500 Δ o

1748.5 Environmental Review; Staff Responsibilities.

(a) The staff shall assess the environmental effects of the applicant's proposal and review the information provided by the applicant and obtained from other sources. Based upon its independent studies and analysis, the staff shall assess the completeness of the applicant's proposed mitigation measures and assess the need for, and feasibility of, additional or alternative mitigation measures.

(b) The staff shall present the results of its environmental assessments in a report (or exhibit) to be offered as evidence at the hearings held under section 1748.

(c) The staff report shall be written to inform interested persons and the commission of the environmental consequences of the proposal using available mitigation measures, and to assist the presiding member in preparing the committee report required by section 1749. The staff report shall indicate the staff's views on the environmental issues affecting a decision on the applicant's proposal.

(d) The staff shall monitor the assessment of environmental factors by interested agencies and shall assist and supplement the agencies' assessment to ensure a complete consideration of significant environmental issues in the proceeding.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25539, 25541.5. Reference: Public Resources Code Sections 21080.5, 25519, 25520, 25521, 25541.5.

1749. Presiding Member's Report; Distribution; Comment Period; Optional Hearings.

(a) At the conclusion of the hearings, the presiding member, in consultation with the other committee members shall prepare a report on the application based upon evidence presented in the hearings. The report shall be published and within 15 days distributed to interested agencies, parties, and to any person who requests a copy.

(b) The report shall contain a summary description of the proposal, a summary of the application proceeding, and a summary of the evidence presented on significant issues in the proceeding.

(c) The report shall contain a discussion of the key environmental factors and issues related to the applicant's proposal which the committee believes are important to a decision on the application. The report shall include the committee's proposed findings and conclusions on each environmental issue. The report shall describe the significant adverse environmental impacts of the proposal and shall discuss the merits of alternative mitigation measures proposed to lessen each such impact.

(d) Any person may submit written comments on the published report. The presiding member shall set a comment period of at least 45 days from the date of distribution.

(e) The presiding member may schedule one or more public hearings to receive comment on the report, and if reasonably necessary to make a decision shall take additional testimony on issues raised in the report. Such hearings, if any, shall conclude no later than 90 days after release of the report.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25539, 25541.5. Reference: Public Resources Code Sections 21080.5, 25521, 25523, 25541.5

1750. Proposed Decision.

After the conclusion of the comment period, the presiding member, in consultation with the other committee members, shall prepare a proposed decision on the notice. The proposed decision shall be forwarded to the full commission and distributed to all parties, interested agencies, and to any person who requests a copy.

NOTE: Authority: Public Resources Code Section 25218, 25539. Reference: Public Resources Code Sections 25522.

1751. Proposed Decision; Basis.

(a) The proposed decision shall be based exclusively upon the evidentiary record of the proceeding.

(b) The proposed decision shall contain reasons supporting the decision and reference to the bases for each of the findings and conclusions in the decision.

NOTE: Authority: Public Resources Code Section 25218. Reference: Public Resources Code Section 25522.

1752. Proposed Decision; Contents.

The proposed decision shall contain the presiding member's recommendation on whether the application should be approved, and proposed findings and conclusions on each of the following:

(a) Whether and the circumstances under which the proposed facilities are in conformity with the 12-year forecast of statewide and service area electric power demands adopted pursuant to section 25309(b) of the Public Resources Code.

(b) The extent to which the proposed facilities are in compliance with:

(1) Public health and safety standards, including any standards adopted by the commission;

(2) Applicable air and water quality standards; and

(3) Any other applicable local, regional, state, and federal standards, ordinances, regulations or laws.

(c) Necessary modifications, mitigation measures, conditions, or other specific provisions relating to the manner in which the proposed facilities are to be designed, sited, and operated in order to:

(1) Protect environmental quality;

(2) Assure safe and reliable operation of the facility; and

(3) Comply with applicable standards, ordinances, regulations or laws.

(d) Unless the commission finds that such provisions would result in greater adverse effect on the environment or would be infeasible, specific provisions to meet the objectives of the California Coastal Act, as may be specified in a report submitted by the California Coastal Commission pursuant to section 30413(d) of the Public Resources Code, or to meet the requirements of Division 19 (commencing with §29000) of the Public Resources Code or Title 7.2 (commencing with §66600) of the Government Code as may be specified in the report submitted by the San Francisco Bay Conservation and Development Commission pursuant to subdivision (d) of section 66645 of the Government Code.

(e) With respect to controlling population density in areas surrounding the proposed facilities, proposed findings on each of the following:

(1) Whether existing governmental land use restrictions are of a type necessary and sufficient to guarantee the maintenance of population levels and land use development over the lifetime of the facilities which will ensure the public health and safety;

(2) Whether, in the case of a nuclear generating facility, the area and population density criteria specified by the United States Nuclear Regulatory Commission for assuring public health and safety are sufficiently definitive for valid land use planning requirements; and

(3) Whether the commission should require as a condition of certification that the applicant acquire, by grant or contract, the right to prohibit development of privately owned lands in areas surrounding the facilities in order to control population densities and to protect public health and safety.

(f) With respect to any facility to be located in the coastal zone or any other area with recreational, scenic, or historic value, proposed findings and conditions relating to the area that shall be acquired, established, and maintained by the applicant for public use and access; and with respect to any facility to be located along the coast or shoreline of any major body of water, proposed findings and conditions on the extent to which the proposed

facility shall be set back from the shoreline to permit reasonable public use and to protect scenic and aesthetic values.

(g) With respect to any of the following areas:

(1) State, regional, county or city parks;

(2) Wilderness, scenic, or natural reserves;

(3) Areas for wildlife protection, recreation or historic preservation;

(4) Natural preservation areas in existence as of January 7, 1975;

(5) Estuaries in an essentially natural and undeveloped state;

Findings and conclusions on whether the facility will be consistent with the primary land use of the area; whether the facility, after consideration of feasible mitigation measures, will avoid any substantial adverse environmental effects; and whether the approval of the public agency having ownership or control of the land has been obtained.

(h) With respect to any facility to be sited in a coastal zone location designated by the California Coastal Commission pursuant to section 30413(b) of the Public Resources Code, or in a location designated by the Bay Conservation and Development Commission pursuant to subdivision (b) of section 66645 of the Government Code, findings on whether the approval of the public agency having ownership or control of the land has been obtained, and findings of the California Coastal Commission or the BCDC, respectively, on each of the following:

(1) Whether the facility will be consistent with the primary land use of the area; and

(2) Whether the facility, after consideration of feasible mitigation measures, will avoid any substantial adverse environmental effects;

(i) Where a nuclear powered facility is proposed, findings on;

(1) Whether and when the facility will require reprocessing of nuclear fuel rods or off-site storage of such fuel rods in order to provide continuous onsite fuel core reserve storage capacity;and

(2) Whether and when facilities with adequate capacity to reprocess nuclear fuel rods, if such reprocessing is required, and facilities with adequate capacity to store such fuel, if such storage is approved by an authorized agency of the United States, are or will be in actual operation at the time the nuclear powered facility requires such reprocessing or storage.

(j) Provisions for restoring the site as necessary to protect the environment, if the commission denies approval of the application.

(k) Findings on the extent to which the applicant has complied with the recommended minimum standards of efficiency for operation of the facility, approved pursuant to section 25402(d) of the Public Resources Code.

(l) With respect to any facility which does not comply with an applicable state, local or regional standard, ordinance or law, findings and conclusions on whether the noncompliance can be corrected or eliminated; and if such noncompliance cannot be corrected, findings on both the following:

(1) Whether the facility is required for public convenience and necessity; and

(2) Whether there are no more prudent and feasible means of achieving such public convenience and necessity.

(m) Any other findings and conclusions relevant to the commission's decision.

NOTE: Authority: Public Resources Code Sections 25218, 25539, 25541.5. Reference: Public Resources Code Sections 21080.5, 25523, 25524.1, 25524.2, 25525 through 25529, 25541.5.

1752.3. Proposed Decision; Air Quality Findings.

(a) The proposed decision shall include findings and conclusions on conformity with all applicable air quality laws, including required conditions, based upon the determination of compliance submitted by the local air pollution control district.

(b) If the determination of compliance concludes that the facility will comply with all applicable air quality requirements, the commission shall include in its certification any and all feasible conditions necessary to ensure compliance. If it concludes that the proposed facility will not comply with all applicable air quality requirements, the commission shall direct its staff to meet and consult with the agency concerned to attempt to correct or eliminate the noncompliance.

(c) If the noncompliance cannot be corrected or eliminated, the commission shall determine whether the facility is required for the public convenience and necessity and whether there are not more prudent and feasible means of achieving such public convenience and necessity. In such cases, the commission shall require compliance with all provisions and schedules required by the Clean Air Act and compliance with all applicable air quality requirements which in the judgment of the commission, can be met.

NOTE: Authority: Public Resources Code Sections 25218, 25539, 25541.5. Reference: Public Resources Code Sections 21080.5, 25523, 25525.

DO NOT WRITE IN THIS SPACE

1752.5. Proposed Decision; CEQA Findings.

The proposed decision shall contain the committee's responses to significant environmental points raised during the application proceeding. The commission shall not certify any site and related facilities for which one or more significant adverse environmental effects have been identified unless the commission makes one or more of the following findings:

(a) With respect to matters within the authority of the commission, that changes or alterations have been required in, or incorporated into, the proposed facility which mitigate or avoid the significant environmental effects of the facility identified in the proceeding.

(b) With respect to matters not within the commission's authority but within the authority of another agency, that changes or alterations required to mitigate such effects have been adopted by such other agency, or can and should be adopted by such other agency.

(c) That specific economic, social, or other considerations make infeasible the mitigation measures or project alternatives identified in the notice or application proceeding.

NOTE: Authority: Public Resources Code Sections 25218, 25539, 25541.5. Reference: Public Resources Code Sections 21080.5, 21081, 25523, 25541.5.

1753. Proposed Decision; Findings for a Multiple Facility Site.

With respect to any application for a facility to be located on a potential multiple facility site, as determined pursuant to section 25516.5 of the Public Resources Code, if the additional generating capacity of the facilities is in excess of the maximum allowable capacity established by the commission pursuant to section 25516.5, the proposed decision shall contain findings and conclusions on whether exceeding the maximum allowable capacity will increase adverse environmental impacts or create technological, seismic, or other difficulties beyond those found acceptable in the commission's findings on the notice for that site pursuant to sections 25516 and 25516.5.

NOTE: Authority: Public Resources Code Section 25218. Reference: Public Resources Code Section 25524.5.

1754. Hearings on Proposed Decision.

(a) Hearings on the proposed decision shall be held before the full commission no sooner than 15 days and no later than 30 days after the publication and distribution of the proposed decision. The hearings shall be conducted for the purpose of considering final oral and written statements of the parties and final comments and recommendations from interested agencies and members of the public.

(b) The chairman may require that certain statements by parties and other persons be submitted in writing in advance of the hearings. The commission shall not consider new or additional evidence at the hearings under

this section unless due process requires or unless the commission adopts a motion to reopen the evidentiary record. In such case, the commission shall afford such notice to the parties as is fair and reasonable under the circumstances.

(c) Any member may propose an alternative decision, including supporting findings and conclusions. Such alternative may also be considered at the hearings under this section but need not be acted upon until the commission makes its final decision.

NOTE: Authority: Public Resources Code Section 25218. Reference: Public Resources Code Section 25523.

1755. Final Decision.

(a) At the conclusion of the hearings under section 1754, the commission shall hold one or more public hearings for the purpose of adopting, or amending and adopting, any proposed decision considered in previous hearings. The decision shall be in writing, shall contain all of the findings required by these regulations, and shall be based on the evidentiary record of the proceeding.

(b) The decision shall not certify any facility considered in the proceeding unless the commission's findings pursuant to subsections (a), (f), (g), and (l) of section 1752 are all in the affirmative.

NOTE: Authority: Public Resources Code Sections 25218, 25541.5. Reference: Public Resources Code Sections 25523, 25524, 25524.1, 25524.2, 25525 through 25529, 25541.5.

1756. Schedule for Review of Applications.

(a) The commission shall issue its decision on any application filed pursuant to sections 25540.2 and 25540.6 of the Public Resources Code within 12 months from the date of the filing.

(b) It shall be the policy of the commission to expedite the consideration of all other applications for certification wherever practical in order to allow a decision to be made within twelve (12) months (or less) from the date of filing. Where the complexity or magnitude of an applicant's proposal requires additional public review and consideration, an expedited schedule may be impossible or undesirable. Where the nature of the case allows, the presiding member can be expected to pursue a schedule similiar to the one set forth below:

	Event	Days from Filing: One Year Schedule	Days from Filing: Statutory Requirement
(1)	File Application	-0-	-0-
(2)	Commence Staff Meetings	30	No requirement
(3)	Commence Prehearing Conference	60	No requirement
(4)	Commence Hearings	90	90 to 240
(5)	Conclude Hearings	150	No requirement
(6)	Publish Committee Report	210	No requirement
(7)	End Comment Period	270	No requirement
(8)	Publish Proposed Decision	300	No requirement
(9)	Hold Final Hearings	330-345	360 (12 months)
(10)	Issue Decision	360	540 (18 months)

(c) The presiding member may vary the schedule for an individual proceeding, within the limitations of the Warren-Alquist Act, in order to fulfill the purposes of this section and the objectives of the Act. It shall be the responsibility of the presiding member to see that hearings, reports, and proposed decisions are completed in a timely fashion in order to achieve these goals.

NOTE: Authority: Public Resources Code Section 25218. Reference: Public Resources Code Sections 25522, 25540.2, 25540.6.

1757. Multiple-Facility Sites, Review Schedule.

(a) In reviewing an application for an additional facility at a potential multiple facility site, the commission shall undertake a reconsideration of the findings and conclusions in the final report on the notice for the site and related facility applied for, based on current conditions and other reasonable and feasible alternatives to the proposed facility.

(b) The commission shall commence public hearings no later than 60 days after filing of the application and conclude such hearings no later than 150 days after the filing.

(c) The commission shall issue its decision on the matters under reconsideration within 180 days from the filing of the application.

(d) Upon an affirmative decision pursuant to this section, the commission shall follow the procedures and schedules for review of the application as provided in this article and article 1.

NOTE: Authority: Public Resources Code Section 25218. Reference: Public Resources Code Section 25520.5.

1760. Environmental Impact Report.

The commission shall prepare an environmental impact report (EIR) and shall comply with the EIR procedures of the California Environmental Quality Act (Pub. Res. Code §§21000, et seq.) and this section until the commission's regulatory program is certified by the Secretary of the Resources Agency, pursuant to sections 21090.5 and 25541.5 of the Public Resources Code. The commission shall also prepare an EIR and comply with such procedures (1) in any application proceeding commenced prior to the certification of these regulations pursuant to sections 21080.5 and 25541.5 of the Public Resources Code and (2) upon agreement with the applicant, in any application proceeding where the commission determines that public participation in the proceeding and review of environmental considerations would be enhanced by an EIR and such procedures. If an EIR is prepared, the reports required by sections 1748.5 and 1749 shall not be required, and the following procedures shall apply:

(a) Within two hundred and ten days of the filing of the application, the commission shall publish and distribute for public comment a draft environmental impact report (draft EIR) on the site and related facilities proposed in the application.

(1) The draft EIR shall be prepared, published and distributed for public comment in accordance with the provisions of the California Environmental Quality Act (Public Resources Code Sections 21000 et seq.), the State EIR guidelines (14 Cal. Admin. Code 1500 et seq.), and the commission's EIR guidelines (20 Cal. Admin. Code §§ 2300 et seq.).

(2) The draft EIR shall rely upon information available from the notice and application proceedings and obtained by independent staff studies.

(3) The draft EIR shall incorporate by reference the report of feasible alternatives prepared by the staff in the notice proceeding and shall include the findings and conclusions regarding such alternatives contained in the final report and decision on the notice. If no such report was prepared, or there was no notice required for the facility, the staff shall prepare such a report for the draft EIR.

(4) The presiding member, in consultation with the executive director, shall take such steps as necessary to permit adequate public review of and comment on the draft EIR, and shall specify the minimum period for public review and comment which shall be at least forty-five (45) days.

DO NOT WRITE IN THIS SPACE

(5) If during the course of the application proceeding substantial changes or modifications are made in the site and related facility proposal which would require substantial changes in the EIR, a revised draft EIR shall be immediately prepared and distributed for public comment pursuant to this section.

(b) At the hearings held pursuant to section 1748, the committee shall, if necessary, resolve any substantial dispute over the contents of the draft EIR.

(c) The commission shall prepare, publish, and distribute for public review, concurrent with the proposed decision, a final environmental impact report (final EIR) on the site and related facilities proposed in the application. The final EIR shall be prepared under the direction of the presiding member.

(1) The final EIR shall update the draft EIR, as necessary to reflect evidence presented in the hearings, including comments on the draft EIR, and committee responses to significant comments on the draft EIR.

(2) The commission shall consider the final EIR concurrently with the proposed decision at hearings held pursuant to section 1754.

(3) The commission shall certify the final EIR prior to adoption of the decision on the application.

NOTE: Authority: Public Resources Code Sections 25216.5, 25218, 25539. Reference: Public Resources Code Sections 21100, 25519, 25541.5.

1765. Projects Exempted from Notice Requirements; Application Procedures.

The consideration of site and related facilities subject to the provisions of section 25540.6 shall comply with the provisions of articles 1 and 3 of this subchapter except in the following respects:

(a) A final decision shall be issued pursuant to section 1754 within twelve (12) months of filing of such application, or at such later time as is mutually agreed by the commission and the applicant.

(b) The schedule for proceedings on the application shall be determined by order of the presiding member.

(c) In addition to the information required by section 1704 and Appendix B, the applicant shall include in its application a section entitled "Project Alternatives" containing a discussion of the availability and feasibility of alternative sites and related facilities which could satisfy the purposes of the applicant's proposal and which may substantially lessen any significant environmental impacts anticipated for the proposal. The applicant may limit its information to facilities using technologies determined to be commercially available by the commission, if such determinations have been made.

(d) Hearings on the application shall be held for the additional purpose of permitting a party to present information on the feasibility of available site and facility alternatives to the applicant's proposal which substantially lessen the significant adverse impacts of the proposal on the environment. The presiding member shall use the determinations, findings, and conclusions available from any generic proceedings on the commercial availability of technologies to determine which alternatives merit consideration in the hearings, which require preliminary showings as to their commercial availability, and which require resolution of issues affecting their feasibility.

(e) An affirmative finding of conformity with the adopted forecast and assessment of demand shall not be required for facilities subject to the provisions of section 25540.6(e).

(f) Facilities subject to provisions of Section 25540.6 need only comply with those provisions of Appendix B regarding the facility for which certification is being sought.

NOTE: Authority: Public Resources Code Section 25218. Reference: Public Resources Code Sections 25540 through 25540.6.

1768. Notice of Decision; Filing with Resources Agency.

The executive director shall file a notice of the final decision with the Secretary of the Resources Agency.

NOTE: Authority: Public Resources Code Section 25541.5. Reference: Public Resources Code Section 21080.5.

Article 4. Additional Provisions Applicable to Geothermal Notices and Applications

A. General Provisions

1801. Applicability of Regulations.

Except as otherwise provided in this article, the provisions of Articles 1, 2, and 3 of this subchapter shall apply to the consideration of all notices and applications for geothermal power plants, associated transmission lines, and appurtenant facilities.

NOTE: Authority Cited: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25500-25540.5, Public Resources Code.

1802. Policies of the Commission on the Siting of Geothermal Power Plants.

In carrying out the provisions of this article it shall be the policy of the commission:

(a) To promote the accelerated development of economically feasible and environmentally acceptable geothermal power plants;

(b) To establish a 12-month certification process for the consideration of geothermal applications for projects for which a resource supply has been confirmed;

(c) To enhance public participation in decisions relating to the development of geothermal energy in California to ensure a thorough and balanced consideration of relevant issues;

(d) To assist and cooperate with local permitting agencies in the preparation of environmental documents relating to geothermal power plants, to encourage local agencies to prepare full-field environmental impact reports at the earliest practical time, to provide such agencies with technical and financial assistance wherever possible in the preparation of such reports; and

(e) To avoid the duplication of environmental analyses by coordinating with local, state, and federal agencies in the preparation of environmental documents, including the use of documents prepared by such agencies to the extent practicable.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25001, 25005, 25006, 25540-25540.5, 25600(e), Public Resources Code.

1803. Alternative Certification Processes for Geothermal Power Plants.

(a) Eighteen-month certification process. The commission shall issue its decision on a geothermal notice as specified in section 1728 of article 2 within nine months from the date of filing such notice, and except as provided

in subsection (b), shall issue its final decision on an application as specified in section 1755 of article 3 within nine months from the date of filing of the application, or at such later times as are mutually agreed upon by the commission and the applicant.

NOTE: Authority: Sections 25213, 25218, 25539, Public Resources Code. Reference: Section 25540.2(b), Public Resources Code.

(b) Twelve-month certificationn process. If the applicant can demonstrate at the outset of proceedings on an application filed pursuant to Public Resources Code section 25540.2(a) that the site is reasonably capable of producing geothermal resources in commercial quantities, no notice shall be required for such site and related facilities, and the application shall be processed under the provisions of section 1765 of these regulations. In such case, the commission shall issue its decision as specified in section 1755 of article 3 within 12 months of the filing of the application. Any application filed pursuant to Public Resources Code section 25540.2(a) shall explicitly state that a commercial resource has been discovered and that a 12-month process is requested.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Section 25540.2(a), Public Resources Code.

1804. Special Geothermal Definitions.

In addition to the definitions contained in section 1702 and unless otherwise indicated, the following definitions shall apply to this article.

(a) "Administrative record" means all materials that have been entered into the docket on the proceeding. The administrative record includes but is not limited to the hearing record (as defined below).

(b) "Applicant" means any person or persons who propose to construct or modify any geothermal power plant or facility pursuant to the provisions of this article. Any person who elects to join in filing a notice for any reason other than to construct a geothermal facility shall not be considered an applicant pursuant to this article.

(c) "Appurtenant facility" means equipment connected to or essential to the operation of the electrical generating facility. Exploratory, development, and production wells, resource conveyance lines, and other related equipment used in connection with a geothermal exploratory project or geothermal field development project are not appurtenant facilities for the purposes of these regulations.

(d) "Areas of critical concern" are special or unique habitats or biological communities that need protection from potential adverse effects resulting from project development and which may be identified by local, state, and federal agencies with resource responsibility within the project area, or by educational institutions, museums, biological societies, and special interest groups with specific knowledge of resources within the

project area. This category includes, but is not limited to, wildlife refuges, wetlands, thermal springs, endangered species habitats, and areas recognized by the California Natural Area Coordinating Council and the refuges, wetlands, thermal springs, endangered species habitats, and areas recognized by the California Natural Area Coordinating Council and the Governor's Office of Planning and Research.

(e) "Commmercial quantities of a geothermal resource" means enough geothermal steam or hot water resources from a sufficient number of completed wells to support a reasonable conclusion that a proposed power plant will be able to achieve the applicant's estimated gross capacity over the life of the project.

(f) "CEQA" means the California Environmental Quality Act of 1970 commencing with section 21000 of the Public Resources Code.

(g) "Performance criteria" means performance goals for which the applicant proposes to design the facilities.

(h) "Full-field environmental impact report" means an environmental impact report which considers in detail the impacts of the development of a geothermal field, as defined by the resource developer, including but not limited to the construction of well pads, the drilling and operation of geothermal wells, and the construction and operation of geothermal resource conveyance lines, and which generally considers the construction, operation, and maintenance of one or more geothermal power plants within such geothermal field.

(i) "Generating capacity" means the maximum net operating capacity of an electric generating facility, after consideration of electrical operating requirements for the facilities and the associated geothermal field.

(j) "Geothermal field" means the geographic area containing the wells that supply steam and/or hot water to one or more geothermal power plants proposed in a notice or application.

(k) "Geothermal power plant" means any thermal power plant, as defined under section 25120 of the Public Resources Code, which uses geothermal resources as the principal energy source for the generation of electrical power.

(l) "Hearing record" means the materials upon which the commission may make a finding. The hearing record includes:

(1) Written and oral testimony presented at a hearing, including direct and cross-examination of a witness.

(2) Supporting documentary evidence or exhibits submitted with testimony.

(3) Public comment offered at a hearing or entered into the record at a hearing.

(4) Public agency comment offered at a hearing or entered into the record of a hearing.

(5) Matters of which official notice has been taken.

(6) And other evidence that the committee accepts at a hearing.

(m) "Environmental documents" means draft environmental impact reports (draft EIR), final environmental impact reports (final EIR), initial studies, draft and final negative declarations, notices of preparation, notices of determination, notices of exemption and statements of findings and overriding considerations, and the documentation prepared by the commission or its staff for a certified regulatory program in compliance with section 21080.5 of the Public Resources Code.

(n) "Twelve month process" means the consideration, and the granting or denial of the certification, within 12 months from the filing of an application for a geothermal plant for which no notice is required pursuant to Public Resources Code section 25540.2(a).

(o) "Impact area" means the area which is potentially impacted by the construction, modification, or operation of a geothermal power plant, appurtenant facilities, and associated transmission lines.

(p) "KGRA" means Known Geothermal Resource Area as defined by the United States Geological Survey.

(q) "MCE" means Maximum Credible Earthquake as defined by the United States Geological Survey.

(r) "MPE" means Maximum Probable Earthquake as defined by the United States Geological Survey.

(s) "Plant maturation period" means the initial break-in period for a geothermal power plant which includes the period from commencement of operation to the time required to achieve the anticipated capacity factor.

(t) "Reconnaisance survey" means a survey as defined by the Federal Power Commission in Archaeological and Historical Investigation for Energy Facilities: A State of the Art, 1977.

(u) "Resource conveyance line" means the pipelines that transport the steam and/or hot water from the well to the geothermal power plant or from the power plant to a holding pond for reinjection.

(v) "Species of special concern" means candidate rare or endangered species that may need protection from potential adverse effects resulting from project development and which may be identified by local, state, and federal agencies with resource responsibility within the project area or by educational institutions, museums, biological societies, and special interest

groups with specific knowledge of resources within the project area. In addition to species designated pursuant to state or federal law, this category includes, but is not limited to, those rare and endangered plant species recognized by the Smithsonian Institution and the California Native Plant Society.

(w) "Thermal spring" means any natural or artificial spring outlet whose average temperature is at least 15°F above the mean annual temperature of the air at the same locality.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Section 25539, Public Resources Code.

1805. Information Requirements for Geothermal Notices and Applications

(a) General requirements. All geothermal notices and applications shall conform to the following requirements:

(1) Except where otherwise indicated, any descriptions, statements, analyses, and discussions required in the notice or application shall extend to the geothermal power plant and associated geothermal field, including wells that supply the power plant or reinject geothermal fluids, resource conveyance lines, major access roads, storage sites, switchyards, waste disposal sites, and all other structures or improvements which are appurtenant to the power plant or transmission lines.

Comment: Information and data concerning the associated geothermal field are required to the extent that they relate to the environmental impacts of the entire project and to the reliability of the proposed power plant. In most cases, incorporation of environmental impact reports on the geothermal field will fulfill the requirements for field information.

(b) Information requirements for geothermal notices. The notice shall contain all the information specified in Appendix A of this article. Where required information on any aspect of the proposed geothermal power plant is unavailable, the notice may contain typical operating data or projections representative of the size and type of the facilities proposed, together with a discussion of the applicability of the data to the proposed facilities, an identification of limitations inherent in the representative data, an explanation for the unavailability of the required information, and an estimate of when such information will be available.

Comment: The substitution of representative or projected information for the information requested in Appendix A is intended to allow and encourage the filing of a notice prior to the discovery or confirmation of commercial resources. The 18-month certification process described in section 1803(a) will apply to this situation. Appendix A recognizes that information necessary for a final certification decision will not be available at the notice stage.

(c) Information requirements for geothermal applications filed following an NOI decision. The application for certification of a geothermal site and related facilities shall contain all the information required by Appendix B to

this article and any information required by the decision on the notice adopted pursuant to section 1728. The application shall also contain all of the information required for an authority to construct under the applicable new source review rule.

(d) Information requirements for geothermal applications filed pursuant to Public Resources Code section 25540.2(a) Any application filed for a geothermal power plant site and related facilities for which no notice is required pursuant to Section 25540.2(a) of the Public Resources Code shall contain all of the information specified in Appendix C to this article. The application shall also contain all of the information required for an authority to construct under the applicable new source review rule.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25502, 25504, 25519, 25520, 25540-25540.5, Public Resources Code.

1806. Schedule for Review of Geothermal Notices.

(a) The commission shall issue its decision on a geothermal notice, pursuant to section 1728 of these regulations, not later than 9 months after the notice is filed. Notwithstanding the time requirements of sections 1724, 1725, and 1726, the presiding member shall schedule the issuance of the summary and hearing order of adjudicatory hearings, and final report on a geothermal notice to allow a final decision within 9 months of the date the notice is filed.

(b) Following is a suggested schedule for the review of geothermal notices of intention. The schedule is advisory only, and shall not be deemed to limit the presiding member's discretion to fashion a schedule that meets the needs of a particular case, so long as the purpose and objectives of proceedings on the notice are accomplished.

	Event	Day
1.	Submit Notice For Review of Contents	0
2.	Notice Docketed or Returned	20
3.	Informational Presentations	30-45
4.	Nonadjudicatory Hearings	75-120
5.	Summary and Hearing Order	150
6.	Adjudicatory Hearings	180-210
7.	Final Report	240
8.	Hearings on Final Report	255
9.	Decision	270

31918-750 3-75 26M △ c

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Section 25540.2(b), Public Resources Code.

1807. Schedule for Review of Applications Following Approval of a Geothermal Notice.

(a) Notwithstanding the time requirements in article 3, the commission shall schedule prehearing conferences, hearings, the issuance of the committee report, the issuance of a proposed decision, and final hearings so as to allow a final decision within 9 months of the date the application is filed.

(b) Following is a suggested schedule for a 9 month process on a geothermal application. The schedule is advisory, and shall not be deemed to limit the presiding member's discretion to fashion a schedule that meets the needs of a particular case.

	Event	Day
1.	File Application	0
2.	Commence Hearings	90
3.	Conclude Hearings	150
4.	Committee Report	180
5.	End Comment Period	225
6.	Proposed Decision	240
7.	Final Hearings	255
8.	Decision	270

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Section 25540.2(b), Public Resources Code.

1808. Schedule for 12-Month Review of Geothermal Applications

(a) The commission shall issue the decision on a geothermal application filed pursuant to section 25540.2 of the Public Resources Code not later than 12 months after the filing unless a later date is agreed to by the applicant and commission.

(b) Section 1756(b) provides a suggested schedule for the 12-month review of geothermal applications. The schedule is advisory only and shall not limit the presiding member's discretion to fashion a schedule that meets the needs of a particular case.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Section 25540.2(a), Public Resources Code.

31916-780 3-75 26M △ c

1809. Determination of Availability of Commercial Resource

(a) Within thirty (30) days of the filing of an application pursuant to Public Resources Code section 25540.2(a) and section 1803 of these regulations, the commission shall hold a hearing before a committee of the commission appointed by the chairman for the sole purpose of determining whether the proposed site is reasonably capable of supplying geothermal resources in commercial quantities. Such hearing shall be publicly noticed.

(b) The applicant shall present testimony, studies or other evidence in support of its contention that sufficient geothermal resources have been confirmed at the site. The staff shall also present its evaluation of the site's resource capabilities.

(c) The California Division of Oil and Gas (DOG) shall be requested to review the application and all well records filed with the division concerning wells completed at the site, and shall be requested to present at the hearing its conclusions, based on the professional experience of its personnel, as to whether the site is reasonably capable of providing geothermal resources in commercial quantities.

(d) The determination of the DOG shall be entitled to great weight, and shall be accepted by the committee unless the committee finds such conclusion, or the basis thereof, clearly erroneous.

(e) If the commission determines that the site is reasonably capable of providing geothermal resources in commercial quantities, the application shall be processed in accordance with section 1809 of these regulations.

(f) If the commission determines that the site is not reasonably capable of producing geothermal resources in commercial quantities, or that the applicant has failed to demonstrate that the site is reasonably capable of producing geothermal resources in commercial quantities, the applicant may, at its option, withdraw the application or request that the application be treated as a notice filed pursuant to section 1803(a). The document shall, as of the date such request is granted, be processed in accordance with sections 1807 and 1808.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Section 25540.2(b), Public Resources Code.

DO NOT WRITE IN THIS SPACE

B. Delegation of Geothermal Power Plant Siting Authority to Local Government

1860. Policy and Purpose.

(a) General. Pursuant to section 25540.5 of the Public Resources Code, the commission is permitted to delegate its siting authority over geothermal power plants and related facilities to county governments which have adopted geothermal elements to their general plans.

(b) Policy. It is the policy of the California Energy Commission to delegate its geothermal power plant siting authority to county governments which have demonstrated a capability to expeditiously process applications for geothermal power plants and/or geothermal field development projects, provided, however, that such county governments have formally adopted policies which are consistent with adopted policies of the commission with respect to the development of geothermal resources for the generation of electrical energy.

(c) Purposes. Delegation of the commission's geothermal power plant siting authority to county governments will maximize local control over development projects whose impacts are peculiarly local. The provisions of this article will ensure that local exercise of such control will occur in a manner that is consistent with the state's interests in a reliable supply of electrical energy and environmental maintenance. Further, a delegation pursuant to this article will vest permitting authority over both the geothermal field and the geothermal power plant in a single agency, thus allowing a consolidated review of all aspects of a geothermal project.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25003, 25540.5, Public Resources Code.

1861. Counties Elegible to Petition for Delegation of Authority.

(a) Any county government which has adopted a geothermal element to its general plan may petition the commission for delegation of the commission's exclusive authority to certify geothermal power plants and related facilities vested in section 25500 of the Public Resources Code.

(b) Two or more counties, each of which has adopted a geothermal element to its general plan and which have executed a joint powers agreement or its equivalent for the administration of such geothermal power plant siting authority as may be delegated by the commission, may jointly petition the Energy Commission for delegation of its exclusive authority to site its geothermal power plants and related facilities.

(c) Upon the delegation of geothermal power plant siting authority by the Energy Commission, the county government or governments which have petitioned for such delegation shall be exclusively responsible for administering and

deciding upon all applications for geothermal power plants and related facilities which are wholly located within the territorial jurisdiction of the petitioning county or counties until such time as the authority delegated pursuant to this article shall have been revoked pursuant to the provisions of section 1870.

(d) The provisions of this section shall not apply to any application for a geothermal power plant and related facilities which are not wholly located within the territorial jurisdiction of such counties that have been delegated siting authority pursuant to the provisions of this article. Applications for such facilities shall be filed with the commission.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Section 25540.5, Public Resources Code.

1862. Contents of Petition.

Every petition filed pursuant to section 1861 shall contain all of the following:

(a) A resolution approving and directing the submission of the petition adopted by the county board of supervisors;

(b) A copy of the geothermal element and the date of adoption;

(c) A written statement from the Governor's Office of Planning and Research that the geothermal element complies with the office's guidelines and/or criteria for geothermal elements;

(d) A description of the policy statements contained in the geothermal element with respect to the development of geothermal resources for the generation of electrical energy;

(e) A description of the procedures contained in the geothermal element for the implementation of the policies expressed in the element, and a discussion of the status of such implementation;

(f) A complete and detailed description of the program that the county seeks to have designated as an equivalent certification program for the orderly and efficient review of geothermal power plant applications. Such description shall indicate the manner in which the program complies with each of the requirements set forth in section 1863 below;

(g) A detailed description of the procedures will be employed to comply with the provisions of the California Environmental Quality Act (Public Resources section 21000 et seq.);

(h) The level of staffing required to carry out the responsibilities delegated pursuant to this article;

(i) A discussion of any additional staffing required by the administering agency, including job descriptions and duration of need;

(j) A discussion of funding required by the administering agency to process applications in accordance with the provisions of this article; and

(k) Such additional information as the county desires to submit.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Section 25540.5, Public Resources Code.

1863. Equivalent Certification Program Requirements.

No county program shall be designated as an equivalent certification program unless it contains provisions for all of the following:

(a) Certification of geothermal areas as multiple facility sites, if so applied for;

(b) Distribution of all applications to the commission and to each federal, state, and local agency having jurisdiction or special interest in matters pertinent to the proposed site and related facilities, as well as provisions for receipt of and response to the comments and recommendations of each such agency;

(c) Preparation and distribution of a written decision on each power plant application. Such written decision shall contain each of the findings and conclusions required by sections 1752-1753 of these regulations, and shall be based on the formal record of the proceeding;

(d) Public hearings, including provisions for adjudication of disputed issues of fact through testimony taken under oath and refutation by cross-examination;

(e) Formal intervention by any person with a legally recognizable interest in the outcome of the proceedings;

(f) Timely and orderly amendment of the program to reflect changes in law or commission certification requirements;

(g) Administration of and decision upon geothermal power plant applications within 12 months of the filing of such applications; and

(h) Appeal to the commission on any aspect of the decision of the county.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Section 25540.5, Public Resources Code.

1864. Commission Staff Analysis.

(a) The commission and its staff may participate in any aspect of county proceedings on an application for a geothermal power plant and related facilities if such application would have been filed with the commission but for the delegation of authority pursuant to this article.

(b) The Commission staff shall assist the county in assemblying a record adequate to support findings on each of the following:

(1) Conformity of the proposed power plant and appurtenant facilities with the 12-year forecast of statewide and service area electric power demands adopted pursuant to section 25309(b) of te Public Resources Code;

(2) Necessary modifications, mitigation messures, conditions or other specific provisions relating to the nmanner in which the proposed facilities are to be designed, sited, constructed and operated in order to assure reliability of operation or otherwise meet the need for electrical power;

(3) Whether the applicant has complied with load management standards applicable to the site nd related faccility adopted pursuant to section 25403.5 of the Public Resources Code; and

(4) The extent to which the applicant has complied with the recommended minimum standards of efficiency for operation of the facility approved pursuant to section 25402(d) of the Public Resources Code.

(c) The county may submit a written request for staff assistance in the technical evaluation of any issue presented in the proceedings, or in the conduct of the proceedings on the applications. Staff may render such assistance s it deems appropriate, provided however, that it shall indicate in writing its intention to do so within fifteen (15) days of the receipt of the county's request.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Section 25539, Public Resources Code.

1865. Air Quality Determinations.

Whenever any county is administering an application for a geothermal power plant and related facility pursuant to authority delegated by the commission, the air pollution control officer shall prepare and submit to such county its determination of compliance as specified in section 1774.5 within 180 days of the filing of the application.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Section 25539, Public Resources Code.

1866. Record of Proceedings.

The county counsel shall be responsible for ensuring the preparation of a record adequate to support all required findings and conclusions.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25539, 25540.5, Public Resources Code.

1867. Commission Action on Petition.

(a) Within twenty (20) days of the filing of a petition pursuant to section 1861, the executive director shall determine whether the petition contains the information specified in section 1862.

(1) If the executive director determines that the petition is complete, he or she shall so certify in writing and shall inform the petitioner.

(2) If the executive director determines that the petition is not complete, it shall be returned to the petitioner with a statement of its defects. The petitioner may correct the petition and resubmit it at any time.

(b) Unless the petition has been returned pursuant to (a)(2) above, the commission shall, within sixty (60) days of the filing of the petition, convene two hearings to allow representatives of the county explain each aspect of its proposed equivalent certification program, and to allow any interested party to offer testimony or comments. One (1) of the hearings shall be in the petitioner's county seat, and one (1) of the hearings shall be in the state capitol, except where the petitioner's county seat is the state capitol, in which case only one (1) such hearing, in the state capitol, shall be required. There shall be no less than ten (10) nor more than forty-five (45) days, exclusive, between the dates of the two hearings. Such hearings shall be publicly noticed, and any person shall be entitled to offer testimony or comments.

(c) Within thirty (30) days of the conclusion of the hearing convened pursuant to (b) above, the commission shall issue its decision as to whether the county's program shall be designated as an equivalent certification program. The commission's decision shall include findings on the compatibility of commission and county policies pertinent to geothermal energy development, and on the county's technical and financial ability to carry out the responsbilities which may be delegated by the commission.

NOTE: Authority: Sections 25213, 25218(e) 25539. Reference: Section 25539, 25540.5, Public Resources Code.

1868. Appeals to Commission

(a) Any party to county proceedings conducted pursuant to authority delegated by the commission may, within 30 days of the issuance of the county's written decision, or within 30 days of the disposition by that county of an appeal filed pursuant to county ordinances, appeal any aspect of the county decision to the commission.

(b) The appeal shall specify the bases therefor, and shall include a succinct summary of the evidence received by the county pertinent to the issues appealed, and shall specify the relief requested.

(c) The appeal shall include a copy of the administrative record of the county which has been certified by the county as complete.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Section 25540.5, Public Resources Code.

1869. Commission Action on Appeals.

(a) Within fifteen (15) days of the receipt of any appeal filed pursuant to section 1868 above, the commission shall determine if the appeal has merit

and whether further action is warranted. An appeal shall be deemed meritorious unless it can be determined on its face, that no arguable claim to relief has been stated.

(b) If the appeal is deemed meritorious, the commission shall, within 60 days, convene a hearing for the presentation of arguments on the appeal. In reviewing a factual issue, the commission shall determine whether, in light of the whole record, the record contains substantial evidence to support that aspect of the county decision which has been appealed.

(c) If the commission finds for the applicant, it shall take such action as it deems appropriate, including, but not limited to:

(1) Returning the case to the county for further proceedings as may be directed; or

(2) Conducting further evidentiary hearings before the commission; or

(3) Removing the case from the county for disposition by the commission.

NOTE: Authority: Sections 25213, 25218(e) 25539, Public Resources Code. Reference: Section 25540.5., Public Resources Code.

1870. Revocation of Delegation.

(a) The commission may, after public hearings, revoke its approval of a county's equivalent certification program whenever it finds that such program does not comply with current statutory requirements, duly adopted regulations of the commission, or that the program is not being effectively and efficiently administered.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Section 25540.5, Public Resources Code.

Appendix A. Information Requirements for a Geothermal Notice of Intent.

I. In a section entitled "Project Description", the notice shall contain:

A. A map indicating the location or tentative location of the geothermal leasehold and the location or tentative location of each proposed power plant site and related facility, along with a description by section, township, range, and county of the leasehold.

B. The location or tentative location of production and reinjection well sites, resource conveyance lines, access roads, and waste disposal sites in relation to each geothermal power plant.

C. Photographic and/or other suitable graphic representations of the geothermal leasehold and each proposed geothermal power plant, and the visual appearance and general surroundings of such proposed power plant.

D. A description of the process by which the tentative site was selected within the geothermal leasehold and the consideration given to site geology and ease of engineering, physical environmental impact, socioeconomic impacts, resource conveyance constraints, electric transmission constraints, land use constraints, and any other factors considered by the applicant and not listed herein.

E. A preliminary description of the type, quality, and characteristics of the geothermal resource encountered or expected, including, to the extent known, pressure and temperature, flow rates, concentrations of non-condensible gases, concentrations of dissolved solids, and descriptions and concentrations of any substances potentially harmful to the environment or to the public health and safety.

F. Where a notice is filed early in the resource development process, and where the pressure, temperature, flow rate, and constituency and concentration of dissolved solids in the geothermal resources are uncertain, an estimate of the probable range of the various resource parameters based upon nearby development, leasehold exploration if it has occurred, or any other information sources available to the applicant and resource developer. In addition, the basis for such estimations shall be clearly identified.

Comment: The 18-month certification process is particularly appropriate for the instances described in this subsection.

G. The maximum estimated generating capacity of each proposed power plant.

H. A tentative project schedule including permit approvals from the commission and other agencies from which permits must be issued prior to construction or operation, construction lead times, anticipated date of commercial operation, and anticipated operating plant life.

I. For each of the following facilities and/or systems a general description, which includes dimensions, surface area requirements, and typical operating data, performance and design criteria for protection from impacts due to geotechnical hazards, flood hazards, and meteorological extremes, performance and design criteria for assurance of public health and safety and protection of the environment:

1. Power generation system;
2. Heat dissipation system;
3. Cooling water supply system;
4. Reinjection system;
5. Atmospheric emission control system;
6. Waste disposal systems and disposal sites;
7. Geothermal resource conveyance lines;
8. Pre-plant cooling water treatment systems, where applicable;
9. Switchyards/transformer systems; and
10. Other significant facilities, structures or system components proposed by the applicant not listed above.

Comment: The term "performance criteria", when used in these regulations, refers to performance goals which the applicant proposes to use in designing the proposed facilities. For example, a component of the seismic performance criteria would be designing a turbine generator so as to allow continued operation of the proposed facility at full load after the occurrence of a design basis earthquake at the site. Performance criteria are an alternate statement of acceptable risk and are usually semi-quantitative in nature.

The term "design criteria" refers to the limiting criteria used for detailed design of a structure or component. The design criteria produce a design which will meet or exceed the desired performance criteria. For example, design criteria include design loads and the methods for determining loads.

J. A list of all project participants and their legal interests in the power plant facilities, the geothermal leasehold, the geothermal resource conveyance lines, the geothermal reinjection system, and the electric transmission facilities.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Section 25502, 25504, Public Resources Code.

II. In a section entitled "Need for Project", the notice shall contain:

A. A discussion of the conformity of the proposed facilities with the level of statewide and service area electrical demand adopted by the commission pursuant to section 25309 of the Public Resources Code. The discussion shall specify the reasons why the applicant has concluded that the facilities should be added to the applicant's electrical system, including a discussion of whether the facilities are being proposed to meet projected capacity or energy deficits, to displace existing units scheduled for retirement, or to meet requirements for additional reserves.

Comment: In the discussion of need, the applicant may incorporate by reference any other relevant filings or submittals to the commission and must include a summary of the referenced material and a discussion of the relevance of such filings or submittals.

B. An energy and capacity balance showing the forecast of electricity demand as adopted pursuant to section 25309(b) of the Public Resources Code and generating resources expected to be available to the applicant when the proposed plant is scheduled to begin operation.

C. The anticipated generating capacity of each proposed facility or facilities, and:

1. The expected annual capacity factor from the date of initial operation through the 12-year forecast period; and

2. The expected average annual capacity factor over the anticipated operating life of the facility.

D. The applicant may demonstrate need for a geothermal facility by reference to the most recent Biennial Report, and in making such demonstration the applicant may cite any findings and conclusions resulting from any generic proceedings conducted by the commission.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25502, 25504, Public Resources Code.

III. In a section entitled "Financial Impacts", the notice shall contain:

A. A discussion of the preliminary financial requirements for constructing and operating the proposed facilities, including a table summarizing capital requirements and operating expenses, and their principal components. The discussion shall indicate and explain the basis for any assumed escalation rates and costs of capital, fuel, or other principal components. If more than one site is proposed, significant cost differences between alternative sites should be identified.

B. A preliminary summary of the cost of the installed generating capacity (expressed in $/kw) and of the cost of energy at the busbar

(expressed in ¢/kwhr). A list of principal cost components, an explanation of the source of derivation of each, and the calculations used to arrive at the summary costs above shall be provided. Any major uncertainties in the cost figures used or assumptions relied upon shall be explicitly identified and their significance shall be discussed.

C. In situations where electric transmission facilities serve more than one geothermal power plant, the notice shall identify costs associated with such transmission facilities in a manner which recognizes the allocation of such costs over more than one unit.

D. A general discussion of the estimated impact of the proposed facilities on customer rates during construction and after commencement of operation.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Section 25502, 25504, 25506.5, Public Resources Code.

IV. In a section entitled "Applicable Laws, Ordinances, Standards, Permits, and Aprovals", the notice shall contain tables which identify:

A. Laws, regulations, standards, adopted local, regional, state, and federal land use plans, permits, and approvals applicable to the proposed project, and a discussion of the applicability of each.

B. The agency with jurisdiction to issue applicable permits and approvals or to enforce such identified laws, regulations, standards, and adopted local, regional, state, and federal land use plans, or agencies which would have permit approval or enforcement authority but for the exclusive authority of the commission to certify geothermal sites and related facilities.

C. The name, title, and address, if known, of an official within each agency who will serve as a contact person for each respective agency.

D. References to the text of the notice wherein the compatibility of the proposed project with each identified law, regulation, standard, adopted local, regional, state, and federal land use plans, permits and approvals, is discussed.

Comment: The information requirements set forth in portion IV of Appendix A applies only to facilities to be constructed by the applicant, and not to the geothermal field. The applicant's discussion in this portion shall give particular consideration to those county hydrologic elements, county solid waste management laws, state water use plans, and water basin plans identified in Appendix A.V.B.

NOTE: Authority: Sections 25213, 25216.3, 25218(e), 25539, Public Resources Code. Reference: Sections 25502, 25504, 25506, Public Resources Code.

DO NOT WRITE IN THIS SPACE

V. In a section entitled "Environmental Description and Project Effects", the notice shall identify potential physical, biological, social, econo mic and cultural effects of the proposed project and contain:

A. With respect to air quality:

1. Available baseline air quality data including concentrations of pollutants, and a comparison of air quality data with applicable ambient air standards.

2. Available meteorological data, including wind speed and direction, ambient temperature, relative humidity, stability and mixing height, and available upper air data.

3. A discussion of the extent to which the data in subsections 1 and 2 above are typical of conditions at the proposed site and the KGRA; also, provide a description of the monitoring program, if any, used to obtain required data, including the location and elevation of monitoring stations, parameters measured, and duration of monitoring.

4. A worst case air quality impact analysis for each proposed site and related facility and source of air emissions, assuming worst case meteorological conditions and emissions consistent with applicable emission standards, including the cumulative effect of wells and pipelines in normal and shutdown modes of operation, in order to determine the worst case impact on potential sensitive receptors. Such analysis shall include the basis of the worst case and consider topography, meteorology, and contributions from other sources in the KGRA.

5. A general description of normal and shutdown modes of operation for the proposed facility or facilities that affect the release of pollutant emissions into the atmosphere for existing and proposed sources or groups of sources that would have additive effects, including estimated frequency of occurrence, duration, location, and estimated emission rate for each pollutant of interest.

6. A general discussion of expected or confirmed chemical constituencies of gaseous and particulate pollutants from the proposed project including wells and resource conveyance lines.

7. For facilities using an external water supply, an estimate of cooling tower particulate and gaseous emissions associated with each alternative cooling water source considered.

8. A discussion of applicable rules, including but not limited to standards, new source review, and significant deterioration rules established pursuant to Chapter 1 (commencing with § 39000) of Division 26 of the Health and Safety Code, and the methods proposed to satisfy these rules.

B. With respect to hydrology, water supply, and water quality:

1. A description of surface waters which may be a source of cooling water or which may be potentially impacted by the proposed project. Such description shall indicate the proximity of such surface waters to the geothermal field and power plant site, availability of cooling water for the project, competitive uses for the cooling water supply, quality of cooling water supply, and available data on existing quality of surface waters potentially impacted or any programs proposed to identify and monitor water quality.

2. A description of local and regional groundwater aquifers and related geologic formations, structures, recharge areas, and major groundwater uses.

3. A description of existing regional and local precipitation and storm runoff data, including maximum probable precipitation and flood potential.

   Comment: If the applicant proposes to use other than maximum probable precipitation for flood hazard mitigation design criteria, other historical extreme precipitation values used for design criteria shall be provided.

4. A general discussion of any liquid discharges, permitted or accidental, or disposals of solid waste materials which could impact the quality of surface or groundwater.

5. A general discussion of potential project impacts on local hydrologic flows and runoff.

6. A general discussion of the potential for flood hazard to the proposed facilities.

7. A general discussion of potential mitigation measures to protect surface and groundwaters from project impacts, including the identification of any spill clean-up contingency plans proposed or under consideration at the time of filing of the notice.

8. A discussion of potential project impacts on the temperature, mineral content, rate of flow, and other aspects of nearby utilized thermal springs.

C. With respect to geology and seismicity:

1. A general description based on existing data, including maps, of the tectonic history, fault activity, and historical seismicity within 50 km of the site, including all known or inferred potentially active and active faults, an estimate of the magnitude of MCE and MPE derived for each active fault, and

the epicenter and date of any earthquake with a magnitude equal to or in excess of M4 or which could be reasonably inferred to have caused ground acceleration of greater than 0.1 G at the site.

2. The MCE and MPE peak bedrock or ground accelerations derived for the proposed site.

3. A brief discussion of the known stratigraphic units and significant geologic structures within 10 km of the site with emphasis on those potentially associated with geotechnical problems.

4. A map and detailed description, based on existing data, of all recognized stratigraphic units, geologic structures, and geomorphic features or processes within the leasehold boundaries or two km of the site, whichever is greater, with emphasis on those associated with geotechnical problems in the site area. The discussion should include the following anticipated site conditions: ground rupture from faulting, mass wasting and slope stability, liquefaction or settlement, subsidence and associated ground rupture, expansion or collapse of soil structures, cavities, and other adverse site or foundation conditions.

5. A description, with maps, of commercially developed mines, gem, mineral, and fossil collecting localities, fumaroles, geysers, hot springs, or other geologic resources of unique recreational or scientific value which may be affected by the proposed project.

6. A detailed description, including maps showing location, of potential impacts to the geological environment resulting from construction, operation, or failure of the proposed facilities including inducement or acceleration of mass wasting, subsidence, seismicity, and fault rupture.

   Comment: The geological environment includes, but is not limited to, developed mines, gem, mineral and fossil collecting localities, fumeroles, geysers, and thermal springs.

7. A general description of typical mitigation measures, if any, under consideration to eliminate or reduce identified geologic hazards and impacts to the geologic environment.

   Comment: The 2, 10 and 50 km distances in items 4, 3, and 1 respectively, are intended as guidelines, and may decrease, if reasons are given, or increase, as geologic conditions warrant.

   Comment: Also, for purposes of the proceedings on the notice, the MCE, MPE and associated accelerations requested in items 1 through 7 above are intended to establish a common data base with respect to seismic setting and are not meant to imply proposed levels of seismic design.

Furthermore, where an applicant pursues a certification process pursuant to section 1803(a) and files a notice early in the resource development process information related to the geologic environment may be based on existing information without performing original research and investigation.

Finally, the geotechnical information requested above is consistent with the policy adopted by the State Board of Registration for Geologists and Geophysicists on July 17, 1978.

D. With respect to agriculture and soils:

1. A map of soils at the site and within geothermal, the leasehold based on available soils information, and a description of mapped soils including soil erodability, soil taxonomy, and physical and chemical characteristics. The description of soils shall be sufficient to allow an evaluation of soil erodability, infiltration rate, permeability, and of the potential for leaching of pollutant deposition and cycling of pollutants in the soil-vegetation system.

2. An assessment of the general effects of construction and operation of each proposed geothermal power plant facility on soils including, but not limited to, accelerated soil loss, soil dispersal and deposition patterns and quantities, the effects of power plant emissions on surrounding soil-vegetation systems, and the methods used to determine such effects.

3. A discussion of the effects of construction and operation of each proposed geothermal power plant facility on agricultural resources, including the effects of cooling tower drift on crops and the removal of prime agricultural land from production. The discussion of these effects should be based on land capability classifications and storie ratings for all soil series of the proposed site.

4. A discussion of mitigation measures under consideration to minimize effects on agricultural resources and soil-vegetation systems and to prevent off-site sediment transport.

E. With respect to biological resources:

1. A description of vegetational communities, general wildlife and aquatic resources, and dominant species within the area potentially impacted by the proposed project.

2. An identification on a map and a description of the known probable distribution of fully protected, rare, threatened or endangered plant and animal species, and commercially or recreationally valued species and habitats that may be adversely affected by the project.

3. An identification of biological species of special concern and areas of critical biological concern.

   Comment: In the notice, an attempt shall be made to identify species of special concern and areas of critical concern that may be, or are known by the applicant to be, of special interest to: (1) local, state, and federal agencies responsible for biological resources within the area potentially biologically impacted by the project; and/or (2) educational institutions, museums, biological societies and members of the public that might have specific knowledge of the biological resources within the area.

4. A description of the potential effects of the proposed project on legally protected and commercially and recreationally valued biological resources, species of special concern, and areas of critical biological concern.

5. A discussion of measures proposed or under consideration to mitigate impacts to identified biological resources.

F. With respect to noise:

1. A land use map which identifies noise sensitive receptors or groups of receptors in the vicinity of the proposed site and related facility, and geothermal leasehold, which includes future land uses identifiable from adopted land use plans and filed development plans at the time of filing the notice.

2. A discussion of either the results of daytime and nighttime ambient noise surveys at the site and at sensitive receptors, including the general weather conditions during the surveys, or any plans to conduct such surveys.

   Comment: If noise concerns are likely to be a significant consideration for site acceptability due to the proximity of the proposed facilities to sensitive noise receptors, the applicant should conduct ambient noise surveys for inclusion in the notice; without such information, no conclusive findings shall be made during the proceedings on the notice regarding the acceptability of project noise impacts.

3. A description of major plant noise sources and the estimated range of noise emission levels and characteristics.

4. An estimation of the plant construction and operational noise levels at sensitive receptors potentially impacted by project noise.

5. A discussion of applicable noise standards and ordinances and the general conformance of the proposed project therewith.

G. With respect to cultural resources:

1. A description of all cultural resource properties (archaeological, historical, paleontological, and areas of unique religious or scientific value) within the area potentially impacted by the project identifiable from a literature and reconnaisance survey.

2. A discussion of those cultural resources listed in, declared eligible for, or nominated to the National Register of Historic Places; those resources that are listed as state or local landmarks or points of historic interest; and those resources that are otherwise protected by existing law.

3. A description of the methodology and techniques used to identify and evaluate site area cultural resources and any plans for future studies.

4. A description of potential impacts on identified cultural resources from construction and operation of each proposed geothermal power plant, and the measures under consideration for mitigation of such impacts.

H. With respect to social and economic effects:

1. A general description, with an accompanying map, of the existing and proposed future land uses of the proposed power plant site and geothermal leasehold as designated by applicable land use plans or guidelines of local, regional, state, and federal agencies; of the present and proposed land use classifications for the site, leasehold and adjoining areas which are potentially impacted by the project; and the location of municipal, county, regional, state and federal parks, recreational areas, scenic areas, wildlife sanctuaries, religious sanctuaries, or natural areas in the vicinity of the site and leasehold.

2. A general description of the social and economic setting of the area subject to impact from the proposed project.

3. An estimation of labor required during construction and operation of the proposed geothermal power plant and the geothermal field.

4. An estimation of the level of temporary and permanent project-related immigration to the local area.

5. An estimation of the impact of construction activities and project operation on the local economy and on the availability of public services and facilities fixtures.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25502, 25504, 25506, Public Resources Code.

VI. In a section entitled "Public Health Impacts", the notice shall contain the following information on the potential public health effects from the construction and operation of the proposed power plant and geothermal field:

A. An identification, to the extent known, of solid, gaseous, and water-borne emissions, such H_2S, SO_2, NH_3, and B, total suspended and respirable particulates, trace metals, and radioactive materials, which may cause adverse health effects in the surrounding population.

B. An estimation of the ambient concentrations for the pollutants identified in subsection A of this section, and the worst case incremental increase expected as a result of project emissions.

C. A general discussion of concentrations, to the extent known, required for the creation of potentially significant adverse health effects from identified pollutants as disclosed in available literature. The discussion shall include variables due to differing age groups within the general population and portions of the general population which may be particularly affected by any identified emissions. The discussion shall also include the age distribution and size of the population which may be potentially affected by these emissions.

D. A discussion of all existing federal, state, and local health standards for identified project emissions.

VII. In a section entitled "Power Plant Reliability" the notice shall contain the following information on site dependent reliability-related factors:

A. A general discussion of the impact on plant reliability from potential hazards to each proposed facility caused by, but not limited to, ground rupture by faulting, mass wasting, and slope stability, liquefaction or settlement, subsidence and associated ground rupture, expansion or collapse of soil structures, cavities or other adverse foundation conditions, flooding, meteorological and climatic extremes, and cooling water supply reliability.

B. A general discussion of performance and design criteria for protecting the facilities from potential hazards.

C. A general description of the basis for formulation or selection of performance and design criteria discussed in subsection B of this section.

NOTE: Authority: Sections 25214, 25218(e), 25539, Public Resources Code. Reference: Sections 25001, 25502, 25504, Public Resources Code.

VIII. In a section entitled "Electric Transmission Facilities", the notice shall contain the following information:

A. A description of any electric transmission facilities, lines, stations, or other equipment, whether or not within the exclusive permit authority of the commission, which will be required to carry electrical power from each proposed geothermal power plant at each of the sites presented in the notice to the principal load centers to be served by the new power plant. Such description shall include the width of rights-of-way and the physical and electrical characteristics of towers, conductors, and insulators. For electric transmission facilities outside the exclusive permit authority of the commission, response to this subsection may be limited to information, such as capacity and voltage levels and right-of-way widths, which will allow the commission staff to perform an electric transmission system planning analysis and to assess the cumulative environmental impacts.

B. A discussion of the need for the additional electric transmission lines, stations, or other equipment referred to in the notice, the basis for selecting principal points of junction with the existing electric transmission system, and the capacity and voltage levels of the proposed lines along with the basis for selection of the capacity and voltage levels.

C. A discussion of the extent to which the proposed electric transmission facilities have been designed, planned, and/or routed to meet the transmission requirements created by additional generating facilities planned by the applicant or any other entity in the same general area.

Comment: A precise definition for "general area" as used here cannot be provided. In some instances the KGRA in which the proposed geothermal power plant is to be located would comprise the "general area". In all cases the applicant should acknowledge whether or not power plants proposed in an area which could be served by common transmission to the main transmission grid were considered in determining the capacity and general route of the proposed electric transmission facilities.

D. An identification of the owners and operators of the proposed electric transmission facilities and their legal interest in the proposed route or corridor.

E. A discussion of alternative methods of transmitting power from each proposed geothermal power plant that were considered by the applicant, and the basis for selection of such methods.

F. A map or maps showing the potential corridor or corridors proposed or alternative points of interconnection, and existing and proposed land uses at and adjoining the corridor(s) as designated by local, regional, state, and federal agencies.

G. A description of the corridor or route selection process.

H. A discussion of the physical, biological, social and cultural, environmental, and engineering advantages and disadvantages of the alternatives considered.

I. A preliminary estimate of the costs of lines, stations, and other equipment that would be required.

J. If the applicant does not or will not have an ownership interest in those electric transmission lines proposed to transmit power from the power plant to a point of junction with an interconnected system, a discussion of contracts executed or arrangements contemplated for the transmission of electric power from the proposed geothermal power plant.

Comment: Where tap lines are proposed, the discussion may be route-specific due to their limited length.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25006, 25110, 25502, 25504, Public Resources Code.

Appendix B. Information Requirements for a Geothermal Application for Certification

I. In a section entitled "Description of Project" the applicant shall provide any updates or changes in the description of the project as presented in the notice as a result of either the decision on the notice and the conditions specified therein, or other reasons, and provide an updated schedule reflecting certification, construction, and the commencement of operation for each facility approved since filing of the notice.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25519, 25520, Public Resources Code.

II. In a section entitled "Need for Project", the application shall contain the following information where such information has not been previously provided in the notice or where circumstances or forecasts have materially changed.

A. All the specific information required in Appendix A.II of this article.

B. A statement of the cost of the installed generating capacity and of the cost of supplying energy at the busbar. The statement should identify all principal cost components and explain the source or derivation and the underlying assumptions for each component.

C. A discussion of the anticipated costs of the geothermal resources to be used over the service life of the facilities, including an explanation of underlying assumptions.

D. A discussion of the anticipated impact of the proposed facilities on customer rates during both construction and operation.

Comment: For many cases it is anticipated that issues relating to need for the project will be resolved during proceedings on the notice. In that event, the application need only incorporate information submitted in the notice and findings contained in the final report. It is recognized, however, that for some projects certain information requirements will be unavailable during proceedings on the notice, in which case the application need only add to and update the information submitted in the notice. The scope of inquiry will then be limited to a determination of whether the newly provided information materially affects the acceptability of the project.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25216.5, 25519, 25520, Public Resources Code.

III. In a section entitled "Facility Description, Design, and Operation", the application shall contain:

A. Detailed topographic maps showing the proposed final locations and layout of the geothermal power plant, well pads, resource conveyance lines, and access roads.

B. Scale plan and elevation drawings depicting the relative size and location of geothermal power plant structures and also showing the layout of all major mechanical and electrical components and equipment.

C. Plan and profile drawings showing the location, type, depth, and preliminary estimated loadings of foundations to be used for the major power plant components and other structures critical to plant operation, including a description of the methodology, analytical techniques, and assumptions to be used in deriving final foundation loads.

D. An engineering description of the structural performance and design criteria, analytical techniques, assumptions, loading conditions and loading combinations used in the design of each major facility structure for identified loadings.

E. An engineering description of actual site conditions and investigations or studies conducted to determine the site conditions used as the basis for developing structural design and performance criteria. The descriptions should include but not be limited to seismic and other geologic hazards, design basis earthquake, adverse meteorological and climatic conditions, and flooding, if applicable.

Comment: The term "design basis earthquake", when used in these regulations, refers to the earthquake ground motion parameters to be used as the basis for structural design criteria development, or directly in the structural design, in a static or dynamic method (e.g., a response spectrum for tanks designed in accordance with TID-7024).

F. A discussion of any measures proposed to improve adverse foundation conditions.

G. For the systems listed below, provide an engineering description including drawings, calculations, and discussions which address effluent and emission rates, temperatures, and points of discharge, geothermal resources, water, and chemical flows and consumption, and production of wastes. Discussions shall include specific design features employed to comply with applicable laws, legally enforceable standards, ordinances, land use plans, and conditions or modifications specified in the decision on the notice.

1. The power generation system;

2. The heat dissipation system;

3. The cooling water supply system, including, where applicable, pre-plant treatment procedures;

4. The atmospheric emission control system;

5. The waste disposal system;

6. The noise emission abatement system; and

7. Other major systems proposed by the applicant and not listed above, specifically including those employed to mitigate impacts to the environment and public health and safety.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25216.5, 25519, 25520, Public Resources Code.

IV. In a section entitled "Environmental Description and Project Effects", the application shall contain:

A. The results of any studies or analyses identified by the applicant, required by order of the committee, or by the decision on the notice, needed to complete the assessment of the environmental setting of the proposed site.

B. A detailed discussion of all significant adverse effects on the environment of the impact area which would result from project construction, operation, and maintenance. Such discussions shall include the cumulative effect of the resource conveyance systems, and each geothermal power plant and appurtenant facility.

C. A detailed discussion of the specific measures proposed to mitigate each significant adverse impact identified or to make the facilities compatible with immediate or long-term land uses for the impact area, together with a discussion of the anticipated effectiveness of each mitigation measure proposed. If any significant adverse impact is identified for which no specific mitigation measures are proposed, include a description and discussion of any economic, social, or other conditions that make mitigation of such identified impacts infeasible.

Comment: All significant adverse impacts and specific mitigation measures should have been considered in the proceedings on the notice. If the notice contained sufficient information to identify such impacts and measures, then the application need only incorporate this information by reference to the notice. In addition, the application should discuss impacts and mitigation mesures not previously identified or resolved in proceedings on the notice due to the lack of detailed plans or designs.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25216.5, 25519, 25520, Public Resources Code.

V. In a section entitled "Project Construction" the application shall contain:

A. Schedules for each major construction activity, including a discussion of potential factors that could cause unscheduled delays.

B. To the extent known, a general description of plans for preparation of the power plant site including major earthwork activities and equipment required therefor, and plans for monitoring construction activities and for documenting actual site conditions exposed during excavation which could require mitigation measures significantly different than those originally proposed.

C. A description of anticipated methods to be employed for construction of the geothermal power plant.

D. A description of plans for restoring the construction site and for controlling erosion at the site.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25216.5, 25519, 25520, Public Resources Code.

VI. In a section entitled "Reliability", the application shall contain:

A. A discussion of the anticipated service life and degree of reliability expected to be achieved by the proposed facilities based on a consideration of:

1. Expected annual and lifetime capacity factors.

2. The demonstrated or anticipated feasibility of the technologies, systems, components, and measures proposed to be employed in the facilities, including the power generation system, the heat dissipation system, the water supply system, the reinjection system, the atmospheric emission control system, resource conveyance lines and the waste disposal system.

3. Geologic and flood hazards, meteorologic conditions and climatic extremes, and cooling water availability.

4. Special design features adopted by the applicant or resource supplier to ensure power plant reliability.

5. The expected power plant maturation period.

Comment: To the extent possible, the information required pursuant to this subsection may be developed by reference to past designs, operating experience, and actual capacity.

B. An identification and discussion of major plant upset conditions which could result in output reduction or plant shutdown and the measures designed to eliminate or reduce both their occurrence and their duration. The discussion should include an assessment of the probability of occurrence of such conditions.

C. A description of the maintenance requirements for the proposed facilities including geothermal wells and resource conveyance lines insofar as they may affect power plant reliability.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25216.5, 25519, 25520, Public Resources Code.

VII. In a section entitled "Health and Safety", the application shall contain:

A. A description of all significant emissions resulting from the operation of the proposed facility which were determined in the proceedings on the notice or are otherwise known to be capable of producing adverse impacts on human health. The description shall include:

1. The source of such emissions;

2. The manner in which the emissions are produced;

3. The quantities of wastes produced, expressed in units consistent with applicable health and safety standards;

4. The measures and methods proposed for the handling, storage, and long-term disposal of such wastes; and

5. The anticipated effect on human health and safety resulting from the creation, handling, storage, and disposal of such wastes.

B. A description of any other toxic or hazardous substances which will be used in or result from the operation of the proposed facilities, including:

1. The source or purpose of such substances;

2. The quantities present during normal operation;

3. The measures and methods proposed for their safe handling, storage, and disposal; and

4. The potential health and safety risks associated with their accidental release or mishandling.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25216.5, 25519, 25520, Public Resources Code.

VIII. In a section entitled "Applicable Laws, Ordinances, Standards, Permits, and Approvals; Compliance Plan", the application shall contain:

A. Any changes in the tables or matrices provided in the notice due to project revisions or the enactment, amendment, or repeal of laws, ordinances, or standards. The table or matrix shall reference pages in the application wherein conformance with each law or standard is discussed or portions of the final report or decision on the notice wherein compliance was resolved.

B. A schedule indicating when permits outside the exclusive authority of the commission will be obtained, and the steps the applicant has taken or plans to take to obtain such permits.

C. A discussion of any proposed monitoring plan to ensure continued compliance of the proposed facility during its construction and operation.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25216.5, 25519, 25520, Public Resources Code.

IX. In a section entitled "Electric Transmission Facilities" the application shall contain:

A. A discussion and map or maps of the proposed electric transmission line routes depicting proposed rights-of-way, if known, and proposed or existing access roads, and:

1. Present and proposed future land use designated in adjacent local, regional, state and federal land use plans:

2. Significant biological and cultural resources or areas; and

3. Geologic hazards or hazard areas.

Such map or maps shall extend to those areas that are adjacent to the proposed route in which impacts from the construction, operation, and maintenance of the electric transmission facilities are probable.

B. A description of any new or additional electric transmission facilities, such as powerlines, substations, switchyards, or other transmission equipment which will be constructed to transmit electrical power from the proposed geothermal power plant to the load centers to be served by the facility, whether or not such new or additional facilities will be added prior to or beyond the point of junction with an interconnected system. This description shall include a power load flow diagram which updates the applicant's latest submittal of load flows as part of the common forecasting methodology input if any revisions to the CFM submittal have been proposed by the applicant. Descriptions provided in the notice may be referenced.

Comment: In order to assess cumulative environmental impacts, overall project acceptability and system reliability as it affects the proposed power plant and appurtenant facilities, all construction related to system additions and modifications necessitated by the proposed facilities must be considered.

C. A justification for the electric transmission route and additional facilities proposed including a discussion of the advantages and disadvantages of the proposed route(s) compared with any alternative systems or corridors found acceptable in the decision on the notice. The discussion shall consider:

DO NOT WRITE IN THIS SPACE

1. The effects on the environment including water quality, geologic, resources, potentials for accelerated soil erosion, impacts to biological, cultural and historical resources, scenic, recreational, and economic values, and public health and safety;

2. The cost of construction and operation of the proposed electric transmission facilities; and

3. The reliability of the proposed electric transmission facilities.

D. Specific measures proposed to mitigate identified impacts.

E. A description of measures proposed to eliminate or reduce significant noise, radio and television interference, and electrical effects on the public.

F. A general description of tower dimensions, locations, and styles and voltages.

G. A discussion indicating the conformity of the proposed electric transmission facilities with the applicable laws, standards and ordinances.

H. Such other information as the applicant may wish to submit.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25216.5, 25519, 25520, Public Resources Code.

Appendix C. Information Requirements for a 12-Month Geothermal Application.

I. In a section entitled "Facility Description, Design, and Operation", the application shall contain:

A. Detailed topographic maps showing the location of the geothermal leasehold, along with a description by section, township, range and county of the leasehold. In addition, the maps should indicate the proposed final locations and layout of the gothermal power plant in relation to production and reinjection well sites, resource conveyance lines, access roads, and waste disposal sites.

B. Photographic and/or other suitable graphic representations of the geothermal leasehold, and scale plan and elevation drawings depicting the relative size and location of geothermal power plant structures and also showing the layout of all major mechanical and electrical components and equipment.

C. A description of the process by which the site was selected within the geothermal leasehold and the consideration given to site geology and ease of engineering, physical environmental impact, socioeconomic impacts, resource conveyance constraints, electric transmission constraints, land use constraints, and any other factor considered by the applicant and not listed herein.

D. A detailed description of the type, quality, and characteristics of the geothermal resource, including pressure and temperature flow rates, constituents and concentrations of noncondensible gases, concentrations constituencies of dissolved solids, and descriptions and concentrations of any substances potentially harmful to the environment or to the public health and safety.

E. Plan and profile drawings showing the location, type, depth, and preliminary estimated loadings of foundations to be used for the major power plant components and other structures critical to plant operation, including a description of the methodology, analytical techniques, and assumptions to be used in deriving final foundation loads.

F. An engineering description of the structural performance criteria, structural design criteria (including deriviation), analytical techniques, assumptions, loading conditions and loading combinations used in the design of facility structures and major (critical) mechanical and electrical equipment.

G. An engineering description of the actual site conditions and investigations or studies conducted to determine the site conditions used as the basis for developing structural performance and structural design criteria. The descriptions should include, but not be limited to, seismic and other geologic hazarads, adverse meteorological and climatic conditions, design basis earthquake and flooding, if applicable.

DO NOT WRITE IN THIS SPACE

H. A discussion of any measures proposed to improve adverse foundation conditions.

I. For each of the following facilities and/or systems provide an engineering description including drawings, calculations, and discussions which address effluent and emission rates, temperatures, and points of discharge, geothermal resources, water, and chemical flows and consumption and production of wastes. In addition, the description shall contain dimensions, surface area requirements, typical operating data, performance and design criteria for protection from impacts due to geotechnical hazards, flood hazards, and meteorological extremes, and performance criteria for assurance of public health and safety and protection of the environment. Discussions shall include specific design features employed to comply with applicable laws, legally enforceable standards, ordinances, and land use plans.

1. The power generation system;

2. The heat dissipation system;

3. The cooling water supply system, including, where applicable preplant treatment procedures;

4. The atmospheric emission control system;

5. The waste disposal systems and disposal sites;

6. The noise emission abatement system;

7. Reinjection system;

8. Geothermal resource conveyance lines;

9. Switchyards/transformer systems; and

10. Other significant facilities, structures or system components proposed by the applicant not listed above.

Comments: The term "performance criteria", when used in these regulations, refers to performance goals which the applicant proposes to use in designing the proposed facilities. For example a component of the seismic performance criteria would be designing a turbine-generator to remain capable of continued operation at full load after the occurrence of the site specific functional basis earthquake (a moderate event). Performance criteria are an alternate statement of acceptable risk, and are usually of a semi-quantitative nature.

The term "design criteria", when used in these regulations, refers to the limiting criteria used as the basis for detailed design of a structure, component, etc. The design criteria should provide a design which will achieve or exceed the desired performance

criteria. For example, design criteria include design loads, methods or basis for the determination of design loads, load combinations, specified analysis method, etc.

The term "design basis earthquake", when used in these regulations, refers to the earthquake ground motion parameters to be used as the basis for structural design criteria development, or directly in the structural design in a static or dynamic method (e.g. a response spectrum for tanks designed in accordance with TID-7024).

J. The anticipated generating capacity of each proposed power plant.

K. A proposed project schedule, including permit approvals from other agencies from which permits must be issued prior to construction or operation, construction lead times, anticipated date of commercial operation, and anticipated operating plant life.

L. A list of all project participants and their legal interests in the power plant facilities, the geothermal leasehold, the geothermal resource conveyance lines, the geothermal reinjection system, and the electric transmission facilities.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25216.5, 25519, 25520, Public Resources Code.

II. In a section entitled "Need for Project", the application shall contain the following information:

A. A discussion of the conformity of the proposed facilities with the level of statewide and service area electrical demand adopted by the commission pursuant to section 25309 of the Public Resource Code. The discussion shall specify the reasons why the applicant has concluded that the facilities should be added to the applicant's electrical systsem, including a discussion of whether the facilities are being proposed to meet projected capacity or energy deficits, to displace existing units scheduled for retirement, or to meet requirements for additional reserves. In the discussion of need, the applicant may incorporate by reference any other relevant filings or submittals to the commission, and must include a summary of the referenced material and a discussion of the relevance of such filings or submittals.

B. An energy and capacity balance showing the forecast of electricity demand as adopted pursuant to section 25309(b) of the Public Resources Code and generating resources expected to be available to the applicant when the proposed plant is scheduled to begin operation.

C. The anticipated generating capacity of each proposed facility or facilities, and

1. The expected annual capacity factor from the date of initial operation through the 12-year forecast period; and

2. The expected average annual capacity factor over the anticipated operating life of the facility.

D. The applicant may demonstrate need for a geothermal facility by reference to the most recent Biennial Report, and in making such demonstration the applicant may cite any findings and conclusions resulting from any generic proceedings conducted by the commission.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25216.5, 25519, 25520, Public Resources Code.

III. In a section entitled "Financial Impacts", the application shall contain:

A. A discussion of the financial requirements for constructing and operating the proposed facilities, including a table summarizing capital requirements and operating expenses, and their principal components. The discussion shall indicate and explain the basis for any assumed escalation rates and costs of capital, fuel, or other principal components, specifically, the anticipated costs of the geothermal resources to be used over the service life of the facilities, including an explanation of underlying assumptions.

B. A summary of the cost of the installed generating capacity (expressed in $/kw) and of the cost of supplying energy at the busbar (expressed in ¢/kwh). A list of principal cost components, an explanation of the source of derivation of each, and the calculations used to arrive at the summary costs above shall be provided. Any major uncertainties in the cost figures used or assumptions relied upon shall be explicitly identified and their significance shall be discussed.

C. In situations where electric transmission facilities serve more than one geothermal power plant, the application shall identify costs associated with such transmission facilities in a manner which recognizes the allocation of such costs over more than one unit.

D. A discussion of the estimated impact of the proposed facilities on customer rates during construction and after commencement of operation.

E. Any other information which the applicant believes to be required in order to secure a certificate of public convenience and necessity from the Public Utilities Commission.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25216.5, 25519, 25520, Public Resources Code.

IV. In a section entitled "Applicable Laws, Ordinances, Standards; Permits, and Approvals; Compliance Plan", the application shall contain tables which identify:

A. Laws, regulations, standards, adopted local, regional, state, and federal land use plans, permits, and approvals applicable to the proposed project, and a discussion of the applicability of each. The table or matrix shall explicity reference pages in the application wherein conformance, both during construction and operation of the facility, with each law or standard is discussed.

B. The agency with jurisdiction to issue applicable permits and approvals or to enforce such identified laws, regulations, standards, and adopted local, regional, state, and federal land use plans, or agencies which would have permit approval or enforcement authority but for the exclusive authority of the commission to certify geothermal sites and related facilities.

C. The name, title, and address, if known, of an official within each agency who will serve as a contact person for each respective agency.

D. A discussion of any proposed monitoring plans to ensure continued compliance of the proposed facility during its construction and operation.

E. A schedule indicating when permits outside the exclusive authority of the commission will be obtained, and the steps the applicant has taken or plans to take to obtain such permits.

Comment: The information requirements set forth in portion IV applies only to facilities to be constructed by the applicant, and not to the geothermal field. The applicant's discussion in this portion shall give particular consideration to those county hydrologic elements, county solid waste management laws, state water use plans, and water basin plans identified in subsection V.E.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25216.5, 25519, Public Resources Code.

V. In a section entitled "Environmental Description and Project Effects", the application shall identify potential physical, biological, social, economic and cultural effects of the proposed project and contain:

A. A detailed discussion of all significant adverse effects on the environment which would result from project construction, operation, and maintenance. Such discussion shall include the cumulative effect of the resource conveyance systems, and each geothermal power plant and appurtenant facility.

B. A detailed discussion of the specific measures proposed to mitigate each significant adverse impact identified or to make the facilities compatible with immediate or long-term land uses for the impact area, together with a discussion of the anticipated effectiveness of each mitigation measure proposed. If any significant adverse impact is identified for which no specific mitigation measures are proposed, include a description and discussion of any economic, social, or other conditions that make mitigation of such identified impacts infeasible.

C. With respect to air quality:

1. Baseline air quality data including concentrations of pollutants, and a comparison of air quality data with applicable ambient air standards.

2. Meteorological data, including wind speed and direction, ambient temperature, relative humidity, stability and mixing height, and available upper air data.

3. A discussion of the extent to which the data in subsection 1 and 2 above are typical of conditions at the proposed site and the KGRA; also, provide a description of the monitoring program, if any, used to obtain required data, including the location and elevation of monitoring stations, parameters measured, and duration of monitoring.

4. A worse case air quality impact analysis for the proposed site and related facility and source of air emissions, including the cumulative effect of wells and pipelines in normal and shutdown modes of operation, in order to determine the worst case impact on potential sensitive receptors. Such analysis shall include the basis of the worst case and consider topography, meteorology, and contributions from other sources in the KGRA.

5. A description of normal and shutdown modes of operation for the proposed facility or facilities that affect the release of pollutant emissions into the atmosphere for existing and proposed sources or groups of sources that would have additive effects, including estimated frequency of occurrence, duration, location, and estimated emission rate for each pollutant of interest.

6. A discussion of the chemical constituencies of gaseous and particulate pollutants from the proposed project including wells and resource conveyance lines.

7. For facilities using an external water supply, an estimate of cooling tower particulate and gaseous emissions associated with each alternative cooling water source considered.

8. A discussion of applicable rules, including but not limited to standards, new source review, and significant deterioration rules established pursuant to Chapter 1 (commencing with §39000) of Division 26 of the Health and Safety Code, and the methods proposed to satisfy these rules.

Comment: This information is needed to make a determination of compliance as set forth in Section 1744.5 of these regulations.

D. With respect to hydrology, water supply, and water quality:

1. A description of surface waters which may be a source of cooling water or which may be potentially impacted by the

proposed project. Such description shall indicate the proximity of such surface waters to the geothermal field and power plant site, availability of cooling water for the project, competitive uses for the cooling water supply, quality of cooling water supply, and available data on existing quality of surface waters potentially impacted or any programs proposed to identify and monitor water quality.

2. A description of local and regional groundwater aquifers and related geologic formations, structures, recharge areas, and major groundwater uses.

3. A description of regional and local precipitation and storm runoff, including maximum probable precipitation and flood potential.

   Comment: If the applicant proposes to use other than maximum probable precipitation for flood hazard mitigation design criteria, other historical extreme precipitation values used for design criteria shall be provided.

4. A discussion of any liquid discharges, permitted or accidental, or disposals of solid waste materials which could impact the quality of surface or groundwater.

5. A discussion of potential project impacts on local hydrologic flows and runoff.

6. A discussion of the potential for flood hazard to the proposed facilities.

7. A discussion of potential mitigation measures to protect surface and groundwaters from project impacts, including the identification of any spill clean-up contingency plans proposed or under consideration at the time of filing the application.

8. A discussion of potential project impacts on the temperature, mineral content, rate of flow, and other aspects of nearly utilized thermal springs.

E. With respect to geology and seismicity:

1. A general description based on existing data, including maps, of the tectonic history, fault activity, and historical seismicity within 50 km of the site, including all known or inferred potentially active and active faults, an estimate of the magnitude of MCE and MPE derived for each active fault, and the epicenter and date of any earthquake with a magnitude equal to or in excess of M4 or which could be inferred to have caused ground acceleration of greater than 0.1 G at the site.

   Comment: The MPE, which is used for a comparison of the site seismicity and not necessarily intended to be the design basis earthquake, is as defined in CDMG Note 43 with a mean recurrence interval equal to 100 years.

2. The design basis earthquake for the proposed site, including the assumptions, methodologies, data and justification.

3. A brief discussion of known stratigraphic units and significant geologic structures within 10 km of the site with emphasis on those potentially associated with geotechnical problems.

4. A map and description of all recognized stratigraphic units, geologic structures, and geomorphic features or processes within the leasehold boundaries or two km of the site, whichever is greater, with emphasis on those associated with geotechnical problems in the site area. The discussion should include the following actual site conditions: ground rupture from faulting, mass wasting and slope stability, liquefaction or settlement, subsidence and associated ground rupture, expansion or collapse of soil structures, cavities and other adverse site or foundation conditions.

5. A description, with maps, of commercially developed mines, gem, mineral, and fossil collecting localities, fumaroles, geysers, hot springs, or other geologic resources of unique recreational or scientific value which may be affected by the proposed project.

6. A detailed description, including maps showing location of potential significant adverse impacts to the geological environment resulting from construction, operation, or failure of the proposed facilities including inducement or acceleration of mass wasting, subsidence, seismicity, and fault rupture.

   Comment: The geologic environment includes but is not limited to developed mines, gem, mineral and fossil collecting localities, fumaroles, geysers, and thermal springs.

7. A description of design and mitigation measures, if any, under consideration to eliminate or reduce identified geologic hazards and impacts to the geologic environment.

   Comment: The 50, 10, and 2 km distances in items 1, 3 and 4, respectively, are intended as guidelines, and may decrease, if reasons are given, or increase, as geologic conditions warrant. Also, the geotechnical information requested in items 1 through 7 above is consistent with the intent of the policy adopted by the State Board of Registration for Geologists and Geophysicists on July 17, 1978.

F. With respect to agriculture and soils:

1. A map of soils at the site and within the geothermal leasehold, based on available soils information, and a description of mapped soils including soil erodability, soil taxonomy, and physical and chemical characteristics. The description of

soils shall be sufficient to allow an evaluation of soil erodability, permeability, and of the potential for leaching of pollutant deposition and cycling of pollutants in the soil-vegetation system.

2. An assessment of the general effects of construction and operation of each proposed geothermal power plant facility on soils including, but not limited to, accelerated soil loss, soil dispersal and deposition patterns and quantities and, the effects of power plant emissions on surrounding soil-vegetation systems, and the methods used to determine such effects.

3. A discussion of the effects of construction and operation of each proposed geothermal power plant facility on agricultural resources, including the effects of cooling tower drift on crops and the removal of prime agricultural land from production.

4. A discussion of mitigation measures under consideration to minimize effects on agricultural resources and soil-vegetation systems and to prevent off-site sediment transport.

G. With respect to biological resources:

1. A description of vegetational communities, general wildlife and aquatic resources, and dominant species within the area potentially impacted by the proposed project.

2. A map identification and description of the known probable distribution of fully protected, rare, threatened or endangered plant and animal species, and commercially or recreationally valued species and habitats that may be adversely affected by the project.

3. An identification of biological species of special concern and areas of critical biological concern.

   Comment: In the application, an attempt shall be made to identify species of special concern and areas of critical concern that may be, or are known by the applicant to be of special interest to: (1) local, state, and federal agencies responsible for biological resources within the area potentially biologically impacted by the project; and/or (2) educational institutions, museums, biological societies and members of the public that might have specific knowledge of the biological resources within the area.

4. A description of the potential effects of the proposed project on legally protected and commercially and recreationally valued biological resources, species of special concern, and areas of critical biological concern.

5. A discussion of measures proposed or under consideration to mitigate impacts to identified biological resources.

H. With respect to noise:

1. A land use map which identifies noise sensitive receptors or groups of receptors in the vicinity of the proposed site and related facility, and geothermal leasehold, which includes future land uses identifiable from adopted land use plans and filed development plans at the time of filing the application.

2. A discussion of either the results of daytime and nighttime ambient noise surveys at the site and at sensitive receptors, including the general weather conditions during the surveys, or any plans to conduct such surveys.

   Comment: If noise concerns are likely to be a significant consideration for site acceptability due to the proximity of the proposed facilities to sensitive noise receptors, the applicant should conduct ambient noise surveys for inclusion in the application.

3. A description of major plant noise sources and the estimated range of noise emission levels and characteristics.

4. An estimation of the plant construction and operational noise levels at sensitive receptors potentially impacted by project noise.

5. A discussion of applicable noise standards and ordinances and the general conformance of the proposed project therewith.

I. With respect to cultural resources:

1. A description of all cultural resource properties (archaeological, historical, paleontological, and areas of unique religious or scientific value) within the area potentially impacted by the project identifiable from a literature and reconnaissance survey.

2. A discussion of those cultural resources listed in, declared eligible for, or nominated to the National Register of Historic Places, those resources that are listed as state or local landmarks or points of historic interest, and those resources that are otherwise protected by existing law.

3. A description of the methodology and techniques used to identify and evaluate site area cultural resources and any plans for future studies.

4. A description of potential impacts on identified cultural resources from construction and operation of each proposed geothermal power plant, and the measures under consideration for mitigation of such impacts.

J. With respect to social and economic effects:

1. A description, with an accompanying map, of the existing and proposed future land uses of the proposed power plant site and geothermal leasehold as designated by applicable land use plans or guidelines of local, regional, state, and federal agencies, of the present and proposed land use classifications for the site, leasehold and adjoining areas which are potentially impacted by the project and the location of municipal, county, regional, state and federal parks, recreational areas, scenic areas, wildlife sanctuaries, religious sanctuaries, or natural areas in the vicinity of the site and leasehold.

2. A general description of the social and economic setting of the area subject to impact from the proposed project.

3. An estimation of labor required during construction and operation of the proposed geothermal power plant and the geothermal field.

4. An estimation of the level of temporary and permanent project-related immigration to the local area.

5. An estimation of the impact of construction activities and project operation on the local economy and on the availability of public services and fixtures.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 21100, 25216.5, 25519, 25520, Public Resources Code.

VI. In a section entitled "Public Health Impacts", the application shall contain the following information of the potential public health effects from the construction and operation of the proposed power plant and geothermal field:

A. An identification of solid, gaseous, and water-borne emissions, including H_2S, SO_2, NH_3, and B, total suspended and respirable particulates, trace metals, and radioactive materials, which may cause adverse health effects in the surrounding population. The description shall include:

1. The source of such emissions;

2. The manner in which the emissions are produced;

3. The quantities of wastes produced, expressed in units consistent with applicable health and safety standards;

4. The measures and methods proposed for the handling, storage, and long-term disposal of such wastes; and

5. The anticipated effect on human health and safety resulting from the creation, handling, storage, and disposal of such wastes.

B. A description of any other toxic or hazardous substances which will be used in or result from the operation of the proposed facilities, including:

1. The source or purpose of such substances;

2. The quantities present during normal operation;

3. The measures and methods proposed for their safe handling, storage, and disposal; and

4. The potential health and safety risks associated with their accidental release or mishandling.

C. An estimation of the ambient concentrations for the pollutants identified in subsection A of this section, and the worst case incremental increase expected as a result of project emission.

D. A general discussion of concentrations required for the creation of adverse health effects from identified pollutants as disclosed in available literature. The discussion shall include variables due to differing age groups within the general population and portions of the general population which may be particularly affected by any identified emissions. The discussion shall also include the age distribution and size of the population affected by these emissions.

E. A discussion of all existing federal, state, and local health standards for identified project emissions.

NOTE: Authority Section 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 21600, 25216.5, 25519, 25520, Public Resources Code.

VII. In a section entitled "Reliability", the application shall contain:

A. A discussion of the anticipated service life and degree of reliability expected to be achieved by the proposed facilities based on a consideration of:

1. Expected annual and lifetime capacity factors.

2. The demonstrated or anticipated feasibility of the technologies, systems, components, and measures proposed to be employed in the facilities, including the power generation system, the heat dissipation system, the water supply system, the reinjection system, the atmospheric emission control system, resource conveyance lines and the waste disposal system.

3. Geologic and flood hazards, meteorologic conditions and climatic extremes, and cooling water availability.

4. Special design features adopted by the applicant or resource supplier to ensure power plant reliability.

5. The expected power plant maturation period.

Comment: To the extent possible, the information required pursuant to this subsection may be developed by reference to past designs, operating experience, and actual capacity.

B. An identification and discussion of major plant upset conditions which could result in output reduction or plant shutdown and the measures designed to eliminate or reduce both their occurrence and their duration. The discussion should include an assessment of the probability of occurrence of such conditions.

C. A description of the maintenance requirements for the proposed facilities including geothermal wells and resource conveyance lines insofar as they may affect power plant reliability.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25006, 25216.5, 25519, 25520, Public Resources Code.

VIII. In a section entitled "Electric Transmission Facilities" the application shall contain:

A. A discussion and map or maps of the proposed electric transmission line routes, or alternative points of interconnection, depicting rights-of-way and access roads:

1. Present and proposed future land use designated in adjacent local, regional, state and federal land use plans.

2. Significant biological and cultural resources or areas.

3. Geologic hazards or hazard areas.

Such map or maps shall extend to those areas that are adjacent to the proposed route in which impacts from the construction, operation, and maintenance of the electric transmission facilities are probable.

B. A description of any new or additional electric transmission facilities, such as powerlines, substations, switchyards, or other transmission equipment, whether or not within the exclusive permit authority of the commission, which will be constructed to transmit electrical power from the proposed geothermal power plant to the load centers to be served by the facility, whether or not such new or additional facilities will be added prior to or beyond the point of junction with an interconnected system. Such description shall

include the width of rights-of-way and the physical and electrical characteristics of electrical transmission facilities such as towers, conductors, and insulators. For electric transmission facilities outside the exclusive permit authority of the commission, response to this subsection may be limited to information, such as capacity and voltage levels and right-of-way widths, which will allow the commission staff to perform an electric transmission system planning analysis and to assess the cumulative environmental impacts. This description shall include a power load flow diagram which updates the applicant's latest submittal of load flows as part of the common forecasting methodology input if any revisions to the CFM submittal have been proposed by the applicant.

Comment: In order to assess cumulative environmental impacts overall project acceptability, and system relibility as it affects the proposed power plant and appurtenant facilities, all construction related to system additions and modifications necessitated by the proposed facilities must be considered.

C. A discussion of the need for the additional electric transmission lines, stations, or other equipment, the basis for selecting principal points of junction with the existing electric transmission system, and the capacity and voltage levels of the proposed lines along with the basis for selection of the capacity and voltage levels.

D. A discussion of the extent to which the proposed electric transmission facilities have been designed, planned, or routed to meet the transmission requirements created by additional generating facilities planned by the applicant or any other entity in the same general area.

Comment: A precise definition for "general area" as used here cannot be provided. In some instances the KGRA in which the proposed geothermal power plant is to be located would comprise the "general area". In all cases the applicant should acknowledge whether or not power plants proposed in an area which could be served by common transmission to the main transmission grid were considered in determining the capacity and general route of the proposed electric transmission facilities.

E. A justification for the electric transmission route and additional facilities proposed including a discussion of the advantages and disadvantages of the proposed route(s) compared with any alternative systems or corridors. The discussion shall consider:

1. The effects on the environment including water quality, geologic resources, potentials for accelerated soil erosion, impacts to biological, cultural and historical resources, scenic, recreational, and economic values, and public health and safety.

2. The cost of construction and operation of the proposed electric transmission facilities.

3. The reliability of the proposed electric transmission facilities.

F. Specific measures proposed to mitigate identified impacts.

G. A description of measures proposed to eliminate or reduce significant noise, radio and television interference, and electrical effects on the public.

H. A discussion indicating the conformity of the proposed electric transmission facilities with the applicable laws, standards and ordinances.

I. An identification of the owners and operators of the proposed electric transmission facilities and their legal interest in the proposed route or corridor.

J. A discussion of contracts executed or arrangements contemplated for the transmission of electric power from the proposed geothermal power plant in the event the applicant does not or will not have an ownership interest in those electric transmission lines proposed to transmit power from the power plant to a point of junction with an interconnected system.

K. Such other information as the applicant may wish to submit.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 21000, 25216.5, 25519, 25520, Public Resources Code.

IX. In a section entitled "Project Construction" the application shall contain:

A. Schedules for each major construction activity, including a discussion of major factors that may cause unscheduled delays.

B. To the extent known, a general description of plans for preparation of the power plant site including major earthwork activities and equipment required therefor, plans for erection and removal of temporary structures or improvements, and plans for monitoring construction activities and for documenting actual site conditions exposed during excavation which could require mitigation measures significantly different from those originally proposed.

C. A description of anticipated methods to be employed for construction of the geothermal power plant.

D. A description of plans for restoring the construction site if certification is not obtained or is withdrawn.

NOTE: Authority: Sections 25213, 25218(e), 25539, Public Resources Code. Reference: Sections 25216.5, 25519, 25520, Public Resources Code.

The Commission finds that:

1. The adoption of the attached power plant siting regulations will not have a significant effect on the environment.

2. The costs, if any, incurred by local agencies in complying with these regulations are reimbursable pursuant to section 25538 of the Public Resources Code.

This order shall take effect on the thirtieth day after its filing with the Secretary of State as provided in section 11422 of the Government Code.

Dated: 9/10/75

STATE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

Russell L. Schweickart
Chairman

DO NOT WRITE IN THIS SPACE

LEASING POLICY FOR GEOTHERMAL DEVELOPMENT

Submitted by

Leasing Policy Development Office
of the
U.S. Department of Energy

November 27, 1979

GEOTHERMAL DEVELOPMENT AND LEASING POLICY

Geothermal energy development is in its infancy. As such it is undergoing rapid change in technology, government and private participation, and public awareness and attitudes. Due to its economic and environmental advantages geothermal energy will be developed. Geothermal's contribution may be small but it is one of the few alternative energy sources that can make an important contribution in the next decade. Geothermal energy could produce as much as 5 percent of total national energy needs by the year 2000 and a much higher percentage of regional needs in some areas. It may provide 80 percent of Idaho's non-transportation energy needs, and energy importers like Nevada could become energy exporters. However, due to uncertainty and institutional barriers this development may well be slow. Government initiatives and policy may be able to accelerate development significantly.

The above considerations plus the fact that the majority of the known geothermal resource is under federal lands highlight the need for concerted Federal effort in meeting our responsibilities in the development of geothermal energy. The Leasing Policy Development Office of the Department of Energy (DOE) and other offices in the Federal Government have been and are now performing work related to the development of geothermal energy. It is essential that there be coordination between the activities of

everyone with responsibilities in geothermal energy to avoid duplication and to create a climate in which geothermal energy can and will be developed.

Section 302(b) of the Department of Energy Organization Act (DOE Act) transferred to DOE authority under the Geothermal Steam Act of 1970 to promulgate regulations applicable to federal leases which would (1) foster competition; (2) implement alternative bidding systems; (3) establish diligence requirements; (4) set rates of production; and (5) specify the terms, procedures and conditions for the acquisition and disposition of federal royalty interests taken in kind. The DOE Act explicitly reserves to the Department of the Interior (DOI) responsibility for the issuance and supervision of Federal leases and for the enforcement of all regulations applicable to Federal mineral leasing. While DOI will continue the day-to-day administration of federal leases -- i.e., setting their terms and conditions and issuing the leases -- Section 303(c)(1) of the DOE Act grants the DOE authority to review all proposed leases prior to issuance by DOI and to either approve or disapprove the terms and conditions therein which relate to the regulatory authorities transferred to the DOE under Section 302(b) of the DOE Act.

If adopted, pending amendments to the Geothermal Steam Act will change the approach to geothermal leasing in several respects. For example, it has been proposed to amend the definition of a Known Geothermal Resources Area (KGRA) to employ a stricter standard for designation of lands as KGRAs. In addition, the proposed legislation anticipates enhanced diligence requirements and a series of time frames for processing leases and permits. In light of these pending amendments and their potential impact on our areas of statutory responsibility, DOE feels it would be premature to propose any regulations prior to final passage and, accordingly, does not anticipate doing so.

DOE is, however, actively involved in preparing geothermal production goals and in analyzing areas in which the promulgation of regulations would encourage geothermal exploration and development. In the course of preparing production goals for geothermal energy, with interim goals scheduled to be ready by Spring 1980, several review papers have been written covering the status of various aspects of geothermal development. These include:

1. Status of the geothermal resource and its development;
2. Current federal leasing system and a history of federal geothermal leasing;

3. Listing of possible constraints to geothermal energy development;
4. Review of regulatory, legal, and legislative aspects;
5. Investigation of available sources of information on geothermal and determination of other agencies and offices involved in geothermal energy; and
6. Initial review and inventory of geothermal rig availability and technology.

Two additional studies are underway, one concentrating on electric generation from geothermal energy, and the other gathering available resource data and supply information on ownership to supplement the information we now have and enable us to determine exactly what part of the resource is federally controlled. The second study will also review non-electric commercialization, critiquing and enhancing existing studies to obtain forecasts for direct use of geothermal energy. DOE anticipates that the research undertaken in the development of production goals will provide a foundation for future regulatory activity.

As stated earlier, it is unlikely that specific regulations applicable to geothermal development would be promulgated by DOE before the final legislation is enacted. There are certain areas, however, that are being studied and in which we anticipate the eventual promulgation of regulations.

One such area is the use of alternative bidding systems. DOE is evaluating bidding systems other than the cash bonus bidding system to determine whether one or more alternative system might be particularly appropriate for geothermal leasing in light of our goal to increase participation and ease entry into the geothermal field.

The definition of a KGRA contained in one of the legislative proposals would limit the designation of KGRAs to those areas on which there is substantial physical evidence that the resource could be used to generate electricity in commercial quantities, or to areas in which there is demonstrated competitive interest. With respect to the latter standard, DOE anticipates promulgating regulations that will define what criteria must be met to designate an area as a KGRA because of competitive interest. It is expected that a narrower standard will be applied than is now used. One definition that has been proposed would also

limit to once the number of times that an area designated as a KGRA because of competitive interest may be offered for sale under competitive bidding procedures. If this competitive sale attracted no bids, the lease would be offered to the original first applicant. We believe that these changes will decrease the amount of time required to obtain a lease and, in that respect, will encourage a more rapid development of geothermal resources.

In the area of diligence requirements, DOE believes a strict standard is needed to ensure that development actually takes place and that leases are not simply held indefinitely without any positive action being taken that would lead to production. There also exists the related problem of ensuring that, once production is reached, leases continue to produce at the maximum efficient rate. One approach that is being considered is to establish a diligence standard for the pre-production period and use a production rate requirement to ensure post-production diligence. DOE's flexibility in establishing a diligence standard is likely to be controlled by the pending legislative amendments. Hopefully, whatever diligence standard is mandated will provide sufficient flexibility for waiver of the requirements in appropriate cases.

Regulations providing authority for direct use of geothermal resources and setting an appropriate royalty rate are being considered and can be expected once the geothermal area is more fully developed.

The Department is very much interested in obtaining the views of those involved in the geothermal industry, as well as other interested parties, and toward that end we actively solicits comments, ideas and proposals on any of the areas related to the authorities transferred to DOE under the provisions of the DOE Act. In this regard the names, addresses, and telephone numbers of staff members of the Leasing Policy Development Office are provided below.

Diane Menefee - (202) 633-9437
John Broderick - (202) 633-8300
Dan Dick - (202) 633-9437

Leasing Policy Development Office
U.S. Department of Energy
1200 Pennsylvania Avenue, N.W.
Room 2313
Washington, D.C. 20461

Attached are the Oregon statutes pertinent to geothermal resource development. Also included is a copy of the Department of Geology and Mineral Industries Administrative Rules dealing with geothermal drilling regulations.

The reader is cautioned that changes have been made in both the statutes and the rules and have yet to be incorporated into the official documents. Copies of House Bills 2134 and 3175 that outlined the changes are included for your information.

OREGON

STIPULATIONS WHICH APPLY TO GEOTHERMAL, OIL AND GAS DRILLING PERMITS

1. A plan of operation is to be submitted with the application to drill showing a plat of the drilling pad and including location of the mud sump and any road which is to be constructed. Dimensions of these items should be indicated on the plat.

2. Details of the mud system are to be submitted at the time of application giving the mud pit capacity (dimensions) and type mud to be used.

3. An emergency contingency plan is to be submitted prior to commencement of drilling describing:

    a. Field supervisor's name and how to contact him.

    b. Blow-out prevention equipment.

    c. BOP drills on test planned.

    In the event of an emergency, a department representative should be contacted:

Vernon C. Newton - Petroleum Engineer	(503)229-5580	Office
	(503)628-1527	Home
Donald A. Hull - State Geologist	(503)229-5580	Office
	(503)245-5942	Home
Joe F. Riccio - Geothermal Specialist	(503)229-5580	Office
	(503)646-3715	Home

4. In the event of a blow-out, a DOGAMI representative is to be notified as soon as possible.

5. Permission must be obtained from the State DEQ for any extraordinary offsite disposal of drilling mud or wastes or any other emergency that could effect adjoining properties.

6. Notice is to be given the State Geologist or his representative:

    a. When drilling is commenced.

    b. Prior to BOP tests after running casing strings.

    c. Prior to performing work to complete or abandon a well.

    c. Prior to running or pulling casing strings.

7. Upon completion of drilling operations, the site is to be restored to as near original condition as is practical.

OREGON: GEOTHERMAL WELL PERMITTING

GEOTHERMAL RESOURCES AND THE INSTITUTIONAL MAZE

GEOTHERMAL RESOURCES COUNCIL

November 1979

OREGON WELL PERMITTING REGULATIONS

In Oregon, geothermal resources are basically divided between two state agencies, Department of Geology and Mineral Industries (DOGAMI) and Department of Water Resources (DWR), for regulatory purposes.

HISTORY OF SEPARATION:

I. During promulgation of geothermal regulations in the late 60's, it was felt that rules should not hamper existing geothermal applications in Klamath Falls.

II. From an insurance and physical point of view, fluids above 250° F are more difficult to handle since pressure can build up and a blow out could occur. Therefore, it was felt that DOGAMI could better regulate drilling for high temperature resources.

III. Lower temperature and shallow resource uses are more likely to conflict with surface water uses, so it was felt that DWR was in a better position to regulate.

So with this philosophical background, the Geothermal Resource Act (Oregon Revised Statute (ORS)522) was changed in 1975 to exclude shallow, low temperature wells. These wells are essentially indifferentiated from common water wells.

BASIC DEFINITIONS:

Geothermal well: "...includes any excavation made for producing geothermal resources and any geothermal reinjection well..." (ORS 522.005(6))

Prospect well: "...includes any well drilled as a geophysical test well, seismic shot hole, mineral exploration drilling, core drilling or temperature gradient test well, less than 2,000 feet in depth and drilled in prospecting for geothermal resources..." (ORS 522.005(9))

Regulatory procedure for these wells comes under the jurisdiction of DOGAMI.

In application (ORS 522.0025), DOGAMI rules do not apply to geothermal fluids less than 250° F bottom hole temperature and less than 2,000 feet in depth. However, geothermal fluids of less than 250° F, but produced from below 2,000 feet depth, come under DOGAMI rules.

All geothermal well drilling permits are conditional upon approval of local authorities.

Well Drilling Procedure for Shallow-Low Termperature Resources (2,000 ft. 250° F).

Department of Water Resources

- No permit needed before drilling. Contact a licensed well contractor.
- The contractor will file a start card with local Watermaster describing location, proposed use, and expected depth.
- Bonded to $2,000 penal bond.

- Drilling procedures must conform to ORS Chapter 690 "Rules and Regulations Prescribing General Standards for the Construction and Maintenance of Water Wells in Oregon".

WATER RIGHTS:

All water from all sources of water supply are declared by statute to belong to public and subject to existing rights and legislative and administrative withdrawals, may be appointed for beneficial use by complying with the requirements of the water code.

Applications for which water right permits are not required:

- Domestic purposes - less than 15,000 gallons per day
- Irrigation - less than 1/2 acre
- Stock watering
- Single industrial or commercial purpose - less than 5,000 gallons per day.

Department of Water Resources policy is that beneficial use must be demonstrated to receive a water right. Reinjection wells will generally qualify.

DWR is developing regulations governing the disposal of geothermal fluids from wells under their jurisdiction as directed by the 1979 Legislature (HB3175).

Well Drilling Procedures for Geothermal Resources

Department of Geology & Mineral Industries

I. Regulatory Procedure for Prospect Wells

"Prospect well" includes any well drilled as a geophysical test well, seismic shot hole, mineral exploration drilling, core drilling or temperature gradient test well, less than 2,000 feet in depth, and drilled in prospecting for geothermal resources.

A. File a plan for operation and hole locations (letter form).

B. Filing fee - $100 per permit.

C. File a bond or security deposit in the sum of not less than $5,000 or blanket bond of $25,000.

D. DOGAMI sends notice of permit application to Department of Water Resources (DWR), Department of Environmental Quality (DEQ), Division of State Lands (DSL), Department of Land Conservation and Development (DLCD), and any other agencies deemed appropriate. Agencies have a 15 day period in which to comment.

E. Within 30 days of receipt of an application, a permit shall be granted. Restrictions are added to the permit if agency comments require them. Stipulations are made a condition of every permit.

F. Casing and abandonment requirements are also made a condition of each permit. Permitting of shallow holes is done on a blanket basis, area-by-area under one permit. As many as 100 holes may be drilled under one permit.

G. Formation logs and notations of water zones encountered are required of every operator. Blow Out Prevention rules require operators to monitor hole temperatures. If the temperature exceeds 125^{0} F, drilling is to cease and the hole can be completed as an observation hole, abandoned or equipped with safety devices as prescribed by rule.

H. A final statement is required of the operator describing plugging procedure. Final locations are to be submitted.

I. Sites are inspected for clean up and to check for ground water leakage. The drilling bond is released if all conditions are met. Inspections are coordinated with the U.S. Geological Survey to avoid duplication.

II. Regulatory Procedure for Geothermal Wells

"Geothermal well" includes any excavation made for producing geothermal resources and any geothermal reinjection well.

A. File an application and a detailed plan of operation including: hole location, estimated drilling depth, blow-out prevention equipment, waste mud and drill cuttings disposal, emergency plans, and site and road construction.

B. Filing fee - $100 per well.

C. File a bond or security deposit of $10,000 per well, or a $25,000 statewide bond.

D. DOGAMI sends notice of permit application to eleven agencies and the County Board of Commissioners.

E. Permits are issued within 45 days after receipt of application providing no serious concerns arise. Stipulations are made condition of every permit. Casing and cementing programs are approved and all requirements satisfied before a permit is issued.

F. An inspection is made early in the operation to test blow-out prevention equipment, see that mud is being properly handled and that records are being kept and drill samples collected.

G. Inspections are made when fluid tests or subsequent casing strings are run.

H. All subsequent cementing or casing operations are witnessed, including abandonment plugging or completion work.

I. Sites are inspected for well completion and site restoration.

J. All records related to the drilling are required to be filed with DOGAMI within 20 days after completion or abandonment. Records are held confidential for a four-year period.

K. When all requirements are met, the drilling bond is released.

III. Disposal of Geothermal Fluids

A. DOGAMI is developing regulations governing the disposal of geothermal fluids from wells under their jurisdiction as directed by the 1979 Legislature (HB2143, 3175).

B. A water pollution control facilities permit is required from the Department of Environmental Quality before reinjection is commenced.

C. Permit required from Department of Environmental Quality for disposal of liquid wastes such as drilling nuds, equipment oils, geothermal water, and solid wastes.

Chapter 522

1977 REPLACEMENT PART

Geothermal Resources

CROSS REFERENCES

Air and water pollution control permit for geothermal well drillings and operation, 468.350
Assessment of lands subject to geothermal resource exploration leases for ad valorem taxation, 308.370
Exploration, mining and processing of geothermal resources in areas zoned for farm use, 215.213
Geothermal resource rights on state lands, 273.780

GENERAL PROVISIONS

522.005 Definitions. As used in this chapter, unless the context requires otherwise:

(1) "Board" means the governing board of the State Department of Geology and Mineral Industries.

(2) "Byproduct" means any mineral or minerals, exclusive of helium or of oil, hydrocarbon gas or other hydrocarbon substances, which are found in solution or in association with geothermal resources and which have a value of less than 75 percent of the value of the geothermal resource or are not, because of quantity, quality, or technical difficulties in extraction and production, of sufficient value to warrant extraction and production by themselves.

(3) "Department" means the State Department of Geology and Mineral Industries.

(4) "Drilling" includes drilling, redrilling and deepening of a geothermal well.

(5) "Geothermal area" means any parcel of land that is, or reasonably appears to be, underlaid by geothermal resources.

(6) "Geothermal well" includes any excavation 500 feet deep or more made for discovery or producing geothermal resources.

(7) "Geothermal resources" means the natural heat of the earth, the energy, in whatever form, below the surface of the earth present in, resulting from, or created by, or which may be extracted from, the natural heat, and all minerals in solution or other products obtained from naturally heated fluids, brines, associated gases, and steam, in whatever form, found below the surface of the earth, exclusive of helium or of oil, hydrocarbon gas or other hydrocarbon substances, but including, specifically:

(a) All products of geothermal processes, embracing indigenous steam, hot water and hot brines;

(b) Steam and other gases, hot water and hot brines resulting from water, gas, or other fluids artificially introduced into geothermal formations;

(c) Heat or other associated energy found in geothermal formations; and

(d) Any byproduct derived from them.

(8) "Operator" means the person:

(a) Who possesses the legal right to drill a geothermal well;

(b) Who has obtained a drilling permit pursuant to ORS 522.135; or

(c) Who possesses the legal right to operate a completed geothermal well as described by ORS 522.185.

(9) "Prospect well" includes any well drilled as a geophysicial test well, seismic shot hole, mineral exploration drilling, core drilling or temperature gradient test well, less than 500 feet in depth, and drilled in prospecting for geothermal resources. "Prospect well" does not include a geothermal well as defined in subsection (6) of this section.

(10) "Waste" means any physical waste, including but not limited to underground waste resulting from the inefficient, excessive or improper use or dissipation of reservoir energy or resulting from the location, spacing, drilling, equipping, operation or production of a geothermal resource well in such a manner that reduces or tends to reduce the ultimate economic recovery of the geothermal resources within a reservoir; and surface waste resulting from the inefficient storage of geothermal resources and the location, spacing, drilling, equipping, operation or production of a geothermal resource well in such a manner that causes or tends to cause the unnecessary or excessive surface loss or destruction of geothermal resources released from a reservoir. [1975 c.552 §3]

522.010 [1971 c.776 §2; 1973 c.388 §1; repealed by 1975 c.552 §55]

522.015 Policy. (1) The Legislative Assembly hereby finds and declares that:

(a) The people of the State of Oregon have a direct and primary interest in the development of geothermal resources situated in this state.

(b) The State of Oregon, through the State Department of Geology and Mineral Industries, shall control the drilling, redrilling and deepening of wells for the discovery and production of geothermal resources so that such wells will be constructed, operated, maintained and abandoned in the manner necessary to safeguard the life, health, property and welfare of the people of this state, to safeguard the air, water and other natural resources of this state, and to encourage the maximum economic recovery of geothermal resources therefrom.

(2) It is the policy of the Legislative Assembly that this chapter be administered:

(a) To prevent damage to and waste of geothermal resources;

(b) To prevent interference with or damage to waters used or to be used for beneficial purposes that may result from improper drilling, operation, maintenance or abandonment of geothermal or prospect wells; and

(c) To supervise the drilling, operation, maintenance and abandoment of geothermal or prospect wells in a manner permitting the operator to utilize all methods known to the industry for the purpose of increasing the ultimate economic recovery of geothermal resources, that are suitable, and consistent with protection of the air, water and other natural resources of the state.
[Formerly 522.050]

Note: HJR 50 (1977), provides:

Whereas geothermal resources present an economical source of energy; and

Whereas geothermal resources, if properly utilized, could be of great benefit to Oregon; and

Whereas geothermal resources must be developed in a systematic and coordinated manner in order to maximize economic benefit and minimize possible damage to the environment; and

Whereas there must be an ecologically safe and economically viable means of disposing of geothermal fluids; and

Whereas the surface disposal of geothermal fluids is currently the subject of scientific inquiry; and

Whereas the type of system used to dispose of geothermal fluids must be adapted to local geological and environmental conditions; and

Whereas improper disposal of geothermal fluids may result in serious environmental detriment; and

Whereas the State of Oregon presently does not have a policy on the regulation of geothermal fluid disposal; and

Whereas there are presently at least four state agencies which have some involvement in the regulation of geothermal resources; and

Whereas a coordinated effort among these agencies is necessary in order to assure proper regulation which best serves Oregon; now, therefore,

Be It Resolved by the Legislative Assembly of the State of Oregon:

(1) The Water Resources Department, Department of Environmental Quality, State Department of Geology and Mineral Industries and Department of Energy are directed to make a cooperative and coordinated effort to establish a policy and, if necessary, promulgate rules on the disposal of geothermal fluids. Any rules proposed as a result of this effort shall be sufficiently flexible to promote economically beneficial and environmentally safe use of geothermal resources.

(2) The directors of these agencies shall submit a joint report to the Sixtieth Legislative Assembly on the progress they have made toward this goal. The report may include a recommendation for new legislation.

(3) A copy of this resolution shall be transmitted to the Governor, the Water Resources Director, the Director of the Department of Environmental Quality, the State Geologist and the Director of the Department of Energy.

522.020 [1971 c.776 §32; repealed by 1975 c.552 §55]

522.025 Application. The provisions of this chapter relating to the location and drilling of any well for the production of geothermal resources do not apply to any wells producing geothermal resources on July 1, 1975, or wells, other than prospect wells, drilled to a depth no greater than 2,000 feet where:

(1) The geothermal fluids produced are of less than 250 degrees Fahrenheit bottom hold temperature; or

(2) Such fluids have been appropriated pursuant to ORS 537.505 to 537.795.
[1975 c.552 §4]

522.035 Ownership rights. Ownership rights to geothermal resources shall be in the owner of the surface property underlain by the geothermal resources unless such rights have been otherwise reserved or conveyed. However, nothing in this section shall divest the people or the state of any rights, title or interest they may have in geothermal resources.
[1975 c.552 §21]

522.045 Abandoned well; jurisdiction. Any well drilled under authority of this chapter from which usable geothermal resources cannot be derived, or the owner or operator has no intention of deriving usable geothermal resources, shall be plugged and abandoned as provided in this chapter or, upon the operator's written application to the department and with the concurrence and approval of the Water Resources Director, jurisdiction over the well may be transferred to the Water Resources Director and, in such case, the well shall no longer be subject to the provisions of this chapter but shall be subject to any applicable laws and rules relating to wells drilled for appropriation and use of ground waters. If an application is made to transfer jurisdiction, a copy of all logs, records, histories and descriptions shall be provided to the Water Resources Director by the applicant.
[1975 c.552 §4c]

522.050 [1971 c.776 §1; 1975 c.552 §1; renumbered 522.015]

PROSPECT WELLS

522.055 Permit; application; fee. (1) No person shall engage in drilling a prospect well without first obtaining a permit issued under the authority of the State Geologist and without complying with the conditions of such permit.

(2) An application to drill prospect wells shall contain such information as the department may require, and shall be accompanied by a fee set by the department but not to exceed $200 to cover all prospect wells included within the application.
[1975 c.552 §4a]

522.060 [1971 c.776 §34; repealed by 1975 c.552 §55]

522.065 Circulation of application to state agencies; suggested conditions to permit; time limit for permit action. (1) Upon receipt of an application to drill prospect wells, the State Geologist shall circulate copies of the application to the Water Resources Director, the Director of the Department of Environmental Quality, the Director of the Department of Land Conservation and Development, and the Director of the Division of State Lands.

(2) Any public agency desiring to suggest conditions under which a permit should be granted shall provide such information to the department within 15 days of receipt of the copy of the application.

(3) Except as provided in ORS 522.075, within 30 days of receipt of an application to drill prospect wells, the State Geologist shall grant a permit to drill, subject to such conditions as he may impose. Included among the conditions shall be provision for the proper and safe abandonment of each prospect well.
[1975 c.552 §4b]

522.070 [1971 c.776 §7; repealed by 1975 c.552 §55]

522.075 Bond or security; execution; cancellation; waiver. (1) No permit for prospect wells shall be granted until the applicant has filed with the department a bond or security deposit in the sum of $5,000 for all prospect wells which are included within the application and to be drilled by the applicant.

(2) The bond or deposit shall be conditioned upon compliance with the requirements of this chapter, rules adopted and orders issued pursuant thereto, which shall secure the state against all losses, charges and expenses incurred by it in obtaining such compliance.

(3) The bond provided for in subsection (1) of this section shall be executed by the applicant, as principal, and shall meet such conditions as the board by rule may establish.

(4) With the consent of the board, any bond submitted as required by this section may be terminated and canceled and the surety be relieved of all obligations thereunder. However, the board shall not consent to the termination and cancellation of any bond until the prospect wells described by such bond have been properly and safely abandoned pursuant to the abandonment plan required by the permit or another valid bond for the prospect wells has been submitted and approved by the board.

(5) For those applications concerning prospect wells on federal lands, the board may waive the requirements of subsections (1) to (4) of this section upon receipt of suitable proof of compliance by the applicant with federal bond requirements which would, in the opinion of the board, be unnecessarily duplicated by the requirements of this section.
[1975 c.552 §4c; 1977 c.87 §1]

522.085 Report certifying completion of abandonment plan. Upon completion of all drilling and testing undertaken pursuant to an application to drill prospect wells, the applicant shall file with the State Geologist a report certifying the completion of the abandonment plan required by the permit.
[1975 c.552 §4d]

522.110 [1971 c.776 §11; 1973 c.388 §2; repealed by 1975 c.552 §55]

GEOTHERMAL WELLS

522.115 Permit; application; fee. (1) No person shall engage in the drilling or operating of any geothermal well without first obtaining a permit issued under the authority of the State Geologist, and without complying with the conditions of such permit.

(2) An application for a permit shall contain:

(a) The location and elevation of the floor of the proposed derrick.

(b) The number or other designation approved by the department by which the well shall be known.

(c) The applicant's estimate of the depths to be drilled.

(d) The nature and character of the geothermal resource sought.

(e) Such other information as the board by rule may require.

(3) An application shall be accompanied by a nonrefundable fee of $100.

(4) All fees collected by the department under this section shall be deposited with the State Treasurer and are continuously appropriated to the department for the administration of chapter 552, Oregon Laws 1975.
[1975 c.552 §5; 1977 c.87 §2]

Note: The Legislative Counsel has not, pursuant to 173.160, undertaken to substitute specific ORS references for the words "this Act" in 522.115 or 522.135. Chapter 552, Oregon Laws 1975, enacted into law and amended the ORS sections which may be found by referring to the 1975 Comparative Section Table located following the Index in volume 6 of Oregon Revised Statutes (1975 Replacement Parts).

522.120 [1971 c.776 §§12, 13; 1973 c.388 §3; repealed by 1975 c.552 §55]

522.125 Circulation of application to state agencies; suggested conditions to permit. (1) Upon receipt of an application for a permit to drill or operate a geothermal well, the department shall circulate copies of the application to the Water Resources Director, the State Fish and Wildlife Director, the State Forester, the Director of the Department of Environmental Quality, the administrative officer of the State Soil and Water Conservation Commission, the State Parks Superintendent, the Water Policy Review Board, the State Highway Engineer, the Director of the Department of Land Conservation and Development, the Director of the Division of State Lands and the governing body of the county or counties in which the well or wells will be located.

(2) Any public agency desiring to suggest conditions under which a permit should be granted shall provide such information to the department within 30 days of receipt of the copy of the application.
[1975 c.552 §6]

522.130 [1971 c.776 §14; repealed by 1975 c.552 §55]

522.135 Permit; time limit for action; grounds for issuance; conditions; construction of permit. (1) Within 45 days after receipt of the application, the State Geologist shall by order issue, deny, suspend, modify, revoke or not renew a permit pursuant to this chapter and ORS chapter 183 except that appeal of any order issued pursuant to this section shall be made to the governing board of the State Department of Geology and Mineral Industries before any appeal under ORS 183.480 is allowed.

(2) The State Geologist may issue the permit if, after receipt of comments from the agencies referred to in ORS 522.125, he determines that issuance thereof would be consistent with the purposes set forth in ORS 468.280, 468.710 and 537.525, rules adopted pursuant to ORS 468.725, and the purposes of this chapter.

(3) If the State Geologist issues a permit pursuant to this section, he shall impose such conditions as he considers necessary to carry out the purposes set forth in ORS 468.280, 468.710 and 537.525, rules adopted pursuant to ORS 468.725, and the purposes of this chapter. He shall include in the permit a statement that issuance thereof does not relieve any person from any obligation to obtain a permit under ORS 468.725 or 468.730.

(4) The State Geologist shall incorporate into the permit requirements:

(a) Any conditions made by the Water Resources Director necessary to comply with the purposes set forth in ORS 537.525; and

(b) Any conditions made by the Department of Environmental Quality necessary to comply with the purposes set forth in ORS 468.280 and 468.710.

(5) Nothing in chapter 552, Oregon Laws 1975, shall be construed to excuse an operator of a geothermal well from complying with the provisions of the Federal Water Pollution Control Act amendments of 1972 (Public Law 92-500) or ORS 468.730 or to dilute the authority of the Department of Environmental Quality to issue National Pollution Discharge Elimination Systems Permits.
[1975 c.552 §7]

Note: See note under 522.115.

522.140 [1971 c.776 §6; 1973 c.388 §4; repealed by 1975 c.552 §55]

522.145 Bond or security; execution; cancellation; waiver. (1) Except as waived by rule of the board, no permit shall be granted until:

(a) The applicant has filed with the department a bond or security deposit in the sum of $10,000 for each well to be drilled; or

(b) The applicant to drill more than one geothermal well has filed with the department a bond or security deposit in the sum of $25,000 for all wells to be drilled.

(2) The bond or deposit shall be conditioned upon compliance with the requirements of this chapter, rules adopted and orders

issued pursuant thereto, which shall secure the state against all losses, charges and expenses incurred by it in obtaining such compliance.

(3) The bonds provided for in subsection (1) of this section shall be executed by the applicant, as principal, and shall meet such conditions as the board by rule may establish.

(4) With the consent of the board, any bond submitted as required by this section may be terminated and canceled and the surety be relieved of all obligations thereunder. However, the board shall not consent to the termination and cancellation of any bond until the geothermal well described by such bond has been properly completed or lawfully abandoned or another valid bond for the well has been submitted and approved by the board.

(5) For those applications concerning geothermal wells on federal lands, the board may waive the requirements of subsections (1) to (4) of this section upon receipt of suitable proof of compliance by the applicant with federal bond requirements which would, in the opinion of the board, be unnecessarily duplicated by the requirements of this section.
[1975 c.552 §8; 1977 c.87 §3]

522.150 [1971 c.776 §8; repealed by 1975 c.552 §55]

522.155 Liablity for failure to protect ground water; standards for protection of ground and surface water. (1) In addition to any other liability of the operator of a geothermal well, the operator shall be liable to any person or public agency that sustains damages from failure of the operator to comply with a condition in a permit requiring him to provide for the protection of ground water in the area affected by the well.

(2) The board shall adopt by rule standards for blowout prevention, equipment and casing design and removal, and any other procedures necessary to shut out detrimental substances from strata containing ground or surface water usable for beneficial purposes.
[1975 c.552 §9]

522.160 [1971 c.776 §18; repealed by 1975 c.552 §55]

522.165 Location, number, or designation change; alteration of casing. (1) The location, number or designation specified for any geothermal well in a permit issued pursuant to ORS 522.135 shall not be changed without first obtaining written consent from the department.

(2) No operator shall alter in any manner the casing of a geothermal well without notifying the department and obtaining its approval.
[1975 c.552 §10]

522.170 [1971 c.776 §5; repealed by 1975 c.552 §55]

522.175 Abandonment; proceedings against operator for unlawful abandonment. (1) No person shall abandon a geothermal well without first obtaining approval of the department.

(2) A geothermal well shall be considered lawfully abandoned when the operator has conformed to ORS 522.245 and to rules adopted by the board designed to:

(a) Protect underground and surface water usable for beneficial purposes from pollution resulting from infiltration or addition of any deleterious substance;

(b) Prevent the escape of all fluids to the surface;

(c) Close the surface aperture of the well; and

(d) Remove all surface equipment except that necessary to maintain permanent closure of the well.

(3) When the operator has violated subsection (1) or (2) of this section or ORS 522.225, or when the department has issued a written disapproval of abandonment, the board may proceed against the operator and his surety as provided for in ORS 522.145 or 522.185, and may bring suit pursuant to ORS 522.810.
[1975 c.552 §11]

522.180 [1971 c.776 §19; repealed by 1975 c.552 §55]

522.185 Production and abandonment bond; cancellation; completed well. (1) Upon completing a geothermal well, as described by subsection (3) of this section, the operator of the well shall file with the department a production and abandonment bond in addition to the bond required by ORS 552.145, to insure compliance with the requirements of this chapter and rules adopted and orders issued pursuant thereto, and the sealing of the well when production has ceased. The board by rule shall establish the sum and terms of the production and abandonment bond required.

(2) The production and abandonment bond shall not be terminated and canceled by the board until the geothermal well described by the bond has ceased production and is lawfully abandoned, or another valid bond for the well has been submitted and approved by the board.

(3) A geothermal well is completed for purposes of subsection (1) of this section when it is producing geothermal resources and the operator of the well has received written assurance from the department that the manner of drilling of the well and the manner of producing geothermal resources therefrom are satisfactory.
[1975 c.552 §13]

522.190 [1971 c.776 §20; repealed by 1975 c.552 §55]

522.195 Monthly production statement. Except as excluded by rule adopted by the board, the operator of any completed geothermal well shall file with the department a monthly statement of the geothermal resources production from such well during the preceding calendar month.
[1975 c.552 §14]

522.200 [1971 c.776 §28; repealed by 1975 c.552 §55]

522.205 Transfer or purchase of well; notice; application; fee; notice by landowner of transfer or purchase. (1) Except as excluded from the provisions of this section by rule of the board, any prospective operator of a geothermal well shall notify the department in such form as the department may direct of the purchase, assignment, transfer, conveyance or exchange of such well within 15 days of the purchase and shall accompany such notice with an application for transfer of the permit for the particular well. The fee for transfer of a permit is $25.

(2) Any buyer of land on which a geothermal well is located shall notify the department of the purchase, assignment, transfer, conveyance or exchange of the land upon which such well is situated within 15 days of such purchase.
[1975 c.552 §15]

522.210 [1971 c.776 §31; repealed by 1975 c.552 §55]

522.215 Suspension of drilling or operation; application; terms; extension; presumption of abandonment; unlawful abandonment; notice; proceedings against operator. (1) No operator shall suspend drilling or operation of a geothermal well without obtaining permission from the department.

(2) The department may authorize an operator to suspend for a specific period operations or remove equipment from an uncompleted geothermal well upon such terms as the department may specify, upon written application of the operator and his affidavit showing good cause therefor.

(3) Within a period of six months from the ending date specified for such suspension, the operator may make written application for an extension of suspension, and file it with his affidavit showing good cause for such an extension. Upon a finding that the extension is merited, the board may extend the suspension for an additional specific period.

(4) If, after suspension, operations are not resumed by the operator within six months from the ending date specified for the suspension or extension thereof, an intention to abandon and unlawful abandonment shall be presumed.

(5) Whenever an operator whose operations have been suspended fails to comply with such terms as the department may specify in its authorization, the geothermal well shall be presumed unlawfully abandoned. A well shall also be deemed unlawfully abandoned, if, without notice to the department, any drilling or producing equipment is removed.

(6) An unlawful abandonment shall be declared by order of the board, and written notice thereof shall be mailed by registered mail both to such operator at his last-known post-office address, to his registered agent if any, and to the operator's sureties.

(7) After declaration of unlawful abandonment, the board may proceed against the operator and his surety as provided for in ORS 522.145 or 522.185, and may bring suit pursuant to ORS 522.810.
[1975 c.552 §16]

522.220 [1971 c.776 §21; repealed by 1975 c.552 §55]

522.225 Notice of intent to abandon. (1) Before commencing any operation to abandon a geothermal well, the operator shall give notice to the department of his intention to abandon the well and the date upon which the work of abandonment will begin.

(2) Such notice shall be given at least 24 hours before the commencement of abandonment operations and shall indicate:

(a) The condition of the well;

(b) The proposed method of the abandonment operation; and

(c) Any additional information that may be required by the department.
[1975 c.552 §17]

522.230 [1971 c.776 §23; repealed by 1975 c.552 §55]

522.235 Conditions precedent to abandonment. Before the proposed date upon which the work of abandonment will

begin, the department shall furnish the operator with:

(1) Approval to commence the abandonment operation;

(2) Conditional approval to commence the abandonment operation, stating what specific work or tests will be necessary before approval of the abandonment operation will be given; or

(3) A report stating what specific information is required to be furnished by the operator to the department before the department may take action upon the proposed abandonment operation.
[1975 c.552 §18]

522.240 [1971 c.776 §9; repealed by 1975 c.552 §55]

522.245 Department approval of abandonment; report by operator; effect of failure to comply; proceedings against operator. (1) A representative of the department shall be present during any abandonment operation. If he determines that the abandonment is satisfactory, he shall approve the abandonment of the well.

(2) Within 30 days after the completion of abandonment of any geothermal well, the operator of the well shall make a written report of all work done with respect to the abandonment. Within 10 days after the receipt of such report, the department shall furnish the operator with a written final approval of abandonment, or a written disapproval of abandonment setting forth the conditions upon which the disapproval is based.

(3) Failure to abandon in accordance with the approved method of abandonment, failure to submit to the department any notice or report required by this chapter, or failure to furnish the department with any required information shall constitute sufficient grounds for disapproval of the abandonment of such well.

(4) When the department has issued a written disapproval of abandonment, the board may proceed against the operator and his surety as provided for in ORS 522.145 or 522.185, or may bring suit pursuant to ORS 522.810.
[1975 c.552 §19]

522.250 [1971 c.776 §10; repealed by 1975 c.552 §55]

522.260 [1971 c.776 §30; repealed by 1975 c.552 §55]

ADMINISTRATION

522.275 Administration by State Geologist. Subject to policy direction by the board, the State Geologist shall administer this chapter, the rules and orders made pursuant thereto, and supervise the department in carrying out the provisions of this chapter.
[1975 c.552 §23]

522.305 Rules. In accordance with applicable provisions of ORS chapter 183, the board may make reasonable rules necessary for the administration of this chapter.
[1975 c.552 §22]

522.310 [1971 c.776 §24; repealed by 1975 c.552 §55]

522.315 Final order of department; delivery to operator. Whenever the department gives any written direction concerning any geothermal well and the operator requests in writing that a final order for purposes of ORS chapter 183 be made, the department shall, within 15 days after receipt of the notice, deliver such final written order to the operator.
[1975 c.552 §24]

522.320 [1971 c.776 §§25, 26; repealed by 1975 c.552 §55]

522.325 Compliance with final order; appeal. (1) The operator of any geothermal well shall within 15 days from the date of the service of any order, either comply with the order or file with the department a written statement that the order is not acceptable, and the reasons therefor, and the statement shall constitute an appeal from such order to the board.

(2) Any final written order of the board may be appealed in the manner provided in ORS chapter 183 for appeals from final orders in contested cases.
[1975 c.552 §25]

522.330 [1971 c.776 §27; repealed by 1975 c.552 §55]

WELL RECORDS

522.355 Records of well; contents; drill cutting and core samples. (1) The operator of any geothermal well shall keep, or cause to be kept, a careful and accurate log, core record and history of the drilling of the well.

(2) The log referred to in subsection (1) of this section shall show the character and depth of each formation encountered in the drilling of the well; the amount, size and weight of casing used; and the location, depth

and temperature of water-bearing strata, including the temperature, chemical composition and other chemical and physical characteristics of fluid encountered from time to time, so far as determined.

(3) The core record referred to in subsection (1) of this section shall show the depth, character and fluid content of cores obtained, so far as determined from the study and analysis thereof.

(4) The history referred to in subsection (1) of this section shall show the location and amount of sidetracked casings, tools or other material; the depth and quantity of cement in cement plugs; the shots of dynamite or other explosives used; the results of production and other tests during drilling operations; and completion data.

(5) The log referred to in subsections (1) and (2) of this section shall be kept in the local office of the operator and, together with the tour reports of the operator, shall be subject, during business hours, to inspection by the board, or department.

(6) The operator of any geothermal well shall, in addition to furnishing the log, records, and tests required by this section, collect representative drill cuttings. The operator shall additionally, in the event cores are taken, collect representative core samples. The drill cuttings and core samples shall be filed with the department promptly upon completion or upon its written request, and upon the abandonment or upon suspension of operations for a period of at least six months.
[1975 c.552 §26; 1977 c.87 §4]

522.365 Filing record with department; exemption from disclosure. (1) Each operator of any geothermal well or his designated agent shall file with the department a copy of the log, history and core record, or any portion thereof, promptly upon completion, or upon the written request of the department at any time after the commencement of the work of drilling any geothermal well, and upon the abandonment or upon suspension of operations for a period of at least six months.

(2) For a period of four years after the receipt of any log, history, core record, or any portion thereof, such record shall be exempt from disclosure as a trade secret pursuant to subsection (1) of ORS 192.500 unless the operator gives approval to release the data.
[1975 c.552 §27]1

522.410 [1971 c.776 §3; repealed by 1975 c.552 §55]

522.420 [1971 c.776 §35; repealed by 1975 c.552 §55]

522.430 [1971 c.776 §36; repealed by 1973 c.388 §8]

522.440 [1971 c.776 §38; repealed by 1973 c.388 §8]

522.450 [1971 c.776 §37; repealed by 1973 c.388 §8]

522.460 [1971 c.776 §4; repealed by 1975 c.552 §55]

522.470 [1971 c.776 §22; 1973 c.388 §5; repealed by 1975 c.552 §55]

522.480 [1971 c.776 §33; 1973 c.388 §6; repealed by 1975 c.552 §55]

522.510 [1971 c.776 §15; 1973 c.794 §24; repealed by 1975 c.552 §55]

522.520 [1971 c.776 §17; 1973 c.794 §25; repealed by 1975 c.552 §55]

522.530 [1971 c.776 §16; repealed by 1973 c.794 §34]

522.540 [1971 c.776 §29; repealed by 1973 c.794 §34]

ENFORCEMENT

522.810 Suits to enjoin violations. Whenever it appears that any person is violating or threatening to violate any provision of this chapter or any rule or order of the board made thereunder, or is threatening to or committing waste, the board may bring suit against such person in the circuit court of any county where the violation or waste occurs or is threatened, to restrain such person from continuing such violation or waste. In any such suit, the court shall have jurisdiction to grant to the board, without bond or other undertaking, such temporary restraining orders or final prohibitory and mandatory injunctions as the facts may warrant, including any such orders restraining the movement, disposition or waste of geothermal resources.
[1971 c.776 §41; 1973 c.388 §7; 1975 c.552 §29]

522.815 Orders by board; scope; notice; hearing. (1) When necessary to conserve geothermal resources or other natural resources, or to protect the environment, the correlative rights of any person having an ownership interest in the affected land or resource, or beneficial uses of water, or to accomplish the efficient and economical development of a geothermal reservoir, the board may, upon the request of any interested party or upon its own motion, after hearing, enter an order. The order shall include a description of the geothermal reservoir and the overlying land and may also include provisions for the following:

(a) Division of a geothermal reservoir into zones;

(b) Establishment of spacing units including a description of the location, size and shape of such spacing units;

(c) The integration of separately owned tracts or interests within a spacing unit for the development and operation of the spacing unit and the sharing of production therefrom;

(d) Unit operation of one or more reservoirs within a field and a statement of the terms, conditions and procedures for such unit operation including the allocation of production, royalties and costs. Such allocation shall be in accordance with any agreement of the parties, or if there is no such agreement, then such allocation shall be fair, just and equitable;

(e) The protection of existing and future beneficial uses of water;

(f) Maintaining the renewability of geothermal resources and any other natural resources; and

(g) Any additional provisions the board deems necessary for carrying out the provisions of chapter 552, Oregon Laws 1975 or for protecting the public health, safety and welfare.

(2) Any order entered under this section may in the board's discretion supersede any right or privilege previously granted by or previously entered by the board with respect to such reservoir and may after hearing be amended or supplemented as appears necessary to the board to accomplish the purposes of chapter 552, Oregon Laws 1975.

(3) Any proceeding under this section shall be conducted as a contested case in accordance with ORS chapter 183. In addition to the notice requirements of that chapter, notice shall be given to the following persons:

(a) Any operator who has a drilling permit issued pursuant to ORS 522.135 or has a legal right to operate a geothermal well pursuant to ORS 522.185 in the geothermal reservoir;

(b) Any person who has an ownership interest in the geothermal reservoir; and

(c) Any person who has an ownership interest in land within one mile of the boundaries of the geothermal reservoir.
[1975 c.552 §43]

Note: The Legislative Counsel has not, pursuant to 173.160, undertaken to substitute specific ORS references for the words "this Act" in 522.815. Chapter 552, Oregon Laws 1975, enacted into law and amended the ORS sections which may be found by referring to the 1975 Comparative Section Table located following the Index in volume 6 of Oregon Revised Statutes (1975 Replacement Parts).

PROHIBITED ACTS

522.910 Aiding in violations prohibited. No person shall knowingly aid or abet any other person in the violation of any provision of this chapter or of any rule or order of the board made thereunder.
[1971 c.776 §40; 1975 c.552 §30]

522.915 False entries, omissions, destruction, or removal of records or reports. No person shall:

(1) Make or cause to be made any false entry or statement in a report, record, log, account or other writing required by this chapter or any rule adopted pursuant thereto;

(2) Omit or cause to be omitted from any such report, record, log, account or writing, full, true and correct entries as required by this chapter or any rule or order adopted pursuant thereto;

(3) Destroy, mutilate, alter or falsify any such report, record, log, account or writing; or

(4) Remove from this state the original copy of any such report, record, log, account or writing before an abandonment has been approved pursuant to subsection (2) of ORS 522.245.
[1975 c.552 §28]

522.920 [1971 c.776 §39; repealed by 1975 c.552 §55]

PENALTIES

522.990 Penalties. Violation of any provision of this chapter or of any rule or order of the board made thereunder is punishable, upon conviction, by a fine of not more than $2,500 or by imprisonment in the county jail for not more than six months, or both.
[1971 c.776 §42; 1975 c.552 §31]

CERTIFICATE OF LEGISLATIVE COUNSEL

Pursuant to ORS 173.170, I, Thomas G. Clifford, Legislative Counsel, do hereby certify that I have compared each section printed in this chapter with the original section in the enrolled bill, and that the sections in this chapter are correct copies of the enrolled sections, with the exception of the changes in form permitted by ORS 173.160 and other changes specifically authorized by law.

Done at Salem, Oregon,
October 1, 1977.

Thomas G. Clifford
Legislative Counsel

DIVISION 20

GEOTHERMAL REGULATIONS

Jurisdiction and Authority

632-20-005 (1) The 1971 Geothermal Resources Act authorized the Department of Geology and Mineral Industries to control the drilling, redrilling, and deepening of wells for the discovery and production of geothermal resources so that such wells will be constructed, operated, maintained, and abandoned in the manner necessary to safeguard the life, health, property, and welfare of the people of this state and to encourage the maximum economic recovery of geothermal resources therefrom.

(2) The Governing Board of the Department shall:

(a) Administer and enforce the provisions of the Geothermal Resources Act; and

(b) In accordance with the applicable provisions of ORS Chapter 183, adopt rules and regulations and issue orders that it may deem necessary in carrying out the provisions of the Geothermal Resources act.

(3) The permittee shall in addition to complying with the 1971 Geothermal Act and these regulations comply with applicable laws and regulations of the State Engineer, Department of Environmental Quality, and any other agency having jurisdiction and control in the field of natural resources within the State of Oregon.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Definitions

632-20-010 (1) "Board" means governing board of the State Department of Geology and Mineral Industries.

(2) "By Products" means all minerals obtained from naturally produced or artificially injected fluid, brine, or associated gas and steam in any form whatsoever, but excluding oil, hydrocarbon gas, and other hydrocarbon substances.

(3) "Department" means the State Department of Geology and Mineral Industries.

(4) "Geothermal Area" means any parcel of land that is, or resonably appears to be underlaid by Geothermal Resources.

(5) "Geothermal Resources" means the natural underground reservoirs of heat that may be exploited for the production of heat energy, including, but not limited to, all minerals obtained from naturally produced or artificially injected fluid, brine, or associated gas and steam in any form whatsoever, but excluding oil, hydrocarbon gas, and other hydrocarbon substances and hot waters of less than 250°F. bottom hole temperature.

(6) "Operator" means any person who, duly authorized, is in charge of the development of a lease or the operation of a producing well.

(7) "Owner" means the person who has the right to drill into and produce from a geothermal resources field or reservoir, or to appropriate the production therefrom, or both, either for himself or for himself and others.

(8) "Person" means any individual, corporation, company, association of individuals, joint venture, partnership, receiver, trustee, guardian, executor, administrator, or personal representative that is the subject of legal rights and duties under these regulations.

(9) "Pollution" means any damage or injury resulting from the loss, escape, or unauthorized disposal of any substances at any well subject to the provisions of the Geothermal Resources Act and these regulations.

(10) "Prospect well" means a geophysical test well, temperature gradient test well, or other test well drilled solely for informational purposes in the exploration of and search for geothermal resources.

(11) "Waste" means any physical waste, deleterious effects on surface and groundwater, including but not limited to underground waste resulting from the inefficient, excessive or improper use or dissipation of reservoir energy or resulting from the location, spacing, drilling, equipping, operation, or production of a geothermal resource well or prospect well in such manner that reduces or tends to reduce the ultimate economic recovery of the geothermal resources within a reservoir; and surface waste resulting from the location, spacing, drilling, equipping, operation, or production of a geothermal resource well or

prospect well in such a manner that causes or tends to cause the unnecessary or excessive surface loss or destruction of geothermal resources released from the reservoir.

(12) "Supervisor" means the State Geologist.

(13) "Well" means any excavation made for the discovery or production of geothermal resources in a geothermal area or any special facility, converted producing facility, or reactivated or converted abandoned facility used for the reinjection of geothermal resources or the residue thereof underground.

(14) "Blow-Out" means a sudden or violent uncontrolled escape of fluids, as from a drilling well when high formational pressure is encountered.

(15) "Permittee" means "owner".

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Inspection and Supervision

632-20-015 The Supervisor or his deputy shall inspect and supervise geothermal operations for the purpose of enforcing compliance with the rules, regulations, and orders promulgated by the Board.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

General Rules

632-20-020 General rules shall be statewide in application unless otherwise specifically stated and applicable to all lands within the jurisdiction of the State of Oregon.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Supremacy of Special Rules

632-20-025 Special rules will be issued when required and shall prevail as against general rules if in conflict therewith.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Application and Permit to Drill, Redrill, or Deepen

632-20-030 (1) The owner or operator of any well or prospect well before commencing the drilling, redrilling, or deepening of any well or prospect well shall file with the Supervisor or his authorized deputy a written notice of intention to commence such drilling, redrilling, or deepening accompanied by a fee of $25 prescribed by this section, except no fee is required for the filing of such a notice for a prospect well. The notice will contain the following:

(a) The location and ground elevation of the proposed drill-site. The location shall include the township, range, section, and quarter-quarter section together with the distance and bearing to a section or quarter section corner.

(b) The number or other designation, approved by the Supervisor, by which the well shall be known.

(c) The owner's or operator's estimate of the depths between which production will be attempted.

(d) Such other pertinent data as the Board may require on the printed forms to be supplied by the Department or on other forms acceptable to the Supervisor.

(2) the Superisor shall notify the State Game Commission, the State Fish Commission, State Water Resources Board, the State Department of Environmental Quality, and the State Engineer prior to the issuance of a permit under the provisions of the Geothermal Resources Act and these regulations.

(3) Upon receipt of the application, the fee and the bond required under section 632-20-035, the Board will make its determination and issue such person a permit to drill, unless the drilling of the well or prospect well is contrary to law, or to rule, regulation, or order of the Board. The drilling, redrilling, or deepening of a well or prospect well for geothermal resources is prohibited until a permit is obtained. If the permit is disallowed, the Board will immediately notify the person in writing the reasons therefor.

(4) Drilling, redrilling, or deepening operations must commence within 90 days from the date of issuance of the permit or such permit shall become void unless the

Board grants an extension.

(5) After completion of any well, the provisions of this section shall also apply, where applicable, to the deepening or redrilling of the well, to any operation involving the plugging of the well and to any operations permanently altering in any manner the casing of the well.

(6) The number or designation specified for any well or prospect well in a notice filed as required by this section, shall not be changed without first obtaining the written consent of the Supervisor.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Drilling Bond

632-20-035 (1) Every person who engages in the drilling, redrilling, or deepening of any well for geothermal resources shall file with the Board an idemnity bond in the sum of $5,000 for each well drilled, redrilled, or deepened, or a $25,000 blanket bond for the drilling, redrilling, or deepening of one or more wells being conducted at any time. The Bond shall be filed with the Supervisor at the time of the filing of the notice of intention to drill, redrill, or deepen as required in section 632-20-035 of this chapter. The bond shall be executed by such person, as principal, and by a surety company authorized to do business in the State of Oregon, as surety, conditioned upon the faithful compliance by the principal with the rules, regulations, and orders under this chapter and shall secure the state against all losses, charges, and expenses incurred by it in obtaining such compliance by the principal of the bond.

(2) The condition of each bond required by subsection (1) of this section shall be stated in substantially the following language: "If said_____(naming the principal) shall well and truly comply with all the provisions of ORS 522 and shall obey all lawful orders of the Supervisor or his deputy and not appealed as provided in ORS 522 or, if appealed, upon affirmance thereof by the Board and shall pay all charges, costs, and expenses incurred by the Supervisor or his deputy with respect to such well, wells, or property of said principals or assessed against such well, wells, or property of such principals in pursuance of the provisions of ORS 522 and the regulation made thereunder, in the event said well, or wells cease to produce geothermal resources in commercial quantities or do not produce geothermal resources in commercial quantities, then this obligation shall be void; otherwise, it shall remain in full force and effect, or until another valid bond for such well or wells has been substituted therefor and approved by the Board".

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Assignment, Transfers of Ownership

632-20-040 (1) The owner or operator of a well shall notify the Supervisor in writing in such form as the Supervisor may direct, of the sale, assignment, transfer, conveyance, or exchange by him of such well and of the sale, assignment, transfer, conveyance, or exchange of the land upon which such well is situated within five days thereof. Each such notice shall contain the following:

(a) The name and address of the person to whom such well or land was sold, assigned, transferred, conveyed, or exchanged.

(b) The name and location of such well.

(c) The date of such sale, assignment, transfer, conveyance, or exchange.

(d) The date when possession of such well or land was relinquished by such owner or operator.

(e) A description of the land upon which the well is situated.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Notice of Change in Ownership

632-20-045 Every person who acquires the ownership or the right of operation of a well or land as described by section 632-20-040 of this Act shall, within five days after acquiring such well or land, notify the Supervisor or his authorized deputy, in writing of his newly acquired ownership or right of operation. Each such notice shall contain the following:

(a) The name and address of the person from whom the well or land was acquired.
(b) The name and location of such well.
(c) The date of such acquisition.
(d) The date when possession of such well or land was acquired by him.
(e) A description of the land upon which such well is situated.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Cancellation of Bond

632-20-050 Any bond submitted as required by section 632-20-035 of these regulations may with the consent of the Board, be terminated and canceled and the surety be relieved of all obligations thereunder. However, the Board shall not consent to the termination and cancellation of any bond until the well described by such bond has been properly completed or abandoned or another valid bond for such well has been submitted therefor and approved by the Board. No bond shall be released until the Board in writing shall have authorized such release.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Proper Completion and Abandonment

632-20-055 (1) A well is properly completed for the purposes of this chapter when it has been completed and is producing geothermal resources and the person engaged in drilling, redrilling, or deepening such well has shown to the satisfaction of the Board that both the manner of drilling, redrilling, or deepening of the well and the manner of producing geothermal resources therefrom are satisfactory. A well shall be considered completed 30 days after such well has begun to produce geothermal resources unless drilling operations are resumed on such well before the end of such 30-day period.

(2) A well shall be considered properly abandoned, for the purpose of this chapter, when the drilling, redrilling, or deepening has ceased before the completion and production of geothermal resources therefrom or when the well no longer produces economic quantities of geothermal resources when the conditions of the Geothermal Act and these regulations are fulfilled and the person drilling, redrilling, or deepening such well has shown to the satisfaction of the Board that all proper steps have been taken to protect underground and surface water used for irrigation or domestic purposes from pollution resulting from the infiltration or addition of any detrimental substance and to prevent the escape of all fluids to the surface.

(3) Proper completion and abandonment shall be also conditioned upon adequate procedures to implement protection of the environment and of aesthethic qualities of the surface in the area of operation.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Well Records

632-20-060 (1) The owner or operator of any well shall keep, or cause to be kept, a careful and accurate log, core record, representative samples of drill cuttings and cores, if cores are taken, and history of the drilling of the well. In the case of prospect wells, a log shall be kept describing the type of rock penetrated and depths of water-bearing formation. Copies of prospect well logs shall be made available to the State Engineer but subject to confidential restrictions of section 632-20-075 as far as release to the public.

(2) The log referred to in subsection (1) of this section for geothermal wells shall show the character and depth of each formation encountered in the drilling of the well; the amount, size, and weight of casing used; the size, type, and depths of perforations; and the location, depth, and temperature of water-bearing strata, including the temperature, chemical composition, and other chemical and physical characteristics of fluid encountered from time to time.

(3) The core referred to in subsection (1) of this section for geothermal wells shall show the depth, character, and fluid content of cores obtained, so far as determined from the study and analysis thereof.

(4) The history referred to in subsection (1) of this section for geothermal wells

shall show the location and amount of sidetracked casings, tools, or other material; type and depth of bore hole, surveys made; the depth and quantity of cement in cement plugs; the shots of dynamite or other explosives used; the results of production and other tests during drilling operations and completion data.

(5) The log referred to in subsections (1) and (2) of this section for geothermal wells and prospect wells shall be kept at the drill-site or local office of the owner or operator and, together with the tour reports of the owner or operator, shall be subject, during business hours, to inspection by the Board, the Supervisor, or his authorized deputy.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Sundry Notices and Reports

632-20-065 (1) Any written notice of intention to do work or to change plans previously approved must be filed with the Supervisor unless otherwise directed, and must be approved by him before work is begun. If, in case of emergency, any notice is given orally or by wire, an approval is obtained, the transaction shall be confirmed in writing. A subsequent report of the work performed must also be filed with the Supervisor.

(2) Notice shall be given in advance to the Supervisor or his representative of the Date and time when the operator or owner expects to make a casing test. Later, by agreement, the exact time shall be fixed. In the event of casing failure during the test, the casing must be repaired or replaced or recemented as required by the Supervisor or his representative. The results of the test must be reported within thirty (30) days after making a casing test. The report must describe the test completely and state the amount of mud and cement used, the lapse of time between running and cementing the casing and making the test, and the method of testing.

(3) Before the repairing or conditioning of a well, a notice setting forth in detail the plan of work must be filed with, and approved by, the Supervisor. A detailed report of the work accomplished and the methods employed, including all dates, and the results of such work must be filed within thirty (30) days after completion of the repair work.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Well Designations

632-20-070 Every person drilling any well for geothermal resources or operating, owning, or controlling or in possession of any well drilled for geothermal resources, shall paint or stencil and post and keep posted in a conspicuous place near the well, the name of the person drilling, operating, owning, or controlling the well, the name of the lease, the number of the well, and the number of the permit for the well, together with the Section, Township, and Range.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Filing of Records Confidential Period

632-20-075 (1) Upon the completion or abandonment of any well or upon suspension of operations conducted with respect to any well for a period of at least six months, copies of the lithologic log, core record, borehole surveys, representative samples or drill cuttings and cores, if any cores are taken, and history, prepared in such form as the Board may direct, shall be filed with the supervisor within 20 days after such completion, abandonment or six-month suspension for geothermal wells and within 60 days for prospect holes. Records of subsequent work shall be filed upon the recompletion of any well.

(2) For a period of two years from the date of completion, abandonment, or six-month suspension, the Supervisor shall keep such logs and records confidential and shall not permit public inspection of such records.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Inspection of Records

632-20-080 Each owner or operator of any

well or his designated agent shall file with the Supervisor a copy of the lithologic log, bore hole surveys, history and core record, or any portion thereof, or the driller's log in the case of a prospect well, at any time after the commencement of the work of drilling any well or prospect well upon the written request of the Supervisor or his authorized deputy. The request shall be signed by the Supervisor or the deputy and served such owner, operator or agent either personally or by mailing a copy of the request by registered mail to the last-known post-office address of such owner, operator, or agent.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Blow-Out Prevention

632-20-085 Any person engaged in operating a well wherein high pressures are known to exist and any person drilling for geothermal resources in any geothermal area wherein the pressures are unknown shall equip such well with casings of sufficient strength seated in competent rock formation and cemented in place and with such other safety devices as may be necessary, in accordance with methods approved by the Supervisor, and shall use every reasonable effort to prevent blow-outs, explosions, and fires from such well operation.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Noise Abatement

632-20-090 The lessee shall minimize noise when conducting air drilling operations or when the well is allowed to produce while drilling or drilling is conducted. Welfare of the operating personnel and the public must not be affected as a consequence of the noise created by the expanding gases. The method and degree of noise abatement shall be as approved by the Supervisor and shall comply with the regulations and standards pertaining thereto adopted by the Oregon Department of Environmental Quality.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Casing Requirements

632-20-095 (1) The owner or operator of any well on lands producing or reasonably presumed to contain geothermal resources shall properly case such well with adequate grade casing and cement such casing where necessary with methods approved by the Supervisor or his authorized deputy.

(2) The owner or operator of any such well shall also use every reasonable effort to shut out detrimental substances from strata containing water used for irrigation or domestic purposes and from surface water used for such purposes and to prevent the infiltration of detrimental substances into such strata or into such surface water. The operator of any well drilled for geothermal resources which penetrates a usable fresh water horizon shall be required to set casing through this formation and cement such casing from top to bottom unless the Supervisor approves a different program.

(3) Casing and casing seals used for prospect wells, where the temperature of groundwater does not exceed 250°F., shall comply with the general standards for the construction and maintenance of water wells set by the State Engineer.

(4) Each fluid bearing zone above the producing horizon in a geothermal resources well shall be cased and sealed off to prevent effectively the migration of formation fluids to other areas. Such casing and sealing off shall be effected and tested in such manner and by such methods and means as may be prescribed by the Supervisor.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Removal of Casings

632-20-100 No person shall remove a casing, or any portion thereof, from any well or prospect well without first giving advance notice and obtaining approval in writing from the Supervisor or his deputy.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Directional Drilling

632-20-105 (1) The maximum point at which a well penetrates the producing formation shall not unreasonably vary from the vertical drawn from the center of the hole at the surface. Deviation is permitted without special permission for short distances to straighten the hole, sidetrack junk or correct other mechanical difficulties.

(2) Permission to directionally drill a well shall be obtained from the Supervisor.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Serving Orders

632-20-110 Whenever the Supervisor or his authorized deputy makes or gives any written direction concerning the drilling, testing, or other operations conducted with respect to any well or prospect well drilled, in the process of being drilled, redrilled, deepened, or in the process of being abandoned and the operator, owner, or designated agent of either, serves written notice, either personally or by mail, addressed to the Supervisor or deputy, requesting that a definite order be made upon such subject, the Supervisor or his deputy shall, within five days after receipt of the notice, deliver a final written order on the subject matter. Any such final written order of the Supervisor may be appealed in the manner provided in ORS Chapter 183 for appeals from final orders in contested cases.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Measurement of Geothermal Resources

632-20-115 The lessee shall measure or gauge all production in accordance with methods approved by the Supervisor or may arrange with the Supervisor for other acceptable methods of measuring and recording production. The quantity and quality of all production shall be determined in accordance with the standard practices, procedures, and specifications generally used in industry.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Production Reports

632-20-120 The owner or operator of any well producing geothermal resources shall file with the Supervisor on or before the 10th day of each month a statement of the geothermal resources production from such well during the preceding calendar month. Such report shall be submitted on such forms and in such manner as may be prescribed by the Supervisor.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Abandonment

632-20-125 (1) Notice of Intention. Protection of water and geothermal resources:

(a) Before any operation is commenced to abandon any well drilled for geothermal resources, the owner or operator of such well shall give written notice to the Supervisor or deputy of his intention to abandon the well and the date upon which the work of abandonment will begin.

(b) The notice referred to in subsection (a) of this section shall be given at least 24 hours before the proposed date for the commencement of abandonment operations, and it shall show the condition of the well and the proposed method of such abandonment operation.

(c) The owner or operator of such well shall furnish the Supervisor or deputy any additional information that may be requested regarding the condition of the well and the proposed method of abandonment, at any time between the filing of the notice of intention to abandon the well and the completion of abandonment operation.

(2) Geothermal resource, environment, and water resources to be protected:

(a) Before any well or any producing horizon encountered therein shall be abandoned, the owner or operator shall use such means, methods, and procedure as may be necessary to prevent water from entering any geothermal resources bearing formation, and to protect any underground or surface water that is suitable for domestic or irrigation purposes from waste, downward drainage, harmful infiltration, and addition of deleterious substances.

(b) Prior to granting approval for final abandonment of any well drilled for geothermal resources, the Supervisor shall determine that the site be restored to as near its original state as possible.

(3) Suspension, Unlawful Abandonment, Removal of Equipment:

(a) The Board may authorize a permittee to suspend operations or remove equipment from a well for the period stated in the Board's written authorization, given upon written application of the permittee and his or its affidavit showing good cause. The period of suspension may be extended by the Board, upon written application made before expiration of the previously authorized suspension, accompanied by affidavit of the permittee showing good cause for granting of such extension.

(b) After operations on or at a well have been suspended with the approval of the Board pursuant to subsection (a) of this rule, if operations are not resumed within six months from the date specified in such approval of suspension, an intention to abandon and unlawful abandonment shall be presumed unless the permittee has obtained from the Board an extension of time of such suspension, upon his or its written application and affidavit showing good cause for the granting of such extension.

(c) Whenever operations on or at any well shall have been suspended for a period of six months without compliance with these regulations, the well shall be presumed unlawfully abandoned.

(d) A well shall be deemed unlawfully abandoned if, without notice given to the Board as required by these rules, any drilling or producing equipment is removed.

(e) Any unlawful abandonment under these regulations shall be declared by the Board and such declaration of abandonment shall be entered in the Board minutes and written notice thereof delivered by registered mail both to such permittee at his last known post office address as disclosed by the records of the Board and to the permittee's surety; and the Board may thereafter proceed against the permittee and his or its surety.

(f) All wells abandoned or declared abandoned as herein provided shall be plugged as required by law and by these regulations.

(4) Plugging Methods and Procedure, Geothermal Wells:

(a) The hole shall be filled with an approved mud-laden fluid from bottom to top of the hole. At the top of each producing formation a cement plug shall be placed which extends either from the bottom of the hole or from a point twenty-five (25) feet below the top of each producing formation upward to a point at least fifty (50) feet above each producing formation.

(b) A cement plug not less than fifty (50) feet in length shall be placed below all fresh water bearing strata.

(c) A twenty (20) foot cement plug shall be placed at the top of the casing in each hole plugged in such a manner as not to interfere with soil cultivation and a steel plate welded over the casing stub.

(d) The interval between plugs shall be filled with an approved heavy mud-laden fluid. Approved heavy mud-laden fluid is defined as mud weighing approximately 9.0 pounds per gallon of not less than thirty-six (36) viscosity (API Full Funnel Method).

(e) If the surface string of casing is set below the deepest fresh water-bearing formation, a cement plug shall be placed in the hole extending from a point at least twenty-five (25) feet below the base of a surface string and twenty-five (25) feet into the bottom of the casing. The hole shall also be capped as provided in subsection (c) above.

(f) The operator shall have the option as to method of placing cement in the hole:

(A) by the dump bailer;

(B) pumping through tubing;

(C) pump and plug displacement; or

(D) other method approved by the Supervisor.

(5) Affidavit on Completion. Copies:

Within 20 days after the plugging of a geothermal well and 60 days after the plugging of prospect wells has been accomplished, the owner or operator thereof shall file an affidavit with the director setting forth in detail the method used in plugging the well. Such affidavit shall be made on a form supplied by the Board.

(6) Plugging Methods and Procedure, Prospect Wells. Before abandoning any prospect well which well penetrates a useable fresh-water horizon, it shall be the duty of the owner or operator of such prospect well to plug the same in such manner as to protect properly all water-bearing formations; and within sixty (60) days after the plugging, an affidavit shall be filed with the Supervisor by the owner or operator, setting forth the location of the prospect well and the method used in plugging the same to protect water-bearing formations. Plugging shall consist of the following procedures unless a different method is approved by the Supervisor:

(a) In wells where water is not encountered, the hole shall be filled wih approved heavy mud-laden fluid and a twenty (20) foot cement plug placed at the top of the hole in such a manner as not to interfere with soil cultivation. Approved heavy mud-laden fluid is defined as mud weighing approximately 9.0 pounds per gallon of not less than thirty-six (36) viscosity (API Full Funnel Method).

(b) In wells where water is encountered but is not under artesian pressure, the hole shall be filled with cement through the water zone to a point at least fifty (50) feet above the water zone, or if the top of the zone is less than fifty (50) feet from the ground surface, the cement shall extend to the ground surface. If a well penetrates below a fresh-water zone, a cement plug shall extend from twenty-five (25) feet below the bottom of the water bearing zone to at least fifty (50) feet above the water zone.

(c) In wells where artesian water is encountered, the hole shall be plugged with cement as required under subsection (b). If the plug does not seal off the flow of water, the hole shall be replugged or pressure-grouted with cement until the flow is stopped.

(7) Wells Used for Fresh Water:

(a) When the drilled well to be plugged may safely be used as a fresh-water well and such use is desired by the land owner, the well need not be filled above the required sealing plug set below fresh water; provided, however, authorization for use of any such well shall be obtained from the State Engineer.

(b) Application for leaving the well partially unplugged as a fresh water well may be made to the Board by the land owner, accompanied by his affidavit as to his need of water and the intended use of the well, together with certified copy of the State

Engineer's order or permit authorizing such use.

(c) The operator shall leave the fresh water well in a condition approved by the Supervisor.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Subsequent Abandonment Report

632-20-130 (1) Within five days after the completion of abandonment of any well, the owner or operator of such well shall make, in such form as the Supervisor or deputy may direct, a written report, in duplicate, of all work done with respect to the abandonment. The Supervisor or deputy shall, within 10 days after the receipt of a written report of completion, furnish the owner or operator with a written final approval of abandonment, or a written disapproval of abandonment, setting forth the conditions upon which the disapproval is based.

(2) Failure to abandon in accordance with the approved method of abandonment, failure to submit to the Supervisor or his deputy any notice or report required by these regulations or failure to furnish the Supervisor or deputy, at his request, with any information regarding the condition of the well, shall constitute sufficient grounds for disapproval of the abandonment of such well.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Well Spacing

632-20-135 The Board shall approve proposed well-spacing programs or prescribe such modifications to the programs as it determines necessary for proper development, giving consideration to such factors as:

(1) topographic characteristics of the area;

(2) hydrologic and geologic conditions in the reservoir;

(3) minimum number of wells required for adequate development; and

(4) protection of the environment.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Commingling Production

632-20-140 The Supervisor may authorize the lessee to commingle the production from different wells and/or leases with the production of other operators subject to such conditions as he may prescribe.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Pits or Sumps

632-20-145 Materials and fluids or any fluid necessary to the drilling, production, or other operations by the permittee may be discharged or placed in pits and sumps if approval to do so is obtained from the Supervisor and the State Department of Environmental Quality. The operator shall provide pits and sumps of adequate capacity and design to retain all materials. In no event shall the contents of a pit or sump be allowed to:

(1) contaminate streams, artificial canals or waterways, groundwaters, lakes, or rivers;

(2) adversely affect the environment, persons, plants, fish, and wildlife and their populations; or

(3) damage the aesthetic values of the property or adjacent properties.

When no longer needed, pits and sumps are to be filled and covered and the premises restored to a near natural state.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Disposal of Solid and Liquid Wastes

632-20-150 In addition to any permit issued under these regulations, a permit is also required from the State Department of Environmental Quality for disposal of liquid wastes such as drilling muds, equipment oils, produced wastes including geothermal waters and solid wastes resulting from geothermal operations.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Re-Injection of Fluids into Reservoir

632-20-155 (1) The Board may authorize

re-injection into the reservoir of fluids produced with geothermal resources providing it is established that such practice will be done in the best possible manner with respect to the environment and to economic considerations and that such re-injection will not be contrary to any law, rule, or regulation of another agency.

(2) Applications for permission to re-inject fluids into the reservoir shall contain such information as the Board deems necessary to make its determination.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Appeals From Board Actions

632-20-160 Application for rehearing by person adversely affected by order of Board. Any person adversely affected by any rule, regulation, or order of the Board may within 30 days after its entry apply to the Board for a rehearing. Such application shall be acted upon by the Board within 30 days from its filing date, and if granted, such rehearing shall be held without undue delay.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Judicial Review of Board Actions

632-20-165 (1) Any person adversely affected by any rule, regulation, or an order entered by the Board may obtain judicial review thereof pursuant to ORS Chapter 183.

(2) The circuit court having jurisdiction shall, in so far as is practicable, give precedence to proceedings for judicial review under this chapter.

(3) Either party may appeal to the Supreme Court of the State of Oregon in the same manner as provided by the laws for appeals from the circuit court in suits in equity.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Environmental Protection

632-20-170 In the absence of coverage by any other section of these regulations, the permittee shall conduct operations under this chapter so as not to pollute land, water or air, pollute streams, damage the surface or pollute the underground water. The operator must comply with Federal and State air and water quality standards. Plans for disposal of well effluents must take into account the effect on groundwaters, streams, plants, fish and wildlife and their populations, atmosphere, or any other effects which may cause or contribute to pollution, and such plans must be approved by the Supervisor before action is taken under them.

Statutory Authority:
Hist: Filed 7-20-72 as GMI 4, Eff. 8-1-72

Geothermal Blow-Out Prevention

Blow-Out Prevention Rules for Geothermal Wells

632-20-175 (1) Cementing of Casing. The conductor and surface casing strings shall be cemented with a quantity of cement sufficient to fill the annular space back to the surface. The intermediate casing string shall likewise be cemented back to the surface or to the top of the lap if a liner is used as an intermediate string. Production casing shall be cemented with a high temperature resistant admix, unless waived by the Supervisor and shall be cemented in a manner necessary to exclude, isolate, or segregate overlying formation fluids from the geothermal resources zone and to prevent the movement of fluids into possible fresh water zones. Production casing shall be cemented back to the surface or, if lapped, to the top of the lap. A temperature or cement bond log may be required by the Supervisor after setting and cementing the production casing and after all primary cementing operations if an unsatisfactory cementing job is indicated. Proposed well cementing techniques differing from the requirements of this paragraph will be considered by the Supervisor on an individual well basis.

(2) Pressure Testing. Prior to drilling out the casing shoe after cementing, all casing strings set to a depth of 500 feet or greater, except for conductor casing, shall be pressure tested to a minimum pressure of 1,000 psi or 0.2 psi/ft whichever is greater. All casing strings set at a depth less than 500 feet, except for conductor casing, shall be pressure tested to a minimum pressure of 500 psi. Exceptions to these minimum pressures may be allowed with the specific prior permission of the State Geologist. Such test shall not exceed the rated working pressure of the casing or the blow-out preventer stack assembly, whichever is lesser.

In the event of casing failure during the test, the casing must be repaired or recemented until a satisfactory test is obtained. A pressure decline of 10 percent or less in 30 minutes shall be considered satisfactory.

Casing test results shall be recorded on the driller's log and reported to the Supervisor within 30 days after the completion of such test. Advance notice of all casing and lap tests shall be given in sufficient time to enable the State Geologist or his representative to be present to witness such tests. The casing and lap test reports shall give a detailed description of the test; including mud and cement volumes, lapse of time between running and cementing casing and testing, method of testing and test results.

(3) Blow-Out Prevention Equipment and Procedures. All necessary precautions shall be taken to keep all wells under control at all times, utilize trained and competent personnel, and utilize properly maintained equipment and materials. Blow-out preventers and related well control equipment shall be installed, tested immediately thereafter and maintained ready for use until drilling operations are completed. Certain components, such as packing elements and ram rubbers, shall be of high temperature resistant material as necessary. All kill lines, blowdown lines, manifolds and fittings shall be steel and shall have a temperature derated minimum working pressure rating equivalent to the maximum anticipated wellhead surface pressure. Subject to subsections (a) and (b) hereinbelow, blow-out prevention equipment shall have manually operated gates and hydraulic actuating systems and accumulators of sufficient capacity to close all of the hydraulically operated equipment and have a minimum pressure of 1,000 psi remaining on the accumulator. Dual control stations shall be installed with a high pressure backup system. One control panel shall be located on the ground at least 50 feet away from the wellhead or rotary table. Air or other gaseous fluid drilling systems shall have blow-out prevention assemblies. Such assemblies may include, but are not limited to, a rotating head, a double ram blow-out preventer or equivalent, a banjo-box or an approved substitute therefor and a blind ram blow-out preventer or gate valve, respectively. Exceptions to the requirements of this paragraph will be considered by the State Geologist only for certain geologic and well conditions such as stable surface areas with known low subsurface formation pressures and temperatures:

(a) Conductor Casing. In certain instances a remotely controlled hydraulically operated expansion type preventer or an acceptable alternative, approved by the Supervisor, including a drilling spool with side outlets or equivalent may be required by the Supervisor in areas where shallow thermal zones are indicated.

(b) Surface, Intermediate, and Production Casing. Unless otherwise approved by the Supervisor, before drilling below any of these strings, the blow-out prevention equipment shall include a minimum of:

(A) One expansion-type preventer and accumulator or rotating head;

(B) A manual and remotely controlled hydraulically operated double ram blow-out preventer or equivalent having a temperature derated minimum working pressure rating which exceeds the maximum anticipated surface pressure at the anticipated reservoir fluid temperature;

(C) A drilling spool with side outlets or equivalent;

(D) A fillup line;

(E) A kill line equipped with at least one valve; and

(F) A blowdown line equipped with at least two valves and securely anchored at all bends and at the end.

(c) Testing and Maintenance. Ram type blow-out preventers and auxiliary equipment shall be tested to a minimum of 1,000 psi or to the working pressure of the casing or assembly, whichever is the lesser. Expansion type blow-out preventers shall be tested to 70 percent of the above pressure testing requirements. The blow-out prevention equipment shall be pressure tested:

(A) when installed;

(B) prior to drilling out plugs and/or casing shoes;

(C) not less than once each week, alternating the control stations; and

(D) following repairs that require disconnecting a pressure seal in the assembly.

During drilling operations, blow-out prevention equipment shall be actuated to test proper functioning as follows: once each trip for blind and pipe rams but not less than once each day for pipe rams; and at least once each week on the drill pipe for expansion type preventers.

All flange bolts shall be inspected at least weekly and retightened as necessary during drilling operations. The auxiliary control systems shall be inspected daily to check the mechanical condition and effectiveness and to insure personnel acquaintance with the method of operation. Blow-out prevention and auxiliary control equipment shall be cleaned, inspected, and repaired, if necessary, prior to installation to assure proper functioning. Blow-out prevention controls shall be plainly labeled, and all crew members shall be instructed on the function and operation of such equipment. A blow-out prevention drill shall be conducted weekly for each drilling crew. All blow-out prevention tests and crew drills shall be recorded on the driller's log.

(4) Related Well Control Equipment. A full opening drill string safety valve in the open position shall be maintained on the rig floor at all times while drilling operations are being conducted. A kelly clock shall be installed between the kelly and the swivel.

(5) Drilling Fluid. The properties, use, and testing of drilling fluids and the conduct of related drilling procedures shall be such as are necessary to prevent the blow-out of any well. Sufficient drilling fluid materials to ensure well control shall be maintained in the field area readily accessible for use at all times.

(6) Drilling Fluid Control. Before pulling drill pipe, the drilling fluid shall be properly conditioned or displaced. The hole shall be kept reasonably full at all times, however, in no event shall the annular mud level be deeper than 100 feet from the rotary table when coming out of the hole with drill pipe. Mud cooling techniques shall be utilized when necessary to maintain mud characteristics for proper well control and hole conditioning.

(7) Drilling Fluid Testing. Mud testing and treatment consistent with good operating practice shall be performed daily or more frequently as conditions warrant. Mud testing equipment shall be maintained on the drilling rig at all times.

The following drilling fluid system monitoring or recording devices shall be installed and operated continuously during drilling operations, with mud, occurring below the shoe of the conductor casing. No exceptions to these requirements will be allowed without the specific prior permis-

sion of the Supervisor:

(a) high-low level mud pit indicator including a visual and audio-warning device;

(b) Degassers, desilters, and desanders;

(c) a mechanical, electrical, or manual surface drilling fluid temperature monitoring device. The temperature of the drilling fluid going into and coming out of the hole shall be monitored, read, and recorded on the driller's or mud log for a minimum of every 30 feet of hole drilled below the conductor casing; and

(d) a hydrogen sulfide indicator and alarm shall be installed in areas suspected or known to contain hydrogen sulfide gas which may reach levels considered to be dangerous to the health and safety of personnel in the area.

(8) Wellhead Equipment and Testing:

(a) Completions. All wellhead connections shall be fluid pressure tested to the API or ASA working pressure rating. Cold water is recommended as the testing fluid. Welding of wellhead connections shall be performed by a certified welder using materials in conformance with ASTM specifications.

(b) Wellhead Equipment. All completed wells shall be equipped with a minimum of one casinghead with side outlets, one master valve and one production valve, unless otherwise authorized by the Supervisor. All casingheads, christmas trees, fittings, and connections shall have a temperature derated working pressure equal to or greater than the surface shut-in pressure of the well at reservoir temperature. Packing, sealing mediums, and lubricants shall consist of materials or substances that function effectively at, and are resistant to, high temperatures. Wellhead equipment, valves, flanges, and fittings shall meet minimum ASA standards or minimum API Standard 6A specifications. Casinghead connections shall be made such that fluid can be pumped between casing strings.

(9) Supervision. From the time drilling operations are initiated and until the well is completed or abandoned, a member of the drilling crew or the toolpusher shall monitor the rig floor at all times for surveillance purposes, unless the well is secured with blow-out preventers or cement plugs.

Statutory Authority: ORS 522.305

Hist: Filed and Eff. 11-17-76 as GMI 8

Blow-Out Prevention Rules for Geothermal Prospect Wells

632-20-180 The following stipulations shall apply to the drilling of shallow prospect holes for measurement of temperature gradients or heat flow:

(1) If the conditions outlined in (3), (4), or (5) below are encountered, the State Geologist shall be notified immediately. No exceptions to the stipulations of (3), (4), or (5) will be allowed without the specific prior permission of the State Geologist.

(2) Holes for measuring temperature gradients shall be limited to a depth of 500 feet.

(3) Return-line temperatures shall be taken at no less than 30 foot intervals during drilling operations on shallow holes drilled with mud. If return-line mud temperature should reach 52°C (125°F), drilling ahead shall cease immediately and the hole will be either:

(a) completed as an observation hole by running steel tubing as deep as possible, filling the annulus with drilling mud from total depth to 10 feet below the surface and with cement from 10 feet to the surface;

(b) abandoned by filling the hole with drilling mud from total depth to 10 feet below the surface and cement to the surface thereafter; or

(c) equipped with mud cooling and wellhead control devices to maintain well control and mud returns temperature at or below 52°C (125°F).

(4) If hot water or flowing steam at 65°C (150°F) or greater is encountered, further drilling shall stop immediately and the hole will be either:

(a) completed as an observation hole using steel tubing cemented from total depth to surface; or

(b) abandoned by plugging with cement from total depth to surface.

(5) If cold flowing artesian water is encountered, the hole will be completed as in (4) hereinabove, except that plastic tubing may be used.

(6) Locations proposed in natural thermal areas within a 1,000 foot radius of hot

springs, fumaroles, or other surface geothermal indicia, or in areas of known artesian water flow, will require a detailed drilling program for each hole, approved by the State Geologist. The State Geologist may require special drilling and completion techniques for such holes (such as cemented surface casing and simple expansion type blow-out preventers) to safely control formations containing geothermal or other resources which may be penetrated.

(7) A supply of mud and lost circulation material shall be kept on hand while drilling to control abnormal pressure if rotary equipment is used.

Statutory Authority: ORS 522.305
Hist: Filed and Eff 11-17-76 as GMI 8

Enrolled

House Bill 2134

Ordered printed by the Speaker pursuant to House Rule 12.01 (at the request of State Department of Geology and Mineral Industries) Presession filed

CHAPTER.....163.....

AN ACT

Relating to geothermal energy; creating new provisions; and amending ORS 522.005 and 522.075.

Be It Enacted by the People of the State of Oregon:

Section 1. ORS 522.005 is amended to read:

522.005. As used in this chapter, unless the context requires otherwise:

(1) "Board" means the governing board of the State Department of Geology and Mineral Industries.

(2) "Byproduct" means any mineral or minerals, exclusive of helium or of oil, hydrocarbon gas or other hydrocarbon substances, which are found in solution or in association with geothermal resources and which have a value of less than 75 percent of the value of the geothermal resource or are not, because of quantity, quality, or technical difficulties in extraction and production, of sufficient value to warrant extraction and production by themselves.

(3) "Department" means the State Department of Geology and Mineral Industries.

(4) "Drilling" includes drilling, redrilling and deepening of a geothermal well.

(5) "Geothermal area" means any parcel of land that is, or reasonably appears to be, underlaid by geothermal resources.

(6) "Geothermal well" includes any excavation [*500 feet deep or more*] made for [*discovery or*] producing geothermal resources **and any geothermal reinjection well as defined in subsection (10) of this section.**

(7) "Geothermal resources" means the natural heat of the earth, the energy, in whatever form, below the surface of the earth present in, resulting from, or created by, or which may be extracted from, the natural heat, and all minerals in solution or other products obtained from naturally heated fluids, brines, associated gases, and steam, in whatever form, found below the surface of the earth, exclusive of helium or of oil, hydrocarbon gas or other hydrocarbon substances, but including, specifically:

(a) All products of geothermal processes, embracing indigenous steam, hot water and hot brines;

(b) Steam and other gases, hot water and hot brines resulting from water, gas, or other fluids artificially introduced into geothermal formations;

(c) Heat or other associated energy found in geothermal formations; and

(d) Any byproduct derived from them.

(8) "Operator" means the person:

(a) Who possesses the legal right to drill a geothermal well;

(b) Who has obtained a drilling permit pursuant to ORS 522.135; or

(c) Who possesses the legal right to operate a completed geothermal well as described by ORS 522.185.

(9) "Prospect well" includes any well drilled as a geophysical test well, seismic shot hole, mineral exploration drilling, core drilling or temperature gradient test well, less than *[500]* **2,000** feet in depth, and drilled in prospecting for geothermal resources. "Prospect well" does not include a geothermal well as defined in subsection (6) of this section.

(10) "Geothermal reinjection well" means any well or converted well constructed to dispose of geothermal fluids derived from geothermal resources into an underground reservoir.

(11) "Reservoir" means an aquifer or combination of aquifers or zones containing a common geothermal or groundwater resource.

[(10)] **(12)** "Waste" means any physical waste, including but not limited to underground waste resulting from the inefficient, excessive or improper use or dissipation of reservoir energy or resulting from the location, spacing, drilling, equipping, operation or production of a geothermal resource well in such a manner that reduces or tends to reduce the ultimate economic recovery of the geothermal resources within a reservoir; and surface waste resulting from the inefficient storage of geothermal resources and the location, spacing, drilling, equipping, operation or production of a geothermal resource well in such a manner that causes or tends to cause the unnecessary or excessive surface loss or destruction of geothermal resources released from a reservoir.

Section 2. ORS 522.075 is amended to read:

522.075. (1) No permit for prospect wells shall be granted until the applicant has filed with the department a bond or security deposit in the sum of **not less than** $5,000 **for each hole to be drilled or a blanket bond in the amount of $25,000** for all prospect wells which are included within the application and to be drilled by the applicant.

(2) The bond or deposit shall be conditioned upon compliance with the requirements of this chapter, rules adopted and orders issued pursuant thereto, which shall secure the state against all losses, charges and expenses incurred by it in obtaining such compliance.

(3) The bond provided for in subsection (1) of this section shall be executed by the applicant, as principal, and shall meet such conditions as the board by rule may establish.

(4) With the consent of the board, any bond submitted as required by this section may be terminated and canceled and the surety be relieved of all obligations thereunder. However, the board shall not consent to the termination and cancellation of any bond until the prospect wells described by such bond have been properly and safely abandoned pursuant to the abandonment plan required by the permit or another valid bond for the prospect wells has been submitted and approved by the board.

(5) For those applications concerning prospect wells on federal lands, the board may waive the requirements of subsections (1) to (4) of this section upon receipt of suitable proof of compliance by the applicant with federal bond requirements which would, in the opinion of the board, be unnecessarily duplicated by the requirements of this section.

SECTION 3. Section 4 of this Act is added to and made a part of ORS chapter 522.

SECTION 4. (1) (a) In order to accomplish the policy of ORS 522.015 all geothermal fluids derived from geothermal resources shall be reinjected into the same reservoir from which withdrawn unless it is determined by the department that these policies and the public interest require other disposal of the fluids.

(b) Subject to the determination in paragraph (a) of this subsection, injection into other reservoirs or disposal by other means may be allowed by the department in specific instances where it is shown that such action is consistent with the policies cited in this section. Disposal by other means may include any secondary use of geothermal fluid after the primary use of such fluid for electrical power generation or for other direct application of the heat or other associated energy contained in such fluids or for by-product extraction. Secondary uses may include, but shall not be limited to, use of condensate resulting from electrical power plant operations for plant-cooling purposes, or use of such geothermal fluid for agricultural, commercial or industrial purposes.

(2) The State Department of Geology and Mineral Industries shall adopt rules which govern the reinjection of geothermal fluids derived from geothermal resources. The rules shall include standards whereby contamination may be determined, construction standards for reinjection wells, testing procedures for identifying aquifers, standards and procedures for determining whether adjacent aquifers are being degraded by the reinjection process, guidelines for conservation of the resource, criteria for evaluating reservoirs or zones for geothermal fluid disposal and requirements for prior approval of all geothermal fluid reinjection proposals.

(3) A water pollution control facilities permit shall be obtained from the Department of Environmental Quality under ORS 468.740 before reinjection is commenced. The Department of Environmental Quality may, by agreement with the State Department of Geology and Mineral Industries, waive this requirement for reinjection into the reservoir from which the fluid came where adequate standards and tests have been adopted to insure the fluid and its residues are uncontaminated.

Enrolled

House Bill 3175

Sponsored by COMMITTEE ON ENVIRONMENT AND ENERGY (at the request of Representative Wilhelms)

CHAPTER 547

AN ACT

Relating to geothermal resources; creating new provisions; and amending section 4, chapter 163, Oregon Laws 1979.

Be It Enacted by the People of the State of Oregon:

Section 1. Section 4, chapter 163, Oregon Laws 1979 (Enrolled House Bill 2134), is amended to read:

Sec. 4. (1) (a) In order to accomplish the policy of ORS 522.015 all geothermal fluids derived from geothermal resources shall be reinjected into the same reservoir from which withdrawn unless it is determined by the department that these policies and the public interest require other disposal of the fluids.

(b) Subject to the determination in paragraph (a) of this subsection, injection into other reservoirs or disposal by other means may be allowed by the department in specific instances where it is shown that such action is consistent with the policies cited in this section. Disposal by other means may include any secondary use of geothermal fluid after the primary use of such fluid for electrical power generation or for other direct application of the heat or other associated energy contained in such fluids or for by-product extraction. Secondary uses may include, but shall not be limited to, use of condensate resulting from electrical power plant operations for plant-cooling purposes, or use of such geothermal fluid for agricultural, commercial or industrial purposes.

(2) The State Department of Geology and Mineral Industries shall adopt rules which govern the **disposal by** reinjection **or other means** of geothermal fluids derived from geothermal resources **from wells of 250 or more degrees Fahrenheit bottom hole temperature or wells 2,000 or more feet deep.** The rules shall include standards whereby contamination may be determined, construction standards for reinjection wells, testing procedures for identifying aquifers, standards and procedures for determining whether adjacent aquifers are being degraded by the reinjection process, guidelines for conservation of the resource, criteria for evaluating reservoirs or zones for geothermal fluid disposal and requirements for prior approval of all geothermal fluid reinjection proposals.

(3) A water pollution control facilities permit shall be obtained from the Department of Environmental Quality under ORS 468.740 before reinjection is commenced. The Department of Environmental Quality may, by agreement with the State Department of Geology and Mineral Industries, waive this requirement for reinjection into the reservoir from which the fluid came where adequate standards and tests have been adopted to insure the fluid and its residues are uncontaminated.

SECTION 2. Section 3 of this Act is added to and made a part of ORS 537.505 to 537.795.

SECTION 3. (1) The Water Resources Director shall adopt rules which govern the disposal by reinjection or other means of geothermal fluids derived from:

(a) Geothermal or hot water wells less than 2,000 feet deep producing fluids of less than 250 degrees Fahrenheit bottom hole temperature; or

(b) Geothermal or hot water wells less than 2,000 feet deep producing fluids that have been appropriated pursuant to ORS 537.505 to 537.795.

(2) The rules adopted under subsection (1) of this section shall include standards whereby contamination may be determined, construction standards for reinjection wells, testing procedures for identifying aquifers, standards and procedures for determining whether adjacent aquifers are being degraded by the reinjection process, guidelines for conservation of the resource, criteria for evaluating reservoirs or zones for geothermal fluid disposal and requirements for prior approval of all geothermal fluid reinjection proposals.

(3) A water pollution control facilities permit shall be obtained from the Department of Environmental Quality under ORS 468.740 before reinjection is commenced. The Department of Environmental Quality may, by agreement with the Water Resources Director, waive this requirement for reinjection into the reservoir from which the fluid came where adequate standards and tests have been adopted to insure the fluid and its residues are uncontaminated.

QUESTIONNAIRE

GEOTHERMAL RESOURCES AND THE INSTITUTIONAL MAZE

1. Is the material covered in the course what you expected it to be? Yes ( ) No ( )
   Remarks_____

   _____

2. Were the speakers adequate? Yes ( ) No ( )

   Remarks_____

   _____

3. Would you recommend to your management that other company employees be sent to a similar course? Yes ( ) No ( )

   Remarks_____

   _____

4. Which of the following topics covered in this course (Well Permitting, Facilities Siting, Unitization, Environmental Requirements, Lease Acquisition and Contracts and Pricing Formulas) would you like to see expanded into a special one or two day course?

   Name one or more_____

   _____

5. Is there a subsection of one of the above topics that you would like to see expanded into a special course or seminar? Yes ( ) No ( )

   Please elaborate_____

   _____

6. Was the tuition rate: high ( ) low ( ) or reasonable ( ). If high or low by how much? $_____

7. Are the hotel accomodations adequate? Yes ( ) No ( )

   Remarks_____

   _____

8. What is your overall rating of the course?

   Circle one: 1 2 3 4 5

9. What part of the course would you like to see improved if it were given again?

_____

_____

_____

10. Do you feel that this same course should be given in two years? Yes ( ) No ( )

Remarks _____

_____

11. General Remarks _____

_____

_____

_____

FACILITY SITING

I. Warren-Alquist Act: General

A. Purposes

(1) Common forum - consolidation of regulatory functions in single agency - PRC 25500

(a) CEC must find compliance with all applicable federal, state and local standards

(1) If CEC finds non-conformance, may override to extent permitted by federal law.

(2) Creation of "State Mobilization Board" - state with authority and mandate to ensure a reliable supply of electrical energy to meet present and future demand - PRC 25500. CEC-ARB Joint Agreement.

(a) local government presents concerns to CEC; does not have power to block or delay needed powerplants.

(1) The geothermal exception - county government has the authority to control the location and pace of geothermal development through its control over geothermal wells. PRC 25120

B. Jurisdiction

(1) Geothermal powerplants with net generating capacity of 50 MW or more

(a) Powerplants with generating capacity of less than 50 MW must obtain county conditional use permit and PUC certificate of public convenience and necessity.

(2) Federal lands - permits issued by BLM & USGS

(a) federal regulations require applicant to obtain state and local permits

(b) state and federal agencies have initiated cooperative permitting process for geothermal (see below)

(1) Imperial County/BLM-East Mesa

(2) CEC/BLM/USGS - NCPA Geothermal Project #2, Sonoma County (see below)

II. CEC Geothermal Powerplant Siting Processes

A. Two Basic Regulatory Schemes

(1) 2 Phase NOI-AFC

(a) 1st phase (9 month NOI) has site screening and early planning as principal objectives

(b) 2nd phase (9 month AFC) is final licensing review

(1) CEQA Compliance completed during AFC

(2) Single phase 12 month AFC

(a) presumes substantial planning already accomplished by county and developer

(1) exploratory, confirmation drilling permitted and completed

B. Initiating NOI

(1) Information requirements (Article 4, Appendix A; see also Article 1)

(a) Focus; scope: level of detail

(b) allowable presumptions regarding powerplant

(2) Air Quality analysis

(3) Demonstrate need for geothermal facility

(C) NOI Procedure (Article 2)

(1) Public Process - role of local and state agencies

- role of intervenors

(2) Identification of issues - discovery; non-adjudicatory hearings

(3) adjudication of disputed issues

(4) condition setting for AFC

(D) AFC

(1) Information requirements (Appendix B)

(2) Determination of compliance

monitoring & Compliance

(E) 12 Month AFC

(1) Information requirements (Appendix C)

(2) Proving commercial resource

(a) Proprietary information

III. Special Problems

(1) Delegation of siting authority

(a) conditions

(2) Air Quality in the Geysers

(a) H_2S rollback control strategy and new source review

(b) prevention of significant deterioration

(c) jurisdiction between Air Pollution Control Districts and CEC

(a) problem of steam stacking

(3) CEQA compliance under three jurisdictions - steamfield EIR v. powerplant EIR

IV. Federal-State Joint Permitting

A. NCPA Shell case history

GEOTHERMAL LEGISLATION

IN THE STATES

Presented at the Geothermal Resources Council
Management Survey Course No. 1

San Diego, CA

November 28-30, 1979

Energy Program - Geothermal Project
National Conference of State Legislatures
1405 Curtis Street, 23rd Floor
Denver, Colorado 80202
303/623-6600

APPENDIX I

State Laws and Regulations Regarding Geothermal Resources

ALASKA
Statutes: Geothermal Resources Act (1971) AK. Stat. 38.05.181
Leasing: Div. of Lands - Regulations & Statutes Pertaining to Coal and Other Leasable Minerals (1974) 11 A.A.C. 84.700...
Drilling: Div. of Oil & Gas - 11 A.A.C. 94.730... (1974)

ARIZONA
Statutes: Geothermal Resources (1972); amend. HB 2257 (1979) A.R.S. 27-651...
Leasing: Land Dept. - Geothermal Resources (1972) T.12C.5.A.22 (under revision)
Drilling: Oil & Gas Conservation Comm. - General Rules & Regulations Governing the Conservation of Geothermal Resources (1972) T.27C.4.A.4

CALIFORNIA
Statutes: leasing - Geothermal Resources Act (1967) Pub. Res. Code 6902...
production - Laws for the Conservation of Geothermal Resources (1967, as amend.) Pub. Res. Code 3700...
siting - Energy Resources Development; Conservation Act (1974) Pub. Res. Code 25000...
Leasing: State Lands Comm. - Leases & Prospecting Permits for Geothermal Resources (1970) C:A.C. 2250...
Drilling: Div. of Oil & Gas - Statewide Geothermal Regulations (1976) C.A.C. 1900...
Siting: Energy Comm. - Provisions Applicable to Geothermal Notices & Applications (1978) DRAFT

COLORADO
Statutes: Geothermal Resources Act (1974) C.R.S. 34-70-101...
Leasing: Board of Land Commissioner - Special Rules & Regulations Relating to Geothermal Resources Leases (1972) SLB #248-1
Drilling: Oil & Gas Conservation Comm. - Rules & Regulations for the Development & Production of Geothermal Resources (1976) G101...

HAWAII
Statutes: Government Mineral Rights (1974); amend. HB 3033 (1978) H.R.S. 182-1...
Leasing: Dept. of Land & Natural Resources - Regulations on Leasing & Drilling Geothermal Resources (1978) Reg. No. 8
Drilling: Reg. No. 8

IDAHO
Statutes: leasing - Geothermal Resources Leasing Act (1975) ID Code 47-1601...
production - Geothermal Resources Act (1974, as amend.) ID Code 42-4001...
Leasing: Board of Land Commissioner - Rules & Regulations Governing the Issuance of Geothermal Resources leases (1974) (under revision)
Drilling: Water Resource Board - Drilling for Geothermal Resources (1978)

LOUISIANA
Statutes: Geothermal Energy Resources (1976) L.R.S. 30:800...; Geothermal & Geopressure Energy Research & Development Act (1975) L.R.S. 30:681
Leasing: Mineral Board - none (oil & gas model likely)
Drilling: Office of Conservation - statewide order 29-P (1978)

MARYLAND
Statutes: Geothermal Resources Act (1978) A.C.M. 8-8A-01

Appendix I

MONTANA
Statutes: leasing - Lease of Geothermal Resources (1974) R.C.M. 81-2601...
siting - Major Facilities Siting Act (1975, as amend) R.C.M. 70-801...
filing bottom-hole temperatures - Act to Facilitate the Discovery of Geothermal Energy Sources (1975) R.C.M. 60-127, 144,148
Leasing: Dept. of State Lands - Geothermal Rules & Regulations (1975) M.A.C. 26-2.6(2)
Drilling: Dept. of Natural Resources & Conservation - Geothermal Investigation Reports (1975) M.A.C 36-2.8(14)

NEVADA
Statutes: leasing - An Act Relating to State Lands (1975) N.R.S. 322.030...
production - An Act Relating to Geothermal Resources (1975) N.R.S. 534A.010.
Leasing: Div. of Lands - pending
Drilling: Div. of Water Resources - Regulations Pertaining to Exploration Drilling (1978)

NEW MEXICO
Statutes: Geothermal Resources Act (1967) N.M.S.A. 7-15-1...
Geothermal Resources Conservation Act (1975) (Chap. 272)
Leasing: State Land Office - Rules & Regulations Relating to Geothermal Resources Leases (1971)
Drilling: Oil Conservation Div. - Rules & Regulations for Geothermal Resources (1974)

OREGON
Statutes: Geothermal Resources (1975) O.R.S. 522.005...
Geothermal Heating Districts (1975) O.R.S. 523.010...
Leasing: Div. of State Lands - Geothermal Lease Regulations (1975) 75-010...
Drilling: Dept. of Geology & Mineral Industries - Rules, Regulations & Laws Relating to Exploration & Development of Geothermal Resources (1977) 632-20-005...

TEXAS
Statutes: Geothermal REsources Act (1975) V.A.C.S. Art. 5421s
Leasing: Railroad Comm./Div. of Oil & Gas - none (oil & gas model likely)
Drilling: Railroad Comm./Div. of Oil & Gas - Rules Having General Application to Oil, Gas, & Geothermal Resource Operations (1976) 051.02.02.000
School Land Board - Rules & Regulations Governing Drilling & Producing on Permanent Free School Lands (1974) (general)

UTAH
Statutes: Water & Irrigation Laws (1973) U.C.A. 73-1-120
Leasing: Div. of Lands - Rules & Regulations Governing Issuance of Mineral Leases (1973); Geothermal Steam Lease Agreement (1973)
Drilling: Div. of Water Rights - Rules & Regulations for Wells Used for the Discovery & Production of Geothermal Energy (1978)

WASHINGTON
Statutes: Geothermal Resources Act (1974) T.79 R.C.W.
Leasing: Dept. of Natural Resources - Geothermal Leasing Policy (1978) DRAFT
Drilling: Dept. of Natural Resources - none

WYOMING
Statutes: Underground Water (1973) WY Stat. 41-121
Leasing: Board of Land Commissioner - Rules & Regulations Governing the Issuance of Geothermal Resource Permits & Leases (1975)
Drilling: Oil & Gas Conservation Comm. - Rules & Regulations (1975) (general)

ENACTED INCENTIVES FOR GEOTHERMAL DEVELOPMENT

INCOME TAX

Colorado	H.B. 1019	(1978)	Commercial or residential investments for solar, wind and geothermal energy systems deductible for state income tax.
	S.B. 321	(1979)	Include geothermal system in alternative energy devices for income tax deduction.
Idaho	H.B. 468	(1976)	Income tax deduction for investments in residential geothermal energy facilities.
Montana	H.B. 292	(1977)	Tax deduction for residential nonfossil energy generating systems (may apply to geothermal).
	S.B. 167	(1977)	Tax credit for nonfossil energy systems (may apply to geothermal).
Oregon	S.B. 399	(1977)	Income tax credit up to $1,000 for residential geothermal space heating.

PROPERTY TAX

Colorado	S.B. 316	(1979)	Exclude alternative energy devices from valuation of property for property tax assessment.
Hawaii	S.B. 2467	(1976)	Property tax exemption for building improvements to use geothermal energy.
Nevada	A.B. 144	(1979)	Exempt nonproducing geothermal leases from property tax.
	A.B. 277	(1977)	Property tax credit up to $2,000 for residential geothermal facilities for heating and cooling.
South Dakota	H.B. 1354	(1978)	Residential and commercial property tax credit for geothermal and other renewable energy systems.

SALES TAX

Hawaii	H.B. 3033 (1978)	Determines the applicability of excise taxes on geothermal gross proceeds. Provides for royalties in lieu of a severance tax. Clarifies utility access.

LOANS

Alaska	H.B. 266 (1978) Ch. 29	Establishes an alternative power resources revolving loan fund within the state Department of Commerce and Economic Development.
Oregon	S.B. 477 (1977)	Loan program for veterans--up to $3,000 for residential geothermal energy facilities.
Virginia	H.B. 100 (1978) Ch. 631	Directs the Virginia Housing Development Authority to establish a loan program for financing the purchase and installation of insulation, storm windows and doors, and solar and other alternative energy sources that will reduce reliance on present sources of energy in residential, public and nonprofit buildings.

LEASING POLICY

California	S.B. 1027 (1978)	Modifies leasing procedures giving State Lands Commission discretion in issuing exploration and development leases; revises rentals, royalties and renegotiation procedures; gives the commission discretion in issuing and setting the terms of direct use leases.
New Mexico	H.B. 446 (1979)	Extend the acreage limitation on state geothermal leases from 25,000 to 51,200 acres and provide for a second 5-year lease term without production upon payment of increased rental.

DEVELOPMENT REGULATIONS

California	A.B. 2644 (1978)	Streamlines geothermal exploration and field development regulation and facility siting; authorizes the state energy commission to prohibit curtailment of geothermal power production or transmission.
Oregon	H.B. 2159 (1977)	Authorizes waiver of state bonding requirements for well drilling if operation has bond with federal government.
	H.B. 2134 (1979)	Establish procedures for reinjecting geothermal fluids and permit DOGAMI to adopt regulations on reinjection and require DEO water pollution control facilities permit for reinjecting contaminated fluid.

UTILITY REGULATIONS

California	S.B. 77 (1976)	Empowers PUC to order public utilities to transmit electricity generated by private producers from non-conventional sources.
	A.B. 2644 (1978)	Streamlines geothermal exploration and field development regulation and facility siting; authorizes the state energy commission to prohibit curtailment of geothermal power production or transmission.
	A.B. 4032 (1976)	Higher rate of return allowed for utility investments in renewable energy facilities.
Hawaii	S.B. 995 (1977)	Exempts nonfossil power generation and transmission facilities from PUC regulation when energy used by producer or sold directly to public utility. Authorizes PUC to require public utilities to purchase surplus power from such facilities.

Utility Regulations cont.

Hawaii	H.B. 2165 (1978)	Makes rates paid by public utilities to geothermal developers for geothermal steam, or electricity from geothermal steam, subject to PUC regulation.
	H.B. 3033 (1978)	Determines the applicability of excise taxes on geothermal gross proceeds. Provides for royalties in lieu of a severance tax. Clarifies utility access.
Kansas	H.B. 2842 (1978)	Allows utilities to receive a 1/2% to 2% higher rate of return on investments in systems which derive energy from solar, geothermal and other renewable energy sources.

DEVELOPMENT AUTHORIZATIONS

Hawaii	S.B. 1773 (1978) Act 36	Authorizes counties individually or together with utilities and end users to develop geothermal and other alternative energy resources.
Oregon	S.B. 572 (1977)	Energy Conservation and Production Fund financed by state bond issues established to assist utility companies and individuals in development of non-nuclear energy resources. Emphasis on geothermal and other resources not currently in widespread use. Oregon Department of Energy authorized to develop alternate energy projects, fix rates and sell energy.
	SJR 32 (1977)	Authorizes issuance of bonds for Energy Conservation and Production Fund (rejected by voters).
	H.B. 3185 (1975)	Authorizes geothermal heating districts with contracting and bonding authority and power of eminent domain.

Development Authorizations cont.

Oregon	S.B. 502	(1979)	Permit joint participation in geothermal activities of cities and people's utility districts in Oregon with cities, utility districts, electric cooperatives and privately owned electric utility companies in Nevada and California.

LIFE-CYCLE COSTING/BUILDING CODES

Maryland	H.B. 413	(1978)	Requires consideration of life-cycle costing and energy consumption analysis during the preliminary design of new buildings financed by the state or with state assistance.
Mississippi	S.B. 2379	(1978)	Establishes life-cycle costing in the design of state buildings.
Nevada	S.B. 326	(1977)	State energy conservation standards for buildings must allow design and construction latitude to the extent that solar, geothermal, or other nondepletable energy sources are used.
New Jersey	A.B. 562	(1978)	Requires life-cycle cost analysis in the design phase of any construction or renovation of major facilities. The analysis must compare alternative energy systems.
New Mexico	H.B. 395	(1975)	Life-cycle cost analysis of nonfossil energy systems required for new state buildings or major renovations.
Ohio	H.B. 419	(1978)	Requires life-cycle cost analysis in state-owned, assisted or leased facilities.
Texas	HSR 24	(1977)	Requests all state agencies and universities to encourage feasibility studies and demonstration projects for alternate energy use in state buildings.

OMBUDSMAN/TECHNICAL ASSISTANCE

Oregon	S.B. 572	(1977)	Energy Conservation and Production Fund financed by state bond issues established to assist utility companies and individuals in development of non-nuclear energy resources. Emphasis on geothermal and other resources not currently in widespread use. Oregon Department of Energy authorized to develop alternate energy projects, fix rates and sell energy.

RESEARCH AND DEVELOPMENT/DEMONSTRATIONS

Arizona	H.B. 2078	(1979)	Expands activities of Arizona Solar Energy Research Commission to include other renewable energy sources, including geothermal.
Hawaii	S.B. 1581 H.B. 3039	(1978)	Major funding provided for geothermal resource assessment; research and development of non-electric uses; and the rift zone laboratory.
	H.B. 1680	(1979)	Establish the Energy Laboratory of Hawaii and make appropriations.
Montana	S.B. 86	(1975)	Applies state coal tax fund to renewable energy projects.
New Mexico	S.B. 185	(1975)	Created permanent fund for energy research and development and appropriated funds.
	H.B. 199	(1978)	$2 million appropriation for energy research and development.
	H.B. 2	(1978)	$200,000 appropriation for establishing geothermal space heating demonstration projects. 100% matching funds required.

OWNERSHIP

Washington	S.B. 2191	(1979)	Place ownership of geothermal resources with the surface owner (private).

NAW

TABLE III

GEOTHERMAL LEGISLATION CONSIDERED IN 1979 STATE LEGISLATIVE SESSION

STATE	LEGISLATION	STATUS
Alaska	SR 8 - directs the administration to review current state law relating to geothermal resources and to develop omnibus legislation dealing with that subject; also directs a review of state rules and regulations	Held over until 1980
Arizona	HB 2078- expands activities of Arizona Solar Energy Research Commission to include other renewable energy sources, including geothermal	Passed
Colorado	SB 316 - to exclude alternative energy devices from valuation of property for property tax assessment	Passed and Signed
	SB 321 - to include geothermal system in alternative energy devices for income tax deduction	Passed and Signed
	SB 324 - to require an annual appropriation from the severance tax trust fund to support the development and utilization of alternative energy sources in the state	In Senate Appropriations and Budget Committee
	SB 498 - to establish an Energy Coordinating Council to inventory state energy programs, study and analyze energy policies, etc.	Passed; to Governor
	HB 1495- to exempt alternative energy devices (including heating and cooling systems using geothermal) from sales tax	Postponed Indefinitely
	HB 1540- to exclude an alternative energy device from valuation of property for property tax assessment	Failed
Delaware	(Draft)- Geothermal Resource Conservation Act	Being drafted
Hawaii	HB 368 - to fund research, development and demonstration activities for alternative energy sources	Carried over to 1980 session
	HB 369 - to establish an alternate energy commercialization fund	Carried over to 1980 session
	HB 372 - relating to the Hawaii Natural Energy Institute	Carried over to 1980 session
	HB 376 - to limit speculation in geothermal energy development	Carried over to 1980 session
	HB 393 - relating to state leases on lands with geothermal resources	Carried over to 1980 session
	HB 394 - to establish a Hawaii Geothermal Application Center	Carried over to 1980 session
	HB 395 - to establish tax incentives for geothermal energy development	Carried over to 1980 session
	HB 396 - relating to geothermal rights and state ownership	Carried over to 1980 session
	HB 502 - relating to appropriations for geothermal energy projects	Carried over to 1980 session
	HB 1680- to establish the Energy Laboratory of Hawaii and make appropriations	Passed and Signed
	HR 165 - to review the state's alternate energy development program	Failed
	HR 166 - to review leasing of geothermal resources	Failed
	SB 111 - to establish the Hawaii Geothermal Applications Center	Carried over to 1980 session
	SB 116 - to limit speculation in geothermal energy development	Carried over to 1980 session
	SB 974 - to appropriate for research and development of geothermal fluids in combination with biomass energy projects	Carried over to 1980 session
	SB 1077- to establish a tax credit for non-fossil fuel energy producing utilities	Carried over to 1980 session
	SB 1766- to include geothermal resources in state leases of public lands	Carried over to 1980 session
	SB 1781- to reserve mineral rights for the state with the exception of geothermal resources on private lands	Carried over to 1980 session

STATE	LEGISLATION	STATUS
Maryland	HB 1064- to establish a tax credit for installation of certain energy conserving items or renewable energy sources in an individual's principal residence	Failed
	SB 42 - to exempt from retail sales tax certain energy conservation materials including devices using geothermal resources	Failed
Nevada	AB 144 - to exempt nonproducing geothermal leases from property tax	Passed and Signed
	(Draft)- to authorize general improvement districts to establish heating	Under consideration
AB SB 573	(Draft)- to declare geothermal "sui generis" and to direct the State Water Engineer to formulate rules and regulations	Under consideration passed. died in Committee
New Mexico	HB 366 - to appropriate $2.5 million for energy research and development	Passed
	HB 446 - to extend the acreage limitation on state geothermal leases from 25,000 to 51,200 acres and to provide for a second 5-year lease term without production upon payment of increased rental	Passed
	HB 447 - to clarify procedures and powers regarding the administration of The Geothermal Resources Conservation Act	Passed
	SJM 9 - to direct the Legislative Council to include geothermal policy study in the work of the interim legislative study committees	Passed
	SJM 10 - to direct the Commissioner of Public Lands to examine the existing policy of leasing of state lands for geothermal purposes and to make recommendations for changes	Passed
	(Draft)- amendments to NM Geothermal Resources Conservation Act to eliminate regulatory overlap and to remove high-temperature geothermal resources from the appropriative rights system while establishing a permit procedure for geothermal production to protect water rights	Under consideration
Oregon	HB 2134- to establish procedures for reinjecting geothermal fluids and to permit DOGAMI to adopt regulations on reinjection and to require DEQ water pollution control facilities permit for reinjecting contaminated fluid	Passed
	HB 2715- to require persons submitting designs for construction of state-owned buildings to consider the feasibility of alternative energy systems	Passed House; in Senate Energy and Environment Committee
	HB 2786- to exempt from definition of "public utility" those corporations and other associations furnishing heat, light or power to less than 20 customers	Passed House; to Senate
	HB 2843- authorizes energy conservation facility tax credit of 5% per year for 10 years to trades, business and industry using solid waste, renewable energy and cogeneration, also 20 year property tax exemption for nonprofit corporations based on certification from Oregon DOE	In House Revenue Committee
	HB 2919- amends alternative energy device program to include multifamily and nonresidential buildings	Tabled
	HB 3128- authorizes tax credit of 5% for 5 years to trade or business (other than utility) for cost of "energy equipment", defines "energy equipment"	In House Energy and Environment Committee; then to House Revenue Committee

STATE	LEGISLATION	STATUS
Oregon	SB 337 - to exempt property equipped with geothermal heating or cooling systems from ad valorem taxation	Passed Senate; in House Revenue Committee
	SB 427 - to exclude from the assessment of real property any consideration of a geothermal well located on the property or furnishing an alternative source of heat to the property	Favorable recommendation from Senate Revenue and School Finance Committee
	SB 439 - to limit to five years leases and contracts by the Division of State Lands for exploration and development of geothermal resources upon certain lands	Tabled
	SB 502 - to permit joint participation in geothermal activities of cities and people's utility districts in Oregon with cities, utility districts, electric cooperatives and privately owned electric utility companies in Nevada and California	Passed
	SB 515 - to authorize energy conservation facility tax credit against personal income tax or corporation excise tax to trade or business which conserves energy by use of renewable energy source	Referred to Senate Committee on Revenue and School Finance
	SB 517 - to authorize corporation excise tax credit for commercial lending institutions making low-interest loans for installation, construction and operation of certified alternative energy devices	Passed Senate; in House Revenue Committee
	SB 611 - to establish a small scale local energy project loan program	Passed Senate; in House Energy and Environment Committee
	SB 723 - establishes income tax credit for residents connecting to a geothermal central district heating system	Passed Senate; in House Energy and Environment Committee then to House Revenue Committee
	SB 750 - to create Oregon Natural Energy Commission	Tabled
	SB 862 - to establish the Oregon Power Commission	Favorable recommendation by Senate Ways and Means Committee
	SB 927 - creates Alternative Energy Development Commission which will prepare plans for development of alternative energy	Passed Senate; in House Energy and Environment Committee
	SJR 24 - to amend the Oregon Constitution, upon voter approval, to authorize issuance of general obligation bonds to provide funds to finance development of small scale local energy projects	Passed Senate; on Speakers desk
Utah	SB 290 - to authorize private and municipal heating and cooling districts to utilize hot water or geothermal resources	Not considered (not placed on calendar)
	SB 314 - to appropriate supplementary funds for the Beaver County geothermal project	Failed
	SJR 9 - to include geothermal study as part of the 1979 interim legislative committee work	Killed; geothermal study included in legislature's master resolution for interim studies
	SB 279 - to enact a Geothermal Resource Conservation Act which defines the resource and provides for its regulation	Passed Senate/Killed in House
Washington	HB 674 - to place ownership of geothermal resources in the public domain	Killed in House
	SB 2191- to place ownership of geothermal resources with the surface owner (private)	Enacted

CALIFORNIA LAWS FOR CONSERVATION OF GEOTHERMAL RESOURCES

PUBLICATION NO. PRC02

STATE OF CALIFORNIA
EDMUND G. BROWN JR., *Governor*

RESOURCES AGENCY
HUEY D. JOHNSON, *Secretary*

DEPARTMENT OF CONSERVATION
PRISCILLA C. GREW, *Director*

DIVISION OF OIL AND GAS
M. G. MEFFERD, *State Oil and Gas Supervisor*

Index

Revision Record

(Approved September 17, 1965, Ch. 1483; amended 1967, Ch. 1398; amended 1970, Ch. 110; amended 1971, Ch. 1213; amended 1972, Ch. 1102; amended 1974, Ch. 1069; amended 1975, Ch. 773, 1049, 1255; amended 1976, Ch. 794, 813; 1073; amended 1977, Ch. 112,481, and 579; amended 1978, Ch. 1270 and 1271; amended 1979, Ch. 322.)

CALIFORNIA LAWS FOR CONSERVATION OF GEOTHERMAL RESOURCES

An act to add Chapter 4 (commencing with Section 3700), Division 3, Public Resources Code, relating to geothermal resources

The people of the State of California do enact as follows:

Chapter 4. Geothermal Resources

3700. It is hereby found and determined that the people of the State of California have a direct and primary interest in the development of geothermal resources, and that the State of California, through the authority vested in the State Oil and Gas Supervisor, should exercise its power and jurisdiction to require that wells for the discovery and production of geothermal resources be drilled, operated, maintained and abandoned in such manner as to safeguard life, health, property, and the public welfare, and to encourage maximum economic recovery. State Policy

3701. For the purposes of this chapter, "geothermal resources" shall mean geothermal resources as defined in Section 6903 of this code.* Definitions

* Section 6903. For the purposes of this chapter, "geothermal resources" shall mean the natural heat of the earth, the energy, in whatever form, below the surface of the earth present in, resulting from, or created by, or which may be extracted from, such natural heat, and all minerals in solution or other products obtained from naturally heated fluids, brines, associated gases and steam, in whatever form, found below the surface of the earth, but excluding oil, hydrocarbon gas or other hydrocarbon substances.

3702. For the purposes of this chapter, "geothermal resources area" means the same general surface area which is underlaid, or reasonably appears to be underlaid, by geothermal resources. Geothermal Resources Area

3703. "Well" means any well for the discovery of geothermal resources or any well on lands producing geothermal resources or reasonably presumed to contain geothermal resources, or any

special well, converted producing well or reactivated or converted abandoned well employed for reinjecting geothermal resources or the residue thereof.

3703.1. "Low-temperature geothermal well" means a well drilled in a geothermal resource area for the purpose of producing geothermal resources, as defined in Section 6903, from which fluid can be produced which have value by virtue of the heat contained therein and have a temperature that is no more than the boiling point of water at the altitude of occurrence.

3704. "Department", in reference to the government of this state, means the Department of Conservation.

3705. "Division", in reference to the government of this state, means the Division of Oil and Gas in the Department of Conservation.

3706. "Director" means the Director of Conservation.

3707. "Supervisor" means the State Oil and Gas Supervisor.

3708. "Person" includes any individual, firm, association, corporation, or any other group or combination acting as a unit.

3709. "Operator" means any person drilling, maintaining, operating, pumping, or in control of any well.

3710. "Owner" includes "operator" when any well is operated or has been operated or is about to be operated by any person other than the owner.

3711. "Operator" includes "owner" when any well is or has been or is about to be operated by or under the direction of the owner.

Broad Powers

3712. This chapter shall be liberally construed to meet its purposes, and the board, the director, and the supervisor shall have all powers which may be necessary to carry out the purposes of this chapter.

3713. "Board" means the Geothermal Resources Board.

Duties of Supervisor

3714. The State Oil and Gas Supervisor shall so supervise the drilling, operation, maintenance and abandonment of geothermal resources wells as to encourage the greatest ultimate economic recovery of geothermal resources, to prevent damage to life, health, property, and natural resources, and to prevent damage to, and waste from, the underground geothermal deposits, and to prevent damage to underground and surface waters suitable for irrigation or domestic purposes by reason of the drilling, operation, maintenance, and abandonment of geothermal resources wells.

3714.5 The supervisor, pursuant to regulation, shall designate geothermal resources areas and may exclude from the operation of this chapter certain wells within such geothermal resources areas when there is no probability of encountering geothermal resources.

3715. The supervisor shall also supervise the drilling, operation, maintenance, and abandonment of wells so as to permit the owners or operators of such wells to utilize all methods and

practices known to the industry for the purpose of increasing the ultimate recovery of geothermal resources and which, in the opinion of the supervisor, are suitable for such purpose in each proposed case. In order to further the elimination of waste by increasing the recovery of geothermal resources it is hereby declared as a policy of this state that the grant in geothermal resources lease or contract to a lessee or operator of the right or power, in substance, to explore for and remove all geothermal resources from any lands in the State of California, in the absence of an express provision to the contrary contained in such lease or contract, is deemed to allow the lessee or contractor or his successors or assigns, to do what a prudent operator using reasonable diligence would do, having in mind the best interests of the lessor, lessee and the state, in producing and removing geothermal resources; provided, however, nothing contained in this section imposes a legal duty upon such lessee or contractor, his successors or assigns, to conduct such operations.

Lead Agency

3715.5. For the purposes of the California Environmental Quality Act (commencing with Section 21000), the division shall be the lead agency as defined in Section 21067 for all geothermal exploratory projects as defined in Section 21065.5. The division shall complete all its responsibilities pursuant to the California Environmental Quality Act, including public and agency review and approval or disapproval of the project, within 135 days of the receipt of the application for such project. The division may delegate its lead agency responsibility under this section to a county which has adopted a geothermal element, as defined in Section 25133, for its general plan. Any such delegation shall provide that the county complete its lead agency responsibility under this section within 135 days of the receipt of the application for such project. The provisions of this section shall not apply to geothermal exploratory projects as defined in Section 21065.5 where, prior to January 1, 1979, preparation of an environmental impact report for such project has begun or an application for such project which will require preparation of an environmental impact report has been filed.

Well Data

3716. The district deputy in each district shall collect all information regarding the wells in the district necessary for the proper supervision of such wells. He shall prepare maps and other accessories necessary to determine the underground conditions in a geothermal area and the location and extent of strata bearing water suitable for irrigation or domestic purposes or surface water suitable for such purposes. This work shall be done with the view to advising the operators as to the best means of protecting the geothermal resource deposits and the water-bearing strata and surface water, and with a view to aiding the supervisor in ordering tests or repair work at wells. All such data shall be kept on file in the office of the district deputy of the respective district, and copies thereof shall be forwarded to the Director of Water Resources, the State Geologist, and the appropriate regional water quality control board located in the area involved, subject to the provisions of Section 3752.

Notification.

3717. The supervisor shall notify the Department of Fish and Game, the Department of Water Resources and the regional water quality control board in the area affected of the location, operation, maintenance, and abandonment of all wells.

3718. Nothing in this chapter shall be construed as superseding any of the provisions of Division 7 (commencing with Section 13000) of the Water Code or Division 6 (commencing with Section 5650) of the Fish and Game Code.

Publication and Proceeds

3719. The supervisor shall publish any publications, reports, maps, statistical data or other printed matter relating to geothermal resources, for which there may be public demand. If these publications, reports, maps, statistical data or other printed matter are sold, they shall be sold at cost, and the proceeds shall be deposited in the General Fund.

Districts

3720. For the purposes of this chapter, the state may be divided into one or more districts, the boundaries of which shall be fixed by the director.

Section 3721 is on the next page.

Agent

3721. Every owner or operator of any well shall designate an agent, giving his post office address, who resides in this state, upon whom may be served all orders, notices, and processes of the supervisor, board, or any court of law. Every person so appointing an agent shall, within five days after the termination of any such agency, notify the supervisor, in writing, of such termination, and unless operations are discontinued, shall appoint a new agent.

Transfer by Seller

3722. The owner or operator of any well shall notify the supervisor or the district deputy, in writing, in such form as the supervisor or the district deputy may direct, of the sale, assignment, transfer, conveyance, or exchange by the owner or operator of such well, and the land, owned or leased, upon which the well is located, within 30 days after such sale, assignment, transfer, conveyance, or exchange. The notice shall contain the following:

(a) The name and address of the person to whom such well was sold, assigned, transferred, conveyed, or exchanged.

(b) The name and location of the well.

(c) The date of the sale, assignment, transfer, conveyance or exchange.

(d) The date when possession was relinquished by the owner or operator.

(e) A description of the land upon which the well is situated.

3723. Every person who acquires the ownership or operation of any well, whether by purchase, transfer, assignment, conveyance, exchange, or otherwise, shall, within 30 days after acquiring the well and the land, owned or leased, upon which it is located, notify the supervisor or the district deputy, in writing, of his ownership or operation. The notice shall contain the following:

(a) The name and address of the person from whom the well was acquired.

(b) The name and location of the well.

(c) The date of acquisition.

(d) The date when possession was acquired.

(e) A description of the land upon which the well is situated.

Indemnity Bond

3723.5. Any person who acquires the ownership or operation of any well or wells, whether by purchase, transfer, assignment, conveyance, exchange, or otherwise, shall, within 30 days after acquiring the well or wells, file with the supervisor an individual indemnity bond in the sum of twenty-five thousand dollars ($25,000) for each well acquired, or a blanket indemnity bond in the sum of one hundred thousand dollars ($100,000) for any number of wells acquired. The bond shall be stated in substantially the language set forth in Section 3725.

Notice of Intention to Drill

3724. The owner or operator of any well, before commencing the original drilling of a well or the redrilling of an abandoned well, shall file with the supervisor or the district deputy a written notice of intention to commence drilling accompanied by the fee prescribed

by this section. Drilling shall not commence until approval is given by the supervisor or the district deputy. If the supervisor or the district deputy fails to give the owner or operator written response to the notice within 10 working days, such failure shall be considered as an approval of the notice and the notice shall, for the purposes and intents of this chapter, be deemed a written report of the supervisor. The notice shall contain the following:

(a) The location and elevation of the floor of the proposed derrick.

(b) The number or other designation by which the well shall be known. Such number or designation shall be subject to the approval of the supervisor. Designation of Well

(c) The owner's or operator's estimate of the depths between which production will be attempted.

(d) Such other pertinent data as the supervisor may require on the printed forms to be supplied by the Division of Oil and Gas, or on forms acceptable to the supervisor.

After the completion of any well the provisions of this section, other than the requirement of the payment of the fee, shall also apply as far as may be, to the deepening or redrilling of the well, or any operation involving the plugging of the well, or any operations permanently altering in any manner the casing of the well. The number or designation by which any well heretofore drilled has been known, and the number or designation specified for any well in a notice filed as required by this section, shall not be changed without first obtaining a written consent of the supervisor.

The fee required to be filed for the drilling of a new well or the redrilling of an abandoned well, shall be twenty-five dollars ($25), two hundred dollars ($200), five hundred dollars ($500), or one thousand dollars ($1,000), to be determined by the supervisor with the concurrence of the Geothermal Resources Board based on the estimated cost of supervising geothermal resources operations. Fees

All moneys received under this chapter shall be deposited in the General Fund.

3724.1. An owner or operator may submit to the supervisor for approval a written program to drill a shallow well or wells for geothermal observation purposes. In order to qualify under this section, a program shall contain not more than 25 wells and the maximum total depth of each of these wells shall not exceed 250 feet. Each program submitted for approval shall include:

(a) Well numbers.

(b) Well locations and elevations.

(c) Geologic interpretation of the area under investigation, including any known or inferred temperature data.

(d) Such other data as may be required by the supervisor.

The fee required to be filed for the drilling of these shallow wells shall be twenty-five dollars ($25) per well or two hundred dollars

($200) per program, whichever is the lesser.

3724.2. If, after study by the supervisor, it is determined that one or all of the wells proposed pursuant to Section 3724.1 require additional supervision, the supervisor may require that a proposal for such well or wells be submitted in compliance with all the provisions of Section 3724.

3724.3. Drilling of program wells, as described in Section 3724.1, shall not commence until approval is given by the supervisor or the district deputy. If the supervisor or the district deputy fails to give the owner or operator written response to the program within 10 working days, such failure shall be considered as an approval of the program and the program shall, for the purposes and intents of this chapter, be deemed a written report of the supervisor.

Confidential Status

3724.4. The proposal, and all other data submitted as required by Sections 3724.1, 3724.2, and 3724.3, shall be maintained in a confidential status as provided for in Section 3752.

Bonding

3725. Every person who engages in the drilling, redrilling, deepening, maintaining, or abandoning of any well, except a low-temperature geothermal well, shall file with the supervisor an individual indemnity bond in the sum of twenty-five thousand dollars ($25,000) for each well drilled, redrilled, deepened, maintained, or abandoned. The bond shall be filed with the supervisor at the time of the filing of the notice of intention to drill, redrill, deepen, maintain, or abandon, as provided in Section 3724 or 3724.1. The bond shall be executed by such person, as principal, and by an authorized surety company, as surety, conditioned that the principal named in the bond shall faithfully comply with all the provisions of this chapter, in drilling, redrilling, deepening, maintaining, or abandoning any well or wells covered by the bond, and shall secure the state against all losses, charges, and expenses incurred by it to obtain such compliance by the principal named in the bond.

The conditions of the bond shall be stated in substantially the following language:

"If said _____, the above bounden principal, shall well and truly comply with all the provisions of Chapter 4 (commencing with Section 3700) of Division 3 of the Public Resources Code and shall obey all lawful orders of the State Oil and Gas Supervisor, or his district deputy or deputies, if not appealed as provided in that chapter, or upon affirmance thereof by the Geothermal Resources Board, if appealed thereto, and shall pay all charges, costs, and expenses incurred by the supervisor or his district deputy or deputies in respect of such well or wells or the property or properties of said principal, or assessed against such well or wells or the property or properties of such principal, in pursuance of the provisions of said chapter, then this obligation shall be void; otherwise, it shall remain in full force and effect."

Bonding: Low-temperature Wells

3725.5. Any person who engages in the drilling, redrilling, deepening, maintaining, or abandoning of any low-temperature well, as defined in Section 3703.1, shall file with the supervisor an individual indemnity bond in the sum of two thousand dollars

($2,000) for each well less than 2,000 feet deep, ten thousand dollars ($10,000) for each well 2,000 feet deep or deeper, but less than 5,000 feet deep, fifteen thousand dollars ($15,000) for each well 5,000 but less than 10,000 feet deep, or twenty-five thousand dollars ($25,000) for each well 10,000 or more feet deep. The bond shall be filed with the supervisor at the time of the filing of the notice of intention to drill, redrill, deepen, maintain, or abandon, as provided in Section 3724 or 3724.1. The bond shall be executed by such person, as principal, and by an authorized surety company, as surety, and shall be in substantially the same language and upon the same conditions as provided in Section 3725, except as to the difference in the amount.

3726. Any person who engages in the drilling, redrilling, deepening, maintaining, or abandoning of one or more wells at any time, may file with the supervisor one bond for one hundred thousand dollars ($100,000) to cover all his operations in drilling, redrilling, deepening, maintaining, or abandoning of any of his wells in this state in lieu of an individual indemnity bond for each such operation as required by Section 3725 or 3725.5. The bond shall be executed by such person, as principal, and by an authorized surety company, as surety, and shall be in substantially the same language and upon the same conditions as provided in Section 3725, except as to the difference in the amount.

3727. (Repealed. Effective Jan. 1, 1977.)

3728. Any individual or blanket indemnity bond issued in compliance with this chapter may, with the consent of the supervisor, be terminated and canceled and the surety be relieved of all obligations thereunder when the well or wells covered by such bond have been properly abandoned or another valid bond has been substituted therefor. Should the person who has filed a blanket bond properly abandon a portion of his wells covered by the bond, the bond may, with the consent of the supervisor, be terminated and canceled and the surety be relieved of all obligations thereunder upon the filing by such person of an individual bond for each well which he is still engaged in drilling, redrilling, deepening, maintaining, or abandoning. Liability as to individual wells that have been drilled and abandoned under a blanket bond may also be terminated with the consent of the supervisor.

Cash in Lieu of Bond

3728.5. In lieu of the bond required by Sections 3723.5, 3725, 3725.5, and 3726, a person may, with the written approval of the supervisor, file a cash bond in the applicable amount, together with evidence of the deposit of such amount in banks authorized to do business in this state and insured by the Federal Deposit Insurance Corporation, or investment certificates or share accounts in the applicable amount issued by a savings and loan association doing business in this state and insured by the Federal Savings and Loan Insurance Corporation, or bonds issued by the United States or the State of California in the principal amounts of two thousand four

hundred dollars ($2,400), twelve thousand dollars ($12,000), eighteen thousand dollars ($18,000), thirty thousand dollars ($30,000) or one hundred twenty thousand dollars ($120,000) whichever is applicable, with the State Treasurer. Such bond, or security filed in lieu thereof, shall be subject to all conditions set forth in Sections 3723.5, 3725, 3725.5, and 3726.

3729. For the purposes of Section 3728, a well is properly abandoned when it has been shown to the satisfaction of the supervisor that all proper steps have been taken to protect underground or surface water suitable for irrigation or farm or domestic purposes from the infiltration or addition of any detrimental substance, and to prevent the escape of all fluids to the surface.

Log, Core Record, History

3730. The owner or operator of any well shall keep, or cause to be kept, a careful and accurate log, core record, and history of the drilling of the well.

3731. The log shall show the character and depth of the formation passed through or encountered in the drilling of the well, the amount, size and weight of casing used, and particularly the location, depth and temperature of water-bearing strata, together with the temperature, chemical composition, and other chemical and physical characteristics of fluid encountered from time to time, so far as ascertained.

3732. The core record shall show the depth, character, and fluid content of cores obtained, so far as determined.

3733. The history shall show the location and amount of sidetracked casings, tools, or other material, the depth and quantity of cement in cement plugs, the shots of dynamite or other explosives, the results of production and other tests during drilling operations, and completion data.

3734. The log shall be kept in the local office of the owner or operator and, together with the tour reports of the owner or operator, shall be subject, during business hours, to the inspection of the board, the supervisor, or the district deputy.

3735. Upon the completion or abandonment of any well or upon the suspension of operations upon any well, true copies of the log, core records, history, and, if made, true copies of all electrical, physical or chemical logs, tests, or surveys, in duplicate and in such form as the supervisor may direct, shall be filed with the district deputy within 60 days after such completion or abandonment. Like copies shall be filed upon the recompletion of any well.

3736. The owner or operator of any well, or his local agent, shall file with the supervisor a copy of the log, history, and core record, or any portion thereof, at any time after the commencement of the work of drilling any well upon written request of the supervisor, or the district deputy. The request shall be signed by the supervisor, or the district deputy, and served either personally, or by mailing a copy of the request, by registered mail, to the last known post office address of the owner or operator, or his agent.

Date of Completion

3737. A well is completed, for the purposes of this chapter, 30

days after it has commenced to produce a geothermal resource unless drilling operations are resumed before the end of the 30-day period.

Blowout Prevention

3739. Any person engaged in operating any wells wherein high pressures are known to exist, and any person drilling for geothermal resources in any district where the pressures are unknown shall equip the well with casings of sufficient strength, and with such other safety devices as may be necessary, in accordance with methods approved by the supervisor, and shall use every reasonable effort and endeavor effectually to prevent blowouts, explosions, and fires.

3740. The owner or operator of any well on lands producing or reasonably presumed to contain geothermal resources shall properly case it with watertight and adequate casing, in accordance with methods approved by the supervisor or the district deputy. The owner or operator shall also use every reasonable effort and endeavor to prevent damage to life, health, property, and natural resources, to shut out detrimental substances from strata containing water suitable for irrigation or domestic purposes and from surface water suitable for such purposes, and to prevent the infiltration of detrimental substances into such strata and into such surface water.

Tests

3741. The supervisor shall require such tests or remedial work as in his judgment are necessary to prevent damage to life, health, property, and natural resources, to protect geothermal resources deposits from damage, or to prevent the infiltration of detrimental substances into underground or surface water suitable for irrigation or domestic purposes, to the best interests of the neighboring property owners and the public.

Geothermal Resources Board

3742. There is hereby created in the Department of Conservation a Geothermal Resources Board. The board shall consist of the following or their respective designees: The Director of Conservation, who shall serve as chairman of the board; the State Geologist, who shall serve as secretary to the board; the State Oil and Gas Supervisor; the Executive Officer of the State Lands Commission; the Chairman of the State Water Resources Control Board; the Director of Water Resources; the President of the Public Utilities Commission; and the Director of Fish and Game.

3742.1. The board, to be best able to make its recommendations with respect to the classification of areas as geothermal resources areas, and to allow for the most orderly development of geothermal resources within the state, shall require the filing of drilling logs, descriptions of cores and samples, and drilling histories by all persons engaged in exploration for or production of geothermal resources. All such information secured by the supervisor or the district deputy shall be filed in sufficient number of copies with the supervisor or district deputy to permit transmission thereof to the Division of Mines and Geology for use by the board.

The board is authorized to require such other information as it may deem necessary to perform its responsibilities.

Certificate of Primary Purpose

3742.2. Any person having drilled a well or wells on state, federal or private lands which are producing or, according to the Geothermal Resources Board, are capable of producing geothermal resources, may, at any time, apply to the board for a certificate of primary purpose. When the board determines that such well or wells are primarily for the purpose of producing geothermal resources and not for the purpose of producing water usable for domestic and irrigation purposes, the board shall issue a certificate of primary purpose to such person. Such certificate shall establish a rebuttable presumption that such person has absolute title to the geothermal resources reduced to his possession from such well or wells. Such presumption may be rebutted only upon a showing that the water content of the geothermal resources is useful for domestic or irrigation purposes without further treatment thereof, but not by virtue of any production of such water as a by-product incident to the production of the geothermal resources.

3743. Whenever the supervisor or a district deputy makes or gives any written direction concerning the drilling, testing, or other operations in any well drilled, in process of drilling, or being abandoned, and the operator, owner, or representative of either, serves written notice, either personally or by mail, addressed to the supervisor, or to the district deputy at his office in the district, requesting that a definite order be made upon such subject, the supervisor or the district deputy shall, within five days after receipt of the notice, deliver a final written order on the subject matter in such manner and form that an appeal therefrom may be taken at once to the board as provided in this chapter.

Appealing Orders

* **3744.** Within 30 days after service of an order, pursuant to Section 3743, or if there has been an appeal from the order to the board, within 30 days after service of the decision of the board, or if a review has been taken of the order of the board, within 10 days after affirmance of the order, the owner or operator shall commence in good faith the work ordered and continue it until completion. If the work has not been commenced and continued to completion, the supervisor shall appoint necessary agents who shall enter the premises and perform the work. An accurate account of the expenditures shall be kept. Any amount so expended shall constitute a lien against the real or personal property of the owner or operator upon which the work is done and such lien shall have the force, effect, and priority of a judgment lien pursuant to the provisions of Section 3772.

Monthly Production Reports

3745. The owner of any well producing geothermal resources shall file with the supervisor, on or before the 30th day of each month, for the last preceding calendar month, a statement of production utilized in such form as the supervisor may designate.

* Effective Jan. 1, 1980

Abandonment of Wells

3746. Before abandoning any well in accordance with methods approved by the supervisor or the district deputy, and under his direction, the owner or operator shall use every reasonable effort and endeavor to protect any underground or surface water suitable for irrigation or domestic purposes from the infiltration or addition of any detrimental substances.

3747. Before any work is commenced to abandon any well, the owner or operator shall give written notice to the supervisor or the district deputy of his intention to abandon the well and the date upon which the work of abandonment will begin.

The notice shall be given at least five days before the proposed abandonment, and it shall show the condition of the well and the proposed method of abandonment.

The owner or operator shall furnish the supervisor or the district deputy any additional information that he may request regarding the condition of the well and the proposed method of abandonment, at any time between the filing of the notice of intention to abandon the well and the completion of abandonment.

3748. The supervisor, or the district deputy shall, before the proposed date of commencing work to abandon such well, furnish to the owner or operator either:

(a) A written report of approval of the proposal.

(b) A written report stating that work or tests will be necessary before approval of abandonment will be given.

(c) A written request stating what information will be necessary for the owner or operator to furnish the supervisor or the district deputy before approval to commence work to abandon or before approval of abandonment will be given.

3749. If the supervisor or the district deputy fails to give the owner or operator a written report or request within the specified time, such failure shall be considered as an approval of the proposal to abandon the well, and the proposal shall, for the purposes and intents of this chapter, be deemed a written report of the supervisor or the district deputy.

3750. Within five days after the completion of abandonment of any well the owner or operator of the well shall make, in such form as the supervisor or the district deputy may direct, a written report, in duplicate, of all work done in connection with the abandonment. The supervisor or the district deputy shall, within 10 days after the receipt of a written report of completion, furnish the owner or operator with a written final approval of abandonment, or a written disapproval of abandonment, setting forth the conditions upon which the disapproval is based.

Failure to abandon in accordance with the approved method of abandonment, or failure to notify the supervisor or the district deputy to witness any test provided to be witnessed by the supervisor, the district deputy or his inspector, in the approved proposal, or

failure to furnish the supervisor or the district deputy, at his request, with any information regarding the condition of the well, shall constitute sufficient grounds for disapproval of the abandonment.

3751. No person, whether as principal, agent, servant, employee or otherwise, shall remove the casing or any portion thereof, from any well without first giving written notice to the supervisor or the district deputy of his intention to remove the casing from such well. The notice shall be given at least five days before the proposed removal.

The supervisor or the district deputy shall, before the proposed date of removal, furnish the person with a written report of approval of his proposal, or a written report stating what work shall be done before such approval will be given.

If the supervisor or the district deputy fails to give the person a written report within the specified time, such failure shall be considered an approval of the proposal to remove the casing, and such proposal shall, for the purposes and intents of this chapter, be deemed a written report of the supervisor or the district deputy.

Within five days after the completion of the removal, the person shall make, in such form as the supervisor or district deputy may direct, a written report, in duplicate, of all work done in connection with such removal.

Use of Records

3752. (a) Except as otherwise provided in this section, all the well records, including production records, of any owner or operator which are filed pursuant to this chapter shall be public records for purposes of the California Public Records Act (Chapter 3.5 (commencing with Section 6250) of Division 7 of Title 1 of the Government Code).

Such records shall be public records when filed with the division, unless the owner or operator requests, in writing, the division to retain the well records confidential. The confidential period shall not exceed five years from the date of production or injection for other than testing purposes or abandonment, whichever occurs first. Well records retained confidential by the division shall be open to inspection to those persons authorized in writing by the owner or operator. For the purpose of this section, "date of production for other than testing purposes" means the date on which, in the judgment of the supervisor, sustainable production commenced into a power generating plant, greenhouse, space heating unit, chemical or mineral extraction plant, or other facility dependent wholly or in part upon geothermal resources for its operation. Confidential status shall not apply to state officers charged with regulating well operations, the director, or as provided in subdivision (b).

Upon receipt by the supervisor of a written request documenting extenuating circumstances pertaining to a particular well, the supervisor may extend for six months the period of confidentiality. The total period of confidentiality, including all extensions, shall not ex-

ceed seven years from the date of production or injection for other than testing purposes or abandonment, unless a longer period of time is approved by the director after a public hearing.

(b) Production reports filed pursuant to Section 3745 shall be open to inspection to the State Board of Equalization or its duly appointed representative when making a survey pursuant to Section 1815 of the Revenue and Taxation Code or when valuing state-assessed property pursuant to Section 751 of the Revenue and Taxation Code, and to the assessor of the county in which a well referred to in Section 3745 is located.

(c) For the purposes of this section, "well records" shall not include either experimental logs and tests or interpretive data not generally available to all operators, as defined by the supervisor by regulation.

3752.1. (Repealed, Effective July 1, 1976.)

Written Complaint

3753. Upon receipt by the supervisor or by a district deputy of a written complaint, alleging a condition in violation of this chapter, specifically setting forth the condition complained against, signed by the complainant; or upon a written complaint specifically setting forth the condition complained against, signed by a member of the Geothermal Resources Board, the supervisor shall make an investigation of the well or wells and make a written report and order, stating the work required to repair the damage complained of, or stating that no work is required.

A copy of the order shall be delivered to the complainant, or if more than one, to each complainant, and, if the supervisor orders the damage repaired a copy of the order shall be delivered to each of the owners, operators, or agents having in charge the well or wells upon which the work is to be done.

The order shall contain a statement of the conditions sought to be remedied or repaired and a statement of the work required by the supervisor to repair the condition. Service shall be made by mailing copies to such persons at the post office address given.

Refusal of Access

3754. Any owner or operator, or employee thereof, who refuses to permit the supervisor or the district deputy, or his inspector, to inspect a well, or who willfully hinders or delays the enforcement of the provisions of this chapter, and every person, whether as principal, agent, servant, employee, or otherwise, who violates, fails, neglects, or refuses to comply with any of the provisions of this chapter, or who fails or neglects or refuses to furnish any report or record which may be required pursuant to the provisions of this chapter, or who willfully renders a false or fraudulent report, is guilty of a misdemeanor, punishable by a fine of not less than one hundred dollars ($100), nor more than five hundred dollars ($500), or by imprisonment for not exceeding six months, or by both such fine and imprisonment, for each such offense.

Order of Abandonment

3755. The supervisor or his deputy may order the abandonment

of any well that has been deserted whether or not any damage is occurring or threatened by reason of said well. Suspension of drilling operations and removal of drilling machinery is prima facie evidence of desertion after the elapse of six months unless a request for an extension of time for a period not to exceed an additional six months is theretofore filed. At any time the supervisor may for good cause shown extend this period.

Cooperative Unit Operation

3756. Whenever the Geothermal Resources Board finds that it is in the interest of the protection of geothermal resources from unreasonable waste, the lessors, lessees, operators or other persons owning or controlling royalty or other interests in the separate properties of the same producing or prospective geothermal resources area, may, with the approval of the board, enter into agreements for the purpose of bringing about the cooperative development and operation of all or a part or parts of the area, or for the purpose of bringing about the development or operation of all or a part or parts of such area as a unit, or for the purpose of fixing the time, location, and manner of drilling and operating of wells for the production of geothermal resources. Any such agreement shall bind the successors and assigns of the parties thereto in land affected thereby and shall be enforceable in an action for specific performance. No such agreement when approved by the board hereunder shall be held to violate any of the statutes of this state prohibiting monopolies or acts, arrangements, agreements, contracts, combinations or conspiracies in restraint of trade or commerce.

Spacing of Wells

3757. Any well hereafter drilled for the discovery and production of geothermal resources, which is located within 100 feet of an outer boundary of the parcel of land on which the well is situated, or within 100 feet of a public road or street or highway dedicated prior to the commencement of drilling of the well, is a public nuisance.

3757.1. Notwithstanding any other provisions of this chapter, where a parcel of land contains one acre or more and all or substantially all of the surface is unavailable for the location of a geothermal well and directional drilling is found by the supervisor to be necessary, the supervisor may approve proposals to drill wells at whatever locations he deems advisable for the purpose of properly developing the geothermal resources; provided, that no well shall be drilled or permitted to produce which is located within 25 feet of the outer boundary of the parcel of land on which the well is situated or within 25 feet of a public road, street, or highway dedicated prior to the commencement of drilling. The supervisor may require, at the time he gives approval of the notice of intention to drill, redrill, or deepen such well, that a subsurface directional survey be made, and that the survey be filed with the supervisor within 30 days of cessation of drilling operations.

Spacing Low-temperature Wells

3757.2. For the purpose of developing low-temperature geothermal resources, the supervisor may approve, within geothermal re-

source areas, the drilling of low-temperature geothermal wells at whatever locations he deems advisable; provided, that no such well shall be drilled or permitted to produce which is located within 15 feet of the outer boundary of the parcel of land on which the well is situated or within 15 feet of a public road, street, or highway dedicated prior to the commencement of drilling.

3758. Where several contiguous parcels of land in one or different ownerships are operated as a single geothermal resources lease or operating unit, the term "outer boundary line" means the outer boundary line of the lands included in the lease or unit. In determining the contiguity of any such parcels of land, no street, road or alley lying within the lease or unit shall be deemed to interrupt such contiguity.

3759. For the purpose of this chapter, an alley which intersects or lies within any block or other subdivision unit is not a public street or road.

3760. Each day in which the drilling of any well is carried on, or on which it is permitted to produce geothermal resources in violation of this chapter is a separate nuisance.

3761. The provisions regarding the location of geothermal resources wells do not apply to any wells producing geothermal resources on the effective date of this act. *

3762. The lessor, lessee, or any operator or any well owner, or the owner of any rig, derrick, or other operating structure, or his local agent, shall within five days from the date of the service of any order from the supervisor or a district deputy, either comply with the order or file with the supervisor or the district deputy a written statement that the order is not acceptable, and that appeal from the order is taken to the Geothermal Resources Board under the provisions of this chapter.

Any such appeal shall operate as a stay of any order issued under or pursuant to the provisions of this chapter.

Hearing on Appeal

3763. Immediately upon filing of a notice of appeal the secretary of the board shall call a meeting of the board to hear and pass upon the appeal.

The hearing upon the appeal before the board shall be de novo and at such place as the board may designate.

3764. Within 10 days from the taking of the appeal, 5 days' notice in writing shall be given to the appellant of the time and place of the hearing. For good cause, the board may postpone the hearing, on the application of the appellant or the supervisor, or the district deputy for not exceeding 5 days.

3765. The board, after hearing, shall affirm, set aside, or modify the order from which the appeal is taken, as determined by a majority of the whole board.

Within 10 days after hearing the evidence, the board shall make a written decision with respect to the order appealed from. The

*Effective date: 9/17/65.

decision of the board shall forthwith be filed with the supervisor and upon such filing shall be final. In case the order is affirmed or modified, the board shall retain jurisdiction until such time as the work ordered to be done by the order is finally completed.

The written decision shall be served upon the lessor, lessee, or any operator or any well owner, or the owner of any rig, derrick, or other operating structure, or his local agent, and shall supersede the previous order of the supervisor. In case no written decision is made by the board within 30 days after the date of notice of hearing as provided in Section 3764, the order of the supervisor shall be effective upon the supervisor's notifying any such person that the board has failed to make a decision and subject only to review by writ of certiorari from the superior court as provided in this chapter.

Review by Court

3766. The decision of the board, or in the event the board fails to make a decision within 30 days after notice of hearing, then the order of the supervisor, may be reviewed by writ of certiorari from the superior court of the county in which the well, or wells, affected by the order is situated, if taken within 10 days after the service of the decision upon the lessor, lessee, or any operator or any well owner, or the owner of any rig, derrick, or other operating structure, or his local agent, as provided in Section 3765; or if the board fails to make a decision, then within 10 days after the supervisor notifies any such person of such fact, or within 10 days after decision by the board upon a petition by the supervisor. The writ shall be made returnable not later than 10 days after its issuance and it shall direct the board to certify their record in the cause to the court. On the return day the cause shall be heard by the court unless for good cause it is continued, but no continuance shall be permitted for a longer period than 30 days.

3767. No new or additional evidence shall be introduced in the court, but the cause shall be heard upon the record of the board. The review shall not be extended further than to determine whether or not:

(a) The board or supervisor acted without or in excess of jurisdiction.

(b) The order, decision, or award was procured by fraud.

(c) The order, decision, rule, or regulation is unreasonable.

(d) The order, decision, regulation, or award is clearly unsupported by the evidence.

Enforcement of Lien

3768. If a review is not taken within 10 days, or if taken, in case the decision of the board is affirmed, any charge, including penalty and interest thereon, imposed by the board shall constitute a lien which, upon recordation or filing pursuant to subdivision (c) or (d) of Section 3772, attaches to real or personal property. The lien upon the property shall be enforced in the same manner as are other liens on real property and personal property of the debtor. Upon the

request of the supervisor, the State Controller shall bring an action for the enforcement of the lien in the manner provided in this chapter.

Subpoena of Witnesses

3769. In any proceeding before the board and in any proceeding instituted by the supervisor for the purpose of enforcing or carrying out the provisions of this chapter, or for the purpose of holding an investigation to ascertain the condition of any well or wells complained of, or which in the opinion of the supervisor may reasonably be presumed to be improperly located, drilled, operated, maintained, or conducted, the supervisor and the chairman of the board shall have the power to administer oaths and may apply to a judge of the superior court of the county in which the proceeding or investigation is pending, for a subpoena for witnesses to attend the proceeding or investigation. Upon the application of the supervisor or the chairman of the board, the judge of the superior court shall issue a subpoena directing the witness to attend the proceeding or investigation, and such person shall be required to produce, when directed, all records, surveys, documents, books or accounts in his custody or under his control; except that no person shall be required to attend upon such proceeding, unless he resides within the same county or within 100 miles of the place of attendance.

The supervisor or the chairman of the board may in such case cause the depositions of witnesses residing within or without the state to be taken in the manner prescribed by law for like depositions in civil actions in superior courts of this state, and may, upon application to a judge of the superior court of the county within which the proceeding or investigation is pending, obtain a subpoena compelling the attendance of witnesses and the production of records, surveys, documents, books or accounts at such places as the judge may designate within the limits prescribed in this section.

3770. Witnesses shall be entitled to receive the fees and mileage fixed by law in civil cases, payable from the Geothermal Resources Account of the General Fund.

3771. In case of the failure or neglect on the part of any person to comply with any order of the supervisor or chairman of the board, or any subpoena, or upon the refusal of any witness to testify to any matter regarding which he may lawfully be interrogated, or upon refusal or neglect to appear and attend at any proceeding or hearing on the day specified, after having received a written notice of not less than 10 days prior to such proceeding or hearing, or upon his failure, refusal or neglect to produce books, papers, or documents as demanded in the order or subpoena upon such day, such failure, refusal or neglect shall constitute a misdemeanor. Each day's further failure, refusal, or neglect is a separate and distinct offense.

The district attorney of the county in which the proceeding, hearing, or investigation is to be held, shall prosecute any person guilty of violating this section by continuous prosecution until the person appears or attends or produces such books, papers, or documents, or complies with the subpoena or order of the supervisor or chairman of the board.

State Tax Lien

* 3772. (a) If any person fails to pay any charge or penalty imposed under this chapter at the time that it becomes due and payable, the amount thereof, including penalties and interest, together with any costs in addition thereto, shall thereupon be a perfected and enforceable state tax lien upon all property and rights to property whether real or personal, tangible or intangible, including all after-acquired property and rights to property, belonging to such person and located in the state. Such lien shall not continue for more than 10 years unless recorded or filed as provided in this section.

For the purpose of this section only, "due and payable" means the date a return is required to be filed, without regard to any extension of time, without payment of the amount due or the date a determination or assessment made under this chapter becomes final, whichever is applicable.

Limits of Lien

(b) With respect to real property or any rights therein, at any time after creation of the lien pursuant to subdivision (a), the Controller may record in the office of the county recorder of the county in which such real property is located a notice of state tax lien as specified in subdivision (d).

The lien created by subdivision (a) shall not be valid against the right, title or interest of:

(1) A successor in interest of the taxpayer without knowledge of the lien;

(2) A holder of a security interest;

(3) A mechanic's lienor; or

(4) A judgment lien creditor,

where such right, title or interest was acquired or perfected prior to recording of a notice of state tax lien as provided in this subdivision.

(c) With respect to personal property, whether tangible or intangible, at any time after creation of the lien pursuant to subdivision (a) the Controller may file a notice of state tax lien with the Secretary of State pursuant to Chapter 14.5 (commencing with Section 7220) of Division 7 of Title 1 of the Government Code.

The lien created by subdivision (a) shall not be valid as to personal property against:

(1) The holder of a security interest therein whose interest is perfected pursuant to Section 9303 of the Uniform Commercial Code prior to the time the notice of the state tax lien is filed as herein provided;

* Effective July 1, 1978

(2) Any person, other than a person liable for the tax, who acquires his interest in the property under the law of this state without knowledge of the lien or who perfects his interest in accordance with the law of this state prior to the time that the notice of state tax lien is filed with the Secretary of State;

(3) A buyer in the ordinary course of business, as defined in subdivision (9) of Section 1201 of the Uniform Commercial Code, who, under Section 9307 of such code, would take free of a security interest created by his seller;

(4) Any person, other than a person liable for the tax, who, notwithstanding the prior filing of the notice of state tax lien:

(A) Is holder in due course of a negotiable instrument, as defined in Section 3302 of the Uniform Commercial Code;

(B) Is a holder to whom a negotiable document of title has been duly negotiated as provided in Section 7501 of the Uniform Commercial Code;

(C) Is a bona fide purchaser of a security, as defined in Section 8302 of the Uniform Commercial Code;

(D) Is a purchaser of chattel paper, as defined in Section 9105(1)(b) of the Uniform Commercial Code, or an instrument, as defined in Section 9105(1)(i) of such code, who gives new value and takes possession of it in the ordinary course of business;

(E) Is a holder of a purchase money security interest, as defined in Section 9107 of the Uniform Commercial Code;

(F) Is a collecting bank holding a security interest in items being collected, accompanying documents and proceeds, pursuant to Section 4208 of the Uniform Commercial Code;

(G) Acquires a security interest in a deposit account, as defined in Section 9105(1)(e) of the Uniform Commercial Code, or in the beneficial interest in a trust or estate;

(H) Acquires any right or interest in letters of credit, advices of credit or money;

(I) Acquires without actual knowledge of the state tax lien a security interest in or a claim in or under any policy of insurance including unearned premiums;

(J) Acquires any right or interest in property subject to a certificate of title statute of another jurisdiction under the law of which indication of a security interest on the certificate of title is required as a condition of perfection of such security interest.

Lien Notice Contents

(d) The notice of state tax lien recorded or filed pursuant to subdivision (b) or (c) shall include the name and last known address of the person liable for the tax, the amount of the tax, a statement that the tax shall be a lien upon all real or personal property and rights to such property, including all after-acquired property and rights to property belonging to such person, and a statement that the Controller has complied with all the provisions of this part in the computation and levy of the amount assessed.

(e) Any lien arising pursuant to this section shall continue for 10 years from the date of recording or filing of a notice of state tax lien pursuant to subdivision (b) or (c), unless sooner released or otherwise discharged. The lien may, within 10 years from the date of the recording or filing of the notice of state tax lien or within 10 years from the date of the last extension of the lien in the manner herein provided, be extended by recording or filing a new notice of state tax lien in the office of the county recorder of any county or with the Secretary of State as provided in subdivision (b) or (c), and from the time of such recording or filing the lien shall be extended for 10 years unless sooner released or otherwise discharged.

(f) Notwithstanding the provisions of Sections 688 and 688.1 of the Code of Civil Procedure, in the event the taxpayer is a party to an action or special proceeding in which the taxpayer may become entitled to property or a money judgment, a lien created pursuant to subdivision (a) shall extend to the taxpayer's cause of action and any judgment in favor of the taxpayer subsequently procured in such action or proceeding. Notice of such a lien shall be given to all parties who prior thereto have made an appearance in the action and to judgment creditors who prior thereto have been granted a lien or an order permitting intervention under Section 688.1 of the Code of Civil Procedure. Such lien shall have priority from the time of filing of the notice in the action. No compromise, dismissal, settlement, or satisfaction shall be entered into by or on behalf of the taxpayer with any other party, lienor or intervenor in the action without the consent of the Controller unless the lien is sooner satisfied or discharged. The judge or clerk of the court shall endorse upon the judgment recovered in such action or proceeding a statement of the existence of the lien, the time of the filing of the notice in the action and the place where entered, and any abstract issued upon the judgment shall contain, in addition to the matters set forth in Sections 674 and 688.1 of the Code of Civil Procedure, a statement of the lien in favor of the Controller.

Duration

(g) Any lien, and any rights or causes of action under such lien, heretofore recorded in any county pursuant to former Section 3772, shall continue in full force and effect for a period of 10 years from the date of last recordation or extension thereof and may, within said period of 10 years, be further extended in the manner provided for in subdivision (e) of this section. Upon recordation of an extension, the lien shall have the same effect as a lien filed pursuant to this section. Such extended lien shall have the same priority as it originally had under the law in effect prior to January 1, 1978.

* 3772.2. A warrant may be issued by the State Controller or his duly authorized representative for the collection of any charges, interests and penalty and for the enforcement of any such lien directed to the sheriff or constable and shall have the same effect as a writ of execution. It may and shall be levied and sale made pursuant

* Effective July 1, 1978

to it in the same manner and with the same effect as a levy of and a sale pursuant to a writ of execution.

* 3772.4. The sheriff or constable shall receive, upon the completion of his services pursuant to a warrant, and the Controller is authorized to pay to him the same fees and commissions and expenses in connection with services pursuant to said warrant as are provided by law for similar services pursuant to a writ of execution; provided, that fees for publication in a newspaper shall be subject to approval by the Controller rather than by the court; such fees, commissions and expenses shall be an obligation of the person or persons liable for the payment of such charges and may be collected from such person or persons by virtue of the warrant or in any other manner provided in this chapter for the collection of such charges.

* 3772.6. In the event that the lien of the charges, penalties or interest attaches to real property from which geothermal energy is extracted and more than one parcel of property is included within the lien, the Controller may release by certificate pursuant to Section 3772.8 from the lien of such charges, interest, and penalties and costs, upon payment by the owner of any parcel or parcels of property of his proportionate share of the charges.

* 3772.8. The Controller may at any time release all or any portion of the property subject to the lien from the lien or subordinate the lien to other liens if he determines that the charges are sufficiently secured by a lien on other property of the taxpayer or that the release or subordination of the lien will not endanger or jeopardize the collection of such charges. A certificate by the Controller to the effect that any property has been released from the lien herein provided for or that such lien has been subordinated to other liens shall be conclusive evidence that the property has been released or that the lien has been subordinated as provided in the certificate.

3773. The Controller shall, on or before the 90th day following the delinquency of any charge, bring an action in the name of the people of the state, in the county in which the property involved in the order is situated, to collect any delinquent charges, together with any penalities or costs, which have not been paid.

Attorney General

3774. The Attorney General, as provided in Section 3102 of the Public Resources Code, shall commence and prosecute any such action to final judgment.

3775. In such actions the record of charges, or a copy of so much thereof as is applicable, duly certified by the Controller, showing unpaid charges against any person, is prima facie evidence of the charges, the delinquency, the amount of charges, penalties, and costs due and unpaid, that the person is indebted to the people of the State of California in the amount of charges and penalties therein appearing unpaid, and that all forms of law in relation to the charges have been complied with.

* Effective July 1, 1978

The provisions of the Code of Civil Procedure relating to service of summons, pleadings, proofs, trials, and appeals are applicable to the proceedings.

Payment of Delinquent Fees

3776. Payment of the penalties and charges, or the amount of the judgment recovered in the action, shall be made to the State Treasurer, and shall be returned and credited to the General Fund.

Excerpts from AB 2644 that affect the responsibilities of the California Division of Oil and Gas. Effective date: January 1, 1979.

SECTION 1. Section 65928.5 is added to the Government Code, to read:

65928.5. "Geothermal field development project" means a development project as defined in Section 65928 which is composed of geothermal wells, resource transportation lines, production equipment, roads, and other facilities which are necessary to supply geothermal energy to any particular heat utilization equipment for its productive life, all within an area delineated by the applicant.

SEC. 2. Article 6 (commencing with Section 65960) is added to Chapter 4.5 of Division 1 of Title 7 of the Government Code, to read:

65960. Notwithstanding any other provision of law, if any person applies for approval of a geothermal field development project, then only one permit from the lead agency and one permit from each responsible agency shall be required for all drilling, construction, operation, and maintenance activities required during the course of the productive life of the project, including, but not limited to, the drilling of makeup wells, redrills, well cleanouts, pipeline hookups, or any other activity necessary to the continued supply of geothermal steam to a powerplant. The lead agency and each responsible agency may approve such permits for less than full field development if the applicant submits such an application. Such permits shall include (1) any conditions or stipulations deemed necessary by the lead or responsible agency, including appropriate mitigation measures within the statutory jurisdiction of such agency, and (2) a monitoring program capable of assuring the permittee's conformance with all such conditions or stipulations. This section shall not apply to any permit whose issuance is a ministerial act by the permitting agency.

SEC. 3. Section 3715.5 is added to the Public Resources Code, to read:

3715.5. For the purposes of the California Environmental Quality Act (commencing with Section 21000), the division shall be the lead agency as defined in Section 21067 for all geothermal exploratory projects as defined in Section 21065.5. The division shall complete all its responsibilities pursuant to the California Environmental Quality Act, including public and agency review and approval or disapproval of the project, within 135 days of the receipt of the application for such project. The division may delegate its lead agency responsibility under this section to a county which has adopted a geothermal element, as defined in Section 25133, for its general plan. Any such delegation shall provide that the county complete its lead agency responsibility under this section within 135 days of the receipt of the application for such project. The provisions of this section shall not apply to geothermal exploratory projects as defined in Section 21065.5 where, prior to January 1, 1979, preparation of an environmental impact report for such project has begun or an application for such project which will require preparation of an environmental impact report has been filed.

SEC. 4. Section 21065.5 is added to the Public Resources Code, to read:

21065.5. "Geothermal exploratory project" means a project as defined in Section 21065 composed of not more than six wells and associated drilling and testing equipment, whose chief and original purpose is to evaluate the presence and characteristics of geothermal resources prior to commencement of a geothermal field development project as defined in Section 65928.5 of the Government Code. Wells included within a geothermal exploratory project must be located at least one-half mile from geothermal development wells which are capable of producing geothermal resources in commercial quantities.

SEC. 5. Section 21090.1 is added to the Public Resources Code, to read:

21090.1. For all purposes of this division, a geothermal exploratory project shall be deemed to be separate and distinct from any subsequent geothermal field development project as defined in Section 65928.5 of the Government Code.

ADMINISTRATIVE OFFICES

HEADQUARTERS & DISTRICT G1:	1416 Ninth St., Room 1316-35 Sacramento 95814 Phone: (916) 323-1788
CEQA Unit:	Phone: (916) 323-2733
DISTRICT G2:	5199 E. Pacific Coast Hwy. Suite 309-N Long Beach 90804 Phone: (213) 590-5311

AREA OFFICE

DISTRICT G3:	2904 McBride Lane Santa Rosa 95401 Phone: (707) 525-0479

Edward W. Hieronymus
O'Melveny & Myers, Los Angeles
November, 1979

OUTLINE

PROVISIONS OF FEDERAL AND STATE STATUTES CONCERNING COMPULSORY UNITIZATION

I. Introduction

A. Rationales for Unitization.

1. Protect correlative rights.
2. Enhance recovery.
3. Minimize costs.
4. Avoid acreage limitations.

B. Basic Unitization Issues.

1. Allocation of production.
2. Allocation of costs.
3. Decision making mechanisms.
4. Satisfaction of lessee's obligations to lessor by unit operations on other lands.

II. Documentation -- Necessary Parties.

A. Unit Agreement.

1. Lessees & Other Working Interest Owners (WIO).
2. Royalty Owners (Lessors & Others).

B. Unit Operating Agreement-- Lessees & Other WIO's.

III. Voluntary vs. Involuntary Unitization.

A. Voluntary Contract.

1. Obstacles to consummation.

(a) Competition.
(b) Fragmented ownership.
(c) Allocation problems.

B. Resource Management Tool.

1. Public Lands.

2. Private Lands.

IV. The Federal Scheme for Federal Lands.

A. Statute (30 U.S.C. §1017).

B. Regulations (43 C.F.R. §§ 3243.1, et.seq.; 30 C.F.R. §§271.1, et. seq.)

1. Application

(a) Proponent
(b) Inclosures to Application
(c) Proposed form of Unit Agreement.

2. Secretary's Certification re "public interest"

3. Exception from Acreage Limitation.

4. Modification of approved agreements.

C. Form Unit Agreement (30 C.F.R. §271.12)

V. State Geothermal Unitization Statutes.

A. Express provisions for compulsory unitization.

B. Statutes of uncertain meaning.

STATUTES RELATING TO UNITIZATION

A. Federal:

Geothermal Act of 1970, as amended, 30 U.S.C. §§ 1001 et. seq. (especially §1017) (Chapter 23, Geothermal Steam and Associated Geothermal Resources) (authorizes compulsory unitization).

B. State:

(1) Arizona:

Ariz. Rev. Stat. Ann. §§27-651 et. seq. (especially §§27-664 and 27-665) (Article 4, Geothermal Resources) (similar to California statute but expressly authorizes compulsory unitization.

(2) California:

Cal. Pub. Res. Code §§3700 et. seq. (especially §3756) (West) (Chapter 4, Geothermal Resources) (generally comprehensive statute providing for State approval of unit and other cooperative development agreements; no express provision for compulsory unitization).

(3) Colorado:

Colo. Rev. Stat. Ann. §§34 -70 et. seq. (especially §34-70-104) (Article 70, Geothermal Resources) (authorizes compulsory unitization).

(4) Idaho:

Idaho Code §§42-4001 et. seq. (especially §42-4013) (Chapter 40, Geothermal Resources) (authorizes compulsory unitization).

(5) Montana:

Mont. Rev. Codes Ann. §§81 - 2601 et. seq. (Chapter 26, Lease of [State] Geothermal Resources) (authorizes cooperative agreements re State lands with State consent)

(6) Nevada:

Nev. Rev. Stat. §§ 534A.010 et. seq. (Chapter 534A, Geothermal Resources) (no express provision for compulsory unitization).

(7) Oregon:

Or. Rev. Stat. §§522.005 et. seq. (especially §522.915) (Chapter 522, Geothermal Resources) (authorizes compulsory unitization.)

(8) Utah:

Utah Code Ann. §§73-1-20 et. seq. (Title 73, Water and Irrigation, Geothermal Energy Production) (brief, vague statute not expressly authorizing compulsory unitization).

(9) Washington:

Wash. Rev. Code §§90.44 et. seq. (especially §79.76.160) (Chapter 70.76, Geothermal Resources) (authorizes compulsory unitization).

28 Nov 79

R. Stone

1200 Federal leases for 2 M acres. This can roughly be doubled considering private & (State). Reid says this indicates a going industry.

WELL PERMITTING

Dave Anderson - Overview

NEPA, CEQA (Calif. Environmental Quality Act)

Two acts that generated a lot of well permitting regulations. These caused many many regulations to be promulgated and the time necessary for permitting to increase. We need to turn this curve around to spur energy development.

Dave Richard -

- when an ~~project is set~~ application (or permit is sent in to USGS, a certain person is assigned to collar them -- a company can call in and actually talk to this person.

Industry Response — County Regs.

Inyo Co. + GRIPS. — Dwight Carey

- There is tremendous disparity among counties in how things are handled. Differences extend to state and federal agencies.
- We finds that each project has to be considered from the start because regs, people, issues change both in time and in space
- Inyo county requires use permit for A/N surveys
- Advises people wanting new regs to do a lot of communication w/ other counties, etc. and with companies before writing regs.
- no such thing as a common way or method for permitting.

Pet Peeves

- utilization of KCRA boundaries (geological) as a political boundary -- counties get to convert that development is supposed to occur only within KCRA's
- master EIR's are a good idea
-

Unitization

Unit Contracts - mechanism

Merges leases ~~Contracts~~ in an area except for special provisions in each lease -

Distinguished from "cooperative agreements" because no single lease concept came at

Distinguished from "pooling agreements" -- pool small tracts so as to get a size block that can be drilled under spacing reg.

Unit Operating Agreements - provide for an operator and how costs and shares are to be allocated

Atlas

wells can be based on geol rather than boundaries

fewer wells

drainage not a problem

common equipment

decrease waste

facilitate injection

Federal & state statutes constituting Unitization

A compulsory unit is one in which one or more interests are included by act action, involuntarily.

Voluntary Unitization - agreed upon voluntarily by negotiation among unit interests

Involuntary or Compulsory Unitization - a fed agency exercises "police" power. - in oil & gas, this has been upheld in courts, so would likely be same in geothermal.

no compulsory geothermal unitization has been effected to date of 7-8 units in existence

"Guidelines for Federal Geothermal Units" - wrote to USGS - Menlo Park

Process

1. Submit an Application w/ map (to USGS) as susceptible to unit develop
2. Proponent attempts to get signatures of all resource holders. those that refuse have their reasons become part of record.
3. Fed decides if this is in best interest of US or not.

State

Arizona: Oil & Gas Conserv. Comm (+ geoth

- Apply to them -

They determine if unit agreement is in best interest from conservation standpoint

- They issue permit.

- For non signatures, no effect unless they are needed -- if so they are included

-- costs allocated to n-s are collectible only out of royalties, not directly -

-- work on any part of unit is deemed to have been done for benefit of unit.

Fed comp Units applies only to fed lands.

Could a proposal make an area a "natural resource", thereby extending power of fed or thru force ~~state~~ units.

In State, some statutes w/ compulsory units have been applied to private lands.

Robert Humphrey – Union

Basic difference is due to nature of resource – in petroleum product can be hauled away – gas can't.

Facilities – will have wells, pipelines, pollution control at well and consuming facility (generating plant) and plant. You must account for surface use to a much greater extent. As will have a 3rd party in site, namely the utility. Unit agreement must address surface acreage, surface damage.

Development is a significant difference. A block of resource is enough to power a consuming facility for 30 yrs. Plan is usually to drill 3–4 wells, then facility construction gets ahead and rest of wells drilled to be finished at time facility is done.

Time lag is a difference – In petroleum, can truck oil away from 1 well. In geoth, 3–5 yrs before use can be made of resource. Also utility wants to sequentially build plants, even though field may be a bonanza.

Units must be of long life -- must be assured a statutory life, say 30 yrs.

Allocation of resources. Becomes very complicated if several purchasers building plants.

- co picks hole, convinces rest of supporters, who see how it pts.
- neighbors will support your project mainly to get the drilling results. Big co's do not like to give drill results to land owners because they are not pet people, will not treat it properly. This info is backbone of a co's being able to make deals, so don't like to pass it around.
- Types of support
  - Dry hole contribution - support in form of well given only if well is dry. If producing, they get info but do not pay.
  - Bottom hole contribution - self-explan. pays above drilling cost
  - Options
    exploration (seismic) - can earn acreage position thru expl activity.
    drilling - have to drill to earn a position
  - Acreage position - support comes in form of land rather than money. This works bec. operator must have the ability to move in any direction dep on results of test hole.

Option Agreement -
- question that must be asked - "do you own land or have an exclusive option"? if not, don't talk to person, because he is trying to peddle someone else's land -- he will be back later if something is found to drop you for a better offer. -- Geologists sometimes fall into trap of talking to these people also later show up

Farm-out agreements - agreement, area / acreage, area of interest around it when if one party becomes interested, have to offer farm-in to other party.
- also add accounting procedures.

- Agreements must be structured properly so that tax deductions can be taken - otherwise they are lost.

in lieu wells or substitute wells - should have a para in agreements that give right to do this.
Also a para which says have right to suspend drilling and drill another site or to stay in for a second hole.

Create an operating Joint. within this area, each own a % interest. (say 50-50). Each party is still responsible for paying own leases in area, etc.

Right to take production in kind → this is done to prevent losing like a corp in the past, to prevent being double taxed (once in corp, and again when the funds come into company).

Change of Operator - any party can come in and make an offer to operate at $ figures -- if operator does not match, he is out, you are in

Loomis – new Fed CEQ

Island Park EIS

- USFS lead agency: USGS, BLM, NPS, FSWLS coop agencies
- emphasis focused on USFS management responsibility to identify areas could be leased, not be leased, could be leased w/ stipulations.
  - concurrent actions required of BLM and USGS
  - will help make decisions in all agencies involved

Coso

Data needs

land use, hydrology, geology, veg, soils, cult, wildlife, air quality, etc – all are of concern
- treats drilling, testing, abandonment, generic treatment of facilities develop.

Navy Coso – this is a development EIS.
emphasis on geology, hydrology, area of resource

- Emphasized early work of DOI to help streamline all processes.

Don Tarlock -

oil & gas, water - mineral rights and regulatory agencies
--competing factions.

Three consequences

1) regulatory jurisdiction → oil & gas divisions
   → water divisions
2) set grounds for leasing → if mineral, case from land owner
   → if water, water laws -
3) sets rights of 3rd parties to object
   a) if mineral (oil & gas) conservation scheme must be in place or someone may come in and pump (amalgamation)
   b) if water, water rights set for that

Tarlock's reasoning

1) gt should be disentangled from water law --
   there is a presumption of separation of water and gt.
2) rights need to be assigned to overlying land owner --
   in some cases if gt + gw are coupled, then water user entitled to compensation.

Tarlock hired Austin to tell him what gt reservoirs are like relative to water reservoirs

- water law is less suited to development of gt
  - lots of forms not applic
  - in some states (Ariz, Cal) overlying land owner is entitled to use of resource - if groundwater, is this case?

- in closed water basins, gt may be blocked
- pumping restrictions may hinder develop
- new water approp are harder to get -- to get water must show - water avail
  - use won't interfere w/ other users
  - environ groups don't object.

<u>What is the Law</u>

There are three approaches

1. Treat gt as water: Nev, Ut, Wy
2. Treat gt as sue generis - means "new"
   Id, Mont. : in Idaho "sui gen, but close to water"
3. Treat gt as min: Ariz, Colo, N.M., Wash. -
   rule is "geoth is a mineral unless its water" w/ burden on user to show descendant from water

Calif & Oreg are variant of (3).

<u>Relationship between federal lessee and State water law</u>

- fed lessee gets develop going, then other water user says "interference" -
  critical issue is date of use - if fed land carries water right which is prior -- or <u>fed reserve right</u>, developer could pump w/ impunity to state law.
  -- use must be made on underlying land
- -- Farleigh says developers should <u>not</u> claim reserved rights.

-- the result is a very confused picture. The burden of disentanglement is with the developer to show that he ~~co~~ has a right to production separate from water.

Reinjection? if can show non-consumptive use, this will help get water rights.

Dale Zimmerman -

GAO report " How to Speed Development of Geoth Energy"
US GAO Dist 1518 441 G St NW WDC

Recom

1. Sec Agric see that USFS give priority to geoth lease, that USFS & BLM speedup
2. Acreage limitations + KGRA's limit development
   recom KGRA's to drilled areas of production suitable for elect power gen
3. Support all recom of Gt Task Force

Phased Environmental Assess - allows to assess impacts in stages - to speed things up -
- in first of lease stage, concentrate on those things that can be done before must go to USGS
- then address other items then to utilization in a summary way

FLPMA – concentrate on Wilderness Provisions –

12 Dec. release of draft Interim Management Guidelines for WSA's
– Zimmerman says that BLM recognizes that WSA's have big impact on gt.

— GOM acres will be studied --
— wilderness policy – Z. feels its good.

a) existing on Oct 21 1976 may continue in same manner of degree, even if may degrade -- "grand father" concept.

b) all leases on or before 21 Oct. have valid existing rights – limited dep what was being done on 21 Oct.
Post FLPMA activities allowed only if do not degrade environment. –

c) after 21 Oct, rights are limited

"non-impairment criteria" – does not impair land for inclusion as wilderness ⟶ temporary – reclamation requirement – reclam to std by trans Sec Int regs to present.
Post FLPMA leases subject to wilderness stipulations

"grandfather"
– existing use would have created actual physical impacts
– if temp shut down on 21 Oct 76, temp period of 12 mo allowed -- if more must show start-up reason. Market reasons are not allowed.

Suspension – these will be granted (for pre FLPMA leases only) where wild study will not let you proceed, but lease may be terminated. Suspension means everything stops – no rentals, etc.

Ken Wonstolen – NCSL – Pending & Proposed Geot. Legis.

Handouts
1. Table of Legislation
2.
3. GT legis introduced 1979 Session

Colo.: Property, Income tax credits
Id: municipal bond OK'd
Nev: Exempt non-prod leases from taxation – no ad valorem
NM: Extended 5-yr term to addit 5 yr term tax w/ no production
raised acreage to 51,200 acres
Oreg: Policy & proc for reinjection
Geoth Task Force
Utah: Resource ownership in Surface Estate (Conservation)
Alaska: requested NCSL to assist them –

Now working w/
Alaska: drafted comprehensive gt resource act
→ – – defines gt by temp threshold @ 120°C
– – would be leased as a mineral
– – 51,200 acres, except producing parcels
– – drill regs by Dept Nat Resources
– – deals w/ water law and gt develop.
– fluids < 120°C treated as groundwater, i.e. ~~lease~~ appropriated rather than leased.

Arizona: - will do study 1980

Delaware: will help draft legis.

Hawaii: assistance to house committee

Maryland: assist reg authorities enforcement of existing regs

Nevada: initiated policy review

NM: consulted w/ state engineer regarding his policy
if 1st producer on a system produces interference, he will need to pick up offset water rights. Subsequent producers can get a ride. If first producer gets out, subseq prod may have to pick up

Oklahoma: correlative rights

Utah: 1979 act passed both houses but could not be reconciled, so died
- 120 °C breakpoint
- correlative rights
- unitization + allocation under doctrine of CR.
- producer needs to appropriate full production

Wash: joint committee on small gt + hydropower

1980 - work in all these states
Oreg, UT, ID, CO, SD, NC, GA to be added.
- add heat pump considerations w/ Nat Assoc water well Drillers.

John Wimmers — Earl Warren Leg. Fest.

Public Utility Regulation of Direct Heat Suppliers

— of concern where there is more than one user.

Problem: Prospect that direct heat suppliers will be subject to regulation as a public utility.

— Public Utility Comm decides
whether you can have a project at all
what your rate structure is

To be a public utility: if you supply to enough of your public a commodity that is defined as being critical to public use: most states define water and/or heat as critical commodity:

Has to be dedicated to public use —

— yourself - as

— 2-3 other people, etc. -- probably not "public use"

— most states test is whether supplier is willing to supply indiscriminately to users in area

—

- type of service or commodity
- public use
- structure project to take advantage of exemptions

If you are a public utility

- fee regulation of day-to-day activities
  - natural accounting, financing, adequacy of service, relations of associates.
- regulate geographic area where you can supply service

if there is an existing utility supplying competing goods (gas, electricity), you may be kept out
- regulate rates -- utility ROR 9-12%. How do you attract capital @ 9-12%
- unsuccessful wells may not be allowed in rate base →

What is being done - what can we do to help
- Earl Warren is working w/ public utility comm to make them aware, give them ways to deal w/ probs, and foster good rules and reg.

Short paper: State Public Utility Reg of Direct Heat
repts. 1 Overview of
2. state by state analysis

Randy Stowas – Recent & Pending Federal Legislation

Alternative Energy Tax Credits

- see handouts
- permits would be issued for small users – would not require leases.

Courtland Lee – House

HR740 – passed increased acreage limitation
- redefine KGRA to eliminate competitive lease KGRA's – non-comp leases, if gvt doesn't issue within year, then they have to give you lease non-comp even though reclassified: if reclassify as KGRA < 1 yr, give you right to meet high bid.

Tom Laughlin – Senate

Have two omnibus bills + S790. Procedure will be to take one of these bills as a vehicle –

Issues

1. Ways & means of Expediting Lease Applic Processing
2. Acreage limitations
   - question of going to much bigger acrg, but exclude oil & gas
   - question of bonds to be exempted –
3. KGRA definition – its likely def. will be contested
4. Protection from reclassific, i.e. grandfathering
5. Under what conditions should lands be declassified from KGRA

30 NOV 79

Leasing (cont.)

Jack Ekstrom - PI

Acreages allowed: - 25 - 50K acre range for max allowed

Primary term 10 yrs most states, but some are 5.

Leases drilled ± 10,000' or deeper can be captured (rentals @ 1-3/yr range -

Royalties usu 1/8 gt and 5-25% overrides

Access to public lands has become more diff.

Q - What would additional lease acreage mean given that # drill rigs is so limited? -

---

Byrd - VIII

Funds that ranchers, etc., are surprised by complexity of Co. Lease Contracts, but wind up signing on best.

Some principles which have grown up of Leasing

1. if you own the resource you are entitled to enough of the surface to develop it. - "Reasonable use of surface"

Each lease had oil & gas lease as its predecessor.

Category	Mining	Petroleum
Geology	X	
Hydro chem	X	
Slt.	X	
Geoph	X	
Econ	X	
Freq Vein Occur	X	
Prospect size		X
Prop Acq		X
Expl costs		X
Drilling		X
Engineering		X
Cap Requirements	X	
Expendit Timing	X	
Develop & Prod Timing	X	
Prod life	X	
Refining	X	
Env Impact		X

Land Owner Wants in a Lease:

1. Rapid development - means royalties
2. Money
3. Retaining max utilization surface rights
4. Protection of future uses of land for landowner

Things Important to Lessee

1. Get lease at least $
2. Term long enough to explore, develop
3. Unrestricted use of surface
4. Keep as long as production or has spec. value
5. Terminate at ant cost if unprofitable

I. Items which lease must deal with - Init'l consideration & Rental Amounts
~~Lease Structure Items~~

1. Location of facilities, wellsites: consultation & approval or arbitration if no agreement
   -- contract needs to ~~deal~~ have provisions to cover this
2. well sites, area required -- may want to limit area for sites
3. Drilling or construction near residence or other structure
   - 100' close -- 4-500' not bad
4. Sealing off subsurface waters & protect fresh aquifers.
   -- operators by -- reg. agencies
5. Compliance w/ Environ Stds
6. Crop Damage
7. Drilling islands, directional drilling, plant sites. -
   @ Geysers, little of surface is used because they are drilling islands. @ Geysers they do this because environ probs and north constructing good pads.
8. Loc of drill sites and facilities on perimeters or corners of fields - its better for lessor that sites be put on perimeters, etc.
9. Lessee to keep roads free of dust to prevent crop damage
10. Use/maintenance of existing roads.

11. Forcing of pumps
12. use of water on premises
13. Damage to land
14. Payment for land use
15. Payment for easements, conditions of use, surrender
16. Subsidence - in Twp valley fields are leased to 1/10 to Slope
17. Restoration

---

2. Granting Clause - Some lawyers think that the US by implication has reserved all gt to itself -- etc sui generis -- but GT Steam Act shows spirit that US does not believe this.
-- he is hesitant to include in lease from a warrantee by lessor that he owns resource --
-- if it turns out that land owner does not own resource, lessee will prob be able to get title from U.S. In that case, lessor should have provision in lease for overriding royalty, etc.

6. Royalties - This is usually 10%. Joe Hidlin & boys were first to adopt this
way leases are structured, windup of a net profits royalty rather than gross: Feels royalty should be on gross.

-- Phillips lease is a pretty good lease -
- no lease yet talks about cascaded use -

Operators Point of View – Fred   Shell Land Dept.
Oil & Gas Lease has a different history in Cal than in mid-Cont

Calif – no implied covenants Lease developed – says if its not in the lease, its not there. This has been challenged in court.

-- Shell uses two Lease forms, one for Cal, one for rest of US.

-- Geothermal Leasing Act, amended – this is tighter than for oil & gas –

– Best Lease from landlords view point is the US Lease –

Granting Clause –
warrantee of Title – must address insurance against mining claims in public domain – many claims pre 1955 and even some after give concern

Shell pays damage to crops based on crop value –

Directional drilling costs are about same of another pad. However its easier environmentally to drill multiple wells from same pad –

Royalty – sort of negotiable –

Granting Clause – (always to Lessee so long as producing in commercial quantities, etc.

Jack McNamara - J.M. Energy Consultants 30 Nov

CEQ guidelines -

1. encourage reference to other docs by reference, rather than doing everything over from start.
2. Trying to get agencies to focus on issues rather than cover everything
3. Guidelines are readable -- effective 30 July 79 and tested in 1 fed court case
4. Real prob will be less challenges to their guidelines

Environmental vs Land Use categories of considerations
↑ affect how you can do things
↑ affect where you can do things

I. Environmental

1. water quality - NPDES
   a) Hazardous waste regulation under Resource Conservation and Recovery Act - affect gt... ⇒ QC based on exemption
   b) Safe Drinking water Act of 1974 Regs have undergone a checkered past. EPA got lot neg. comments -- now UIC Regs (Underground Injection Control) are new stuck gt w/ brown sulfur processes, etc. Could require you to drill 5 monitor wells around each producer. Permits, costs would kill people - - EPA says they will promulgate these regs
OCS - outer Continental Shelf -

2. Air Quality

Clean Air Act (2 yrs ago) 1977 Amendments are important

NAAQS → there will eventually be 6 pollutants

SO_2 & NO_x standards specified so far.

PSD – Prevention of Sig. deterioration -- new sources do not degrade –

PSD are difficult to comply with. Co's sued which were considered by DC Circuit Court of Appeals who rendered decision BACT Best Available Control Tech

PSD requires ~~BPCT Best Practicable Control Technology~~, which they specify – attainment (of air quality) or non-attainment

New Source Performance Stds NSPS -- there are (no regs) none for gt power plants -- this is good –

(Tradeoffs)

Emissions offset Requirements – have to take out more emissions than you are going to emit.

1-2 pollutants and/or any 1-0 generated in one case. You have to find people who have tradeoffs, then deal with them (who are happy you are going to take care of this pollutants). not clear whether can use tradeoffs in other air basins

There are here to stay –

New Source Review –

Class I, II, III Air quality designations. Everything in US basic II. Some are mandated as I: parks, wilderness areas, etc.. Reg does not say WSA's

but Fed Land Managers have discretion to "classify" to I w/ st congressional Approval. Indian Tribes also can do this.

In class I, no excess emissions allowed.
Class III - roughly twice allowable as class II.

no pt in class I or possible upwind from class I areas.

This is sticky because it ties together land use w/ air quality.

2. Land Use

Wilderness - 1964 wilderness Act
creates National Wilderness Preservation System.
Directs NPS, USFS, Fish & Wildlife Service to identify (potential) wilderness areas. Sierra Club then threatened law suit if USFS did not inventory all lands -- so USFS went into second phase of RARE.

RARE II recommended 15M acres - wilderness
11M acres - study
36M acres - multiple use

USFS had to study mineral potential - he says this was not well done.

USFS recommendation RARE II is never being put into legislation.

Two bills have passed senate: S1369 - Hatfield 500K + 134K acres added to wilderness in Oregon, but release

other lands to multiple use. Release language is very important. FS has been threatened w/ law suits if they process leases on multiple use lands.

Church got bill thru that adds 2 m acres in Idaho, no release language.

BLM Wilderness process - no responsibility till FLPMA act.

- FLPMA requires inventory of all BLM areas by 1980.

CDCA - California Desert Conservation Area - speeded up - other areas similar - speeded up areas

State Utah has filed suit against BLM re WSA's.

Next Oct, WSA designated - the study period begins, ends 1991. They have put out a handbook that says how they plan to manage WSA's during study period:

no perm bldgs, locations: use [illegible] drill holes can drill test holes. Test is that you have to be able to completely rehabilitate in 5 yrs, but it's up to local offices.

RARE II - not settled in Congress, will be done on a state by state basis. Calif & Id bills have gone thru - All legislation should be thru during next year.

Barnes →

If good case is not made, congress can grab off WSA and put in wilderness before 1991 - need to identify mineral potential soon -

Land Use Planning

USFS & BLM has to come up w/ management plans for their lands. Planning Units are designated - and management plans put out - this is not WSA areas.

Land use planning process is a political process.

Bonnie ⇒ So we need to be in good position to say about gt resources on BLM lands outside of WSAs.

When you go to FS or BLM w/ proposed project in an area, they will look at their Land Use Plan. If it is not sympathetic to gt use, you may not be allowed to proceed, or you will be slowed down—

FS & BLM is talking about closing lots of this land w/ no surface occupancy.

Endangered Species Act — US Fish & Wildlife Service (FWS) administers (in DOI). They publish lists of endangered species. There is no provision for tradeoffs, etc. But amendments in 1978 was set up to rule on exemptions on individual basis. In Grayrocks dam in Nebraska they set up $7.5 M trust fund to create new habitat for endangered species. Congress exempted Tellico dam — Snail darter

Energy Mobilization Board Bill —

National Historic Register
Historical Preservation Act, 1966 — goes back long way, so it's imbedded. Section 106 is an interagency advisory council to look @ Historical Preservation — Regs require

Council to be notified if you become aware of historical artifacts, etc in your project area. They give ideas on how to mitigate, but may not let you go thru. Places can be nominated to National Register Sites -

HCRS = Historic Conservation and Recreation Service in DOI (Reagan)

American Indian Religious Freedom Act - guarantees access to sites not for worship - Act does not forbid multiple use.

-- There is a bill in Calif. Legislature to protect hot spring sites --

Under Geothermal Steam Act, if you are not afraid of preceding acts, then usFS can FS (and) studies your request for lease -- FS has veto power over what BLM may want to do (or not), but has no veto power for other minerals.

DOD does not have to act thru BLM.

Now BLM does their own study. In case went to an EIS. BLM did a generic doc which took 4 years to do. So BLM generally uses this doc and uses EAR's with it. But they got sued in Alvord case, people saying BLM should have done an EIS. BLM does EIS if they think there will be economic controversy.

you get archeologist's report, quote BLM (have to quote BLM or they won't give lease) if there are such artifacts, triggers the Interagency Advisory Council process. —

Then if BLM gives lease, USGS comes in and respon falls on lead state.

USGS has several levels of POO's. They also have a field "walk-over"! This gives USGS access to more expertise, but creates educational probs. —

GEAP -- they come on walk-over, help USGS design studies.

Now even though USGS approves plan of operation, BLM or USFS still have to sign off, which may give probs. -- land manag agencies do not trust USGS, so take hard look at this.

In terms of air and water quality, USGS enforces permits of other state and fed agencies - GS is responsible for all this enforcement. Do not require you to get county use permits, etc.

Jurisdiction - in some Calif counties, they tried to make people to get county permits even on fed permits. Gulf oil finally took Ventura Co to court and won, but it's being appealed, and to Calif Supreme Court --

Severed Mineral Rights -

Stockraising Homestead Act -

Western Water Law - IDWR thinks that even on fed land, not only have to do POO's, but get a permit of IDWR, too. If people comply, sets a bad precedent -- if don't comply wind up in court. There has been a long legal battle bet west states and feds over water use regulation.
It happens to be position of Solicitor's office that if you have fed lease, don't need state water use permits. So people are getting water rights before use even on fed land. But Idaho courts are where feds or cos prob will not wade in and challenge in near future

NEPA entering 3rd decade -- its changing as shown by CEQ guidelines.

Critical Habitat is name of game in Endangered Species -

National Trail System - They were considering a 5 mi corridor on each side.
Desert Trail - NM, AZ, Cal, Nev, Id, Ore, etc.
Desert Trail Assoc will lobby heavily -- NPS says "no trail". Other trail Dominguez/Escalante - planning stages - may atrophy in Utah. -

Sovereign Immunity – "if king slaps you, tough". Until recently, you could not sue the gov't. A recent act (APA) says you can sue an agency and win if their action was "arbitrary or capricious".

California –
permits needed: water quality, air quality permits
Div. O & Gas Permit DOG
County Permit
} Developers were required to pay for this

In Calif used to have to do an EIR which included all impacts thru utilization, even for exploration. 1977 Appellate court dec struck this down, saying only impacts of what's done.

AB884 – sets 12 mo permitting time limit by EIR environ doc from state agencies

County got lead on density projects
DOG got lead on expl.
Power Plant stage – Energy Comm is lead, which can be delegated to county

Air Quality, water Quality, administered by state for EPA, so have to deal w/ them even on fed. land.

In Geysers Air Pollution Control Board has set std's for emissions which existing plants must meet which get increasingly tough w/ time, currently 1980, 1985 as std's decrease. New plants heavily regulated, too.

County reg's are tougher than state or fed.

Stretford Process now operating on Unit 15 at TG. Everyone is looking to see how well it works. So far hasn't worked as well as hoped.

Usually the DOG environmental document on a project is accepted by the various other state offices (such as water Pollution Control Board, etc). But sometimes a little more data are needed.

< 50 MWe plant, don't need to go to Energy Comm, but can go to county. So in Imperial Valley some plants are 49 MWe. One co plans 2, 49's. Is this a 98? CEC thinks it should be. Prob be tested in court.

Oregon – a pro-environmental state, but do not do things like CA does.

– – well permits

DOGAMI – gives these out

– not large amount of holes, possibly due to large amounts of USFS lands which can't be leased

– Oregon is a leader in land use planning –

– But there are no extra layers of govt like there are in CA.

– They view gt as water – water resources are owned by the public – therefore gt could be publicly owned, but statutes do not specify spell this out.

N Mexico –

– H are ambient H_2S standards – – one of few states

– well permits – they put stips on, ask if are not to degrade environ, etc, then let you go.

– their experience w/ gas, oil, uranium coal; so this helps

– state lands leasing – they are aggressive, lease a lot of land. Fewer fed lands leased. USFS has not been responsive.

Utah – aggressive state lands leasing prog put stips on – little loss of time –

– few probs operating in Utah w/ permits, environ, etc.

Basic Considerations -

Co's just done to assign one or more people to just follow all the changing regs and all the new ad outs, and then to plan a strategy for handling these.

PRICING

Robert Humphrey Unimar

Original contract w/ PG&E ≈ 25 pgs - Present over 25 pages. slow learning

Regulations

1. GT energy sold and used at its source
2. Seller (a risk-taking resources co) and buyer (a utility) are bound for 30 yrs or more
3. Production and utilization must be completely coordinated

Scope of Contract

Seller 1) drill exploratory wells
2) drill development and make-up wells
3) construct ^sour facilities
4) deliver resources
5) take back effluent an dispose
6) dispose of waste materials.

Buyer

1) construct plant and transmission lines
2) purchase resource
3) generate electricity
4) sell electricity

Such a contract is a big undertaking, and for a couple of Union ad buyer

Seller will condition performance upon securing necessary permits, meeting regs.

Buyer also condition upon sellers right to sell the resource

If seller can't deliver, buyer will forfeit
If buyer doesn't take resource, seller can sell to someone else

Concept of buyout by other party

Title -- will derive from gt leases, described in exhibit attached to contract. Seller may warrant or merely furnish title data so that buyer can determine right to sell

Facility will be in producing premises.
Seller can usually assign this to buyer.

Sellers do not want to become utilities (buyers), so must look carefully @ buyers right to be in premises

Seller wants to sell resource as fast as possible at for highest price. Buyer wants to schedule plant startup in a sequence. There are competing needs -

If there is only one utility, he may get all of resource, in which case it may be years before all power is on line.

Seller may contract for certain amount of acreage and withhold some for negotiation of other utilities.

Seller does not warrant resource quality and quantity. Seller instead furnishes res eng data to buyer so that he can satisfy himself that resource is there.

Schedules are such that seller drills varying holes in time to bring needed power on line dep on power plant construction schedule.

Union usually puts in a provision for 100 acre max. size plant because they think this is max size they can handle at once.

Once a plant goes on, a run-in period must be built in (at lesser contract amount) and this lasts until when plant is actually started (run at certain efficiency for certain period)

Parties have to agree to a certain steam standards: temp, press, pollutants, etc.

Parties have to agree on an efficiency.

Seller gets so much shut-down period, stated as 1) maintenance hours down, 2) efficiency as per % of name-plate rating of plant

Agree on a delivery point

Agree on metering points.

water: if condensate is to be used, must be cooled.

waste & effluent disposal - each takes care of own pollution control facilities. Seller may take some waste, esp in ash to go back to ground. Ordinarily seller wants fluid back for reservoir maintenance - longevity, prevent subsidence.

Pricing

can be on several bases: among others

KWH generated

lbs steam delivered

BTU steam delivered

contract should recognize that if seller is ready and willing to deliver, buyer takes it or pays anyway if does not take

Agree on certain efficiency on part of utility -- there are penalties

Here are built in penalties if seller fails to deliver contracted amount.

Inflation/deflation are accounted for

utility has big investment in plant costs. So contract provides for liquidated damages if seller cannot or will not deliver.

Exceptions - inadequate reservoir quantity or quality (no warranty)

- force majeure

Buyout - if one party wants out, other party has right to buy assets for agreed price.

Term of Contract - for one facility it's for operating life of facility. But if new increments to come on line, then Union says 35 yrs after construction of last unit to come on line.

Utility Prospective - Greg Nesbitt - San Diego Gas & Electric

Believes that utilities & developers don't understand each other's risks

Utility Attributes

- has little or no incentive to take risk
  - if takes risk and loses, passes loss to ratepayers
  - if takes risk and wins, passes benefit to shareholders
- rates are based on costs, so if costs go down, rates go down. There is the possibility of cost disallowance for taking risks, by Public Utility Commissions.
- utilities are cash short, but need cash accounts. Earnings are non-cash earnings. E.g. $ for construction are not received until plant goes on line, even though $ must be expended when incurred. Prob less than 1/2 earnings are cash.
- it is not to the utilities advantage to inflate rate base. Stock is sold below book today, as are equities. It has been to leverage to keep expenditures for construction low.

Contract Provisions - still lots of discussion and differences of opinion between developers and utilities
- Two components of Price
  1. initial 2. escolation
  1. Initial Price - how does cost compare with other fuels? GT must compete with oil or coal. gt in coal producing area (Utah) may not compete for same time.
     In Calif oil (use expensive) gt may compete early on.
  2. Escolation - utility says why should there be escolation for anything but inflation.
     How much risk is the developer actually taking since there is a large fixed cost?

Risk is a big area of probs. what if developer does not indeed deliver?? Developer if large has ability to pay liquidated damages. Small developers do not.

Term of contract has to be long, so contract needs flexibility

Performance Incentives -
must give seller and buyer enough $ to maintain incentive throughout contract. Complex econ analysis needed.

Pricing - didn't say anything

Dave Mitchell - Chevron - Operations viewpoint
living or aussie accent -

- gt has to compete in marketplace
- gt is site specific, so # of buyers is limited

- price must compensate developer for ownership and cap. investment.

- Payment Mechanism -
- good thing is fixed and variable components.
Fixed Part - can't just turn wells on and off, so if utility doesn't take, have to shut - so need incentive for utility to take on a continual basis
Variable Part - price has to track continued investment in new facilities. At same time utility costs change. So there needs to be indices for change, and need for renegotiation. Renog is hard because it works best only if both parties can walk away - arms length.

Penalties - Developer penalties - liquidated damages
penalties must recognize that risk is involved. It's not possible for dev. to take all risk. Specif, utility can't take risk in utilities plant. Penalties should ensure that seller does drill new wells if others are declines, etc. Penalties can't be punitive.

Pu Wright

GEOTHERMAL RESOURCES OPERATIONAL ORDERS

Issued under the Geothermal Steam Act of 1970

	GRO Order 1.	Exploratory Operations
	GRO Order 2.	Drilling, Completion and Spacing of Geothermal Wells
	GRO Order 3.	Plugging and Abandonment of Wells
	GRO Order 4.	General Environmental Protection Requirements
(DRAFT)	GRO Order 5.	Plans of Operation, Permits, Reports, Records, and Forms
	GRO Order 6.	Pipelines and Surface Production Facilities
	GRO Order 7.	Production and Royalty Measurement, Equipment, and Testing Procedures

United States Department of Interior
Geological Survey
Office of the Area Geothermal Supervisor

October 1979

TABLE OF CONTENTS

Geothermal Resource Operational (GRO) Orders are issued by the Area Geothermal Supervisor, with the prior approval of the Chief, Conservation Division, U.S. Geological Survey, as provided for in the Code of Federal Regulations (CFR), Title 30, part 270. The GRO Orders serve to implement the more generalized geothermal regulations of part 270 by prescribing detailed procedures and guidelines by which the Supervisor can regulate and the lessee/operator can perform exploration and development activities on federal geothermal leases.

Variances from the requirements of the GRO Orders may be requested by the lessee/operator. The Area Geothermal Supervisor may approve requested variances or prescribe other variances to the Orders as necessary, in accordance with 30 CFR 270.48.

GRO Order No. 1: Exploratory Operations

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CONSERVATION DIVISION

GEOTHERMAL RESOURCES OPERATIONAL ORDER NO. 1

Effective February 1, 1975

EXPLORATORY OPERATIONS

This Order is established pursuant to the authority prescribed in 30 CFR 270.11 and in accordance with 30 CFR 270.78. All exploratory operations other than drilling of exploratory and development wells will be conducted in accordance with the provisions of this Order. All plans for exploratory operations to be conducted shall include provisions for appropriate environmental protection and reclamation of disturbed lands. A cultural resources investigation approved by the Area Geothermal Supervisor (Supervisor) shall be performed prior to any surface disturbance other than Casual Use.

All variances from the requirements specified in this Order shall be subject to approval pursuant to 30 CFR 270.48. Each Notice of Intent to Conduct Geothermal Resources Exploration Operations shall include a notation of any proposed variances from the requirements of this Order. References in this Order to approvals, determinations, or requirements are to those given or made by the Supervisor or his delegated representative.

The following exploratory operations and reasonable expenditures therefor will qualify as diligent exploration if approved by the Supervisor prior to the initiation of such operations.

1. Casual Use. Casual Use shall include any entrance on the leased lands for geological reconnaissance or surveying purposes. Sampling of springs and water wells on the lease for geochemical analysis shall be construed as casual use. Such non-disturbing surveys and reconnaissance operations will not require a Notice of Intent to Conduct Geothermal Resources Exploration Operations. The lessee shall notify the Supervisor prior to commencing such casual use operations. Casual Use operations proposed or completed shall be included in any subsequent Plan of Operations.

2. Geophysical Exploration. Geophysical exploration shall include, but is not limited to, surface electrical resistivity surveys, seismic ground noise surveys, passive micro-earthquake monitoring surveys, magneto-telluric surveys and all other geophysical surveys, including airborne techniques.

Geophysical surveys other than airborne techniques will require a Notice of Intent to Conduct Geothermal Resources Exploration Operations, (Form 3200-9). All such anticipated surveys should be included in the Plan of Operations and must be approved by the Supervisor before the work is begun.

The lessee shall furnish the Supervisor two copies of the records of such surveys within 30 days after the completion of such operations.

3. Drilling of Shallow Holes. Drilling of shallow holes for the measurement of temperature gradients or heat flow will be considered as an exploration operation and will require approval of a Notice of Intent to Conduct Geothermal Resources Exploration Operations (Form 3200-9) by the Supervisor. The following stipulations shall apply to the drilling of such shallow holes:

A. Holes for measuring temperature gradients shall be limited to a depth of 152 metres (500 feet), unless otherwise authorized by the Supervisor.

B. Return-line temperatures shall be taken at no less than 9-metre (30 foot) intervals during drilling operations on shallow holes drilled with mud. If return-line mud temperature should reach 52°C. (125°F.), drilling ahead shall cease immediately and the hole will be either

(1) Completed as an observation hole by running steel tubing as deep as possible, filling the annulus with drilling mud from total depth to 3 metres (10 feet) below the surface and with cement from 3 metres (10 feet) to the surface;

(2) Abandoned by filling the hole with drilling mud from total depth to 3 metres (10 feet) below the surface and cement to the surface thereafter, or

(3) Equipped with mud cooling and wellhead control devices to maintain well control and mud returns temperature at or below 52°C. (125°F.).

C. If flowing steam or hot water at 65°C (150°F.) or greater is encountered, further drilling shall stop immediately and the hole will be either

(1) Completed as an observation hole using steel tubing cemented from total depth to surface; or

(2) Abandoned by plugging with cement from total depth to surface.

D. If cold flowing artesian water is encountered, the hole will be completed as in (C) hereinabove, except that plastic tubing may be used.

If the conditions outlined in (B), (C) or (D) are encountered, the Supervisor shall be notified immediately.

No exceptions to the stipulations of (B), (C) or (D) will be allowed without specific prior permission of the Supervisor.

E. The lessee shall submit the following information with the Notice of Intent to Conduct Geothermal Resources Exploration Operations (Form 3200-9):

(1) The approximate location (to the nearest 30 metres (100 feet) from some identifiable marker or object within the smallest legal subdivision) and hole number or designation of each proposed hole and probable order of drilling;

(2) The type and size of drilling rig;

(3) The proposed drilling program including the drilling system (type of bit and circulating medium), approximate depths and casing (conductor) program for each such hole;

(4) The type of drilling sump and proposed method of sump abandonment at each location;

(5) The approximate time that each hole will be used for observation; and

(6) The proposed method of abandonment for each hole. Additionally, the lessee shall notify and receive the approval of the Supervisor prior to any change in the location of an approved hole or for any additional holes which the lessee desires to drill.

F. Locations proposed in natural thermal areas within a 300-metre (1,000-foot) radius of hot springs, fumaroles, or other surface geothermal indicia, or in areas of known artesian water flow, will require a detailed drilling program for each hole, approved by the Supervisor. The Supervisor may require special drilling and completion techniques for such holes (such as cemented surface casing and simple expansion-type blowout preventers) to safely control formations containing geothermal or other resources which may be penetrated.

G. A supply of mud and lost circulation material shall be kept on hand while drilling to control abnormal pressure if rotary equipment is used.

H. Holes shall be completed for observation purposes in a manner which will allow satisfactory subsequent abandonment. As a minimum, the annular space shall be filled with mud (cuttings and dirt if drilled with air or auger) to 3 metres (10 feet) below the surface and with cement from 3 metres (10 feet) to the surface, and the tubing shall be capped when not in use.

I. Holes shall be abandoned in a manner that will prevent subsurface interzonal migration of fluids and surface leakage. As a minimum, the top 3 metres (10 feet) of tubing below the surface shall be filled with cement. Tubing shall be cut off at ground level or as directed by the Supervisor.

4. Reporting Completion of Exploration Operations. The Notice of Completion of Geothermal Resources Exploration Operations (Form 3200-10) shall be submitted in triplicate, and shall include the following information for each hole drilled:

A. Final hole designation and location;

B. A driller's log noting water table and water aquifers encountered (if determined), and salt, coal beds or other mineral deposits, if present;

C. Method of completion, cementing, and casting and/or tubing used;

D. Complete details of the abandonment procedures;

E. Any information on drilling difficulties or unusual circumstances encountered which would be helpful in assuring future safety of operations or protection of the environment in the area concerned; and

F. Temperature data and logs for each hole surveyed.

5. General. Drilling fluids or cuttings shall not be discharged onto the surface where such discharge might contaminate lakes and perennial or intermittent streams. Excavated pits or sumps used in drilling shall be backfilled as soon as drilling is completed and restored to conform with the original topography. Unattended sumps shall be completely fenced for the protection of the public, domestic animals and wildlife.

6. Notice of Entry. Applicant shall contact the appropriate U. S. Geological Survey Geothermal District Office prior to entry on the land to conduct exploration operations.

Reid T. Stone
Area Geothermal Supervisor

Approved:

Russell G. Wayland,
Chief, Conservation Division

GRO Order No. 2: Drilling, Completion and Spacing of Geothermal Wells

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CONSERVATION DIVISION

GEOTHERMAL RESOURCES OPERATIONAL ORDER NO. 2

Effective February 1, 1975

DRILLING, COMPLETION AND SPACING OF GEOTHERMAL WELLS

This Order is established pursuant to the authority prescribed in 30 CFR 270.11 and in accordance with 30 CFR 270.14, 270.15, and 270.40. All wells shall be drilled in such a manner as to minimize damage to the environment and to protect life, health, property, usable ground waters and geothermal resources.

All exploratory wells drilled for geothermal resources shall be drilled in accordance with the provisions of this Order. Initial development wells drilled for geothermal resources shall be drilled in accordance with the provisions of this Order, and these provisions shall continue in effect until field rules are issued. After field rules have been established by the Area Geothermal Supervisor (Supervisor), development wells in the individual fields shall be drilled in accordance with such rules.

Where sufficient geologic and engineering information is obtained through exploratory drilling, lessees may make application or the Supervisor may request the lessee to submit an application for the establishment of field rules. The Supervisor may issue field rules at any time he deems appropriate upon failure of the lessee to timely file for such field rules.

All wells drilled under the provisions of this Order shall have been included in an exploratory or development Plan of Operations as required under 30 CFR 270.34. Each Application for Permit to Drill (Form 9-331C) shall include all information required under 30 CFR 270.71, and shall include a notation of any proposed variances from the requirements of this Order. All variances from the requirements specified in this Order shall be subject to approval pursuant to 30 CFR 270.48. References in this Order to approvals, determinations, and requirements for submitting of information or applications for approval are to those granted, made or required by the Supervisor or his delegated representative. The lessee shall comply with the following requirements:

1. Well Casing. All wells shall be cased and cemented in accordance with the requirements of 30 CFR 270.15, and the application for permit to drill shall include the casing design safety factors for collapse, tension and burst. The permanent wellhead completion equipment shall be attached to the production casing or to the intermediate casing if the production casing does not reach to the surface except as otherwise authorized by the Supervisor to meet special well conditions. All casing strings reaching the surface shall be cemented at a sufficient

depth to provide adequate anchorage and support for the casing and any blowout prevention equipment required thereon. For the purpose of this Order, the several casing strings in order of normal installation are (1) conductor, (2) surface, (3) intermediate and (4) production strings. The following casing setting depth requirements are general in nature and subject to variations to permit the casing to be set and cemented in a competent formation. The Supervisor's determination of adequate casing setting depths shall be based upon all geologic and engineering factors including apparent geothermal gradients, depths and pressures of the various formations to be penetrated and all other pertinent information about the area. All depths in this Order refer to true vertical depth (TVD) below ground level, unless otherwise specified.

A. Conductor Casing. This casing shall be set at a minimum depth of 15 metres (50 feet) and a maximum depth of 60 metres (200 feet) before drilling into shallow formations suspected or known to contain geothermal resources, non-condensible gases, or other mineral resources or upon encountering such formations.

B. Surface Casing. This casing shall be set at a depth equivalent to or in excess of ten percent of the proposed total depth of the well provided, however, that such setting depth shall be not less than 60 metres (200 feet) nor more than 400 metres (1,300 feet).

C. Intermediate Casing. This casing shall be set at any time when required by well conditions encountered in drilling below the surface casing such as anomalous pressure zones, uncased fresh water aquifers, cave-ins, washouts, lost circulation zones, rapidly increasing thermal gradients or other drilling hazards. If a liner is used as an intermediate string, the lap shall be tested by a fluid entry or pressure test to determine whether a seal between the liner top and the next larger casing string has been achieved. The liner overlap shall be a minimum of 30 metres (100 feet). The test shall be recorded on the driller's log and may be witnessed by the Supervisor. In the event of lap or casing failure during the test, the lap or casing must be repaired or recemented and successfully retested as required by the Supervisor.

D. Production Casing. This casing may be set at the top of or through the potential producing zone and shall be set before completing the well for production. Production casing shall be run to the surface or lapped into the next larger casing string. The liner overlap, if utilized, shall be at least 30 metres (100 feet) and shall be tested, witnessed and recorded as in the case of intermediate casing hereinabove. In the event of lap or casing failure during the test, the lap or casing must be repaired or recemented and successfully retested as required

by the Supervisor. Production casing shall normally be of consistent nominal outside diameter from the surface or from the top of the lap to the casing shoe. The surface casing shall not be used as production casing, unless otherwise authorized by the Supervisor to meet special well conditions.

E. Cementing of Casing. The conductor and surface casing strings shall be cemented with a quantity of cement sufficient to fill the annular space back to the surface. The intermediate casing string shall likewise be cemented back to the surface or to the top of the lap if a liner is used as an intermediate string. Production casing shall be cemented with a high temperature resistant admix, unless waived by the Supervisor and shall be cemented in a manner necessary to exclude, isolate or segregate overlying formation fluids from the geothermal resources zone and to prevent the movement of fluids into possible fresh water zones. Production casing shall be cemented back to the surface or, if lapped, to the top of the lap. A temperature or cement bond log may be required by the Supervisor after setting and cementing the production casing and after all primary cementing operations if an unsatisfactory cementing job is indicated. Proposed well cementing techniques differing from the requirements of this paragraph will be considered by the Supervisor on an individual well basis.

F. Pressure Testing. Prior to drilling out the casing shoe after cementing, all casing strings set to a depth of 152 metres (500 feet) or greater, except for conductor casing, shall be pressure tested to a minimum pressure of 69 bars (1,000 psi) or 0.045 bars/metre (0.2 psi/ft) whichever is greater. All casing strings set at a depth less than 152 metres (500 feet), except for conductor casing, shall be pressure tested to a minimum pressure of 35 bars (500 psi). Such test shall not exceed the rated working pressure of the casing or the blow-out preventer stack assembly, whichever is lesser.

In the event of casing failure during the test, the casing must be repaired or recemented until a satisfactory test is obtained. A pressure decline of 10 percent or less in 30 minutes shall be considered satisfactory.

Casing test results shall be recorded on the driller's log and reported to the Supervisor within 30 days after the completion of such test. Advance notice of all casing and lap tests shall be given in sufficient time to enable the Supervisor to be present to witness such tests. The casing and lap test reports shall give a detailed description of the test, including mud and cement volumes, lapse of time between running and cementing casing and testing, method of testing and test results.

G. Directional Surveys.

(1) General. Deviation surveys (inclination from vertical or single shot) shall be taken on all wells during the normal course of drilling at intervals not to exceed 152 metres (500 feet). The Supervisor may require a directional survey giving both inclination and azimuth or a dipmeter to be obtained on all wells. In calculating all surveys, a correction from true north to Lambert-Grid north shall be made after making the magnetic to true north correction. All surveys shall be filed with the Supervisor. Where directional surveys are required, composite surveys shall be filed with the Supervisor showing the interval from the bottom of the conductor casing to total depth.

(2) Vertical Wells. Wells are considered vertical if inclination does not exceed an average of five degrees from the vertical. The Supervisor may require a directional survey giving both inclination and azimuth at intervals not exceeding 30 metres (100 feet) between stations prior to, or upon, setting any casing string or liner (except conductor casing) and at total depth on any vertical well drilled in close proximity to lease boundaries or areas with an unstable land surface, highly faulted or steeply dipping beds, or in areas of suspected abnormal formation pressures.

(3) Directional Wells. Wells are considered directional if inclination exceeds an average of five degrees from the vertical. Directional surveys giving both inclination and azimuth shall be obtained at intervals not to exceed 30 metres (100 feet) between stations prior to, or upon, setting any casing string or liner (except conductor casing) and at total depth.

2. Blowout Prevention Equipment and Procedures. All necessary precautions shall be taken to keep all wells under control at all times, utilize trained and competent personnel, and utilize properly maintained equipment and materials. Blowout preventers and related well control equipment shall be installed, tested immediately thereafter and maintained ready for use until drilling operations are completed. Certain components, such as packing elements and ram rubbers, shall be of high temperature resistant material as necessary. All kill lines, blowdown lines, manifolds and fittings shall be steel and shall have a temperature derated minimum working pressure rating equivalent to the maximum anticipated wellhead surface pressure. Subject to subparagraphs (A) and (B) hereinbelow blowout prevention equipment shall have manually operated gates and hydraulic actuating systems and accumulators of sufficient capacity to close all of the hydraulically-operated equipment and have a minimum pressure of 69 bars (1,000 psi) remaining on the accumulator. Dual control stations shall be installed with a high

pressure backup system. One control panel shall be located at the driller's station and one control panel shall be located on the ground at least 15 metres (50 feet) away from the wellhead or rotary table. Air or other gaseous fluid drilling systems shall have blowout prevention assemblies. Such assemblies may include, but are not limited to, a rotating head, a double ram blowout preventer or equivalent, a banjo-box or an approved substitute therefor and a blind ram blowout preventer or gate valve, respectively. Exceptions to the requirements of this paragraph will be considered by the Supervisor only for certain geologic and well conditions such as stable surface areas with known low subsurface formation pressures and temperatures.

A proposed blowout prevention program and a blowout contingency plan including proposed containment, public health and safety and clean-up measures shall be submitted with the Application for Permit to Drill (Form 9-331C).

A. Conductor Casing. Before drilling below this string, at least one remotely controlled hydraulically-operated expansion type preventer or an acceptable alternative, approved by the Supervisor, including a drilling spool with side outlets or equivalent, shall be installed. A kill line and blowdown line with appropriate fittings shall be connected to the drilling spool.

B. Surface, Intermediate and Production Casing. Before drilling below any of these strings, the blowout prevention equipment shall include a minimum of:

(1) One expansion-type preventer and accumulator or a rotating head;

(2) A manual and remotely controlled hydraulically-operated double ram blowout preventer or equivalent having a temperature derated minimum working pressure rating which exceeds the maximum anticipated surface pressure at the anticipated reservoir fluid temperature;

(3) A drilling spool with side outlets or equivalent;

(4) A fillup line;

(5) A kill line equipped with at least one valve; and

(6) A blowdown line equipped with at least two valves and securely anchored at all bends and at the end.

C. Testing and Maintenance. Ram-type blowout preventers and auxiliary equipment shall be tested to a minimum of 69 bars (1,000 psi) or to the working pressure of the casing or assembly, whichever is the lesser. Expansion-type blowout preventers shall be tested to 70

percent of the above pressure testing requirements.

The blowout prevention equipment shall be pressure tested:

(1) When installed;

(2) Prior to drilling out plugs and/or casing shoes;

(3) Not less than once each week, alternating the control stations; and

(4) Following repairs that require disconnecting a pressure seal in the assembly.

During drilling operations blowout prevention equipment shall be actuated to test proper functioning as follows:

(1) Once each trip for blind and pipe rams but not less than once each day for pipe rams; and

(2) At least once each week on the drill pipe for expansion-type preventers.

All flange bolts shall be inspected at least weekly and re-tightened as necessary during drilling operations. The auxiliary control systems shall be inspected daily to check the mechanical condition and effectiveness and to ensure personnel acquaintance with the method of operation. Blowout prevention and auxiliary control equipment shall be cleaned, inspected and repaired, if necessary, prior to installation to assure proper functioning. Blowout prevention controls shall be plainly labeled, and all crew members shall be instructed on the function and operation of such equipment. A blowout prevention drill shall be conducted weekly for each drilling crew. All blowout prevention tests and crew drills shall be recorded on the driller's log.

D. Related Well Control Equipment. A full opening drill string safety valve in the open position shall be maintained on the rig floor at all times while drilling operations are being conducted. A kelly cock shall be installed between the kelly and the swivel.

3. Drilling Fluid. The properties, use and testing of drilling fluids and the conduct of related drilling procedures shall be such as are necessary to prevent the blowout of any well. Sufficient drilling fluid materials to ensure well control shall be maintained in the field area readily accessible for use at all times.

A. Drilling Fluid Control. Before pulling drill pipe, the drilling fluid shall be properly conditioned or displaced. The hole shall be kept reasonably full at all times, however, in no event shall the annular mud level be deeper than 30 metres (100 feet) from the rotary table when coming out of the hole with drill pipe. Mud cooling techniques shall be utilized when necessary to maintain mud characteristics for proper well control and hole conditioning.

B. Drilling Fluid Testing. Mud testing and treatment consistent with good operating practice shall be performed daily or more frequently as conditions warrant. Mud testing equipment shall be maintained on the drilling rig at all times.

The following drilling fluid system monitoring or recording devices shall be installed and operated continuously during drilling operations, with mud, occurring below the shoe of the conductor casing. No exceptions to these requirements will be allowed without the specific prior permission of the Supervisor:

(1) High-low level mud pit indicator including a visual and audio-warning device;

(2) Degassers, desilters and desanders;

(3) A mechanical, electrical or manual surface drilling fluid temperature monitoring device. The temperature of the drilling fluid going into and coming out of the hole shall be monitored, read and recorded on the driller's or mud log for a minimum of every 9 metres (30 feet) of hole drilled below the conductor casing; and

(4) A hydrogen sulfide indicator and alarm shall be installed in areas suspected or known to contain hydrogen sulfide gas which may reach levels considered to be dangerous to the health and safety of personnel in the area.

C. Monitoring. From the time drilling operations are initiated and until the well is completed or abandoned, a member of the drilling crew or the toolpusher shall monitor the rig floor at all times for surveillance purposes, unless the well is secured with blowout preventers or cement plugs.

4. Well Logging. All wells shall be logged with an induction electric log or equivalent from total depth to the shoe of the conductor easing. The Supervisor may grant an exception to this requirement when well conditions make it impractical or impossible to meet the above requirements.

A. Electric Logs. The lessee shall furnish to the Supervisor two legible exact copies of all logs run, within 30 days after completion of drilling operations on each well. Two copies of field prints of such logs shall be made immediately available to the Supervisor upon his request. Two copies of chemical analyses of geothermal fluids or other similar services performed shall be submitted to the Supervisor within 30 days after such services are completed.

B. Lithologic Logs. Two legible exact copies of core analysis reports and lithologic (mud) logs shall be submitted to the Supervisor within 30 days after the completion of such reports or logs, when such services are used. However, daily logs shall be made available to the Supervisor immediately upon the completion of such daily logs upon his request.

5. Wellhead Equipment and Testing.

A. Completions. All wellhead connections shall be fluid pressure tested to the API or ASA working pressure rating. Cold water is recommended as the testing fluid. Welding of wellhead connections shall be performed by a certified welder using materials in conformance with ASTM specifications.

B. Wellhead Equipment. All completed wells shall be equipped with a minimum of one casinghead with side outlets, one master valve and one production valve, unless otherwise authorized by the Supervisor. All casingheads, Christmas trees, fittings and connections shall have a temperature derated working pressure equal to or greater than the surface shut-in pressure of the well at reservoir temperature. Packing, sealing mediums and lubricants shall consist of materials or substances that function effectively at, and are resistant to, high temperatures. Wellhead equipment, valves, flanges and fittings shall meet minimum ASA standards or minimum API Standard 6A specifications. Casinghead connections shall be made such that fluid can be pumped between casing strings.

C. Testing. Any well showing sustained casinghead pressure or leaking of geothermal fluids between casing strings shall be tested to determine the origin of the failure, when such failure point is not otherwise determinable, and corrective measures shall be taken.

6. Well Spacing. No producing interval of any well shall be located within 30 metres (100 feet) of the outer boundaries of the leased lands, except where approved by the Supervisor. No surface location of a well shall be located within 15 metres (50 feet) of the boundary of any legal subdivision unless otherwise authorized by the Supervisor. The Supervisor may approve or prescribe such well

spacing as he determines to be necessary for the proper development of the geothermal resources in accordance with the provisions of 30 CFR 270.15.

Reid T. Stone
Area Geothermal Supervisor

Approved:

Russell G. Wayland
Chief, Conservation Division

GRO Order No. 3: Plugging and Abandonment of Wells

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CONSERVATION DIVISION

GEOTHERMAL RESOURCES OPERATIONAL ORDER NO. 3

Effective February 1, 1975

PLUGGING AND ABANDONMENT OF WELLS

This Order is established pursuant to the authority prescribed in 30 CFR 270.11 and in accordance with 30 CFR 270.14 and 270.45. The lessee shall comply with the following minimum plugging and abandonment procedures for all geothermal resources wells. Oral approvals shall be in accordance with 30 CFR 270.11. All variances from the requirements specified in this Order shall be subject to approval pursuant to 30 CFR 270.48. Each Sundry Notice (Form 9-331) shall include a notation of any proposed variances from the requirements of this Order. References in this Order to approvals, determinations or requirements are to those given or made by the Area Geothermal Supervisor (Supervisor) or his delegated representative.

The lessee shall promptly plug and abandon any well on the leased land that is not in use or demonstrated to be potentially useful. No well shall be abandoned until its lack of capacity for further profitable production of geothermal resources has been demonstrated to the satisfaction of the Supervisor. No well shall be plugged and abandoned until the manner and method of plugging have been approved or prescribed by the Supervisor.

Cement used to plug any geothermal resources well, except that cement or concrete used for surface plugging, shall be placed in the hole by pumping through drill pipe or tubing. Such cement shall consist of a high temperature resistant admix, unless this requirement is waived by the Supervisor in accordance with the particular circumstances existing in that well or area.

Prior to commencing abandonment operations, the Supervisor shall be notified of all such proposed operations.

Each Sundry Notice (Form 9-331) shall include all information required under 30 CFR 270.45 and 270.72. Any bond or rider thereto covering a lease or an individual well thereon, shall remain in full force and effect until the lease or individual well is properly abandoned and the surface properly restored. Written approval of the abandonment must be obtained from the Supervisor before release of any bonds will be recommended.

1. Permanent Abandonment.

A. Uncased Hole. In uncased portions of wells, cement plugs shall be placed to protect all subsurface mineral resources including fresh water aquifers. Such plugs shall extend a minimum of 30 metres

(100 feet) below, if possible, and 30 metres (100 feet) above such aforementioned zones. Cement plugs shall be placed in a manner necessary to isolate formations and to protect the fluids in such formations from interzonal migration or contamination.

B. Open Hole. Where there is open hole (uncased and open into the casing string above), a cement plug shall be placed in the deepest casing string by either (1) or (2) below. In the event lost circulation conditions exist or are anticipated, or if the well has been drilled with air or other gaseous substance, the plug shall be placed in accordance with (3) below.

(1) A cement plug shall be placed across the shoe extending a minimum of 30 metres (100 feet) above and 30 metres (100 feet) below; or

(2) A cement retainer with effective back pressure control set approximately 30 metres (100 feet) above the casing shoe with at least 61 metres (200 feet) of cement below the retainer and 30 metres (100 feet) of cement above.

(3) A permanent bridge plug set at the casing shoe and capped with a minimum of 61 metres (200 feet) of cement.

C. Perforations, Junk, Fish and Collapsed Pipe. A cement plug shall be placed across production perforations, extending 30 metres (100 feet) below (where possible) and 30 metres (100 feet) above the perforated interval. When a cement retainer is used to squeeze cement the perforated interval, the retainer shall be set a minimum of 30 metres (100 feet) above the perforations. Where the casing contains perforations at or below fish, junk or collapsed casing, thereby perventing cleanout operations, a cement retainer shall be set at least 30 metres (100 feet) above such point, and the interval below the retainer shall be squeeze cemented.

D. Casing Shoes, Stubs, Laps, and Liners. No casing shall be cut and recovered without first obtaining the written approval of the Supervisor. A cement plug shall be placed across all casing stubs, laps, liner tops and all casing shoes not protected by an inner casing string. Such plug shall extend a minimum of 15 metres (50 feet) below and 15 metres (50 feet) above any such shoe, stub, lap or liner top.

E. Plugging of Annular Space. All open annuli extending to the surface shall be plugged with cement.

F. Surface Plug. The innermost casing string which reaches ground level shall be cemented or concreted to a minimum depth of 15 metres (50 feet)measured from 2 metres (6 feet) below ground level.

G. Testing of Plugs. The hardness and location of cement plugs placed across perforated intervals and at the top of uncased or open hole shall be verified by setting down with tubing or drill pipe a minimum of 6,803 kilograms (15,000 pounds) weight on the plug or the maximum weight of the available tubing or drill pipe string, if less than 6,803 kilograms (15,000 pounds).

H. Mud. The intervals of the hole not filled with cement shall be filled with good quality heavy mud.

2. Surface Restoration. All casing strings shall be cut off at least 2 metres (6 feet) below ground level and capped by welding a steel plate on the casing stub. Cellars, pads, structures and other facilities shall be removed. The surface area shall be restored as specified by the Supervisor in consultation with the appropriate surface management agency.

3. Temporary Abandonment. An uncompleted drilling well that is to be temporarily abandoned shall be mudded and cemented as required hereinabove for permanent abandonment except for the provisions of subparagraphs E, F, and I.

4. Suspended Wells. The drilling equipment shall not be removed on any geothermal resources well where drilling operations have been suspended, either temporarily or indefinitely, without prior approval of the Supervisor and after approved measures have been taken to close the well and to protect all subsurface resources, including fresh water aquifers.

Reid T. Stone
Area Geothermal Supervisor

Approved:

Russell G. Wayland,
Chief, Conservation Division

GRO Order No. 4: General Environmental Protection Requirements

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CONSERVATION DIVISION

GEOTHERMAL RESOURCES OPERATIONAL ORDER NO. 4

Effective August 1, 1975

GENERAL ENVIRONMENTAL PROTECTION REQUIREMENTS

This Order is established pursuant to the authority prescribed in 30 CFR 270.11 and in accordance with 30 CFR 270.2, 270.34(k), 270.37, 270.41, 270.42, 270.43, 270.44, and 270.76. Lessees shall comply with the provisions of this Order. All variances from the requirements specified in this Order shall be subject to approval pursuant to 30 CFR 270.48. References in this Order to approvals, determinations, or requirements are to those given or made by the Area Geothermal Supervisor (Supervisor) or his delegated representative.

All data submitted under this Order shall be available for inspection in accordance with the Freedom of Information Act of 1966 (P.L. 89-487), as amended in 1974 (P.L. 93-502), except information such as geological, geophysical, reservoir, trade secrets, and financial data and interpretations of such data, maps, and related files for which a lessee requests proprietary status; provided that such status is determined by the Supervisor to be warranted and is approved by appropriate officials of the Department of the Interior.

Protection of the environment includes the lessee's responsibility to: conduct exploration and development operations in a manner that provides maximum protection of the environment; rehabilitate disturbed lands; take all necessary precautions to protect the public health and safety; and conduct operations in accordance with the spirit and objectives of all applicable Federal environmental legislation and supporting executive orders.

Adverse environmental impacts from geothermal-related activity shall be prevented or mitigated through enforcement of applicable Federal, State, and local standards, and the application of existing technology. Inability to meet these environmental standards or continued violation of environmental standards due to operations of the lessee, after notification, may be construed as grounds for the Supervisor to order a suspension of operations.

The lessee shall be responsible for the monitoring of readily identifiable localized environmental impacts associated with specific activities that are under the control of the lessee. Monitoring of environmental impacts may be conducted by the use of aerial surveys, inspections, periodic samplings, continuous recordings, or by such other means or methods as required by the Supervisor. Due to the differing natural environmental conditions among geothermal areas, the extent and frequency of such monitoring activities will be determined by the Supervisor on an individual basis. In the event the Supervisor determines that the degree and adequacy of existing environmental protection regulations in certain areas are insufficient, the Supervisor may establish additional and more stringent requirements by the issuance of field orders or by modifying existing orders.

Lessees shall provide for acquisition of environmental baseline data as required in accordance with 30 CFR 270.34(k) for a period of one year prior to submission of a plan for production. Techniques and standards to be used by the lessee for meeting these requirements shall receive prior approval by the Supervisor.

1. Aesthetics. The lessee shall reduce visual impact, where feasible, by the careful selection of sites for operations and facilities on leased lands. The design and construction of facilities shall be conducted in a manner such that the facilities will blend into the natural environmental setting of the area by the appropriate use of landscaping, vegetation, compatible color schemes, and minimum profiles. Native plants or other compatible vegetation shall be used, where possible, for landscaping and revegetation.

2. Land Use and Reclamation. Operating plans shall be designed so that operations will result in the least disturbance of land, water, and vegetation. Existing roads shall be used where suitable. Entry upon certain environmentally fragile land areas, as designated by the surface management agency, may be either seasonally restricted or restricted to special vehicles or transportation methods which will minimize disturbance to the surface or other resources as specified by the Supervisor and surface management agency.

Operating plans shall provide for the reclamation and revegetation of all disturbed lands in a manner approved by the Supervisor and the appropriate surface management agency. Land

reclamation may include preparation and seeding with prescribed wildlife food and plant cover or improved and acceptable substitutes thereof which will equal or enhance the food values for indigenous wildlife species and domesticated animals. Temporary fencing for such reclaimed areas may be required to facilitate restoration thereof.

The lessee shall at all times maintain the leased lands in a safe and orderly condition and shall perform the operations in a workmanlike manner. The lessee shall remove or store all supplies, equipment, and scrap in a timely and orderly fashion.

Operations under a geothermal lease shall not unreasonably interfere with or endanger operations under any other lease, license, claim, permit, or other authorized use on the same lands.

3. Public Access. The public shall have free and unrestricted access to geothermal leased lands, excepting however, where restrictions are necessary to protect public health and safety or where such public access would unduly interfere with the lessee's operations or the security thereof. The lessee shall provide warning signs, fencing, flagmen, barricades, or other safety measures deemed necessary by the Supervisor to protect the public, wildlife, and livestock from hazardous geothermal or related activities.

4. Recreation. Recreational values shall be adequately protected through planning and designing of site development to minimize the aesthetic degradation of the particular recreation area. The lessee shall generally be restricted from surface locations for drilling and other lease operations within 61 metres (200 feet) of established recreation sites and access routes thereto. However, the lessee may relocate a recreational site and/or access routes thereto when approved by the Supervisor with the concurrence of the land management agency.

5. Slope Stability and Erosion Control. Operations shall be conducted in such a manner so as to minimize erosion and disturbance to natural drainage. The lessee shall provide adequate erosion and drainage control to prevent sediments from disturbed sites from entering water courses for soil and natural resource conservation protection.

Mitigating measures to lessen environmental damage may include reseeding of disturbed soils, chemical stabilization, and dust and erosion control on well sites, roads, and construction areas.

All operating plans shall give proper consideration to the potential hazards of slope instability. Where potentially unstable ground conditions exist, design of proposed roads, drill sites, and surface facilities shall be approved by and constructed under the supervision of a qualified engineer or engineering geologist satisfactory to the Supervisor.

6. Biota. The lessee shall conduct all operations in such a manner as to afford reasonable protection of fish, wildlife, and natural habitat. The lessee shall take such measures as are necessary for the conservation of endangered and threatened species of flora and fauna as set forth in applicable executive orders, regulations, and State or Federal legislation such as the Endangered Species Act of 1973 and the Fish and Wildlife Coordination Act. When such species would be adversely affected by the lessee's operations on the leased lands, the lessee shall implement those measures necessary to minimize or eliminate such adverse effects and to protect the flora and fauna as specified by the Supervisor in accordance with recommendations by appropriate Federal and State agencies. Such measures may be in addition to provisions set forth in the lease or accompanying stipulations.

The Supervisor may receive information from recognized experts that a delicate balance of flora and/or fauna exists in the area of operations or proposed operations. Upon receiving such notice, the Supervisor will request timely advice and assistance from appropriate Federal and State agencies regarding: (1) an assessment of the status of flora and fauna in the area which may be adversely affected by operations, and (2) advice as to reasonable mitigating measures appropriate to minimizing or preventing adverse trends in populations, growth, vegetative recovery, or repopulations in potentially affected flora and/or fauna. Based on timely receipt of advice from appropriate agencies, the Supervisor will direct the lessee to take appropriate measures to minimize significant adverse trends in flora and fauna. Such measures may include, but not be limited to, revegetation with grasses, shrubs, or other vegetation of high forage values desirable for habitat, replacement of fauna where lost, replacement of water supply, or sources where destroyed.

Where the lessee's operations have destroyed significant flora and/or fauna or their natural habitat and replacement by natural processes will not take place in a normal growth cycle, the lessee shall take reasonable measures to replace those species or their habitat with the same or other acceptable species or habitat as directed by the Supervisor. The Supervisor's requirements shall be based on recommendations and advice received from appropriate Federal and State agencies.

7. Cultural Resources Preservation. The lessee shall exercise due diligence in the conduct of his operations to protect and preserve significant archaeological, historical, cultural, paleontological, and unique geologic sites. The lessee shall not disturb any known cemetery or burial ground of any group or culture.

Previously unknown sites uncovered by the lessee shall be immediately reported to the Supervisor, and operations on the particular site shall cease until said site can be assessed for its archaeological value and preservation. Necessary controls and remedial actions for the protection and preservation of cultural resources shall be issued on an individual site basis by the Supervisor as warranted.

The preservation, restoration, maintenance, and nomination of all resources for purposes of the National Register of Historic Places shall be in accordance with the provisions of Executive Order 11593 (36 FR 8921) entitled, "Protection and Enhancement of the Cultural Environment," or any amendments thereto.

8. Subsidence and Seismicity. Surveying of the land surface prior to and during geothermal resources production will be required for determining any changes in elevation of the leased lands. Lessees shall make such resurveys as required by the Supervisor to ascertain if subsidence is occurring. Production data, pressures, reinjection rates, and volumes shall be accurately recorded and filed monthly with the Supervisor as provided in 30 CFR 270.37. In the event subsidence activity results from the production of geothermal resources, as determined by surveys by the lessee or a governmental body, the lessee shall take such mitigating actions as are required by the lease terms and by the Supervisor.

If subsidence is determined by the Supervisor to present a significant hazard to operations or adjoining land use, then the Supervisor may require remedial action including, but not limited to, reduced production rates, increased injection of waste or other fluids, or a suspension of production.

A. Surveys. All required surveys shall be second order or better and shall be conducted under the direct supervision of a registered civil engineer or licensed land surveyor using equipment acceptable by the National Ocean Survey for second order surveys. All such work shall be coordinated with the county surveyor of the county in which the surveys and bench marks are to be established. Level lines and networks shall be tied to available regional networks.

Adjusted survey data shall be filed with the Supervisor within 60 days after leveling is completed. Any

lessee having a commercially productive geothermal well or wells shall participate in cooperative County/State subsidence detection programs. All survey data filed with the Supervisor shall be available to the public.

B. Bench Marks. One or more wellsite bench marks shall be required at each completed well prior to prolonged production and said bench marks shall be located in a manner such that there is a minimal probability of destruction or damage to said bench marks. Wellsite bench marks shall be tied to existing regional networks. Additional bench marks between the wellsites and the regional network shall be at 0.8-km (one-half mile) intervals or as otherwise specified by the Supervisor. These bench marks shall be resurveyed during well production operations on a periodic basis as determined by the Supervisor.

Acceptable bench marks include, but are not limited to, a brass rod driven to refusal or 9 metres (about 30 feet) and fitted with an acceptable brass plate or a permanent structure with an installed acceptable brass plate.

C. Reservoir Data. Initial reservoir pressure and temperature shall be reported to the Supervisor in duplicate on Well Completion or Recompletion Report (Form 9-330C) for all completed wells within 30 days after the completion of measurements or tests conducted for the purpose of obtaining such data. Initial production test data including steamwater ratio, surface pressure and temperature, quality, and quantity of well effluent shall also be filed with the Supervisor on Form 9-330C within 30 days after a well is completed.

D. Seismicity. The installation of seismographs or other like instruments in producing geothermal areas for the purpose of detecting potential seismic activity may be initiated from time to time by appropriate public agencies. Lessees shall cooperate with the appropriate public agencies in this regard. The lessee and the appropriate public agency should take care not to unreasonably interfere with or endanger each other's respective operations. The Supervisor shall coordinate such detection programs between the appropriate public agency conducting the program and the lessee.

Where induced seismicity caused by the production of geothermal fluids is determined to exist by the Supervisor, then the Supervisor may require the lessee to install such monitoring devices as necessary to adequately quantify the effects thereof. If induced seismicity is determined to represent a significant hazard, the Supervisor may require remedial

actions including, but not limited to, reduced production rates, increased injection of waste or other fluids, or suspension of production.

9. Pollution, Waste Disposal, and Fire Prevention. The lessee shall comply with all applicable Federal and State standards with respect to the control of all forms of air, land, water, and noise pollution, including the control of erosion and the disposal of liquid, solid, and gaseous wastes. The Supervisor may, at his discretion, establish additional and more stringent standards. Plans for disposal of well effluents must be approved by the Supervisor before any implementation action is undertaken. Immediate corrective action shall be taken in all cases where pollution has occurred.

The lessee shall timely remove or dispose of all waste including human waste, trash, refuse, and extraction and processing waste generated in connection with the lessee's operations in a manner acceptable to the Supervisor.

The lessee shall provide safeguards to minimize potential accidental fires and shall instruct field personnel in fire-prevention methods. The lessee shall maintain fire-fighting equipment in working order at strategic locations on the leased lands.

A. Pollution Prevention. In the conduct of all geothermal operations, the lessee shall not contaminate any natural waters and shall minimize adverse effects on the environment.

(1) Liquid Disposal. Liquid well effluent or the liquid residue thereof containing substances, including heat, which may be harmful or injurious and cannot otherwise be disposed of in conformance with Federal, State, and regional standards, shall be injected into the geothermal resources zone or such other formation as is approved by the Supervisor.

Toxic drilling fluids shall be disposed of in a manner approved by the Supervisor and in conformance with applicable Federal, State, and regional standards.

(2) Solid Waste Disposal. Drill cuttings, sand, precipitates, and other solids shall be disposed of as directed by the Supervisor either on location or at other approved disposal sites. Containers for mud additives for chemicals and other solid waste materials shall be disposed of in a manner and place approved by the Supervisor.

(3) Air Quality. Noncondensible gases such as carbon dioxide, ammonia, and hydrogen sulfide may be vented or ejected into the atmosphere, provided, however, that the volume and the measured concentration of such vented gas or gases shall not exceed applicable Federal, State, or regional air pollution standards. Copies of each permit issued by the appropriate air pollution control agency and the reports required thereunder shall be submitted to the Supervisor.

(4) Pits and Sumps. Pits and sumps shall be lined with impervious material and purged of environmentally harmful chemicals and precipitates before backfilling. In no event shall the contents of a pit or sump be allowed to contaminate streams, lakes, and ground waters. Pits and sumps shall be constructed in a manner and in such locations so as to minimize damage to the natural environment and aesthetic values of the lease or adjacent property. When no longer used or useful, pits and sumps shall be backfilled and the premises restored to as near a natural state as reasonably possible. Temporary fencing of unattended pits and sumps to protect wildlife, livestock, and the public may be required by the Supervisor and the surface management agency.

(5) Production Facilities Maintenance. Production facilities shall be operated and maintained at all times in a manner necessary to prevent pollution. The lessee's field personnel shall be instructed in the proper maintenance and operations of production facilities for the prevention of pollution.

B. Inspection and Reports. Lessees shall comply with the following pollution inspection and reporting requirements.

(1) Pollution Inspections. Drilling and production facilities shall be inspected daily by the lessee. Appropriate preventative maintenance shall be performed as necessary to prevent failures and malfunctions which could lead to pollution. Wells and areas not under production shall be inspected by the lessee at intervals prescribed by the Supervisor. Necessary repairs or maintenance shall be made as required.

(2) Pollution Reports. All pollution incidents shall be reported orally within 18 hours to the appropriate Geothermal District Supervisor and shall be followed within 30 days thereof by a written report stating the cause and corrective action taken.

C. Injection. The use of any subsurface formation, including the geothermal resources zone for the disposal of well effluent, the residue thereof, or the injection of fluids

for other purposes such as subsidence prevention shall not be permitted until the lessee has submitted a plan of injection covering the proposed injection project and has subsequently received the Supervisor's written approval thereof.

(1) Plan of Injection. The plan of injection shall include the quantity, quality, and source of the proposed injection fluid; the means and method by which the fluid is to be injected; a structure map contoured on the intended injection zone; and cross-sections showing producing well locations and the proposed injection well location(s).

(2) Injection Report. The lessee shall file in duplicate with the Supervisor a Monthly Water Injection Report in a form approved by the Supervisor. The subject report shall be filed on or before the last day of the month following the month in which the injection took place.

(3) Inspection. Injection wells and facilities shall be inspected by the lessee at intervals as prescribed by the Supervisor to ascertain that all injected fluids are confined to the approved injection zone. A spinner survey, a radioactive tracer survey, and a cement bond log may be required on each injection well within 30 days after injection begins. The lessee shall furnish to the Supervisor two legible exact copies of any and all such surveys and logs. In the event of a casing failure, inadequate annular cement, or other mechanical failure, the lessee shall without unreasonable delay repair, suspend, or abandon the well. Where failure occurs in a zone which may damage surface or fresh water aquifers, injection shall immediately cease.

(4) New Wells. The drilling of new injection wells in accordance with an approved plan of injection shall be in conformance with the provisions of GRO Order No. 2. An Application for Permit to Drill, Form 9-331C, shall be filed in triplicate and approved for each injection well.

(5) Conversions. The conversion of an existing well to an injection well in accordance with or modification of an approved plan of injection shall be in conformance with the requirements of GRO Order No. 2. The lessee shall demonstrate to the satisfaction of the Supervisor by appropriate testing and logging that the well is mechanically sound and suitable for injection purposes. A Sundry Notice, Form 9-331, shall be filed in triplicate and approved for each conversion.

10. Water Quality. The primary responsibility for water quality and pollution control has been delegated to the States where such States have standards approved by the Environmental

Protection Agency. Such State standards must meet basic Federal requirements prohibiting the deterioration of waters whose existing quality is higher than established water quality standards. The lessee shall comply with the State water quality control organization's standards in such States as have federally-approved standards. The Supervisor, at his discretion, may establish additional and more stringent standards.

The lessee shall file, in duplicate, a detailed water analysis report for all completed geothermal wells within 30 days after completion and annually thereafter or as otherwise specified by the Supervisor. Unless otherwise prescribed by the Supervisor, such analyses shall include a determination of arsenic, boron, radioactive content, and radioactivity of the produced fluids. In the event that a health hazard exists, the Supervisor shall require appropriate health and safety precautions, periodic monitoring, or the suspension of production.

11. Noise Abatement. The lessee shall minimize noise during exploration, development, and production activities. The method and degree of noise abatement shall be as approved by the Supervisor.

The lessee shall conduct noise level measurements during exploration, development, and production operations to determine the potential objectionability to nearby residents as well as the potential health and safety danger due to noise emissions.

Noise level measurements and accompanying data shall be filed with the Supervisor. Such data shall provide the basis for operational and noise control decisions by the Supervisor and shall be based on an assessment of the noise relative to Federal or State criteria including adjustments for the area involved, meteorological conditions, and the time of day of the noise occurence.

The lessee shall comply with Federal occupational noise exposure levels applicable to geothermal activity under the Occupational Safety and Health Act of 1970 as set forth in 29 CFR 1910.95, which are incorporated herein by reference, or with State standards for protection of personnel where such State standards are more restrictive than Federal standards.

A. Measurement Condition. Outdoor noise measurements shall be made at least 3 metres (10 feet) from structures, facilities, or other sound reflecting sources and approximately 1 metre (3 feet) above ground level. Extreme weather conditions, electrical interference, and unusual background noise levels shall be avoided or given due consideration when measuring sound levels.

B. Measurements. The lessee shall monitor and measure noise levels using an octave band noise analyzer with an A-weighted frequency response or a standard sound level meter that conforms to the requirements set forth in USA Standard Specifications for General Purpose Sound Level Meters USASI S1.4-1961 or the latest approved revision thereof. Bandpass filters shall conform to the requirements of USASI S1.11-1966. The lessee shall measure noise level frequency distribution as required by the Supervisor. Sound levels shall be measured in conformance with the USA Standard-Method for the Physical Measurement of Sound USASI S1.2-1962.

C. Criteria. In the absence of more restrictive criteria as may be established in this paragraph, the lessee shall not exceed a noise level of 65 dB(A) for all geothermal-related activity including but not limited to, exploration, development, or production operations as measured at the lease boundary line or 0.8 km (one-half mile) from the source, whichever is greater, using the A-weighted network of a standard Sound Level Meter. However, the permissible noise level of 65 dB(A) may be exceeded under emergency conditions or with the Supervisor's approval if written permission is first obtained by the lessee from all residents within 0.8 km (one-half mile).

D. Assessment. The lessee shall be responsible for taking such noise level measurements as are deemed necessary by the Supervisor. The background noise level shall serve as the criterion for the rating and assessment, by the Supervisor, of the objectionableness of noise emission from a particular source. The background or ambient noise is defined hereby as the minimum sound level at the relevant place and time in the absence of the source noise and shall include consideration for the type of land use, the season, atmospheric conditions, and the time of day.

E. Attenuation. To attenuate objectionable noise, the lessee shall utilize properly designed muffling devices as required by the Supervisor.

F. Relationships. Reference levels and relationships for noise measurements shall be as follows:

(1) Reference sound pressure for airborne sounds shall be 20 MN/m (20 micronewtons per square metre).

(2) Reference power shall be 10-12 watts.

(3) Sound levels shall be measured using a standard Sound Level Meter with an "A" frequency response characteristic (weighting network).

(4) Sound level meter controls shall be set for as uniform a frequency response as possible when measuring sound pressure levels.

(5) Octave band noise levels shall be reported in equivalent A-weighted levels.

G. Record of Sound Measurements. The Supervisor may require sound level measurements during drilling, testing, and producing operations. Such measurements shall be filed in duplicate with the Supervisor and shall include the following data:

(1) Date, time, and location.

(2) Name of observer.

(3) Description of primary noise source emitter under test.

(4) Kind of operation and operating conditions.

(5) Description of secondary noise sources including location, type, and kind of operation.

(6) Type and serial numbers on all microphones, sound level meters, and octave band analyzers used. Length and type of microphone cables.

(7) Position of observer.

(8) Direction of arrival of sound with respect to microphone orientation.

(9) Approximate temperature of microphone.

(10) Results of maintenance and calibration tests.

(11) Weighting network and meter speed used.

(12) Measured overall response and band levels at each microphone position and extent of meter fluctuation.

(13) Background overall response and band levels at each microphone position with primary noise source not operating.

(14) Cable and microphone corrections.

(15) Any other pertinent data such as personnel

exposed directly and indirectly, time pattern of the exposure, atmospheric conditions, attempts at noise control, and personnel protection.

Reid T. Stone
Area Geothermal Supervisor

APPROVED:

Russell G. Wayland
Chief, Conservation Division

(DRAFT) GRO Order No. 5: Plans of Operation, Permits, Reports, Records and Forms

Authority:	30 CFR 270.11
Compliance:	30 CFR 270.30 - 270.78
	30 CFR 271
	43 CFR 3200
Departure from Orders:	30 CFR 270.48

UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

CONSERVATION DIVISION

GEOTHERMAL RESOURCES OPERATIONAL ORDER NO. 5

Effective_____

PLANS OF OPERATION, PERMITS, REPORTS, RECORDS AND FORMS

This Order is established pursuant to the authority prescribed in 30 CFR 270.11 and 270.12. The purpose of this Order is to establish guidelines and requirements to aid the lessee/operator in preparing Plans of Operation, Permits, Reports and Records, and to designate applicable standard geothermal operation forms. All reports, records, requests, etc., concerning lease exploration, development and production operations shall be submitted to the Area Geothermal Supervisor (Supervisor), Menlo Park, California, unless otherwise directed. Permits, orders, directives, notices, etc., shall be issued by or through the Supervisor or his authorized representative. Only emergency actions that involve immediate protection of the biotic environment and public or personnel safety should be directed or relayed by others. Pursuant to 30 CFR 270.48 all variances from the requirements specified in this Order shall be subject to approval of the Supervisor. All statements in this Order concerning approvals, determinations or requirements refer to those given or made by the Area Geothermal Supervisor or his delegated representative. Except for proprietary data, all data submit-

ted under this Order shall be available for inspection in accordance with the Freedom of Information Act of 1966 (P.L. 89-487), as amended in 1974 (P.L. 93-502). Information which is considered proprietary shall include but not necessarily be limited to geological, geophysical, reservoir data, trade secrets, financial data and interpretations of such data. The Supervisor determines whether data is proprietary, and this determination must be approved by appropriate officials of the Department of the Interior.

Any operations proposed by a lessee on Federal geothermal leased lands, lands within a Federal unit area or on private lands where the mineral rights are reserved by the United States shall be subject to the requirements of this Order.

Geothermal exploration operations which entail minor to no surface disturbance, will not require submittal of a Plan of Operation or a major environmental assessment. A Geothermal Exploration Permit, issued by the Supervisor, authorizes the commencement of any exploration operation (see Section 2A).

Major surface disturbing activities shall require submittal by the lessee of a Plan of Operation. An environmental assessment which identifies the potential impacts and recommends mitigating measures for the proposed action shall be prepared and approved by the Supervisor, and joint approval of the Plan of Operation shall be made by the Supervisor and the appropriate surface manager. Approval of a Plan of

Operation does not authorize the lessee to perform operations. A permit (Geothermal Drilling Permit, Geothermal Utilization Permit, or Geothermal Sundry Notice), to authorize commencement of activities is issued by the Supervisor after approval of the Plan of Operation.

Table 1 is a brief summary of application submittal and processing times through full development of a geothermal field. The processing times are representative, and may be longer in certain areas or situations where more extensive consideration of the environmental impacts must be made.

1. Plans of Operation (POO)

A. Plan of Operation - General

Prior to commencing any activities other than "casual use" (as defined by 30 CFR 270.2(q), 43 CFR 3209.0-5(d) and Geothermal Resources Operational Order No. 1), or "exploration operations" (as defined by 30 CFR 270.2(p) and 43 CFR 3209.0-5(a), the lessee shall submit (in triplicate) a Plan of Operation (POO) to the Supervisor for joint approval by the Supervisor and the appropriate land management agency (30 CFR 270.34, 270.34-1, 270.35 and 43 CFR 3203.6(b).

To assure orderly and timely exploration and development, to conserve the geothermal resource, and to minimize adverse environmental impacts, long range planning is desirable and necessary. Accordingly, a POO shall be prepared for each phase of development leading to eventual utilization of the resource.

Table 1. — Summary of Activities, Submittal Time, and Representative Maximum Processing Time for Geothermal Development

Activities	Submittal Time	Maximum Processing Time	
		Plan of Operation	Permit Application
Exploration Operations - surface geophysical surveys and temperature gradient holes to 3000 feet.	Earliest phases of lease exploration.		Geothermal Exploration Permit 30 days
Plan of Exploration (POE) - exploratory and test well drilling deeper than 3000 feet (in certain cases between 2000 and 3000 feet).	After geothermal resource is suspected or known, and before start of exploratory drilling.	6 months for initial POE for an area (includes GEAP review). 4 months for subsequent POEs.	Geothermal Drilling Permit * 15 days
Plan of Baseline Data Collection (PBDC) - collection of environmental data to establish pre-development environmental quality, and preparation of Baseline Data Report.	As early as possible after confirmation of commercial resource, but no later than 15 months prior to submittal of PFP. Collection of environmental data must proceed for a period of at least one year.	Response to PBDC 45 days	
Plan of Development (POD) - development well drilling and pipeline and facility construction. Plan of Injection/Disposal (POI) - injection well drilling, disposal of waste fluids, and construction of injection and disposal facilities. Plan of Utilization (POU) - construction, testing and abandonment of geothermal utilization facilities, power transmission lines, etc.	After confirmation of a commercial geothermal resource. Concurrent submittal of all three plans is recommended.	18 months for major power plant greater than 20 MW. 12 months for research and demonstration facility of up to 20 MW. 3 months for individual production well facility.	Geothermal Utilization Permit * (construction and operation of utilization facility) 15 to 90 days (depends on type of facility proposed) Geothermal Drilling Permit * (development and injection well drilling) 15 days
Plan for Production (PFP) - construction and testing of all production facilities.	As soon as Baseline Data Report is prepared for submittal. The report must precede or accompany the submittal of the PFP.		Geothermal Sundry Notice * (staged facility construction and production, injection/disposal, and development facilities construction) 15 to 60 days (depends on magnitude of proposed construction)

* May be processed concurrently with Plan of Operation. Submittal with the Plan of Operation is recommended.

Six major development phases are considered significant in pursuing a course toward ultimate utilization, and these phases must be addressed in the following Plans:

(1) Plan of Exploration (POE)

(2) Plan of Baseline Data Collection (PBDC)

(3) Plan of Development (POD)

(4) Plan of Injection (POI)

(5) Plan of Utilization (POU)

(6) Plan for Production (PFP)

The Plans of Exploration, Devlopment, Injection/Disposal and Production shall include the information required for a basic POO (Section 1.B.). The Plans shall also include the necessary additional data, detailed under the appropriate sections below, which pertain to the unique aspects of each Plan. The Plan of Utilization shall include that information outlined under Section 1.G. The Plan of Baseline Data Collection shall follow the guidelines described under Section 1.D. Any subsequent operation in an area which will entail additional major surface disturbance will require a subsequent POO.

The lessee may, at the lessee's discretion, submit the various POOs separately or in combination. Submittal of a Plan of Exploration (POE) proposing more extensive operations in an area (i.e. several drill sites) or several alternatives to an activity, will aid timely exploration and development by necessitating the submittal of fewer subsequent POEs. Concurrent submittal of the Plans of Development,

Injection/Disposal, and Utilization is recommended to obtain a more timely approval of these more closely interdependent phases of development.

Since POOs are normally considered to be public information, any information in the POO considered proprietary should be so designated by the lessee, and included in such a manner to allow easy separation of such data from the balance of the Plan.

B. Basic Plan of Operation

All basic POOs shall include at least the information and data described by 30 CFR 270.34(a) through (j) and this subpart. A basic POO shall include the following information and be presented in the following format:

(1) Title Page

The title page shall include; (a) the lease number(s) or unit agreement name; (b) the Known Geothermal Resource Area (KGRA) name, if applicable; (c) the general location of the proposed operations by section, township, range, county and state; (d) the name, address and phone number of the lessee or operator, and contractor and field supervisors (if known); (e) a brief description of the proposed operations and objectives; and (f) the description and estimated starting and completion dates of each activity.

(2) Maps

Maps shall be submitted on readily reproducible transparencies (e.g. Sepia), so that they can be reproduced for interested party

review. To satisfy the requirements of 30 CFR 270.34(a) through (f) two or more maps will be necessary:

(a) A topographic map of appropriate scale (preferably 1:24,00, but not less than 1:62,500 or 1"= 1 mile) on which the following are shown: (i) all pertinent Federal lease boundaries clearly outlined and lease serial numbers clearly labeled; (ii) the location of all proposed, existing and abandoned geothermal wells; (iii) all existing and planned access roads; (iv) the location of water supplies and road building materials proposed for use (if their source is within the mapped area); (v) the location of camp sites, air strips and other support facilities; (vi) topographic features and drainage patterns of the operational area; (vii) the critical environmental and cultural resources in the area; (viii) migration routes, watering holes or habitat of any species of wildlife known to be in the area, if the proposed operation has an identifiable potential impact on that particular wildlife (special consideration of threatened or endangered species must be presented); and (ix) other areas of potential surface disturbance. Where these requirements cannot be shown on a map, a narrative explanation must be presented.

(b) A large scale map of the site of operations, on which is shown a detailed layout of all equipment and facilites, sumps, etc.

(c) Other specialized maps, plans or drawings shall be presented as appropriate. These may include; (i) a large scale map to show any of the foregoing information, if details cannot be satisfactorily indicated on the smaller scale map; (ii) detailed engineer-

ing (construction) plan and profile drawings for any construction at any location when such locations are on steep terrain, potentially unstable ground, or other geologically or environmentally sensitive areas; and (iii) engineering drawings of new road construction or existing road modification when such roads are in rugged terrain, or pass through or near environmentally sensitive areas.

(3) Narrative Statement

A narrative statement shall be presented describing the environmental, safety, cultural and other concerns as follows:

(a) The proposed measures as required by 30 CFR 270.34 (h), to be taken for protection of the environment, including the prevention or control of; (i) fires, (ii) soil erosion, (iii) pollution of the surface and ground water, (iv) damage to fish and wildlife, cultural resources or natural resources, (v) air and noise pollution, (vi) hazards to public health and safety during lease activities, and (vii) the procedures to be followed in complying with Federal requirements and pertinent State and local standards.

(b) The requirements of 30 CFR 270.34(g), (i) and (j), including; (i) methods for disposing of waste materials (including site sanitary facilities), (ii) any pertinent information which the lessee can provide to delineate potential environmental impacts and how they will be minimized, prevented or compensated for, and (iii) where deemed necessary by the Supervisor provisions for monitoring including, but not limited to air, noise, produced fluids (gases, liquids) and solids, and drilling mediums.

(c) Any additional data to clarify items presented on maps, drawings or plans.

(d) Approximate crew size and probable type and location of housing and support facilities for construction and drilling personnel.

(4) Cultural Resources Clearances

The lessee shall furnish the Supervisor and the surface manager prior to any surface disturbing activities a certified statement of the presence of any cultural or historical resources or Native American religious sites, which may be disturbed during operations. The statement required by lease Form 3200-21, Section 18, shall be made by a qualified person acceptable to the surface manager and Supervisor.

(5) Environmental and Ecological Concerns

The lessee is encouraged to become familiar with ongoing studies and available background information on the environment of the area of operation, and to submit this information with the POO as an aid in identifying potential impacts to the environment. Certain critical places, conditions and problems may require additional discussion, study, monitoring and planning so that the environment can be adequately protected, and potential deleterious effects minimized, prevented, or mitigated. Lessee familiarization with critical problems or conditions should aid in development of the protective measures required by 30 CFR 270.34(h). Submittal of pertinent environmental data would facilitate preparing an environmental analysis. Environmental concerns usually include the following areas:

(a) Regional and local geology;

(b) Potential geological engineering hazards, such as active faults, landslide areas, etc.;

(c) Regional and local hydrology;

(d) Regional and local meteorology;

(e) Soil studies;

(f) Biota (identification of fauna and flora with pertinent details on associations and communities, habitat, life patterns, etc.);

(g) Recreational areas in the vicinity;

(h) Current and prospective land uses and local economy; and

(i) Air, noise and visual studies

Various areas may be considered by the surface manager or Supervisor to contain rare, threatened, or endangered flora and fauna. Prior to surface disturbing activities, a survey of the proposed area of disturbance for any rare, threatened, or endangered plant or animal species may be required. The survey shall be made by a qualified person acceptable to the surface manager, and a certified statement of the results shall be provided to the Supervisor and the surface manager.

(6) Emergency Contingency Plans

Emergency contingency plans shall be prepared and copies kept readily available at the work site. An Accident and Injury contingency plan shall be required for all POOs. Other contingency plans, which may be required for specific POOs may include, but are not necessarily limited to prevention or control of fires; blowouts or pollution incidents; accidents

and injuries; and adverse weather or meteorological conditions. Emergency contingency plans shall detail the following concerns:

(a) How the emergency condition will or might affect the lessee's operations, endanger personnel, public health, safety or the environment;

(b) Measures proposed to prevent, control, mitigate or minimize the possible deleterious effects of the incident;

(c) Plans for training and instructing personnel as to proper procedures for preventing, controlling or minimizing the impact of the incident;

(d) Where and how to obtain on-call or stand-by emergency control services (e.g. additional manpower, earth moving equipment, fire or water trucks, airplane or other chemical fogging equipment, specialty well control services, etc.);

(e) Emergency action notification lists with order of notification. Such notification lists shall include, but may not be limited to names, addresses and telephone numbers of appropriate USGS District and Area Geothermal Supervisors, USBIM District Managers and/or U.S. Forest Service Supervisors and other Federal, State or local law enforcement, regulatory and emergency service offices;

(f) Responsibilities, duties and "chain-of-command" from man-in-charge through newest man on the job;

(g) Any qualifying experience and training of personnel in emergency procedures (names and availability of personnel with special training or skills, first aid or fire fighting experience, and those who have been involved in fire

fighting or pollution incidents). There shall be at least two men in each crew or on each shift trained to administer first aid; and

(h) Proximity of and how to obtain first aid, and minor and major medical aid (location, addresses, telephone numbers, maps, and transportation facilities such as air ambulance, etc.).

(7) Any additional information which the Supervisor may require in support of a POO.

C. Plan of Exploration (POE)

Exploration activities to determine and test the actual existence, extent, quality, productivity and commercial potential of the geothermal resource shall be addressed in a Plan of Exploration (POE). A POE is required for any proposed drilling deeper than 914 meters (3000'), but may also be required for shallower drilling (deeper than 610 meters, 2000') in potentially hazardous geologic environments.

At the discretion of the lessee, the initial POE may encompass a multiwell drilling program or only specific operations on localized portions of the lease. Multiwell planning is encouraged to facilitate and expedite the processing, approval and execution of plans and permits.

Requirements for a POE may be satisfied by submission of the basic POO as outlined under Section 1.B. For multiwell or multi-site programs, particular attention should be directed towards submission of area wide geological, geophysical, hydrological and other environmental data.

D. Plan of Baseline Data Collection (PBDC)

In compliance with 30 CFR 270.34(k), prior to submission of a Plan for Production the lessee must collect environmental data for a period of at least one year. This data shall be submitted as a report prior to or concurrently with the Plan for Production so that environmental baselines can be established to assess the effect of later operations. The environmental data to be collected and submitted include; (i) air and water quality; (ii) noise; (iii) seismic and land subsidence activities; and (iv) assessments of species composition and abundance of vascular plant and vertebrate animal communities. The Geothermal Environmental Advisory Panel (GEAP) has published a report entitled "Guidelines for Acquiring Environmental Baseline Data on Federal Geothermal Leases" (U.S. Department of the Interior, January, 1977), which will aid in the proper acquisition and reporting of this data. The GEAP report can be obtained from the Supervisor.

To aid timely development the lessee shall submit a Plan of Baseline Data Collection (PBDC) to be approved by the Supervisor as early as possible, and preferably prior to any data collection. The PBDC shall be submitted with sufficient lead time to allow data to be collected for at least a one-year period prior to submission of a Plan for Production. Ideally the baseline data collection program should begin as soon as a potentially producible resource has been identified. In areas where more than one lessee intends to produce the geothermal resource, the lessees are encouraged to submit a cooperative PBDC.

A PBDC will address a program for collecting baseline data as prescribed in the GEAP Guidelines and will provide the proposed format to be used in the Baseline Data Report (see Section 1.I). The PBDC will be critiqued by the Supervisor, GEAP, interested parties and other agencies having expertise and/or regulatory responsibility. Any deficiencies in a PBDC will be pointed out, and if possible directions or suggestions will be made to eliminate the deficiencies. Approval of the PBDC will be contingent upon the elimination of the deficiencies.

E. Plan of Development (POD)

After determining reservoir extent, characteristics and performance, and before full scale subsurface and surface development of the geothermal resource for commercial utilization, the lessee shall prepare a Plan of Development (POD). Concurrent submittal of a POD with the Plans of Injection/Disposal, and Utilization is recommended for a timely approval of these more closely interdependant phases of development.

The POD shall cover all phases of additional drilling and construction (excluding power plant construction) necessary to allow initiation of commercial production. The POD shall address the drilling of production and injection wells, metering equipment, production and injection pipelines, surface production and injection facilities and any other facilities which may be necessary to place the system in a "ready condition" to commercially utilize the geothermal resource. A POD shall include, in addition to the requirements of 30 CFR 270.34

as detailed under Section 1.B., the following:

(1) A topographic map of appropriate scale (preferably 1:24,000, but not less than 1:62,500 or 1" = 1 mile) which shows the location and spacing of all existing and proposed wells planned for development of the resource, and their connecting pipelines and producing facilities, and the location of the utilization facility. The wells shall be distinguished by their present or proposed status.

(2) A justification shall be presented for the proposed location and spacing of wells. This justification may be accomplished through geologic and geophysical maps, cross sections and reports. Wells should be spaced so that optimum production can be obtained with a minimum number of wells and a minimum impact on the environment. Such justification shall address;

(a) Reservoir characteristics such as thickness, temperatures, pressures, lithology, water analyses, enthalpy, porosities, permeabilities, productivities, areal extent, type of geologic structure, etc.;

(b) Reservoir performance characteristics including productive area, producibility and anticipated future performance;

(c) Topographic features and drainage patterns;

(d) Hydrologic and geologic conditions;

(e) Protection of correlative rights;

(f) Minimizing interference with other uses of the land;

(g) Protecting the environment; and

(h) Other concerns, special stipulations, requirements

or restrictions.

(3) A representative drilling program to describe;

(a) Type of drilling equipment;

(b) Zone of completion;

(c) Casing and cementing program;

(d) Mud program;

(e) Downhole equipment with operational drawings, capacities, etc; and

(f) Safety provisions.

(4) Surface equipment installations (pipelines, separators, metering systems, transmission lines, etc.) to include operational drawings, capacities, safety provisions, etc., in sufficient detail to enable adequate environmental assessment.

F. Plan of Injection/Disposal (POI)

The injection or disposal of geothermal effluent and associated by-products shall be addressed in a Plan of Injection/Disposal (POI). Submittal of the POI concurrently with the Plans of Development, and Utilization is recommended for a timely approval of these more closely interdependent phases of development.

In accordance with Geothermal Resources Operational Order No. 4, Section 9 and 30 CFR 270.41, if liquid well effluent contains potentially harmful or injurious substances, and cannot otherwise be disposed of in conformance with Federal, State or other regulatory requirements, the effluent shall be injected into the geothermal resources reservoir

or other approved subsurface disposal zone. Injection may also be required for subsidence control or reservoir recharge.

Should the resource be disposed through injection, the following concerns in addition to the requirements of Section 1.B., must be addressed in the POI.

(1) A topographic map of adequate scale (preferably 1:24,000, but not less than 1:62,500 or 1" = 1 mile) to show all existing and proposed wells, pipelines, and other surface facilities. All wells shall be distinguished by type.

(2) The injection fluid characteristics such as quality, quantity, source, chemical analysis, chemical reactivity, toxicity, temperature, etc.

(3) The characteristics of the proposed injection zone including volume capacity of the zone, geologic formation and structure, porosity, permeability, chemical analysis of zonal water, static formation pressures and temperatures, anticipated zonal fluid reactivity to the injected fluids, any previous history of injection operations into the same or similar formations, any injectivity tests which may have been conducted, and other pertinent data.

(4) Hydrology of the surrounding area, including ground water quality, quantities, analyses, and the predicted effects of contamination by injected fluids on the existing surface and ground waters.

(5) Subsurface maps and cross sections of the producing and injecting zone structure and lithology and any available logs or histories of the well or other wells penetrating the injection zone, that have not previously been submitted. The effects of injection

on such factors as potable water, seismicity and local tectonic conditions must be discussed.

(6) Representative injection well drilling program, to include the requirements of Section 1.E.(3).

(7) Proposed downhole and surface injection equipment and metering facilities with capacities, design capabilities and design safety factors, in sufficient detail to enable adequate environmental analysis. Construction and engineering design plans should be included.

(8). Proposed injectivity surveys and other means to monitor injection performance.

A proposed waste disposal program, if other than by injection, shall address the requirements of Section 1.B. and the below outlined concerns. Attention should also be given to the disposal of any solid or liquid by-products.

(9) A waste disposal program shall include the;

(a) Surface disposal facilities (equipment with flowline drawings);

(b) Volume of waste and method of processing and disposal;

(c) Proximity and quality of surface and ground water;

(d) A discussion of the chemical compatibility of waste liquids with surface and ground waters of the area, to include chemical analyses of all pertinent fluids, their chemical reactivities, significance of chemical differences, etc.;

(e) Permeability of the impoundment or method of maintaining

separation of waste from the natural water systems;

(f) Treatment of the waste liquids; and

(g) Monitoring and record keeping measures.

G. Plan of Utilization (POU)

Prior to constructing a geothermal resource utilization facility on a Federal lease, a Plan of Utilization (POU) must be submitted as required by 30 CFR 270.34-1. Submittal of the POU along with the Plans of Development, and Injection/Disposal is recommended for timely approval of these more closely interdependent phases of development. Utilization facilities include; 1) Individual Production Well Facilities of not more than 10 MW of electric capacity or heat energy equivalent; 2) Research and Demonstration Facilities of maximum net capacity of 20 MW electric or heat energy equivalent and; 3) any Plant facility other than the above types to be used for either electrical or non-electrical purposes (30 CFR 270.2(r), (s), and (t)). The POU shall address facility construction and operation and the manner(s) of utilizing and transmitting the resource products.

Certain requirements of this part may be waived when the Supervisor determines such requirements are not necessary for the proper consideration of the POU. A POU shall address the following concerns.

(1) A discussion of the structures, equipment and support facilities to be constructed on the lease, and their manner of operation. The presentation shall include the following information:

(a) A topographic map of adequate scale (preferably 1:24,000,

but not less than 1:62,500 or 1" = 1 mile) showing the facility location(s) in relation to the production and injection wells, power transmission lines and pertinent Federal leases clearly outlined and labeled;

(b) A description of the purpose and operation of each facility and a schematic flow diagram of the important components of the facility;

(c) A plan and an artist's conception of the proposed architectural landscaping;

(d) A time schedule for the installation and startup of the facility including design of the plant, materials acquisition, construction, and pre-startup testing of the facility;

(e) The safety provisions and emergency shutdown procedures to protect the public health and environment and a schedule for testing and maintaining safety devices;

(f) A contingency plan or plans outlining procedures planned in case of emergency (see Section 1.B.(6)); and

(g) The number of personnel necessary to operate the facility.

(2) A copy of all preliminary site suitability studies conducted for the utilization facility, such as geological, geotechnical and soils surveys. Included with the resulting reports shall be all core logs, laboratory reports, and other raw data upon which the reports results are based. A description of any additional tests, studies or surveys planned for site suitability assessments should also be presented.

(3) A topographic map of adequate scale showing existing and planned access roads and a statement on the source of any road build-

ing material to be used.

(4) The source, quality, consumption rate and planned use for any outside water supply.

(5) The method(s) for disposal or use of waste water, solid wastes and noncondensible gases.

(6) A narrative statement addressing the requirements of Section 1.B.(3)(a).

(7) A program for monitoring facility operations to assure continuing compliance with applicable noise, air and water quality standards and regulations and for other potential environmental impacts identified by the Supervisor. The monitoring program shall compliment the program established for the Plan for Production (see Section 1.H.(4)).

(8) Any additional data which the Supervisor may require in support of the POU.

(9) A narrative statement briefly describing the timely facility abandonment and site reclamation procedures when the facility is no longer needed.

H. Plan for Production (PFP)

Prior to initiating production for commercial utilization of the geothermal resource, the lessee shall submit to the Supervisor a Plan for Production (PFP). The PFP shall include the manner of production, and the operations conducted after completion of the (i) drilling of all necessary wells, and (ii) construction and installation of all pertinent surface

facilities which may be required to commercially produce the resource.

In compliance with 30 CFR 270.34(k), prior to submission of a PFP, the lessee must collect environmental data for a period of at least one year. The program for data collection, or Plan of Baseline Data Collection must be approved by the Supervisor prior to implementation (see Section 1.D.). The data collected shall be submitted in report form as described under Section 3.I either prior to or concurrently with submission of a PFP. Further orders or field rules may be issued concerning the collection of environmental baseline data. In addition to the requirements of 30 CFR 270.34 as detailed under Section 1.B., a PFP shall include;

(1) Proposed policy on rates of production, anticipated by-products, commingling of lease production, etc.;

(2) Method for determinating and evaluating reservoir performance, including a description of any mathematical or other procedures used and the type of data needed to arrive at an estimate of future performance. The Supervisor may require scheduled reviews of reservoir performance during production operations.

(3) Details of the methods of calculating Federal royalty; and

(4) Program proposed for continued monitoring of noise, air and water quality, seismic and land subsidence activities, and ecological system (including floral and faunal communities) of the leased lands. The monitoring program shall be based on and compliment the format approved under the Plan of Baseline Data Collection (see Section 1.D.).

Requests for variances to the monitoring program shall be considered on a case by case basis.

2. Permits

A. Geothermal Exploration Permit (Form USGS 9-1956).

In compliance with 30 CFR 270.78 and Geothermal Resources Operational Order (GRO) No. 1, a Geothermal Exploration Permit shall be submitted in triplicate for the Supervisor's approval before initiating any exploration operations.

As defined by 30 CFR 270.2(p), exploration operations are those activities which relate to the search for evidence of geothermal resources. Exploration operations may include, but are not limited to, surface geophysical operations, drilling and coring of shallow temperature gradient wells and construction of roads and cross-country transit by vehicles. Exploration operations will usually also include the drilling and coring of deep temperature gradient wells to a maximum depth of 914 meters (3000').

Accompanying the Geothermal Exploration Permit should be a brief explanation of the proposed operation and a topographic map(s) of sufficient scale (preferable 1:24,000, but not less than 1:62,500 or 1"=1 mile), to clearly show all proposed station points, holes, etc. A description of drilling operations shall include that information required by GRO Order No. 1.

The lessee shall submit to the Supervisor and the surface manager a certified statement of the existence of any cultural or historical

resources or Native American religious sites which may be disturbed by the proposed activities. The statement (required by lease Form 3200-21, Section 18) must be made by a qualified person acceptable to the surface manager. A permit may not be issued without a clearance by the surface manager and Supervisor.

A Plan of Operation is not required to permit exploration operations. A Plan of Exploration may be required for some deeper gradient wells, where a potentially hazardous geologic environment is suspected or known, or where the resource may be encountered. A Geothermal Exploration Permit expires one year from the date of issue. All permitted operations must be completed and abandoned within that time unless a written request for an extension is approved by the Supervisor.

B. Geothermal Drilling Permit (Form USGS 9-1957). Prior to initiating deep drilling, redrilling, deepening or plugging back deep wells, a Geothermal Drilling Permit (GDP) shall be filed in triplicate for the Supervisor's approval. A GDP is required for each well which is to be drilled to determine the actual presence of, develop, produce or inject the geothermal resource. A GDP may also be required for observation wells and some deeper temperature gradient holes.

The GDP shall contain all the information required by 30 CFR 270.71 and operations shall be conducted in accordance with the specifications detailed in GRO Order No. 2.

Submittal of a GDP concurrently with the submittal of a Plan of Operation

(POO) will facilitate processing and permitting of drilling activities. A POO covering the activity must be approved prior to the issuance of a GDP. The approved GDP authorizes the commencement of drill site and road construction, and drilling activities.

Drill site and road construction may be commenced prior to approval of the GDP provided the POO has been approved. Approval to construct can, in such cases be obtained with a Sundry Notice, in accordance with Section 2.C.(2) of this Order.

An approved copy of the GDP and drilling program with special stipulations or conditions of approval shall be available at the work site during operations. The following items shall be considered.

(1) Form 9-1957 shall be completely filled out. Particular attention is directed toward;

(a) Item 1b, well status and type - Check the intended status of the geothermal well as shown, and in the space provided indicate the type of well such as hot water, dry steam, hot dry rock, etc;

(b) Item 4 - If the hole is to be directionally drilled, the proposed coordinates from the surface location to the top of the completion zone should be shown;

(c) Item 10, Well No. - Wells shall be numbered using the "modified Kettleman System", in accordance with instructions and examples shown in Exhibit 1; and

(d) Item 19, Elevation - Indicate datum of measurements,

i.e., derrick floor (DF), rotary table (RT), kelley bushing (KB), and distance from the final graded or mat surface to that datum (i.e., mat-to-DF measurement).

(2) Drilling Program - A detailed drilling program shall be submitted to show;

(a) A chronological description of the drilling plan, indicating depths, hole sizes, etc;

(b) Blowout prevention equipment (BOPE) to be used. Include (i) a drawing showing BOPE installation, types, rating, landing heads, auxiliary equipment for each stage of drilling, (ii) accumulator and back up systems to be used, (iii) details of tests to be made, and provisions for notifying the appropriate USGS office for necessary witnessing;

(c) Casing size, weight, grade, couplings, whether new or used, proposed landing depths, proposed perforated intervals, number and size of perforations or slots; design criteria (indicating safety factors achieved in burst, collapse, tension, and manner of allowing for expected thermal stress during completion and subsequent production or workovers), casing tests, showing pressures and hold time, and provisions for notifying the appropriate USGS office for witnessing tests;

(d) Casing cementing details showing quantities, type, additives, desired fill, excess to be used, methods for determining if desired annular fill has been obtained with provisions for recementing to attain desired fill.

(e) Directional measurements to be taken. Include details, plan and profile if well is to be directionally drilled;

(f) Drilling method and circulating media (water, mud, foam, air or combination thereof), method and chemical additives proposed for treatment, mud cooling measures, reserve mud and water to be kept on the work site. Particular attention should be directed to the potential toxicity of the mud and additives, and, if toxic, what protective measures will be taken. If air drilled, give details for noise and dust control;

(g) Completion well head, with drawing showing manufacturer, type, design specifications (pressure, temperature ratings, etc.) valve assembly with auxiliary outlets and other pertinent data;

(h) Proposed methods and tools to be used for formation evaluation, such as coring, mud logging, downhole logging (electric logs, dipmeters, formation density, temperature, etc.);

(i) A description of potential drilling hazards in the area (if known) such as severe lost circulation zones, high pressure gas or water zones, hydrogen sulfide gas zones, etc., and any necessary safety equipment to be used to effectively handle such hazards;

(j) A description of the drilling equipment to be used, indicating type and capacity rating of rig, pumps and accessory equipment;

(k) Emergency contingency plans, if not submitted with a POO (see Section 1.B.(6)). In certain sensitive areas a detailed study may be necessary to determine the potential course and effects of a pollution incident or major spill, and possible measures which might be taken to minimize pollution or hazards to public health and safety; and

(l) If the well is to be production tested, show details of sur-

face piping and facilities, manner of measuring flow rates and temperatures, sampling proposed, and fluid containment. A separate Sundry Notice may be required for testing.

(3) Plat - An official surveyor's plat shall accompany each application to drill a new well. The plat shall show distances of the well from the nearest section or tract lines or corners, as shown on the official survey plat or protracted survey with bearings of those lines. Location section survey markers should be indicated. The scale shall not be less than 1:24,000. The method of obtaining the final ground level shall be indicated. An official surveyor's plat of the preliminary location and elevation will be acceptable, but shall be followed by the final surveyed location and elevation above sea level after the location is completed.

(4) Geologic Conditions - Each application shall be accompanied by supporting geological, geophysical and hydrological data to briefly describe the (a) general geological environment; (b) estimated type of reservoir; (c) estimated type and depths of formations to be drilled; (d) anticipated kind and quality of production (hot water, dry steam, estimated total dissolved solids); and (e) estimated temperature profile.

In areas where several wells have been drilled and previous data have presented the detailed geology of the area, only the depths to the top of the reservoir and other important markers or faults need be shown with reference to previous geologic submittals.

EXHIBIT 1

PROCEDURE FOR NUMBERING GEOTHERMAL WELLS USING
THE MODIFIED KETTLEMAN WELL NUMBERING SYSTEM

1. Locate the surface location of the proposed well within a 10 acre subdivision, preferably the center. A regular 640 acre square section would have 64 subdivisions, numbered from 11 to 88.

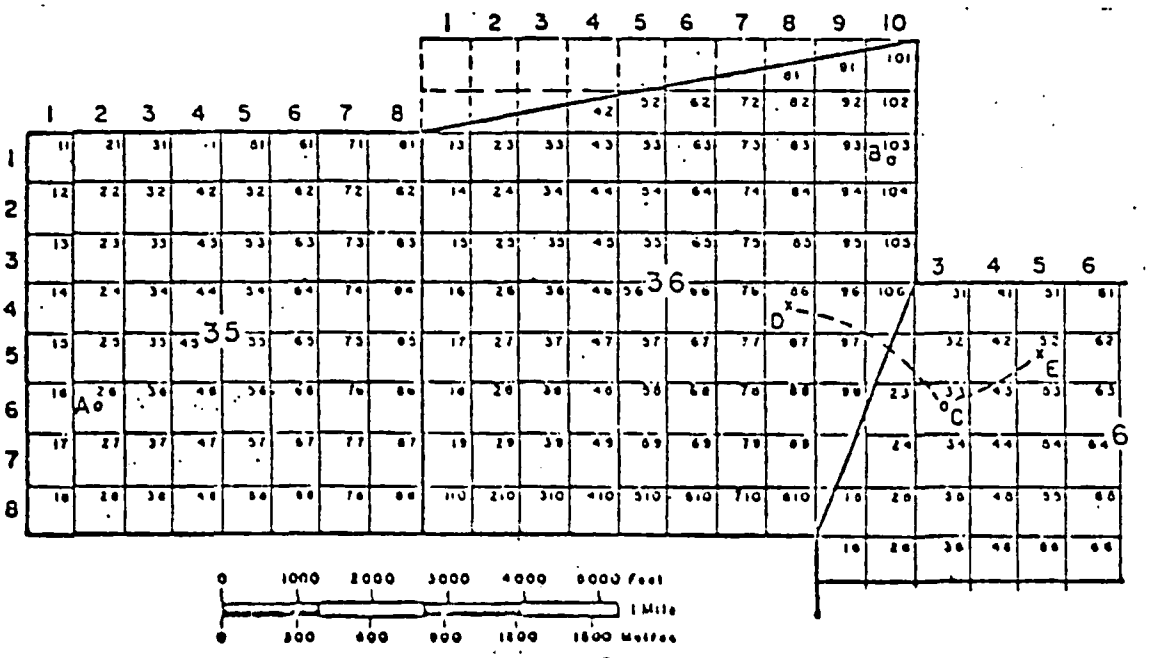
2. Number the well by the 10 acre subdivision in which it is located, followed by the section number. See examples "A" "B" and "C."

3. Number subsequent directional wells drilled from the same 10 acre surface locations with the subdivision number, followed by A, B, C, respectively, then the 10 acre subdivision in which the bottom of the completion interval lies, then the section number. Refer to examples "D" and "E."

4. Subdivide rectangular sections varying from 640 acres, into 10 acre subdivisions, starting with parcel 11 in the northwest corner. Subdivide as far as possible to the east and south using the northwest corner as a reference point.

5. For non-symmetrical sections or sections with irregular boundaries, align a 10 acre grid pattern approximately N-S along the westerly property line, with the top edge on the northernmost NW or NE section corner; number wells according to basic grid. A section plat showing proposed subdivision and well location should be submitted with the Plan of Operation and Geothermal Drilling Permit.

Example A	26-35	Example D	1st Directional 33A (86-36) - 6
Example B	103-36	Example E	2nd Directional 33B (52) - 6
Example C	33-6		



C. Geothermal Sundry Notices (Form USGS 9-1958). The provisions of 30 CFR 270.17, 270.34, 270.35, 270.45, 270.71-1, 270.72, 43 CFR 3205.3-8, GRO Order No. 3 and this subpart require that prior to initiation of certain miscellaneous activities, written notice of intention to do work must be submitted to and approved by the Supervisor. Written notice shall be filed by a Sundry Notice, and shall include a description of the proposed operations. Emergency verbal approval may be obtained but must be confirmed subsequently in writing by filing the Sundry Notice. The following cases are some examples of when a Sundry Notice is applicable.

(1) Preliminary foundation, soils or other geotechnical type survey to determine the site suitability for a proposed operation. Where significant surface disturbance is proposed, such as in trenching or road brushing or construction, joint approval from the Supervisor and appropriate surface manager must be obtained. Results of such surveys are usually needed to supplement a Plan of Operation (POO).

(2) Subsequent to the approval of a POO, but prior to the approval of a Geothermal Drilling Permit, the operator may wish to prepare the drill site. Such activities may include surveying and constructing well site access roads, well pads, sumps, digging cellars and drilling to set conductor pipe. Activities of this nature shall be addressed under an approved POO prior to issuance of a Sundry Notice. A Sundry Notice in such cases will always precede a Geothermal Drilling Permit (GDP).

(3) Changes during or immediately prior to the conduct of opera-

tions which have been approved under one or more of the various POOs or a GDP. Changes to the proposed total depth of a well, casing sizes or cementing depths, minor power plant installations, etc., are a few examples.

(4) Subsequent well operations which are addressed in particular by 30 CFR 270.35 and 270.72 and which can be conducted without surface disturbance in addition to that caused by operations approved under a POO. Examples of these type of activities include repairing, testing, shooting or plugging and abandoning deep wells; stimulating or changing the method of well production, altering casing or liner, changing or reconditioning downhole production or injection equipment, converting a formation or well for fluid injection, etc. The submittal must include a detailed description of the proposed operation and additional support data such as a drilling program.

(5) Construction of new and alteration of existing production or other surface facilities where the production facility will be used for production and not utilization of the resource. Any proposed facility construction or alteration may cause no additional surface disturbance by taking place in a surface use area approved for that use under a POO.

(6) Permitting construction of phases of a utilization facility (30 CFR 270.71-1(g)) when the complete detailed construction plans have not been included in the initial submission of a Geothermal Utilization Permit. The Supervisor may approve construction of separate components or stages of the facility through a Sundry Notice.

D. Geothermal Utilization Permit (Form USGS 9-1968)

An application to construct and operate an Individual Production Well Facility, Research and Demonstration Facility, Plant Facility and all related utilization facilities must be submitted in accordance with 30 CFR 270.71-1. The application shall be submitted in triplicate and shall include the following concerns:

(1) A description of the type of facility contemplated, method of operation, manner of utilizing the resource, and anticipated by-products and their proposed uses;

(2) A survey plat (scale not less than 1:24,000) approved by a registered surveyer, showing the location of the facility and all related sites, by distances in feet from the nearest section corners or tract lines as shown on official survey plats or protected surveys. The survey should also determine the elevation at ground level of the sites;

(3) Complete and detailed engineering design plans and specifications for all construction of the principal facility, related facilities, power transmission lines and facility sites. Included should be plans for construction of new access roads or improvements of existing access roads. Each drawing should contain the original or "wet" signature of the supervising registered engineer;

(4) An operating plan for the facility setting forth the procedures and standards by which the facility will be operated and maintained;

(5) The planned metering of facility input and output to deter-

mine plant performance and the metering to measure the quantity and quality of production (30 CFR 270.60) to assure proper royalty calculation. The proposed methods to test the content of by-products (refer to 30 CFR 270.61) in the produced fluids shall also be addressed;

(6) A schedule and procedure for the installation and pre-startup testing of all facility equipment and, if known, for the commencement of operations for the commercial utilization of geothermal resources; and

(7) Any additional pertinent information or data which may aid in the proper consideration of the application.

Approval of the Geothermal Utilization Permit shall be two-staged. The first approval shall be for facility construction including pre-startup testing. Final approval to operate the facility shall follow approval of the pre-startup test results.

3. Reports

A. Completion of Geothermal Resource Exploration Operations. Within 30 days after completion of exploration operations permitted by a Geothermal Exploration Permit, a completion report in accordance with GRO Order No. 1, shall be submitted in duplicate to the Supervisor. The report shall describe the activities performed, the completion dates of all operations conducted in chronological order, and a description of the abandonment procedures. The completion report shall be submitted on a form convenient to the lessee, and shall be attached to a copy of the approved Geothermal Exploration Permit. Two copies of

all records or reports resulting from the activities shall accompany the report if not previously submitted.

B. Geothermal Well Completion Report (Form USGS 9-1960). Not later than thirty days after completion of well operations permitted under a Geothermal Drilling Permit, a Well Completion Report shall be submitted, in duplicate, providing a record of the activities performed. Form USGS 9-1960 shall be submitted along with two copies of the chronological history of well operations and two copies of all logs and surveys run, as required by 30 CFR 270.72 and 270.73.

The report shall be submitted for all newly drilled and completed wells; and old wells which have been deepened, redrilled, or plugged back.

The report shall contain the following information:

(1) A chronological history of all operations conducted on the well, giving complete details of drilling, cementing, formation and production tests, and noting pertinent geologic or reservoir phenomena such as lost circulation zones and steam entries.

(2) Two final prints of all down-hole logs run, such as electric, sonic, dipmeter, formation density, etc., and analyses of these logs (such as Saraband).

(3) Two copies of all surveys run, such as temperature and fluid entry. If the well was directionally drilled, two copies of the survey data, plan and profile of the hole course including projected bottom hole location if not measured.

(4) Duplicate copies of all analyses of produced liquids, gaseous and solid effluents with pertinent comments and conclusions.

(5) A complete geologist's lithologic log and geologic summary of the drilling results, including duplicate copies of all mud logging and geologist's reports to the operator with pertinent comments and conclusions.

(6) A split of all drill cuttings taken shall be submitted if requested by the Supervisor. The samples should be washed and bagged with intervals clearly labeled.

Any or all of the foregoing requirements may be included by reference if the data has been previously submitted in duplicate to the Supervisor.

C. Geothermal Pollution Incident Report (Form USGS 9-1961).

In accordance with 30 CFR 270.30 and GRO Order No. 4, Section 9.B., all blowouts, spills, leaks, toxic or non-condensible gaseous emissions or other significant environmental impact caused by the lessee's operations shall be verbally reported to the appropriate District Geothermal Supervisor and the Supervisor, no later than 18 hours after the incident. The verbal report shall be confirmed by written report in duplicate, to both Supervisors within 30 days after the incident. With the prior approval of the Supervisor, standard pollution report forms (governmental, company, insurance carrier, computerized, etc.) other than Form USGS 9-1961, may be used if all requisite data is included or appended.

D. Geothermal Accident and Injury Report (Form USGS 9-1962).

As required by 30 CFR 270.46, all accidents and injuries on leased lands shall be reported to the Supervisor by telephone within 24 hours of the occurrence, and a written report shall be filed in duplicate with the Supervisor not later than 15 days after the accident. With prior approval, standard forms (governmental, company, insurance carrier, computerized, etc.) in place of Form USGS 9-1962, may be used if requisite data is included or appended.

E. Monthly Report of Geothermal Operations (Form USGS 9-1963).

In accordance with 30 CFR 270.74, the lessee shall file, in duplicate, with the Supervisor a Montly Report of Geothermal Operations. The Monthly Report shall be a complete production and drilling operations report of all well activities starting with the month in which deep exploratory drilling is started until the lease is terminated or the Supervisor authorizes omission of the report. A report shall be made for each lease for each month beginning with the month in which drilling is initiated, and shall be submitted on or before the last day of the succeeding month unless an extension is granted by the Supervisor.

Beginning with the month in which injection is initiated, the lessee shall submit to the Supervisor a Monthly Water Injection Report as required by GRO Order No. 4, Section 9.C.(2). This report can be combined with the above Monthly Report or submitted separately.

With prior approval of the Supervisor, computerized, or other special

forms, may be used providing that all data required by 30 CFR 270.74 is included either on the form or as an addendum. The Supervisor may, as necessary, require cumulative production data by well, lease, reservoir or formation, or field.

F. Monthly Report of Geothermal Sales and Royalty.

In compliance with 30 CFR 270.75, beginning with the month in which production is first sold or utilized, the lessee shall file a Monthly Report of Sales and Royalties for each productive lease. This report is required, unless otherwise authorized by the Supervisor, for intermittent as well as continuing sales. The report shall be filed on or before the last day of the month following the month in which production is obtained and sold or utilized. Prior to submittal of the initial report the Supervisor shall determine what information is required, and the form on which it may be submitted.

The requirements of 30 CFR 270.49, unless specifically waived, state that the lessee must furnish within 30 days after the effective date, a copy of any contract for the disposal of geothermal resources from the lease, including sales contracts or commercial utilization agreements. The contract shall be used in determining required information for the reporting of royalties.

G. Annual Report of Expenditures for Diligent Geothermal Exploration Operations. In accordance with 30 CFR 270.77 and 43 CFR 3203.5 the lessee shall file in triplicate, for the Supervisor's review, an annual report of expenditures for diligent exploration operations.

This report shall be submitted for each lease on or before the lease anniversary date, and shall include an itemized expenditure for exploration activities conducted on or near the lease during the lease year. The report shall be accompanied by the proprietary results of all surveys claimed, if these have not previously been submitted. The lessee should indicate in the report the desired manner of allocation of expenditures toward all related leases.

H. Annual Report of Compliance with Environmental Protection Requirements. The provision CFR 270.76 requires the lessee to submit annually a report giving a full account of the actions taken to comply with the appropriate Federal and State regulations or requirements of the Supervisor pertaining to the protection of the surface and subsurface environment. This report shall be submitted in duplicate to the Supervisor on or before the lease anniversary date. When appropriate, several related leases may be covered by one report.

The following guidelines are designed to help the lessee understand applicable regulatory requirements and establish uniform reporting. The annual reporting of environmental compliance provides an opportunity for the lessee to review and evaluate environmental conditions and problems resulting from exploration on the lease and determine future optimum courses of action. The report will be useful for lessee and regulatory environmental protection program improvement.

The report shall include all activities related to geothermal exploration,

development or production. The lessee shall describe chronologically all activities which took place on the lease, and for each activity, the duration (dates) of the activities and actions taken to protect the surface and subsurface environment.

Environmental protection concerns that must be addressed for each activity shall include, but not be limited to the following items:

(a) Noise abatement;

(b) Water quality;

(c) Air quality;

(d) Erosion Control;

(e) Subsidence and seismic activity;

(f) Rehabilitation activities;

(g) Waste disposal;

(h) Environmental effects on flora and fauna;

(i) Public access;

(j) Pollution abatement;

(k) Sanitation and waste disposal;

(l) Aesthetics; and

(m) Antiquities and historical sites.

Describe specific actions taken to protect the biotic environment. It is not adequate to just state that no citations were received and no operations were suspended. Monitoring of the air quality, water quality and noise are good indications of the lessee's compliance. Color photography, particularly repetitive aerial color photography,

can provide excellent evidence of lessee's compliance with regulatory waste disposal, reclamation and other environmental protective requirements.

If pollution incidents occurred during the previous year, indicate apparent causes, duration, abatement, extent of damage to the environment, and the final (or current) status. Applicable air quality, noise, water quality and biologic analysis reports with related photographs should accompany this report, or be referenced by submittal date if previously filed with the Supervisor.

The following format is a suggested cover page for the report:

(a) (Title): Annual Report of Environmental Protection Compliance for Year_____.

(b) (Operator):_____.

(c) (Lease Serial Numbers):_____.

(d) (Location): Legal description of lease, by section, township, range, base meridian, county, state and field or KGRA name.

(e) (Lease Date):_____.

(f) (Report Submittal Date):_____.

(g) (Activities during lease year listed chronologically):

(Period Conducted) (Type of Activity)

I. Baseline Data Report

Subsequent to the collection of the environmental baseline data as approved under a Plan of Baseline Data Collection, a lessee shall prepare

and submit a Baseline Data Report (BDR). The BDR shall be submitted prior to or concurrently with a Plan for Production, and address the pre-development environmental quality of the lease(s).

The baseline data collected must be compiled, analyzed and interpreted in an orderly manner in the BDR, and must conform to the format described in the Plan of Baseline Data Collection. A description of the method of using the geothermal resource, method of collecting the data, clear and concise discussions on the data collected for each environmental parameter and the conclusions obtained shall be presented. The BDR must stand alone: referencing other reports is not acceptable as baseline data without summarizing the pertinent data of those reports.

During data collection, quarterly BDRs may be required if a controversial issue exists. The final BDR must be approved before production of geothermal resources can take place.

J. Environmental Quarterly Report. In compliance with Lease Form 3200-21, Section 12, the lessee, when required by the Supervisor, shall submit Quarterly Reports of the environmental data which have been collected by monitoring during the lessee's lease development and subsequent operating activities. The Quarterly Report shall contain the data obtained through the lessee's continued environmental monitoring program (instituted subsequent to the baseline data collection period) as approved under the Plans for Production and Utilization.

The report shall follow the format of the Baseline Data Report described previously.

K. Monthly Report of Facility Operations. Beginning with the month in which initial operations and sales begin, a monthly summation of facility operations must be reported by the facility operator, as required by 30 CFR 270.74-1. A report shall be made every month for each Individual Production Well Facility, Research and Demonstration Facility or Plant Facility and shall be submitted in duplicate, on or before the last day of the following month. The report shall be filed on a form and in a manner agreed to by the lessee and the Supervisor.

L. Miscellaneous Reports pursuant to 30 CFR 270.72. Subsequent to the completion of miscellaneous well operations permitted by a Sundry Notice, the lessee must file in duplicate, a report describing the activities performed and the results obtained. Where operations involve the running of well logs or surveys, duplicate copies of all records must accompany the report if not previously submitted. The report and records shall be attached to a copy of the approved Sundry Notice, and shall be submitted no later than 30 days after completion of the work. Completion reports on surface facility construction permitted by a Sundry Notice will not be required.

4. Records.

During deep well operations all pertinent well records shall be kept at the drill site for use and inspection. Any well records and all

other records required by 30 CFR 270.37, or other applicable regulations, shall be available for inspection at all times at field headquarters or other convenient location, unless otherwise directed by the Supervisor. Final copies or prints of records shall be submitted in accordance with and in a manner required by applicable regulations and the provisions of this Order. Accessible records shall include, but not be limited to the following items.

A. Well Records.

(1) Daily Drilling Report and Record. The lessee shall maintain a complete detailed drilling record at the work site. Unless specifically waived by the Supervisor, a daily telephone report shall be made to the District Supervisor (or Supervisor when required). It should be a chronological report of operations conducted, to include, as a minimum; (a) total and plug back depth, (b) footage drilled and hole size, (c) drilling fluid characteristics, such as weight (pressure when air drilling), temperature in and out, mud losses, (d) hole deviation surveys (plus bottom hole coordinates if directionally drilled), (e) casing run and basic cementing details, (f) formation or production test details, (g) logs and surveys run, (h) drilling problems, such as tight hole, lost circulation, etc., and (i) blowout preventer and casing tests.

(2) Well Logs and Surveys. Working copies of the following shall be kept at the work site, and be accessible to the Supervisor when requested: (a) directional survey data and plots, (b) mud logging data and plots, (c) field prints of down-hole logs (electrical, dip-

meter, etc.), (d) temperature and fluid entry surveys, (e) fluid sampling results, and (f) core recovery and description.

(3) Servicing Records. Working copies of the following well service records shall be kept at the work site, with copies available to the Supervisor when requested: (a) cementing, stimulation, perforation, acidizing, formation fracturing reports, (b) casing drill pipe and other down-hole component measurements, and (c) fishing tool reports, etc.

(4) Other Records. Records of safety meetings, safety devices present at the work site, and blowout, pollution incident or fire contingency plan drills shall also be available at the work site.

B. Submittal of Field Prints or Work Copies. Field prints or work copies of the following wells logs or surveys shall be furnished as indicated below, unless specifically waived by the Supervisor:

(1) One copy to be delivered or mailed to the Area Geothermal Supervisor and District Geothermal Supervisor immediately after running, (a) all down-hole logs, such as electrical, radioactive, formation density, etc., (b) temperature and fluid entry surveys; and

(2) One copy to be mailed or delivered to the Area Geothermal Supervisor and District Geothermal Supervisor upon completion of a data page, of mud logging results.

C. Company Records. All preliminary and subsequent geological, geophysical, stratigraphical, structural, other engineering data, environmental studies, reports or records, which might be useful in plan-

ning, developing, evaluating, or recommending improved procedures or programming production or monitoring reservoir performance shall be made available to the Supervisor, and copies of such data shall be furnished upon request.

5. Forms for Federal Geothermal Operations

In accordance with 30 CFR 270, 43 CFR 3200 and other applicable regulatory requirements, the lessee may make applications for permits or submit periodic reports or other information on designated forms as detailed herein. Copies of these forms are appended to this Order.

A. Form USGS 9-1955, Designation of Geothermal Operator. The lessee shall submit, in accordance with 30 CFR 270.31, a Designation of Geothermal Operator (DOO) form whenever lease exploration, facility construction and/or operation are to be conducted by another operator who will act with full responsibility in the lessee's behalf.

B. Form USGS 9-1956, Geothermal Exploration Permit. Applications to perform exploration operations on Federal leases shall be submitted on Form USGS 9-1956. To report the completion of such operations the lessee shall submit a copy of the approved permit along with a report describing the abandonment procedures. Refer to Sections 2.A. and 3.A. for a more detailed application and reporting explanation.

C. Form USGS 9-1957, Geothermal Drilling Permit. The Geothermal Drilling Permit (GDP) is to be used for deep exploratory well drilling, deepening or plugging back, and should also be used for subsequent redrills of existing wells. If a drilling well requires redrilling,

such should be handled under a Sundry Notice. For guidance in preparing this form refer to Section 2.B. of this Order.

D. Form USGS 9-1958, Geothermal Sundry Notices. To perform the various operations described under Section 2.C. of this Order the lessee must submit for approval a Sundry Notice. To report the completion of the permitted operations a copy of the approved Sundry Notice shall be submitted with a report describing the operations and completion procedures undertaken. Refer to Sections 2.C. and 3.L., for further application and reporting procedures.

E. Form USGS 9-1960, Geothermal Well Completion Report. This form is to be submitted after completion or abandonment of all exploratory well activities permitted under an Application for Permit to Drill. Completion of certain well operations permitted under a Sundry Notice may also be reported on this form if more convenient to the lessee. Guidance in preparing this form may be found in Section 3.B. of this Order.

F. Form USGS 9-1961, Geothermal Pollution Incident Report. Submittal of this form is required for any pollution event as detailed under Section 3.C., resulting from geothermal exploration or operations of facilities.

G. Form USGS 9-1962, Geothermal Accident and Injury Report. A full report of any accident or significant injury shall be made on Form 9-1962, in a manner described under Sec. 3.D.

H. Form USGS 9-1963, Monthly Report of Geothermal Operations. This report is to be submitted for each month beginning with the month that

deep exploratory drilling activities are initiated. The Monthly Water Injection Report may be included on this form. For guidance in preparing this form refer to Section 3.E. of this Order.

I. Form USGS 9-1968, Geothermal Utilization Permit. Applications for construction and operation of Individual Well Production Facilities, Research and Demonstration Facilities and Plant Facilities shall be filed by Form 9-1968. A more detailed explanation for submittal of a utilization permit is provided under Section 2.D.

Form USGS 9-1955

Form approved
Budget Bureau No.

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY, CONSERVATION DIVISION

DESIGNATION OF GEOTHERMAL OPERATOR

The U.S. Geological Survey requires this form or other Supervisor approved form or letter to be prepared and filed in triplicate, with the Supervisor.

The undersigned is, on the records of the Bureau of Land Management, holder of lease(s)

SERIAL NO.: State Office:

and hereby designates

NAME:
ADDRESS:

as his operator and local agent, with full authority to act in his behalf in complying with the terms of the lease and regulations applicable thereto and on whom the Supervisor or his representative may serve written or oral instructions in securing compliance with the Operating Regulations with respect to (describe acreage to which this designation is applicable):

This designation of operator does not relieve the lessee of responsibility for compliance with the terms of the lease and the Operating Regulations. This designation of operator does not constitute an assignment of any interest in the lease.

If the designated operator defaults, the lessee will promptly comply with all regulations, lease terms, or orders of the Secretary of the Interior or his representative.

The lessee agrees to promptly notify the Supervisor of any change in the designated operator.

I hereby certify the foregoing is true and correct.

SIGNED _____ TITLE _____

ADDRESS _____ DATE _____

This report is required by law (30 U.S.C. 1023); and regulations: 30 CFR 270.31. Failure to report in a prescribed manner can result in shutting down operations, suspension and or recommendation of cancellation of lease (30 U.S.C. 1011, 30 CFR 270.80, 43 CFR 3244.3). The United States Criminal Code (18 U.S.C. 1001) makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

Form: USGS 9-1956

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY, CONSERVATION DIVISION

Form Approved
Budget Bureau No. _____

GEOTHERMAL EXPLORATION PERMIT

The U.S. Geological Survey requires this form or other Supervisor approved form to be prepared and filed in triplicate with requisite attachments with the Supervisor. The District Geothermal Supervisor must approve this permit prior to any lease operations.

1. NAME OF LESSEE/OPERATOR

2. ADDRESS OF LESSEE/OPERATOR

3. CONTRACTOR(S) ADDRESS

12. TYPE OF OPERATIONS TO BE CONDUCTED (give brief description)

13. Exploration operations will be conducted during the period (date)

from: to:

4. LEASE SERIAL NO.

5. SURFACE MANAGER: BLM ( ) FS ( ) Other ( )

6. UNIT AGREEMENT NAME

7. PERMIT NO.

8. FIELD OR AREA

9. SEC. T., R., B.& M.

10. COUNTY

11. STATE

14. BOND: Surety bond for $ ( ) Nationwide ( ) Statewide ( ) Lease ( ) Bond to be furnished ( )
Rider to Nationwide bond ( ) Rider to Statewide bond ( ) Bond No.:

15. The undersigned agrees that all exploration operations under this permit shall be conducted in accordance with regulations, GRO Orders and Special Permit Stipulations:

1) The lessee/operator shall have copies of this Permit available on location, at all times, while operations are being conducted.

2) Unless waived, the lessee/operator shall submit in writing to the appropriate District Geothermal Supervisor the status of activities completed or in progress at the end of each month during the term of this permit.

3) If requested by the Supervisor the lessee/operator shall submit two copies of all available records of any operations, surveys, tests, or projects immediately after completion of such activities.

4) Within 30 days after completion of each survey, test, analysis or activity of the permitted operations the undersigned agrees to furnish the Supervisor with two copies of the records of the operation(s).

5) Special Conditions of Approval:

The undersigned agrees: (1) to the special stipulations which may be added by the Supervisor as a condition of approval of this Geothermal Exploration Permit; and (2) that the proposed operations will not be commenced until this Permit has been approved by the Supervisor. Appeals from decisions under this Permit may be made in accordance with 30 CFR 270.90.

16.

SIGNED _____ TITLE _____ DATE _____

(This space for Federal use)
I hereby approve this permit to conduct geothermal resource exploration operations. This permit is effective for one year after the approval date.

SIGNED _____ TITLE _____ DATE _____

This permit is required by law (30 U.S.C. 1023); regulations: 30 CFR 270.78; Federal Geothermal Lease Terms and Stipulations and other regulatory requirements. The United States Criminal Code (18 U.S.C. 1001) makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

(See instructions on reverse side)

INSTRUCTIONS

GENERAL: This form shall be submitted for any application to perform exploration type operations to search for evidence of geothermal resources on Federally leased land or lands covered by a unit or cooperative agreement.

ITEM 12: For drilling operations, describe on a separate sheet the proposed operations in accordance with Geothermal Resource Operational Order No. 1. Include coordinate locations for all proposed holes from the nearest section corner. Attach a map or maps of sufficient scale to clearly show all pertinent lease boundaries outlined and all proposed locations plotted and labelled.

COMPLETED OPERATIONS: Thirty days after completion of all operations approved under this permit, a completion report in duplicate, shall be submitted to the Supervisor. The completion report shall include a copy of the approved Geothermal Exploration Permit with an attached report detailing all important exploration, completion and abandonment procedures. Copies of all records of the operations shall accompany the report if not previously submitted.

Form: USGS 9-1957

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY, CONSERVATION DIVISION

Form Approved
Budget Bureau No. _____

GEOTHERMAL DRILLING PERMIT

The U.S. Geological Survey requires this form or other Supervisor approved form to be prepared and filed in triplicate with requisite attachments with the Supervisor. The Supervisor must approve this permit prior to any lease operation.

4. LEASE SERIAL NO.

5. SURFACE MANAGER: BLM ( ) FS ( ) Other ( )

1a. TYPE OF WORK: DRILL NEW WELL ( ) REDRILL ( ) DEEPEN ( ) PLUG BACK ( ) DIRECTIONALLY DRILL ( ) OTHER ( )

6. UNIT AGREEMENT NAME

1b. WELL TYPE: PRODUCTION ( ) INJECTION ( ) HEAT EXCHANGE ( ) OBSERVATION ( ) WATER SUPPLY ( ) OTHER ( )

7. WELL NO.

8. PERMIT NO.

1c. WELL STATUS:

2. NAME OF LESSEE/OPERATOR

9. FIELD OR AREA

3. ADDRESS OF LESSEE/OPERATOR

10. SEC. T., R., B.& M.

15. LOCATION OF WELL
At surface

At proposed prod. zone

11. COUNTY

16. DISTANCE FROM PROPOSED LOCATION TO NEAREST PROPERTY OR LEASE LINE

12. STATE

17. DISTANCE FROM PROPOSED LOCATION TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR ON THIS LEASE

13. APPROX. STARTING DATE

14. ACRES ASSIGNED (WELL SPACING)

18. DRILLING MEDIA AND CHARACTERISTICS: AIR ( ) WATER ( ) MUD ( ) FOAM ( ) Other ( )

19. PROPOSED DEPTH
MEASURED:

TRUE VERTICAL:

20. ELEVATIONS: ESTIMATED ( ) FINAL ( )

REFERENCE DATUM: GR ( ) MAT ( ) DF ( ) KB ( ) RT ( )
CASINGHEAD FLANGE ( ) OTHER ( )

21. EXISTING AND/OR PROPOSED CASING AND CEMENTING PROGRAM (List existing program first, followed by proposed program, and separate by a sufficient space to clearly distinguish the two programs)

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	COUPLING (Collars & Threads)	GRADE	SETTING DEPTH	QUANTITY OF CEMENT

22. PROPOSED WORK SUMMARY

(Use additional space on reverse side of form)

23.

SIGNED _____ TITLE _____ DATE _____

(This space for Federal use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

This permit is required by law (30 U.S.C. 1023); regulations: 30 CFR 270.71; Federal Geothermal Lease Terms and Stipulations and other regulatory requirements. The United States Criminal Code (18 U.S.C. 1001) makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

(See instructions on reverse side)

INSTRUCTIONS

GENERAL: This form shall be submitted for any application to drill for, test, extract, produce, dispose and/or utilize the actual geothermal resource on Federally leased lands or lands covered by a unit or cooperative agreement.

ITEM 1C: Show the current status for existing wells; I=injecting, F=flowing, P=pumping, HE=heat exchange, SI=shut-in, WS=water supply, OB=observation, O=other(explain).

ITEM 7: Number wells using the Modified Kettleman Well Numbering System.

ITEM 15: Show the surface location coordinates from the nearest section corner or tract lines and if the well is to be directionally drilled, the proposed production zone coordinates (top and bottom) from the surface location.

ITEM 19: Indicate reference datum from which measurement was made (see item 20).

ITEM 21: For subsequent well work the latest well conditions along with all proposed additions and changes must be shown. To show current well conditions either fill out this item or attach the latest completion report on the subject well.

ITEM 22: Summarize other pertinent existing data such as producing and injecting zones, type, size and density of perforations and perforated intervals, etc., in addition to the proposed work. Indicate reasons for changes undertaken.

Form: USGS 9-1958

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY, CONSERVATION DIVISION

Form Approved
Budget Bureau No. _____

GEOTHERMAL SUNDRY NOTICES

The U.S. Geological Survey requests this form or other Supervisor approved form to be prepared and filed in triplicate with requisite attachments with the Supervisor. The Supervisor must approve this permit prior to any lease operations.

4. LEASE SERIAL NO.

5. SURFACE MANAGER: BLM ( ) FS ( ) Other ( )

1a. WELL TYPE: PRODUCTION ( ) INJECTION ( ) HEAT EXCHANGE ( ) OBSERVATION ( ) OTHER ( )

6. UNIT AGREEMENT NAME

1b. WELL STATUS:

7. WELL NO.

8. PERMIT NO.

2. NAME OF LESSEE/OPERATOR

9. FIELD OR AREA

3. ADDRESS OF LESSEE/OPERATOR

10. SEC. T., R., B.& M.

13. LOCATION OF WELL OR FACILITY

11. COUNTY

12. STATE

14. TYPE OF WORK

GEOTECHNICAL WORK	( )	CONVERT TO INJECTION	( )	PULL OR ALTER CASING	( )
SITE AND ROAD CONSTRUCTION	( )	FRACTURE TEST	( )	MULTIPLE COMPLETE	( )
CONSTRUCT NEW PRODUCTION FACILITIES	( )	SHOOT OR ACIDIZE	( )	ABANDON	( )
ALTER EXISTING PRODUCTION FACILITIES	( )	REPAIR WELL	( )	CHANGE PLANS	( )
				OTHER	( )

15. DESCRIBE PROPOSED OPERATIONS (Use this space for well activities only. See instructions for current well conditions on reverse)

16. DESCRIBE PROPOSED OPERATIONS (Use this space for all activities other than well work)

(Use reverse side if needed)

17. I hereby certify that the foregoing is true and correct

SIGNED _____ TITLE _____ DATE _____

(This space for Federal use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

This permit is required by law (30 U.S.C. 1023); regulations: 30 CFR 270.34, 30 CFR 270.35, 30 CFR 270.45, 30 CFR 270.71-1, 30 CFR 270.72; Federal Geothermal Lease Terms and Stipulations and other regulatory requirements. The United States Criminal Code (18 U.S.C. 1001) makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

INSTRUCTIONS

GENERAL: This form shall be used for applications for well work, road, site and facilities construction and other miscellaneous activities performed on Federally leased lands or lands under a unit or cooperative agreement, and are related to operations performed under an approved Plan of Operation.

ITEM 1b: Show the current status for existing wells; I=injecting, F=flowing, P=pumping, HE=heat exchange, SI=shut-in, WS=water supply, OB=observation, O=other (explain).

ITEM 15: The latest well conditions (hole size, casing, cement, perforations, producing and injecting zones, etc.) along with all proposed additions and changes must be shown. When completing this section list existing well program first, followed by the proposed program, and separate by a sufficient space to clearly distinguish the two programs. Current well conditions may be either listed in this section or may be shown by attaching a copy of the latest completion report on the subject well.

ITEM 16: Attach all pertinent engineering plans and specifications.

COMPLETED OPERATIONS: Thirty days after completion of all operations other than construction activities, approved under this permit, a completion report must be submitted in duplicate, to the Supervisor. The completion report shall include a copy of the approved Geothermal Sundry Notice with an attached report detailing the important activities performed, and the completion and abandonment procedures undertaken. Copies of all records of the operations shall accompany the report if not previously submitted.

Form: USGS 9-1960

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY, CONSERVATION DIVISION

Form Approved
Budget Bureau No. _____

GEOTHERMAL WELL COMPLETION REPORT

The U.S. Geological Survey requires this form or other Supervisor approved form to be prepared and filed in duplicate with requisite attachments with the Supervisor within 30 days after completion of permitted operations.

4. LEASE SERIAL NO.

5. SURFACE MANAGER: BLM ( ) FS ( ) Other ( )

1a. WELL TYPE: PRODUCTION ( ) INJECTION ( ) DISPOSAL ( ) WATER SUPPLY ( ) OBSERVATION ( ) COLD ( ) HEAT EXCHANGE ( ) OTHER ( )

6. UNIT AGREEMENT NAME

1b. COMPLETION: NEW ( ) WORKOVER ( ) DEEPENED ( ) PLUGBACK ( ) REDRILL ( ) RECOMPLETED ( ) DRILLED & ABANDONED ( ) OTHER ( )

7. WELL NO. | 8. PERMIT NO.

9. FIELD OR AREA

2. NAME OF LESSEE/OPERATOR

10. SEC. T., R., B.& M.

3. ADDRESS OF LESSEE/OPERATOR

11. COUNTY

18. LOCATION OF WELL
At Surface:
At Top of Production Zone:
At Total Depth:

12. STATE

13. SPUD DATE DATE T.D. REACHED

14. COMPLETION DATE (Ready to produce)

19. TOTAL DEPTH
Measured: True Vertical:

15. DIRECTIONALLY DRILLED INTERVALS

20. PLUGBACK TOTAL DEPTH
Measured: True Vertical:

21. ELEVATION: ESTIMATED ( ) FINAL ( )
REFERENCE DATUM: GR ( ) MAT ( ) DF ( ) KB ( ) RT ( ) CASINGHEAD FLANGE ( ) OTHER ( )

16. SURVEYED INTERVALS

22. DRILLING MEDIA: AIR ( ) WATER ( ) MUD ( ) FOAM ( ) OTHER ( )
List Characteristics:

17. CORE SIZE AND INTERVALS

23. LOG TYPE & INTERVALS

24. CASING RECORD (In Well)

Size	Weight	Grade	Collars & Threads	Shoe Depth	Hole Size	Cementing Record (slurry volume)

25. LINER RECORD

Size	Weight	Grade	Collars & Threads	Top	Bottom	Perforated Intervals	Cementing Record (slurry volume)

26. TUBING RECORD

Size	Weight	Grade	Depth Set	Packer Depth

27. CEMENT SQUEEZE, ACID, FRACTURE, ETC. (detail type, amount, interval

28. PERFORATION RECORD

Type	Total No.	Density (No./ft)	Size	Intervals

29. ATTACHMENTS & PREVIOUS SUBMITTALS: List all reports, surveys, tests and logs, not listed in item 23, which have resulted from drilling and completio operations. List relevant previously furnished data with date of submittal referenced.

30. WELL STATUS: PRODUCING ( ) SHUT-IN ( ) SUSPENDED ( ) INJECTION ( ) DISPOSAL ( ) HEAT EXCHANGE ( ) ABANDONED ( ) WATER SUPPLY ( ) OTHER ( )

31. DO YOU CONSIDER THE WELL TO BE COMMERCIAL? EXPLAIN:

32. I hereby certify the information on this report and the attached information is complete and accurate according to the best of by knowledge.

SIGNED: _____ TITLE _____ DATE _____

This report is required by law (30 U.S.C. 1023); regulations: 30 CFR 270.37, 30 CFR 270.73; Federal Geothermal Lease Terms and Stipulations and other regulatory requirements. Failure to report in a timely prescribed manner can result in shutting down operations, suspension and or recommendation of cancellation of lease (30 U.S.C. 1011, 30 CFR 270.80, 43 CFR 3244.3). The United States Criminal Code (18 U.S.C. 1001) makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

(See instructions on reverse side)

INSTRUCTIONS

GENERAL: This form is designed for submitting a complete and accurate geothermal well completion report, and should be accompanied by a detailed chronological history of well operations and final copies of the results of any logs, surveys or tests performed on the well, which have not previously been submitted. The report shall be submitted within 30 days after the date of completion of continuous well activities, as determined by the District Geothermal Supervisor. The completion date in many cases will be the day the drilling rig is released. The Supervisor may postpone the required report submittal date if adequate justification is presented by the lessee.

ITEM 18: Show the surface location coordinates from the nearest section corner or tract line. Show production zone and total depth coordinates from the surface location if the well is directionally drilled.

ITEM 34: If the well is immediately placed into operation without testing, this section should reflect the first month's production data.

ITEMS 35 & 36: Indicate the depth(s) of subsurface pressure and temperature measurement, and include the reference datum.

33. WELL TEST

TEST DATE	PRODUCTION METHOD; FLOWING ( ) OTHER ( )	PUMPING ( ) - include size, type, intake depth, etc.

34. PRODUCTION

HOURS TESTED	PRODUCTION DURING TEST			ENTHALPY (Btu/lb)
	TOTAL LIQUIDS (lb)	STEAM (lb)	WATER (lb)	

35. STATIC TEST DATA

DEPTH	SURFACE PRESSURE (psig)	SUBSURFACE PRESSURE (psig)	SUBSURFACE TEMPERATURE (°F)	WATER ANALYSIS	
				Total Dissolved Solids	pH

36. FLOWING TEST DATA

SURFACE PRESSURE	SUBSURFACE PRESSURE	SURFACE TEMPERATURE	SUBSURFACE TEMPERATURE	AVE. TOTAL MASS FLOW RATE PER HOUR		
	at _____ feet		at top of perfs.	TOTAL (lb/hr)	STEAM (lb/hr)	WATER (lb/hr)
WELLHEAD:						
SEPARATOR:						

37. SUMMARY OF POROUS ZONES: Show all important porous zones and contents of each; cored intervals with recoveries, drill stem or formation tests with depth of interval tested, time open, cushion used, and flowing and shut-in pressures, temperatures and recoveries.

38. GEOLOGIC MARKERS (TOP)

FORMATION	TOP	BOTTOM	DESCRIPTION OF DETAILS	NAME	MEASURED DEPTH	TRUE VERTICAL DEPTH

Form USGS 9-1961

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY, CONSERVATION DIVISION

Form Approved
Budget Bureau No. _____

GEOTHERMAL POLLUTION INCIDENT REPORT

The U.S. Geological Survey requires this form or other Supervisor approved form to be prepared and filed with requisite attachments with the District and Area Geothermal Supervisors within 30 days after the pollution incident.

4. LEASE SERIAL NO.

5. SURFACE MANAGER: BLM ( ) FS ( ) Other ( )

1. DATE OF REPORT

6. UNIT AGREEMENT NAME

2. NAME OF LESSEE/OPERATOR

7. WELL NO.

8. PERMIT NO.

3. ADDRESS OF LESSEE/OPERATOR

9. FIELD OR AREA

13. INCIDENT DATE AND TIME

10. SEC. T., R., B. & M.

14. DURATION (Days/Hours)

11. COUNTY

15. WEATHER AND WIND CONDITIONS

12. STATE

16. TYPE OF POLLUTION

17. EXTENT OF POLLUTION (attach map of involved area)

18. DESCRIPTION OF INCIDENT (Include the cause such as human error, mechanical or equipment failure, or natural event; the immediate and long range effects; and other pertinent information.)

19. WATER BODY AFFECTED (Lake, Stream, Groundwater) WITH FLOW RATES (if applicable) (Attach analyses of unpolluted and polluted water if possible.)

20. CORRECTIVE ACTION TAKEN (Describe fully; give date, the method used to correct the action, and the name and title of the person performing or supervising the action)

USGS APPROVAL: YES _____ NO _____

(Use additional pages if needed)

21. PREVENTIVE ACTION TAKEN AND PROPOSAL TO PREVENT RECURRENCE (Fully detail including implementation date. Use additional pages, if needed.)

22. REMARKS AND ADDITIONAL PERTINENT INFORMATION (Use additional pages if needed).

23.

SIGNED _____ TITLE _____ DATE _____

(This space for Federal use)

Oral report received by _____ Field Inspection by _____

Date _____ Time _____

Potential environmental damage and pertinent remarks:

This report is required by law (30 U.S.C. 1023); regulations: 30 CFR 270.30, 43 CFR 3264.1; Federal Geothermal Lease Terms and Stipulations and other regulatory requirements. Failure to report in a prescribed manner can result in shutting down operations, suspension and/or recommendation of cancellation of lease (30 U.S.C. 1011, 30 CFR 270.80, 43 CFR 3244.3). The United States Criminal Code (18 U.S.C. 1001) makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

Form USGS 9-1962

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY, CONSERVATION DIVISION

GEOTHERMAL ACCIDENT AND INJURY REPORT

Form Approved
Budget Bureau No. _____

The U.S. Geological Survey requires this form or other Supervisor approved form to be prepared and filed with requisite attachments with the District Geothermal Supervisor and the Supervisor within 15 days after the accident or injury. If the accident is fatal or involves serious injury, report immediately to the District Geothermal Supervisor and Area Geothermal Supervisor by telephone.

3. LEASE SERIAL NO.

4. SURFACE MANAGER: BLM ( ) FS ( ) Other ( )

5. UNIT AGREEMENT NAME

1. NAME OF LESSEE/OPERATOR

6. WELL NO. | 7. PERMIT NO.

2. ADDRESS OF LESSEE/OPERATOR

8. FIELD OR AREA

9. SEC. T., R., B. & M.

10. COUNTY

THE ACCIDENT

12. TIME AND DATE OF ACCIDENT

13. LOCATION OF ACCIDENT

11. STATE

14. OPERATION OR WORK IN PROGRESS AT TIME OF ACCIDENT

15. DESCRIPTION OF ACCIDENT

16. NATURE AND APPARENT UNSAFE CONDITION OR ACTION WHICH CAUSED ACCIDENT

17. HAD THIS CONDITION OR ACTION BEEN REPORTED AS A HAZARD BEFORE THE ACCIDENT?

18. WHAT, IF ANY, REMEDIAL ACTION HAS BEEN RECOMMENDED?

19. HAD IT BEEN OR WAS IT BEING IMPLEMENTED AT TIME OF ACCIDENT?

20. IF NOT, EXPLAIN

21. HOW COULD THE ACCIDENT HAVE BEEN PREVENTED?

22. WHAT ACTION HAS BEEN RECOMMENDED AND/OR TAKEN TO PREVENT A SIMILAR ACCIDENT?

23. RECOMMENDATIONS FOR ADDITIONAL PREVENTIVE ACTION

EFFECTS OF THE ACCIDENT

24. WERE THERE ANY INJURIES? _____ IF SO, FILL OUT INJURY REPORT ON REVERSE. DID A POLLUTION INCIDENT RESULT? _____
IF SO, FILL OUT GEOTHERMAL POLLUTION REPORT, FORM USGS 9-1961. DID ACCIDENT CAUSE A SHUT-DOWN OF OPERATIONS? _____
IF SO, FOR HOW LONG? _____ HAS OPERATION BEEN RESUMED? _____ IF NOT, WHEN WILL IT BE? _____

25. NAME, ADDRESS AND STATEMENT OF WITNESSES TO ACCIDENT INCLUDING INVOLVEMENT (IF APPLICABLE) IN THE ACCIDENT. (THESE SHOULD BE ATTACHED AS ADDITIONAL PAGES TO THIS REPORT AND BE SIGNED BY THE PERSON MAKING THE STATEMENT.)

ALL ACCIDENTS INVOLVING FAILURE OF EQUIPMENT, UNSAFE CONDITIONS OR HAZARDS WHICH HAVE RESULTED IN PERSONNEL INJURY OR SHUTTING-DOWN OF OPERATIONS MUST BE REPORTED TO THE DISTRICT SUPERVISOR AND THE SUPERVISOR IMMEDIATELY, BUT NO LATER THAN 24 HOURS AFTER THE ACCIDENT OR INJURY.

This report is required by law (30 U.S.C. 1023); regulations: 30 CFR 270.46; Federal Geothermal Lease Terms and Stipulations and other regulatory requirements. Failure to report in a timely prescribed manner can result in shutting down operations, suspension and/or recommendation of cancellation of lease (30 U.S.C. 1011, 30 CFR 270.80, 43 CFR 3244.3). The United States Criminal Code (18 U.S.C. 1001) makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

(See instructions on reverse side)

INSTRUCTIONS

GENERAL: This form or other acceptable form shall be submitted in all cases where significant accident and/or injury related to lease operations occurs.

ITEM 13: If the accident occurred at a drill site, locate the area of occurrance in relation to the nearest structure or equipment. Accidents occurring in other lease areas may be located by the appropriate 1/4, 1/4, 1/4 section, other appropriate description, or by maps of sufficient scale to clearly show the accident area. Use additional space under remarks if needed.

ITEM 15: Submit drawings or maps if appropriate.

THE INJURY

26. NAME OF INJURED EMPLOYEE(S)	27. ADDRESS OF INJURED EMPLOYEE(S)	28. COMPANY REPRESENTING
29. OCCUPATION WHEN INJURED (Job Title)	30. DATE INJURED STOPPED WORKING (mo/day/yr)	31. WAS HE/SHE DOING HIS/HER REGULAR WORK?
32. HOW LONG ON THIS TYPE OF WORK?	33. HAD HE/SHE BEEN INSTRUCTED REGARDING HAZARDS OF THE JOB AND THE PROPER WAY TO DO THIS WORK?	34. WERE YOU A WITNESS TO THE ACCIDENT?
35. TYPE OF INJURIES		
36. NAME OF DOCTOR AND/OR MEDICAL FACILITY	37. ADDRESS OF DOCTOR AND/OR MEDICAL FACILITY	
38. WAS PROPER SAFETY PROTECTIVE EQUIPMENT PROVIDED?	39. WAS IT BEING PROPERLY USED AT THE TIME OF THE ACCIDENT?	

40. WHAT TRAINING OR SPECIAL INSTRUCTIONS, REGARDING PREVENTION OF THIS OR SIMILAR ACCIDENTS, HAVE BEEN GIVEN TO THE EMPLOYEES? GIVE DATES OF ANY SAFETY MEETINGS HELD DURING PAST SIX MONTHS ON PREVENTION OF SIMILAR ACCIDENTS.

41. DATE (mo/day/yr) SIGNATURE OF LESSEE'S FIELD SUPERVISOR _____

SIGNATURE OF EMPLOYEE's SUPERVISOR _____

(This space for Federal use)

Oral report received by: _____

Field inspection by: _____ Date and Time: _____

Date _____

Remarks:

Form: USGS 9-1963

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY, CONSERVATION DIVISION

Form Approved
Budget Bureau No

MONTHLY REPORT OF GEOTHERMAL OPERATIONS

The U.S. Geological Survey requires this form or other Supervisor approved form (computerized, company, State, etc.) to be prepared for each month beginning with the month in which drilling is initiated and filed in duplicate with the Supervisor, on or before the last day of the month following unless exception is granted by the Supervisor.

The following is a complete and accurate report of all operations and production for the Month of _____, 19_____.

Signed:_____ Title:_____ Date:_____

1. Name of Lessee/Operator

2. Address of Lessee/Operator

3. LEASE SERIAL NO.

4. SURFACE MANAGER: BLM ( ) FS ( ) Other ( )

5. Unit Agreement Name

6. Field or Area

7. County

8. State

9. INDIVIDUAL WELL PRODUCTION

TWSP, RGE, SEC., B&M	WELL NUMBER	TYPE (STATUS)	DAYS PROD. OR INJ.	MONTHLY PRODUCTION OR INJECTION			PRODUCTION OR INJECTION RATE			AVE. WELLHEAD	
				TOTAL (lb)	STEAM (lb)	WATER (lb)	TOTAL (lb/hr)	STEAM (lb/hr)	WATER (lb/hr)	TEMP. °F	PRESS. psi

This report is required by law (30 U.S.C. 1023); regulations: 30 CFR 270.74; Federal Geothermal Lease Terms and Stipulations and other regulatory requirements. Failure to report in a prescribed manner can result in shutting down operations, suspension and/or recommendation of cancellation of lease (30 U.S.C. 1011, 30 CFR 270.80, 43 CFR 3244.3). The United States Criminal Code (18 U.S.C. 1001) makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

INSTRUCTIONS

General: This form is designed for submitting a complete and accurate account of monthly activity and performance of geothermal wells and production facilities on Federal leases.

Item 9: Group wells together which are producing or injecting into the same reservoir or zone, and distinguish reservoirs or zones by name such as upper, lower, formation name, etc. Within each zone, list injection wells separately from production wells. In column 3, show the type of well reported (P=production, I=injection*, D=disposal*, WS=water supply, OB=observation, HE=heat exchange, O=other (specify under remarks)) and in parenthesis the current month end status for each well or completion (i=injecting, f=flowing, p=pumping, si=shut-in, susp=suspended, obs=observation, o=other (specify under remarks)). For heat exchange wells, report production in British thermal units, Btu and production rate in Btu/hr. Production or injection rate is the total amount of mass flow divided by the total number of active well hours.

Item 10: *In reporting current operations, particular attention should be directed toward 30 CFR 270.74(e).*

Remarks: Report in this section any environmental monitoring conducted, and the results obtained.

10. OPERATIONS CONDUCTED DURING MONTH: Describe Drilling, Remedial Drilling, Redrilling, Stimulation, Testing and other Well Work Performed.

TWSP, RGE, SEC, B&M	WELL NUMBER	OPERATIONS CONDUCTED	MONTH END STATUS

Remarks: (use additional pages if needed)

*A Disposal well is used to inject fluids into the same formation or reservoir from which they are produced. An injection well is used for injection of fluids which are not produced from the formation or reservoir.

Form USGS 9-1968

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY, CONSERVATION DIVISION

Form Approved
Budget Bureau No. _____

GEOTHERMAL UTILIZATION PERMIT

The U.S. Geological Survey requires this form or other Supervisor approved form to be prepared and filed in triplicate with requisite attachments with the Supervisor. The Supervisor must approve this permit prior to any lease operations.

1. NAME AND ADDRESS OF LESSEE

2. NAME AND ADDRESS OF OPERATOR

3. NAME AND ADDRESS OF CONTRACTOR AND/OR FACILITY DESIGNER

4. LEASE SERIAL NO. UPON WHICH FACILTY IS LOCATED

5. LEASE SERIAL NO(S). SERVING FACILITY

6. SURFACE MANAGER: BLM ( ) FS ( ) Other ( )

7. UNIT AGREEMENT NAME

8. WELL NO., FACILITY NO. OR DESIGNATION

9. FIELD OR AREA

10. SEC. T., R., B.& M.

11. COUNTY

12. STATE

13. TYPE OF FACILITY: INDIVIDUAL WELL ( ) RESEARCH & DEMONSTRATION ( ) PLANT ( ) OTHER ( )

ESTIMATED PROJECT LIFE:

14. LOCATION OF FACILITY (1/4, 1/4, 1/4 SECTION)

15. NET GENERATING CAPACITY
ELECTRIC (MW) HEAT (Btu)

16. GROSS GENERATING CAPACITY
ELECTRIC (MW) HEAT (Btu)

17. NAME OF RESOURCE PURCHASER/USER (If other than lessee/operator)

18. NO. OF ACRES AFFECTED BY FACILITY CONSTRUCTION

19. APPROXIMATE START OF CONSTRUCTION

20. APPROXIMATE DATE OF START-UP

21. ELEVATIONS: ESTIMATED ( ) FINAL ( )
REFERENCE DATUM: GR ( ) MAT ( ) Other ( )

22. DESCRIPTION OF PROPOSED UTILIZATION PROGRAM (Include a brief description of the facility, method of operation, manner of proposed utilization of the resource and the anticipated by-products and their proposed uses)

(Use additional sheets if necessary)

23.

SIGNED: _____ TITLE: _____ DATE: _____

(This space for Federal use)
Approval is hereby granted for the construction of a geothermal utilization facility.

PERMIT NO. _____ APPROVAL DATE _____

APPROVED BY _____ TITLE _____

CONDITIONS OF APPROVAL, IF ANY:

Whereas all requirements set forth in the subject leases, laws, regulations and orders have been satisfied, approval to operate the geothermal utilization facility is hereby granted. This permit shall be effective for a period of _____ from the date the facility is certified as operational by the Geological Survey.

CERTIFIED BY _____ DATE _____ APPROVED BY _____ DATE _____
District Geothermal Supervisor Area Geothermal Supervisor

This permit is required by law (30 U.S.C. 1023); regulations: 30 CFR 270.71-1; Federal Geothermal Lease Terms and Stipulations and other regulatory requirements. The United States Criminal Code (18 U.S.C. 1001) makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

(See instructions on reverse side)

INSTRUCTIONS

GENERAL: This form shall be used for applications to construct and operate any utilization facility on Federally leased lands or lands under a unit or cooperative agreement. Approval to operate the utilization facility shall be obtained subsequent to the approval for construction, as provided for on this form, and shall not be granted until all necessary requirements have been satisfied.

GRO Order No. 6: Pipelines and Surface Production Facilities

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CONSERVATION DIVISION

GEOTHERMAL RESOURCES OPERATIONAL ORDER NO. 6

Effective January 1, 1977

PIPELINES AND SURFACE PRODUCTION FACILITIES

This Order is established pursuant to the authority prescribed in 30 CFR 270.11. The design, operation, and testing of all pipelines and surface facilities will be conducted in accordance with the provisions of this Order. All variances from the requirements specified in this Order shall be subject to approval pursuant to 30 CFR 270.48. References in this Order to approvals, determinations, or requirements are to those given or made by the Area Geothermal Supervisor (Supervisor) or his delegated representative.

The design of all pipelines and surface facilities, including but not limited to, production, injection, and waste water disposal systems, shall be submitted with the Application for Permit to Drill or on a Sundry Notice to the Supervisor for approval prior to construction. In addition, a Plan of Operation with contents and approval according to 30 CFR 270.34, shall be required when surface or environmental disturbances are anticipated beyond those covered by a previously approved Plan of Operation.

1. Design and Construction Requirements. All geothermal pipelines and surface facilities shall be designed and constructed in accordance with the following:

A. General Design

(1) Thermal Expansion. All pipelines and production facilities shall be designed to prevent failure in tension or compression due to thermal stresses based on limitations specified in applicable piping codes. Pipelines shall be anchored to isolate or transfer stress to the ground or solid structure, and to prevent unsafe movement in case of line failure. Main anchor locations are to be predicated on the surface configuration of the area, and may be required at pipe ends, at changes in direction, at shut-off valves, at manifolds where lines are interconnected, or at other points as dictated by the expansion design adopted. Intermediate anchors may be required to divide the pipeline into separate expanding sections and to bear any unbalanced

thrust. Intermediate supports between anchors should allow free lateral and longitudinal movement. Vibration, expansion direction and magnitude, and internal tubulence as well as effects of mineral scaling should be considered before including slip joints or expansion bellows in the design.

(2) Two-Phase Flow. Submission of complete design criteria and calculations may be required for planned two-phase production pipelines and surface facilities to demonstrate that the design of such facilities has given consideration to the water hammer stresses that may be caused by two-phase flow. Example stress calculations for the pipeline shall be submitted.

(3) Environmental Considerations. All pipelines and surface facilities shall be designed and constructed in accordance with the environmental protection requirements of GRO Order No. 4 and other applicable laws and regulations.

B. Safety Control Devices

(1) Production Pipelines and Related Facilities. All steam and hot water production pipelines and related surface facilities shall be equipped with the following devices except as noted in 1.B.(1)(d) below:

(a) Each producing well shall be equipped with a low pressure sensing device to actuate a valve to shut in production to minimize safety or pollution hazards caused by pipeline or facility failure.

(b) Pipelines and related surface facilities shall be protected against pressure buildup in excess of the system's design limit by high pressure sensors which will actuate either (1) well shut-in valves, or (2) system or well pressure relief valves and/or rupture discs. If only pressure relief valves and/or rupture discs are installed, it must be demonstrated that such venting in an emergency will not result in exceeding applicable pollution standards; otherwise shut-in valves shall be installed. Vented production must be properly muffled so as to comply with provisions of GRO Order No. 4. A remote controlled shut-in or venting system may be required, in addition to pressure sensors.

(c) Check valves or other approved devices shall be required in the system to prevent uncontrolled crossflow from other parts of the system in case of a line or facility failure, or where a line failure may result in pollution due to line drainage.

(d) Exceptions to requirements 1.B.(1)(a) through (c) above may be made for systems or parts of systems where the lessee can demonstrate to the satisfaction of the Supervisor that lack of such controls will not result in danger of pollution or to public health

and safety. Information to be considered in an evaluation of a requested exception should include, but is not limited to, chemical analysis of the produced fluids, steam and gases; the rate, temperature and pressure of production; environmental conditions in the area; type of geothermal reservoir system; type of resource utilization; the number, hourly coverage, and supervision of personnel operating the facilities; and the type of manually operated controls installed.

(2) Injection Facilities. All injection pipelines and related surface facilities must be designed to safely accommodate maximum expected surface injection pressures and shall be equipped with the following devices, except as noted in 1.B.(1)(d) above.

(a) Each injection well shall be equipped with a pressure sensing or other approved device to actuate a valve to shut in injection to minimize safety or pollution hazards caused by injection pipeline or facility failure.

(b) Injection pipelines and related surface injection facilities shall be protected against pressure buildup in excess of the system's design limit by pressure sensors which will actuate either (1) well shut-in valves, or wellhead or injection pipeline shut-in valves, or (2) a system of well pressure relief valves and/or rupture discs. If only pressure relief valves and/or rupture discs are installed, it must be demonstrated that such venting in an emergency will not result in exceeding applicable pollution standards; otherwise, shut-in valves shall be installed. A remote-controlled shut-in or venting system may be required, in addition to pressure sensors.

(c) Check valves or other approved devices shall be required to prevent uncontrolled backflow from injection wells in the system in case of a line or facility failure, or where a line failure may result in pollution due to line drainage.

C. Testing and Operation

(1) Pipeline Integrity Tests.

(a) Pipeline - steam. The pipes shall be joined and joints tested in accordance with appropriate piping codes for steam distribution systems. The pipeline shall be operationally tested in service with steam during the initial clean-out by pressure testing to the maximum anticipated working pressure for one hour. The Supervisor shall be notified at least 48 hours in advance of the estimated date and time of each test so that the test may be witnessed.

(b) Pipeline - water. The pipeline shall be hydrostatically tested to 1.25 times the design working pressure for a minimum of 2 hours prior to placing the line in service. Certain low pressure lines such as waste disposal drains and all piping designed for internal pressures

at or below 5 psig. regardless of temperature, may be exempted from this requirement, if authorized by the Supervisor. The Supervisor shall be notified at least 48 hours in advance of the estimated date and time of each test so that the test may be witnessed.

(2) Safety Device Tests. The automatic and remote control devices installed in accordance with 1.B.(1) and (2) above shall be tested semiannually or at more frequent intervals as required by the Supervisor. Advance notification of at least 48 hours shall be given so that the Supervisor may witness the test. The lessee shall maintain records on each device showing present status and past history, including dates and details of inspection, testing, repairing, adjustment, reinstallation or replacement, and will forward copies of these records to the Supervisor semiannually.

(3) Operator Monitoring. Production, injection, and other waste disposal systems which are not completely equipped with shut-in or relief devices, shall require 24-hour on-site monitoring by operator personnel unless it can be demonstrated to the satisfaction of the Supervisor that less frequent monitoring will not increase the danger of pollution or to human life and health. Supervisory control system monitoring by power plant or steam supply operators of steam turbine header pressure, water disposal liquid level and injection line pressure can be substituted for the above monitoring provision, if approved by the Supervisor.

2. Application for Construction of Pipeline and Related Surface Facilities. The operator shall submit the items listed below with the Application for Permit to Drill or on a Sundry Notice, in triplicate, to the Supervisor for approval. In addition, as appropriate, a Plan of Operation according to 30 CFR 270.34 items (a) through (i) may be required for submittal for joint approval by the Supervisor and the appropriate land management agency. Production and injection pipelines for wells may be included as a part of the Application for Permit to Drill and Plan of Operation required for drilling the well.

A. Maps. A plat(s) showing the major topographic features and other pertinent data including the proposed route, length, size, and location of the line(s), and any connecting facilities.

B. Equipment Plans. A schematic drawing showing the location of the following pipeline and facilities safety equipment and the manner in which the equipment functions:

(1) high-low pressure sensor(s)
(2) automatic shut-in valve(s)
(3) check valve(s)
(4) metering system(s)
(5) pressure relief valve(s)
(6) other manual or automatic valve(s) or equipment

C. Design Information. General information concerning the pipeline and facilities including the following:

(1) Product(s) to be transported by the pipeline
(2) Size, weight, and grade of the pipeline
(3) Length of line(s)
(4) Type(s) of corrosion protection
(5) Description of protective coatings
(6) Description of pipe insulation and the application of exterior color camouflage
(7) Anticipated gravity or density of the product(s) and a chemical analysis
(8) Design working pressure and capacity
(9) Maximum working pressure and capacity
(10) Pipeline integrity tests
Steam Pipeline - testing pressure and hold time to which the pipeline will be tested after installation.

Water Pipeline - hydrostatic pressure and hold time to which the pipeline will be tested after installation.

(11) Other related information as required by the Supervisor

3. Completion Report. The operator shall submit a report to the Supervisor when installation of the pipeline is completed, accompanied by all hydrostatic test data, including procedure, test pressure, hold time, and results.

Reid T. Stone
Area Geothermal Supervisor

APPROVED:

for Eddie R. Wyatt
Russell G. Wayland
Acting Chief, Conservation Division

GRO Order No. 7: Production and Royalty Measurement, Equipment, and Testing Procedures

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CONSERVATION DIVISION

GEOTHERMAL RESOURCES OPERATIONAL ORDER NO. 7

Effective January 1, 1977

PRODUCTION AND ROYALTY MEASUREMENT, EQUIPMENT, AND TESTING PROCEDURES

This Order is established pursuant to the authority prescribed in 30 CFR 270.11 and 270.12 and in accordance with 30 CFR 270.60, 270.64, 270.74, and 270.75. All geothermal production and the resulting produced energy (electricity) or byproducts, and leasehold operational utilization thereof, shall be measured and monitored in accordance with the provisions of this Order.

All variances from the requirements specified in this Order shall be subject to approval pursuant to 30 CFR 270.48. References in this Order to approvals, determinations, or requirements are to those given or made by the Area Geothermal Supervisor (Supervisor) or his delegated representatives.

All metering systems shall be approved by the Supervisor prior to installation. Field production metering shall be accomplished with sufficient accuracy to assure that royalty calculations using such measurement data will result in fair market value to the Government, and to enable evaluation of well and reservoir production performance and trends. Where royalty is due on other than a well production basis, i.e., plant output in kilowatt hours or production of byproducts, metering systems used in that regard shall also be approved by the Supervisor.

1. Metering. The general requirements and accuracy for measuring production and utilized energy or byproducts of geothermal resources are outlined below:

A. Measurement of Production. Surface facilities and measuring devices shall be installed so that the production mass flow rate (or volume, when appropriate) of water and/or steam and the pressure and temperature of the produced fluids from each well are accurately determined. If metering is not to be accomplished on a continuous basis, each well shall be gauged periodically at the frequency prescribed by the Supervisor.

The operator shall maintain detailed records available for inspection by the Supervisor concerning the performance measurements relative to each well. The record shall show average flow rates, temperature, pressure, and any other pertinent data gathered. Except for drilling and well workover operations, and low rate venting of new geothermal wells to prevent well bore damage prior to facility hook up, vented production shall also be measured and reported.

Each well shall be equipped to permit fluid sampling for determining the enthalpy and chemical content of produced geothermal fluids. Enthalpy and chemical analysis for each well shall be provided the Supervisor yearly or more frequently if required by the Supervisor.

B. Royalty Metering. Metering systems involved in the calculation of royalty values due shall be designed, installed, operated, and maintained to attain the accuracy herein specified. However, the Supervisor may require greater accuracy where conditions dictate that necessity and the technology exists, or may permit a lesser degree of accuracy when physical problems, such as severe corrosion or scaling, preclude attainment of the desired standards.

(1) Steam. Dry steam metering systems and the mass flow calculations derived therefrom shall be designed and maintained to achieve an accuracy of $\pm$4.0% of the measured flow.

(2) Hot Water. Hot water metering systems and the mass flow or volumetric calculations derived therefrom shall be designed and maintained to achieve an accuracy of $\pm$2.0% of the measured flow.

(3) Steam and Water (two-phase flow). Metering of two-phase flow shall be designed and maintained to achieve the maximum reasonable attainable accuracy consistent with the nature of the production to be measured. Due to the complexity and difficulties involved in this type of metering, the Supervisor shall establish the initial accuracy limits for each specific installation based on the nature of existing flow conditions and commensurate with the then existing state-of-the-art. The operator shall, upon request, demonstrate to the satisfaction of the Supervisor that the approved metering system(s) being employed is operating within the prescribed range of accuracy. The Supervisor is authorized, when warranted, to require modifications in the system consistent with new technology to improve the accuracy of measurement or, when required accuracy is not attainable, to direct that the two-phase fluid flow be separated and the steam and water metered individually.

(4) Heat Content. Where the heat content of produced water or steam is the primary use, including but not limited to heating a greenhouse complex, space heating, and plant processing, metering systems shall be designed and maintained to achieve an accuracy of $\pm$2.0% for both the input and discharge flows.

(5) Electrical Power Output or Consumption. Where the resource sales payment is equated to kilowatts of electric power output or geothermal-produced electricity is consumed in geothermal operations, the metering systems shall be designed and maintained to achieve an accuracy of ±0.5%.

(6) By-Products. When the by-product is in liquid form, metering accuracies shall be maintained within ±1.0%. When the by-product is a solid, measurement thereof shall be either by volume or weight and shall be accurate to ±1.0%.

(7) Waste Heat. Waste heat shall be metered in accordance with the standards set forth in 1.B.(4) when such measurements are involved in royalty calculations.

C. Non-Royalty Metering. Measurement of produced or injected fluids that are not involved directly in royalty calculations, such as waste waters or injected waters shall be metered with accuracies sufficient to evaluate well, reservoir, and project performance. Such metering systems shall be designed and maintained to achieve an accuracy of ±5.0%, unless otherwise specified by the Supervisor.

2. Commingling Production. In accordance with 30 CFR 270.64, the Supervisor may authorize a lessee to commingle production from wells on a lease with production from other leases held by the lessee or by other lessees subject to such conditions as the Supervisor may prescribe. Where utilization of the geothermal resource for energy and/or by-products involves commingling production from two or more leases, the following conditions and requirements shall be met:

A. The surface facilities, metering, and fluid sampling systems employed shall be approved by the Supervisor.

B. The commercially utilized production leaving each lease shall be measured in accordance with the standards set forth in Section 1 hereof, either on or off the leasehold, in a manner that will allow accurate allocation and royalty calculation for that lease.

3. Common Storage. Where commercial utilization involves common storage from two or more leases, e.g., a common brine evaporation pool for production of chemical by-products, the contributions of each lease to that facility shall be measured in accordance with the standards set forth in Section 1 hereof, either on or off the leasehold, in a manner that will allow accurate allocation and royalty calculation for that lease. The surface facilities, metering, and fluid sampling systems employed shall be approved by the Supervisor.

4. Meter Testing and Maintenance. All meters and metering systems shall be maintained in acceptable working condition and shall be inspected, tested, and adjusted to meet appropriate design standards.

The frequency and stringency of tests shall be prescribed by the Supervisor. The Supervisor may witness any periodic metering system test or inspection, and the operator shall schedule an acceptable time and date for such tests when requested by the Supervisor.

A. Royalty Meter Tests and Inspections. The following tests and inspections shall be performed on all meters involved in royalty calculations. Depending on inspection results, the Supervisor may alter the inspection frequencies herein specified.

(1) Orifice Meter Tests and Inspections.

(a) Visual functional inspection shall be performed as part of the daily well check. Recorders shall be inspected for malfunctions at that time and repaired if necessary.

(b) Recorders shall be inspected and the calibration checked with master test gauges at least once per month. The equipment used for the calibration check shall verify the differential and static pressure ranges. Field error of a meter exceeding $\pm$1.0% of the meter's differential and static pressure ranges shall require removal of that instrument and installation of a recalibrated instrument.

(c) Orifice plates and meter tube runs shall be inspected by the operator for wear and recalipered to the nearest thousandth of an inch. Worn plates or runs shall be remachined or replaced. The inspection period shall depend on well performance and on the production demand, but meter runs and accessory equipment shall be inspected at intervals not exceeding one year.

(2) Turbine Meter Tests and Inspections.

(a) Daily readout checks shall be made to verify functional operation.

(b) At least once every six months, the turbine meter shall be checked for accuracy with a prover. If a descrepancy in excess of $\pm$0.5% over limited range or $\pm$1.0% over stated range is noted, the meter shall be inspected for bearing wear, turbine damage, or corrosion and repaired or replaced as necessary.

(3) Electrical Meters (Power Meters).

(a) Inspect daily for function.

(b) A detailed check and inspection shall be accomplished at least once each month.

(c) At least every six months, the meter shall be calibrated with a master meter. The meter shall be repaired or replaced if a discrepancy greater than $\pm$0.5% is found.

(4) Other Types of Meters.

(a) Where metering systems depend on static and differential pressure measurements, e.g., venturi or nozzles, testing shall be as outlined above for orifice meters in 4.A.(1).

(b) Testing procedures and frequencies for all other metering systems shall be as approved by the Supervisor.

B. Non-Royalty Meter Tests and Inspections. Metering systems measuring produced or injected fluids which are not involved in royalty calculation shall normally be checked at least weekly for functional operation, and be inspected, calibrated, and/or proven at yearly intervals to demonstrate an overall accuracy of ±5.0%, unless otherwise specified by the Supervisor.

5. Application for Meter Installation. All metering systems shall be approved by the Supervisor prior to installation. Approval may be obtained by inclusion of the required details in a Plan of Exploration, Development, or Production, or where appropriate, separately by submission of a Sundry Notice, in triplicate, to the Supervisor.

Applications shall include the following information:

A. Purpose of the meter and whether it will be involved in royalty calculations.

B. Location; e.g., Well No. 53-6, SE¼SE¼, Section 6, T. 3 S., R. 10E., M.D.M.

C. What is to be metered, such as steam, water, or combination thereof, and appropriate physical characteristics, such as the temperature, pressure, density, corrosive or scaling tendencies, and a chemical analysis.

D. Anticipated average and range of daily rates to be metered.

E. If the meter is involved in royalty calculations, the estimated monthly gross dollar value that will be measured by the meter and how the measurement will be used in royalty calculations.

F. Drawing of the installation showing piping, locations of equipment, and valves.

G. If not shown in a drawing, indicate (a)type of meter, manufacturer, model number, and range of coverage; (b)pressure ratings of piping, valves, and other equipment; and, (c)design code or standards used for installation design.

H. Anticipated accuracy.

I. Proposed inspection, testing or calibration procedures and the testing schedule.

Reid T. Stone
Area Geothermal Supervisor

APPROVED:

for Eddie R. Wyatt
Russell G. Wayland
Acting Chief, Conservation Division

UNIVERSITY OF UTAH
RESEARCH INSTITUTE
EARTH SCIENCE LAB.

State of California | Department of Justice

Memorandum

To : M. G. Mefford
State Oil and Gas Supervisor
Division of Oil and Gas
1416 Ninth Street
Sacramento, CA 95814

Date : July 31, 1979

File No.:

RECEIVED
AUG - 2 1979
DIVISION OF OIL & GAS
SACRAMENTO

From : Office of the Attorney General - LA

Subject: Regulatory Authority of DOG over Geothermal Operations on Lands Patented under the Stock-Raising Homestead Act of 1916

In United States v. Union Oil Company of California, 549 F.2d 1271 (9th Cir. 1977), cert. denied 434 U.S. 930 (1977), rehearing denied 435 U.S. 911 (1978), it was held that geothermal resources were included in the mineral reservation of the federal government in its patents of lands under the Stock-Raising Homestead Act of 1916 (43 U.S.C. section 291 et seq.). Shortly after this decision was issued, you asked me what effect it would have on the authority of the California Division of Oil and Gas (CDOG) to regulate geothermal drilling operations on lands patented under the Stock-Raising Homestead Act. Because the geothermal drilling operations on these lands had been undertaken pursuant to leases issued by the private patentees, they had come within the regulatory jurisdiction of the CDOG. Now that the federal government had been determined to be the owner of the mineral interest, the regulatory jurisdiction of the United States Geological Survey (USGS) became an issue. Because of the persuasiveness of the authority to regulate geothermal drilling operations given the USGS by the Geothermal Steam Act of 1970 (30 U.S.C. section 1001 et seq.), the regulatory authority of the USGS is exclusive in those areas where it has jurisdiction. See 30 U.S.C. section 1023 and 30 C.F.R. Part 270. The problem was whether the USGS had jurisdiction over the geothermal drilling operations on lands patented under the Stock-Raising Homestead Act. I advised you that the jurisdiction of the USGS did not arise until the mineral interest had been leased by the federal government under the Geothermal Steam Act. Therefore, the CDOG retained jurisdiction to regulate geothermal drilling operations on these lands until the private leases were replaced with

federal leases issued pursuant to the Geothermal Steam Act. When that lease change occurred, the regulatory authority of the CDOG terminated and that of the USGS arose. I have been informed by you that the CDOG and the USGS agreed that this would be the proper transition of authority.

Another problem regarding CDOG authority over geothermal drilling operations on these lands has arisen in light of the passage of AB 2644 during the 1977-78 Regular Session of the California Legislature, which, inter alia, made the CDOG the lead agency under the California Environmental Quality Act (CEQA) for all geothermal exploratory projects. This authority was given by adding section 3715.5 to the Public Resources Code, which provides in part as follows:

> "For purposes of the California Environmental Quality Act (commencing with Section 21000), the division shall be the lead agency as defined in Section 21067 for all geothermal exploratory projects as defined in Section 21065.5."

According to your statement requesting this memorandum, the problem is whether the CDOG may be the lead agency for geothermal exploratory projects on lands patented under the Stock-Raising Homestead Act and leased under the Geothermal Steam Act. The answer is no. Section 21067 of the Public Resources Code defines "lead agency" as "the public agency which has the principal responsibility for carrying out or approving a project which may have a significant effect upon the environment." Since the CDOG's regulatory authority over geothermal drilling operations on lands patented under the Stock-Raising Homestead Act and leased under the Geothermal Steam Act has been preempted by the latter federal statute, it cannot be the lead agency for any geothermal project undertaken on these lands. This is merely a consequence of the fact that CEQA applies to activities approved or carried out by state and local agencies. In the case of geothermal drilling operations on

lands patented under the Stock-Raising Homestead Act, federal activities are involved and the provisions of the National Environmental Policy Act (42 U.S.C. section 4321 et seq.) would apply.

ALAN V. HAGER
Deputy Attorney General

AVH:mjp

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
WASHINGTON, D.C. 20242

IN REPLY REFER TO:
Real Estate Svcs.
Minerals

JAN 31 1972

Memorandum

To: Director, United States Geological Survey

Through: Assistant Secretary, Public Land Management

From: Commissioner of Indian Affairs

Subject: Operational Supervision of Geothermal Leases on Indian Land under the Trust Protection of the United States

It has been brought to our attention that the Branch of Oil and Gas Operations, Conservation Division, has been designated to supervise geothermal lease operations of public lands.

We respectfully request that the same functions be performed by the Geological Survey for this type activity on Indian land held in trust or restricted status.

Deputy Commissioner

AUG 11 1972

For - Geothermal Div.

Memorandum

To: Commissioner of Indian Affairs
Through: Assistant Secretary—Mineral Resources
Assistant Secretary—Public Land Management

(Sgd) John F. Mee
AUG 11 1972

From: Director, Geological Survey

Subject: Supervision of geothermal lease operations on Indian lands

This acknowledges your memorandum of January 31, 1972, requesting that the Geological Survey supervise geothermal steam lease operations on Indian lands held in trust or restricted status.

We will be glad to assume this responsibility and suggest that representatives of your office meet with the Chief, Conservation Division, of this office to discuss this matter further.

W. A. Radlinski
Acting Director

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ORDER NO. 2948

Subject: Division of Responsibility Between the Bureau of Land Management and the Geological Survey for Administration of the Mineral Leasing Laws - Onshore

Sec. 1. Purpose. The purpose of this Order is to set forth the administrative and management procedures for Departmental onshore mineral leasing and operating activities. The spirit and intent of this Order flow from the Department's mineral management objectives of: orderly and timely resources development, protection of the environment, and receipt of fair market value for leased mineral resources.

Sec. 1(a) Orderly and Timely Resource Development includes the Department's responsibilities to:

(1) Foster, promote, and encourage the exploration for and the production of the mineral deposits from the leasable lands; promote competition;

(2) Encourage the active development of the mineral deposits in the leasable lands in a manner compatible with the use of the same lands for other purposes; assure that mineral developers receive the acreage necessary for economic plant investment, development, and production;

(3) Encourage the maximum ultimate recovery of the mineral deposit; prevent waste; promote the conservation of the mineral resources;

(4) Assure adequate minimum production and diligent development requirements for mineral deposits.

(b) Protection of the Environment includes the Department's responsibilities to:

(1) Assure that mineral exploration and production be conducted with the maximum protection of the environment;

(2) Assure the rehabilitation of disturbed lands;

(3) Assure that precautions are taken to protect public health and safety; and

(4) Assure full compliance with the spirit and objectives of the National Environmental Policy Act of 1969, other Federal environmental legislation, and supporting Executive Orders and regulations.

(c) Receipt of Fair Market Value for Leased Mineral Resources includes the Department's responsibilities to assure the public a fair market value return for the use of public lands and the disposition of its mineral resources.

Sec. 2. Agency Responsibilities. The BLM exercises at the Bureau level the Secretary's discretionary authority to determine whether or not leases, permits, and licenses are to be issued. The Bureau of Land Management is responsible for issuing mineral leases, permits, and licenses, and is the office of record in mineral leasing matters. The Geological Survey is responsible for all geologic, engineering, and economic value determinations for the Department's mineral management program. These determinations include: the mineral characteristics of lease and permit areas; parcelling; amounts of bonds; royalties; unit values; rentals; mineral resource evaluations; reserves; investment, diligent development, and minimum production requirements; and all other terms and conditions relating to mineral operations under leases and permits. Geological Survey exercises the Secretary's delegated authority regarding operations conducted within the area of operation by permittees, lessees, and licensees and determines the actions to be taken by them from the standpoint of the development, conservation, and management of mineral resources under the jurisdiction of the Department. GS will refer to BLM any instances of noncompliance with lease terms requiring cancellation action, and BLM will initiate the necessary action.

For the purpose of this Order, the area of operation is defined as that area of the present and planned mine, oil and gas field, or geothermal resource field exploratory, development, and production operations, as presented in an approved exploration or mining plan, drilling permit, oil, gas, or geothermal field development plan, or plan for the abandonment of wells or operations. The area of operation may cover a fraction of a lease or permit area, or it may cover several lease or permit areas. It encompasses the general area needed for storage piles, spoils piles, tailings ponds, on-project mill sites, flow lines, separators, surge tanks, storage tanks, on-project truck or rail-loading stations, drill pads, mud pits, workshops, compressors, generators, on-project power plants, and other such facilities used for on-project mine, oil and gas field, or geothermal resource field exploratory, development, and production operations.

(a) Environmental Protection. The Bureau of Land Management, in cooperation with the Geological Survey, formulates the general requirements to be incorporated in leases, permits, and licenses for the protection of the surface and non-mineral resources and for reclamation. The Geological Survey, before approving exploration and mining plans, drilling permits, oil, gas, or geothermal field development plans, or plans for the abandonment of wells or operations, consults with the Bureau of Land Management on the adequacy of the surface use, environmental protection, and reclamation aspects of the plans and will not grant approval if inconsistent with the BLM's recommendations without further discussions with BLM. If differences remain after these further discussions, the resolution is made by the Assistant Secretary--Mineral Resources and the Assistant Secretary--Public Land Management. If required, the Under Secretary resolves any remaining differences. The BLM is responsible for compliance examinations of environmental protection requirements outside the operating area and for reporting infractions to the GS for discussions with, or orders to, the permittee, lessee, or licensee. GS examines operations to ensure compliance with environmental protection and rehabilitation requirements inside the operating area. With respect to approval of access roads, pipelines, utility routes and other surface uses outside the operating area, the Bureau of Land Management has the primary responsibility but obtains the recommendations of the Geological Survey before taking final action. Orders to operators for any remedial action is the responsibility of the Geological Survey.

(b) Expertise. The Geological Survey is responsible for maintaining engineering, geologic, geophysical, economic, and other technical expertise needed by the Department to assure compliance with applicable laws, operating regulations, and the objectives of the Department's mineral management program. The Bureau of Land Management is responsible for maintaining expertise needed by the Department for action on applications filed with BLM under the mineral leasing laws to assure compliance with applicable laws, leasing regulations, and the objectives of the Department's mineral management program.

(c) Contacts with Applicants.

(1) Prior to the issuance of mineral leases, permits, and licenses, the Bureau of Land Management will represent the Secretary in dealing with applicants.

(2) After issuance and during the exploration, development, and production phases of leases, permits, and licenses, and until a lease, permit, or license has terminated (at which time management is the sole responsibility of BLM) the Geological Survey is the sole representative of the Secretary in all matters relating to the supervision of operations.

Sec. 3. Issuance of Mineral Leases, Permits, and Licenses.

(a) Applications. Prior to the issuance of mineral prospecting permits, leases, or licenses, the Bureau of Land Management refers all applications for such permits, leases, or licenses to the Geological Survey for a report as outlined in (b) below.

(1) The Geological Survey is responsible for determining, under the mineral leasing laws and regulations, if sufficient information is known about a mineral deposit to warrant offering the deposit for lease by competitive sale and to notify the Bureau of Land Management of its determination. If the Geological Survey finds that sufficient information is not available to warrant competitive leasing, it notifies the Bureau of Land Management of its conclusions so that the Bureau of Land Management may issue a prospecting permit or noncompetitive lease, as appropriate. The Geological Survey establishes prospecting requirements for prospecting permits. When lands are to be leased, the Geological Survey determines and reports, as appropriate, on: the mineral characteristics of lease and permit areas; parcelling; amounts of bonds; royalties; unit values; rentals; mineral resource evaluations; reserves; investments; diligent development and minimum production requirements; and all other terms and conditions pertaining to lease operations, including environmental and surface rehabilitation stipulations relating to mineral exploration and extraction. With respect to applications for licenses, the Geological Survey determines and reports as to whether the license may be issued.

(2) The Geological Survey is responsible for determining whether a prospecting permittee has demonstrated that the lands contain a mineral deposit having the characteristics required by law and regulations to qualify for a preference right lease and to notify the Bureau of Land Management.

(3) The Bureau of Land Management refers to the Geological Survey all other type applications received which, if approved, may affect operations on existing permits, leases, or licenses.

(4) The Bureau of Land Management notifies the Geological Survey of known oil, gas, and geothermal resource geophysical exploration activity, including the area involved, the type of survey employed, and the name of the operator.

(5) All applications for noncompetitive oil and gas, mineral, and geothermal resource leases filed with the Bureau of Land Management will, prior to issuance of a lease, be referred to the Geological Survey for a determination as to whether the lands are within a known geologic structure (KGS), a known geothermal resource area (KGRA), or a known leasing area (KLA).

(b) Mineral Resource Evaluation Report. GS is responsible for submitting a report of its findings, mineral resource evaluations, and resultant recommendations to the BLM, together with a summary explanation of how the resource evaluations were developed from geophysical, geologic, economic, and engineering data available at the time of the evaluation. The BLM reviews these findings and recommendations in light of multiple-use management requirements and will not issue leases or permits inconsistent with the findings and recommendations without further discussion with GS. If differences remain after further discussion, the resolution is made by the Assistant Secretary--Mineral Resources and the Assistant Secretary--Public Land Management. If required, the Under Secretary resolves any remaining differences.

(c) Competitive Lease Sales. The Bureau of Land Management advertises and conducts competitive lease sales. The Geological Survey's resource evaluations will be used and the Geological Survey will have representatives at the sale and renders a post-sale recommendation to BLM regarding acceptance or rejection of the bids, which must be confirmed in writing.

(d) Files and Records. BLM maintains the official application, permit, and lease case files and forwards to the Geological Survey a copy of each permit, lease, and license, together with copies of relevant correspondence thereafter conducted by the Bureau. The GS forwards to the BLM copies of mining and exploration plan applications, drilling permit applications, and relevant items submitted by the applicants directly to the GS, except confidential proprietary information cited under paragraph (e) below.

(e) Security of Information. The Geological Survey is responsible for receiving and protecting for the confidential use of the Federal Government all proprietary geological, geophysical, engineering, economic, statistical, or other information, mineral resource data, and well logs required to be submitted under Title 30 CFR, Parts 200, 211, 216, 221, 231, 270, and related regulations. The Survey Office receiving such information is designated the Office of Control for those data. Authorized officials of BLM or other surface-managing agencies having a need to see such information will normally make appropriate arrangements to visit the Office of Control for access to such data and for technical advice based on it pertinent to their management responsibilities.

Sec. 4. Mineral Reports. The Geological Survey is responsible for preparing and submitting to the Bureau of Land Management mineral classification and evaluation reports with respect to the leasable mineral value of lands within proposed exchanges, withdrawals, sales, land entries, or other disposals and all other land transactions. The Geological Survey, upon request, also prepares and furnishes mineral reports and other information to the Bureau of Land Management needed for its use in long-range multiple-use planning or inventory of the public lands.

Sec. 5. General Relationships. Such additional references, reports, interchange of information, and advice shall be made by or between the Bureau of Land Management and Geological Survey as may be necessary to perpetuate or improve current practice and provide effective administration of the mineral leasing laws.

The Bureau of Land Management and the Geological Survey must submit to each other for review and recommendations any proposed changes in standard lease terms, regulations, instructions, or other changes that would affect each agency's management responsibilities.

Sec. 6. Implementation of Order. It is intended that there will be no duplication by the BLM or GS of the functions assigned by this Order. BLM and GS will promptly bring their manuals and instructions into agreement with the terms and the spirit and intent of this Order.

Sec. 7. Revocation. The Secretary's instruction (procedures relating to the administration of the mineral leasing laws - General Land Office and Geological Survey) dated September 22, 1925 (51 L. D. 219) is revoked.

(sgd) Rogers C. B. Morton

OCT - 6 1972

Secretary of the Interior

[Order No. 3008]

GEOTHERMAL RESOURCES

Research and Development Operations on Unleased Lands

Subject: Geothermal resources research and development operations conducted on unleased lands under the jurisdiction of the Secretary of the Interior.

SECTION 1. *Purpose.* The purpose of this Order is to insure that geothermal resources research and development operations, carried out pursuant to research, development, and technology demonstration programs on unleased lands under the jurisdiction of the Secretary of the Interior, are conducted in accordance with the same operational requirements as are applicable to geothermal resources operations conducted on lands leased pursuant to the Geothermal Steam Act of 1970 (30 U.S.C. 1001-1025).

SEC. 2. *Compliance with Operating Regulations.* Bureaus and Offices within the Department of the Interior having jurisduction or control over unleased lands, as a condition of permitting entry on said lands by individuals, public or private agencies, institutions or organizations for the purpose of conducting any geothermal resources research and development program, shall require that all drilling, well testing, production or related activities be conducted in accordance with the provisions of Title 30 CFR 270 and the Geothermal Resources Operational (GRO) Orders issued pursuant to said regulations. As a further condition of permitting entry on unleased land for these purposes, the authorizing Bureau or Office shall require that the project area and all wells and facilities thereon be open at all reasonable times for inspection by appropriate officials of the permitting Bureau or Office who are responsible for enforcing compliance with Title 30 CFR 270 and the GRO Orders.

Bureaus and Offices within the Department who sponsor or conduct geothermal resources research and development projects on lands under their control or jurisdiction shall likewise insure that those operations are conducted in accordance with Title 30 CFR 270 and the GRO Orders.

SEC. 3. *Cooperation.* Bureaus and Offices within this Department, as a further condition of permitting entry on unleased lands under their control or jurisdiction for the purpose of conducting geothermal resources research and development projects, shall require the permittee to furnish the Director, Geological Survey, or his designated representative, a copy of all notices, reports, well logs, maps, plats, temperature surveys, geophysical and geological data, records, and all other information collected as a result of the activities conducted. Bureaus and Offices within the Department are likewise to furnish the Director, Geological Survey, with a copy of all such notices, reports, technical data, and information which are collected as a result of geothermal resources research and development projects which are sponsored or conducted by said Bureaus and Offices.

SEC. 4. *Information and Advice.* Except as specifically prohibited by statute or regulation, authorized employees of the Geological Survey may provide technical advice, and shall make available to appropriate individuals, agencies, institutions, or organizations, who are permitted entry in conformity with this Order, such records and information as may be necessary or appropriate for the most efficient performance of those activities and operations.

SEC. 5. *Fiscal.* Any necessary fiscal arrangements and personnel adjustments may be effected to accomplish the purposes of this Order.

SEC. 6. *Effective Date.* This Order is effective immediately and shall remain in effect until it is amended, superseded, or revoked.

Dated: August 19, 1977.

James A. Joseph,
Acting Secretary.

[FR Doc. 77-25061 Filed 8-29-77; 8:45 am]

MEMORANDUM OF UNDERSTANDING
REGARDING THE NORTHERN CALIFORNIA POWER AGENCY GEOTHERMAL UNIT #2 POWER PLANT AT THE GEYSERS, SONOMA COUNTY, CALIFORNIA

This agreement entered into this 11th day of November, 1978, by and between the United States Geological Survey, hereinafter referred to as USGS; the United States Bureau of Land Management, hereinafter referred to as BLM; the United States Department of Energy, hereinafter referred to as DOE; and the California State Energy Resources Conservation and Development Commission, hereinafter referred to as CEC;

W I T N E S S E T H

WHEREAS, the Northern California Power Agency, hereinafter referred to as NCPA, proposes to construct and operate a 110-Mw geothermal-powered thermal power plant on federally-owned and leased lands in the Geysers, Sonoma County; and

WHEREAS, NCPA has filed, pursuant to 43 CFR 3250 et seq., with BLM a license application (LA) to construct the plant on federally-owned land; and

WHEREAS, NCPA has filed pursuant to 30 CFR 270 et seq. with USGS, a plan of utilization (POU) for the construction and operation of the plant; and

WHEREAS, NCPA has filed pursuant to 10 CFR 790 et seq., with DOE, an application for a Federal Geothermal Guaranteed Loan to provide guaranteed financing for the construction of the plant; and

WHEREAS, NCPA has filed with the CEC, pursuant to Public Resources Code section 25500 and implementing regulations a notice of intention to file an application for certification (NOI); and

WHEREAS, the NCPA project may in the view of the CEC have a "substantial adverse impact" (as such is defined by the California Environmental Quality Act, hereinafter CEQA) upon the environment, including, but not limited to, impacts on air and water quality, waste disposal, fish and wildlife, agricultural and growth effects which must be considered by the CEC when reviewing and acting on the project pursuant to CEQA and other applicable state laws; and

WHEREAS, the NCPA project may significantly affect the quality of human environment, within the meaning of the National Environmental Policy Act, hereinafter NEPA, thus the environmental impact must be considered by USGS, BLM and DOE when reviewing and acting on the project pursuant to NEPA, and other applicable federal laws; and

WHEREAS, the additional informational requirements of the respective permitting authorities relative to the approval of the construction of a power plant are similar; and

WHEREAS, it is in the mutual beneficial interest of the USGS, BLM, DOE, and CEC to share in the task of the preparation of the appropriate environmental document, the collection of other data pertinent to the plant construction and to conduct the necessary public hearings on the proposed power plant and environmental document on the proposed NCPA project, jointly

wherever practicable, so as to reduce the dupl ation of staff efforts, share respective staff expertise and information already generated and to promote intergovernmental coordination at the state and federal levels, thus serving the goal of producing more efficient environmental review and power plant permitting process, and the public interest;

NOW THEREFORE, in consideration of the mutual covenants, conditions and promises hereinafter set forth is agreed as follows:

I. ENVIRONMENTAL STUDY

1. USGS, BLM, DOE, and the CEC agree to combine their efforts to prepare a joint environmental study, hereinafter referred to as the study, as set forth in this agreement and in accordance with provisions of NEPA and CEQA.

2. The study shall address itself to the impacts on the environment of the proposed NCPA project as well as alternatives thereto, including, but not limited to, air, water quality, fish and wildlife, agriculture and land use impacts at the proposed location.

3. The general tasks to be performed are outlined immediately below. Specific implementation measures are stated in paragraph 4 following:

a. Each agency (USGS, BLM, DOE and CEC) shall appoint a project representative. An agency may change its designated representative upon notice to other parties. The CEC project representative shall be overall project

leader for the preparation of the study. All contacts, to the extent possible, with NCPA, shall be made through the CEC project leader.

b. The CEC project representative shall in conjunction with the other present representatives prepare or cause to be prepared a draft study, which shall be consistent with the project description, format, outline and the provisions of CEQA and NEPA.

c. The study shall be prepared with all information which USGS, BLM, DOE or CEC believe is necessary in order for the document to properly evaluate the project, provided that use and inclusion of such information is not in violation of applicable laws and regulations.

d. The draft study may be organized to include by reference or appendices technical information, environmental data assessments, and other documents provided that such appendices are separate from the study itself, and the source of such appendices or information is included.

e. The final study shall also address the concerns and comments of public agencies and the general public. To this end, public review of the draft study shall take place through appropriate state and federal procedures jointly wherever practicable. The USGS, BLM, DOE, and CEC shall address public comments before certifying/determining the study as final and complete.

4. The provisio of paragraph 3 shall be implemented as follows:

a. The names, addresses and business phones of the initial agency project representatives are:

Mr. Robert Kent
United States Geological Survey
345 Middlefield Road
Menlo Park, CA 94025
(415) 323-8111

Mr. Joel Verner
Bureau of Land Management
P. O. Box 940
555 Leslie Street
Ukiah, CA 95482
(707) 462-3873

Ms. Kathryn Matthews (Environmental Team Leader)
California Energy Commission
1111 Howe Avenue
Sacramento, CA 95825
(916) 445-8094

Mr. Raymond A. Brechbill
Department of Energy
1333 Broadway
Oakland, CA
(415) 273-7964

b. Within ten days of receipt of an NOI by the CEC, the project coordinators shall meet to establish a preparation plan which shall include but not be limited to the following:

1) outline a time schedule;

2) design study format;

3) determine the possible scope of the proposal, significant issues to be addressed and the alternatives to be considered;

4) identify and eliminate nonsignificant issues from detailed study;

5) agree on data requirements, inventory methodologies and the level of detail for each resource component;

6) agree on assignments for the participating agencies for the preparation of specific sections of the study;

7) prepare a mailing list of interested or affected entities or individuals; and

8) agree on a plan for public involvement in the preparation of the study.

c. Each agency shall thereafter prepare the direct section(s) assigned to it, if any, in accordance with the preparation plan. The completed draft section(s) from the participating agencies shall be forwarded to CEC for incorporation into a predraft study. The predraft study shall be submitted to USGS, BLM, and DOE for review. Within fifteen days of receipt of the predraft, each of the parties to the agreement shall approve or provide comments on the prestudy to the CEC. The draft study shall not be issued without the informed concurrence of all parties.

5. In order to obtain comments from public agencies and input from the general public on the impacts of the project, the approved draft study shall be submitted to the appropriate federal, state, and local agencies and interested persons for review and comment. If deemed necessary by any party, a public hearing or hearings, in addition to the public hearings required for the ultimate approval of the power plant construction, may be conducted

by one or more parties, regarding the draft study. Such public hearing shall be noticed in accordance with the agencies' usual procedures, and shall be conducted jointly whenever possible.

6. After completion of the public review of the draft, the comments received shall be analyzed by each party and environmental issues raised in the review process shall be addressed in the final study.

7. Upon completion of the final study, notification shall be made by the CEC to the State Resources Agency pursuant to CEQA.

8. In the event of disputes as to scientific issues relating to the study, the study shall contain the conflicting viewpoints. Disputes other than scientific shall after the project representatives have exhausted every means of resolution, shall be referred to the next higher level of authority in the respective agencies for resolution.

II. PROJECT REVIEW AND DECISION

It is recognized and understood by all parties to this agreement that each must issue its appropriate agency license, permit, approval or decision for the NCPA project in accordance with its individual procedures. It is also recognized that each of the parties' license, permit, approval or decision may affect the license, permit, approval or decision of the other parties if differing conditions are placed on the respective decisions. It

is therefore the desire of the parties to ensure consistency of decisions to the maximum extent possible.

In order to fulfill the above understandings, the staffs of each party shall cooperate with one another and may participate in the review proceedings of the other parties.

The parties further agree to take whatever further steps they deem necessary, including further agreements or amendments to this memorandum, in order to fulfill the purpose of this memorandum.

III. GENERAL

1. It is the intent of the parties to the agreement to make the appropriate final determination regarding the project within one year from the date of the receipt of the NOI by the CEC to the extent allowable by law.

2. Amendments to any section or term of this agreement shall be made on mutual agreement provided in writing by BLM, USGS, DOE and CEC.

3. BLM, USGS, DOE and CEC may terminate their participation in the agreement upon thirty days written notice served upon the other parties. The party electing to terminate the agreement shall state in writing its reason for desiring the termination and provide such to the other parties. During the ensuing thirty day period all parties shall actively attempt to resolve any disagreements so that the termination of this agreement may be avoided.

4. In the event of termination of this agreement, CEC shall prepare the appropriate document as required under CEQA and other statutory requirements, and BLM, USGS, and DOE jointly or separately shall prepare the appropriate document as required by NEPA and other statutory requirements. The parties shall continue, however, to share and exchange information during the preparation of the environmental documents and project review in order to avoid duplication and excess expense.

5. Unless terminated as set forth above, this agreement shall continue until a final decision has been made by all parties.

IN WITNESSETH THEREOF, the parties hereto have caused this Memorandum of Understanding to be duly executed on the respective date set forth opposite their signatures.

SIGNATURE PAGE

Attached to and made a part of the Memorandum of Understanding regarding the Northern California Power Agency Geothermal Unit #2 Power Plant at The Geysers, Sonoma County, California.

Dated:

United States Geological Survey

By _____
Wright Sheldon
Acting Manager, Conservation Division

Dated:

Bureau of Land Management

By _____
Dean Stepanek
District Manager

Dated:

Department of Energy

By _____
Ruth C. Clusen
Assistant Secretary for Environment

Dated:

Energy Resources Conservation
and Development Commission

By _____
Richard L. Maullin
Chairman

June 1976

MEMORANDUM OF UNDERSTANDING

FOR THE GEOTHERMAL PROGRAM

U. S. GEOLOGICAL SURVEY - BUREAU OF LAND MANAGEMENT -

U. S. FISH AND WILDLIFE SERVICE

COOPERATIVE PROCEDURES IN THE GEOTHERMAL PROGRAM

TABLE OF CONTENTS

MEMORANDUM OF UNDERSTANDING
FOR THE GEOTHERMAL PROGRAM

U. S. GEOLOGICAL SURVEY - BUREAU OF LAND MANAGEMENT -
U. S. FISH AND WILDLIFE SERVICE

The following guidelines are for the mutual cooperative efforts of the U. S. Geological Survey, Bureau of Land Management, and U. S. Fish and Wildlife Service in implementing the Federal geothermal resources program pursuant to the Geothermal Steam Act of 1970.

Abbreviations used hereafter for the various agencies, offices, and reports are as follows:

BLM	-	Bureau of Land Management
BLM-DO	-	Bureau of Land Management District Office
BLM-SO	-	Bureau of Land Management State Office
GS	-	U. S. Geological Survey
GS-RCM	-	U. S. Geological Survey, Regional Conservation Manager
AGS	-	Area Geothermal Supervisor
GS-AG	-	U. S. Geological Survey Area Geologist
GS-DG	-	U. S. Geological Survey District Geologist
FWS	-	Fish and Wildlife Service
FWS-RO	-	Fish and Wildlife Service Regional Office
FWS-AO	-	Fish and Wildlife Service Area Office
EAR	-	Environmental Analysis Record (prepared by BLM)
EA	-	Environmental Analysis (prepared by GS)
GEAP	-	Geothermal Environmental Advisory Panel (Sec. Order 2962)

1. Priorities and Scheduling of Lease Sales and Non-Competitive Leasing. (Primary responsibility - BLM)

Primary contacts will be the AGS, the FWS-RO, the BLM-SO involved.

(a) Competitive Lease Sale Scheduling.

BLM-SO may on its own motion, on recommendation from GS, or through nominations from industry, select areas for and schedule competitive lease sales in Known Geothermal Resource Areas (KGRA's). The BLM-SO will consult with GS-RCM as to KGRA leasing priorities, recommendations for lease stipulations, total area to be covered by the EAR, and overall priority and scheduling of the EAR and the sale. The BLM-SO will consult with FWS-AO and RO concerning fish and wildlife resources and related habitat, and regarding recommended stiputations and mitigating measures to protect these resources.

Generally, the areas to be covered by the EAR, prepared by BLM-DO, should include the maximum number of non-competitive lease applications in the vicinity of the KGRA. Determination of priority of scheduling lease sales will generally be based upon the geothermal potential of the area, its environmental sensitivity, and industry, interest. If nominations are either solicited or received from industry, BLM-SO will send an information copy of nominations to AGS, Menlo Park, and the FWS-AO.

(b) Scheduling for Non-Competitive Leasing.

Where non-competitive leasing only is involved, BLM-SO should consult with AGS and FWS-RO to determine area, priority, and scheduling

of EAR's. Where withdrawn lands are involved, the BLM-SO shall consult with the appropriate land management agencies with the basic authority to permit leasing. The criteria for scheduling of EAR's to be prepared by the BLM-DO should include geothermal potential of the area, its environmental sensitivity, and industry interest. AGS will furnish, upon request by BLM-SO, a priority listing of potential geothermal areas with copies to the FWS-RO.

2. Environmental Analysis Considerations

(a) Pre-Lease Environmental Analysis Record (EAR). (Primary responsibility - BLM)

(1) Upon initiation or revision of an EAR for either competitive or non-competitive leasing, BLM-DO will notify in writing the AGS and the FWS-AO of the area covered by the EAR. The AGS and FWS-AO will furnish BLM-DO with technical advice and information for consideration in the EAR, including recommended stipulations and mitigating measures. BLM-DO should specify deadline for such input with a minimum of 30 days advance notice. Maximum lead time should be provided.

(2) BLM-DO will furnish a copy of the draft EAR, with proposed special lease stipulations, to the AGS and FWS-AO and FWS-RO for review and comments prior to submission of EAR to BLM-SO.

(3) BLM-SO will furnish AGS the final BLM stipulations which are to be attached to non-competitive leases, or included in the notice of competitive lease sale, for the AGS review and concurrence with the stipulations. FWS-RO will be furnished a copy of the stipulations for review and comment.

(4) BLM-SO will furnish AGS and FWS-RO with two copies each of the final EAR.

(b) Post-Lease Environmental Analysis (EA). (Primary responsibility - AGS)

(1) For each proposal which requires a Plan of Operations, an Environmental Analysis (EA) will be prepared by the AGS. The AGS will request the technical advice on fish and wildlife matters, surface management, and environmental expertise of the BLM-SO and FWS-AO. The FWS-AO and the BLM-SO will provide technical advice and information in their areas of expertise to AGS for consideration in the EA which will include the recommended surface protection and reclamation requirements.

(2) When the GEAP chooses to review the draft EA, BLM-DO and FWS-RO will also be sent copies of the AGS draft EA for its review and comment.

(3) In every case, BLM-SO and FWS-AO and GEAP will be provided with a copy of the final EA.

3. Competitive lease Sales. (Primary responsibility - BLM)

In steps (a) through (h) below, the GS contact will be the AGS, and the FWS contact the appropriate FWS-AO. In step (d) below, the BLM contact will be the BLM-DO involved. For all other lease sale matters, the appropriate BLM-SO involved will be the primary contact.

(a) To facilitate the sale procedure BLM-SO shall notify AGS and FWS-AO in writing at least 90 calendar days prior to sale date concerning:

(1) Areas within KGRA to be considered for competitive lease sale.

(2) Problems as they may relate to parceling; i.e., grandfather rights, environmentally sensitive areas (described by legal subdivision), pending law suits or restraining orders, etc.

(3) Any identifiable proposed lease stipulations even though there may be subsequent additions to or modification thereof.

(4) Request GS-RCM recommendations for parceling of tracts or leasing units and for rental and royalty rates at least 60 days prior to scheduled sale date.

(b) It will be BLM-SO responsibility to establish priority of processing and scheduling with input from the GS-RCM and FWS-RO

(c) GS-RCM will recommend rental and royalty rates and parceling into tracts or leasing units for the competitive sale, submitting such information with 30 calendar days from date of request, whenever possible, to BLM-SO.

(d) EAR preparation will be the responsibility of the BLM-SO as outlined in Section 2(a).

(e) Publication of Lease-Sale Notice will be the responsibility of the BLM-SO. AGS concurrence must be recieved prior to publication. The BLM-SO will send a copy of the lease sale notice and lease stipulations to the AGS and the FWS-AO for final review, allowing at least 10 working days for comment.

(f) GS-RCM will prepare a pre-sale geothermal resources economic evaluation for all tracts in the sale. Prior to the scheduled sale the GS-RCM or his designee shall be available to meet with the BLM-SO

and present the technical evaluation of the offered tracts and be prepared to discuss the geologic, engineering, and economic factors upon which the evaluation have been prepared.

(g) Immediately after the sale, the GS-RCM evaluation committee will meet to study the results of the sale. The committee will review its geologic, geophysical, economic and engineering data on all tracts and identify those tracts recommended for acceptance and for rejection supporting the recommendations with appropriate technical information. Immediately following this evaluation, the BLM-SO and GS-RCM committee will meet jointly and the GS-RCM or his designee shall present the GS technical evaluation of and recommendations on each tract for which bids have been received. The GS-RCM will submit his recommendations in writing to the BLM-SO.

(h) BLM-SO will send two copies of the executed lease, including lease terms, to the AGS for his records.

4. Non-Competitive Lease Applications (Primary responsibility - BLM)

(a) Serial Register Page.

The BLM-SO receives applications for non-competitive leases, prepares Serial Register Pages, and processes applications (at end of filing period) to determine if acceptable and if lands are available. Where an agency other than BLM administers withdrawn or acquired lands, BLM-SO will obtain a title report from that agency. The BLM-SO will send information copy of Serial Register Page to BLM-DO, AGS, and the FWS-AO.

(b) Competitive Interest Overlaps.

After reviewing each month's applications BLM-SO will send GS two copies (one to AGS and one direct to the GS-AG ro GS-DG listed below) of those applications which result in competitive interest overlap as defined by 43 CFR 3200.0-5(k)(3); a copy of the land status plat showing applications and overlaps will also be sent to the GS-AG or GS-DG listed below. GS-RCM will review competitive interest overlap as soon as practical after receipt from BLM-SO. GS-RCM will notify BLM-SO as soon as KGRA's have been defined.

For Applications within States of:	Send Overlap Information to:
Montana	GS-DG, Billings, Montana
Wyoming	GS-AG, Casper, Wyoming
Utah	GS-DG, Salt Lake City, Utah
Colorado	GS-AG, Denver, Colorado
New Mexico	GS-AG, Roswell, New Mexico
Alaska	GS-AG, Anchorage, ALaska
California, Oregon, Washington, Idaho, Nevada, Arizona	GS-AG, Menlo Park, California
Eastern States	GS-AG, Washington, D. C.

(c) Environmental Considerations.

BLM-DO will prepare an EAR requesting input and technical advice and information from the AGS, the FWS-AO and other agencies as necessary.

(d) KGRA Clear Listing - Issuance of Lease

BLM-SO will prepare lease forms and develop lease stipulations in consultation with the AGS, which will be sent to the AGS for final review and concurrence. Upon receipt of AGS concurrence, BLM-SO will forward lease form for applicant's signature. Upon receipt of lease signed by applicant, BLM-SO will forward lease forms to the AGS for final clear listing. The AGS will forward lease forms to the appropriate GS-AG or GS-DG who will then submit a KGRA clear listing report and return the lease forms to the BLM-SO. The GS-AG or GS-DG will also provide the AGS with an informational copy of the clear listing report. The BLM-SO will then issue the lease providing the AGS with two copies, including the stipulations.

5. Pre-Lease Exploration Permit (Primary responsibility - BLM)

(a) Upon receipt of a Notice of Intent to Conduct Geothermal Resources Exploration Operations, the BLM-DO will forward a copy of the Notice of Intent and any attachments to the AGS and the FWS-AO. This may include appropriate stipulation or documents relating to access routes across BLM lands.

The AGS and FWS-AO will notify the BLM-DO within five working days of any recommended stipulations considered desirable. The BLM-DO will send the AGS a copy of the approved permit.

(b) It will be the responsibility of the BLM-DO to see that the operator conducts exploration in accordance with regulations and terms of the permit. AGS and FWS-AO personnel are available, on request, to assist in supervision of operations under such permit.

(c) The BLM-DO will send the AGS a copy of the Notice of Completion of Exploration Operations for his records (Form 3200-10).

6. Post-Lease Notice of Intent to Conduct Geothermal Resources Exploration Operations (Primary responsibility - GS)

(a) Upon receipt of a Notice of Intent to Conduct Geothermal Resource Exploration Operations from an operator on an existing lease (as required by 30 CFR 270.78), the AGS will immediately forward a copy of the Notice and the required Plan of Operation to the BLM-DO and FWS-AO. The BLM-DO and FWS-AO will recommend any additional surface protection, reclamation requirements, and fish and wildlife protection measures including mitigations within their area of expertise.

(b) Upon receipt of the Notice of Intent and the required Plan of operation, an Environmental Analysis (EA) will be prepared by the AGS.

(c) It will be the responsibility of the AGS to see that exploratory operations on the lease concerned are conducted in accordance with regulations, GRO Oders, the approved Plan of Operation and Notice of Intent. The AGS will notify the BLM-DO in writing if the permittee does not comply with surface protection, fish and wildlife protection measures, reclamation requirements, and the corrective action taken or recommended. In cases of emergency, where serious surface or environmental damage occurs, or appears imminent, the BLM-DO may, if the AGS or his representative is not immediately available, issue a stop order to the lessee or his representative and then immediately notify the AGS.

7. Plan of Operation and Application for Permit to Drill (APD)

(Primary responsibility - GS)

(a) Upon receipt by the AGS of an Application for Permit to Drill, the AGS will immediately send a copy of the Plan of Operation (per 30 CFR 270.34) and APD (form 9-331C with proprietary information deleted as necessary) to the BLM-DO, the FWS-AO and the FWS-RO.

(b) For exploratory wells, and for all other drilling operations where GS, BLM, or FWS considers such necessary, the AGS will schedule with BLM-DO, FWS-AO, and the operator, a joint on-site inspection and discussion of the proposed operation and proposed access routes over BLM lands. The operator will normally be encouraged to discuss the proposed action and conduct the on-site inspection with the BLM-DO, AGS, and FWS-AO, prior to writing his drilling program and Plan of Operation.

(c) If BLM-DO, FWS-AO, or AGS consider that additional information is necessary in the Plan of Operation, the AGS shall request the operator to provide such input as deemed necessary.

(d) When such additional information is requested, the operator will submit a final Plan of Operation or supplements to the Plan of Operation to the AGS who will forward a copy of same to BLM-DO and the FWS-AO.

(e) The BLM-DO and the FWS-AO will notify the AGS in writing of any special conditions which are recommended for inclusion in the approved plan of Operation.

(f) Upon receipt of the Plan of Operation, an EA will be prepared by the AGS. The EA prepared for subsequent well operations or for the post-lease Notice of Intent to Conduct Geothermal Resource Exploration Operation may vary in level of detail depending on the nature of the operation, the sensitivity of the area, and other appropriate considerations.

(g) The AGS will prepare and sign a letter of approval of the Plan of Operation containing conditions of approval mutually agreeable to both the BLM-DO and the AGS, and send the signed letter to the BLM-DO for approval.

(h) BLM-DO will sign the letter to complete the joint approval of Plan of Operation and forward an approved copy to lessee and an executed copy to the AGS and FWS-AO. The BLM-DO also forwards other documents relating to access over BLM lands outside the leased area to the operator with an information copy to the AGS and FWS-AO

(i) The AGS will then approve the Application for Permit to Drill (Form 9-331C) and furnish a copy to the BLM-DO and the FWS-AO.

(j) The AGS will be responsible for compliance inspections of all operations conducted under the Plan of Operation and Application to Drill in the Area of Operations. However, BLM-DO and FWS-AO may inspect operations to assure conditions of the approved Plan of Operation are being met and will notify AGS of any non-compliance observed. The AGS will seek and utilize BLM-DO and the FWS-AO on surface management reclamation and fish and wildlife matters, and will request inspection assistance when considered necessary within their areas of expertise. AGS is the sole contact with operators except in cases of emergency. BLM-DO may issue instructions, notices, or orders to the operator only under the following emergency circumstances and conditions: (1) emergency situation exists that clearly threaten immediate serious or irreparable damage to the environment and resources or to the health and safety of employees and/or the public; or (2) the AGS representative is not timely available to take the necessary immediate action. The BLM-DO may in such emergency situations order the immediate cessation or correction of activities responsible for the emergency situation and may order repair or correction of damages, such orders to be followed by prompt telephoned

and documented notification to the AGS of the action taken. BLM-DO will be responsible for all acitivities outside the Area of Operation, within the leasehold.

(k) Any desired significant changes in a Plan of Operation must be jointly approved by both BLM-DO and AGS.

8. Plans of Operation for Surface Installations or Subsequent Well Work

A Plan of Operation as per 30 CFR 270.34 will be required for all surface construction operations and subsequent well work. Procedure for approval will be as per 7(a) through (h) above. Joint on-site inspections may not be required, unless specifically considered necessary by AGS, BLM-DO, or FWS-AO. The AGS will be responsible for compliance inspections in the Area of Operations. BLM will have the same option covered in 7(j).

9. Plans of Development, Injection, or Production

The operator will be required to submit (1) a Plan of Development prior to entering the development stage of its operation as determined by mutual agreement between the operator and the AGS, (2) a Plan of Injection where fluid injection is proposed, and (2) a Plan for Production prior to commencing production for commercial utilization of the geothermal resource. Procedure for joint BLM-DO and AGS approval will be essentially as per 7(a) through (h), described above for the Plan of Operation. The AGS will be responsible for compliance inspections in the Area of Operations.

10. Designation of Operator

The AGS will furnish BLM-DO a copy of any Designation of Operator received.

11. Filing and Termination of Bonds

(a) BLM-SO will routinely advise the AGS of the filing of any lease compliance (3206.1-1(b)) or protection bonds (3206.1-1(c)). The AGS will not permit operations on a lease until advised by BLM-SO that such bonds have been filed.

(b) The period of liability under any bond shall not be terminated by BLM until the AGS has advised the BLM-SO and FWS-AO that all terms and conditions, insofar as operations on the lease are concerned, have been fulfilled.

12. Relinquishments

BLM-SO will furnish the AGS a copy of any lease relinquishment filed. The AGS will furnish BLM-SO and the FWS-RO a report as to satisfactory restoration and abandonment of any affected portion of leased lands.

13. Annual Environmental Report

The AGS will furnish the BLM-DO a copy of the lessee's annual report of compliance with environmental protection requirements as required under 30 CFR 270.76. These reports will be available for inspection at either office for FWS-AO inspection.

14. Annual Report of Diligent Exploration

AGS will advise BLM-SO of the amount of expenditures considered qualified for diligent exploration pursuant to 43 CFR 3203.5.

15. Designation of Coordinating Offices for Purposes of the Memorandum

(a) For the U. S. Geological Survey, the office of the Assistant Division Chief of Operations, Conservation Division is designated as the coordinating office.

(b) For the Bureau of Land Management, the Division of Minerals Resources is designated as the coordinating office.

(c) For the U. S. Fish and Wildlife Service, the Office of Biological Services is designated as the coordinating office.

16. General Provisions

All assistance rendered under this Agreement will be carried out in full compliance with the objectives, policies, and responsibilities of the Department. Any unresolved matters concerning geothermal program where there is a mutual interest shall be referred for resolution to the next supervisory level involved.

The above cooperative procedures are in accord with S.O. 2948 between BLM and GS and supersedes all other implementing cooperative procedures involving geothermal leasing, administration, and supervision.

The AGS, BLM-SO and FWS-RO will meet, as necessary, to surface internal problems which occur as a result of implementing the requirements of this Agreement and to develop strategies for mitigating those problems.

This Agreement shall become effective upon execution hereof by the Directors. At least three months prior to the first and subsequent anniversary dates hereof, the AGS, BLM-SO, and FWS-RO shall apprise their respective coordinating offices of any suggested modifications in this Agreement which would improve its workability, reduce duplication

of effort, and enhance the ability of the Department to perform its assigned functions relating to the leasing of Federal lands for geothermal resources and approval of operations in a more timely manner.

George W. Miller — Director, Fish and Wildlife Service — 6/7/76 — Date

George L. Turcott — Director, Bureau of Land Management — 5/28/76 — Date

W. A. Radlinski — Director, Geological Survey — 6.1.76 — Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Area Geothermal Supervisor's Office
Conservation Division, MS 92
345 Middlefield Road
Menlo Park, CA 94025

MAY 9 1979

Memorandum

To: Conservation Manager, WR

From: Area Geothermal Supervisor

Subject: Transmittal of NTL-79-01 for the direct use of geothermal resources

The subject Notice to Lessees and accompanying cover memorandum to the Chief, Conservation Division, are enclosed for your action. The requested changes to the NTL and the cover memorandum have been completed, and the NTL has been formatted for publication in the Federal Register.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Area Geothermal Supervisor's Office
Conservation Division, MS 92
345 Middlefield Road
Menlo Park, CA 94025

MAY 9 1979

Memorandum

To: Chief, Conservation Division

Through: Conservation Manager, WR
Conservation Manager, CR
Conservation Manager, ER

From: Area Geothermal Supervisor

Subject: Measuring and determining the value of direct-use geothermal resources in the absence of an established market value, NTL-79-01

With the advent of the direct use of geothermal energy, development of a standard method for measuring and determining the value of geothermal resources has become a significant royalty-accounting concern. The enclosed Notice to Lessees (NTL) establishes both a method for measuring the amount of heat extracted by a producer and a method for determining the value of the extracted heat in the absence of an established market value. This value-determining method will remain in effect only until negotiated sales contracts between producer and consumer establish a market value for the direct use of geothermal energy. The purpose of this memorandum is to provide the reasoning behind the NTL and to request your comments.

Value

The value of an energy resource is usually established by negotiated sales contracts between the producers of the energy and the consumers of the energy. To date, the producer and the consumer have been the same for direct-use projects. Therefore, until sales contracts between producers and consumers establish values for direct-use geothermal energy, the NTL establishes an alternate method for determining value. This method establishes a value for direct-use geothermal energy in comparison with an alternate energy source.

We began by examining the competitive energy commodities of natural gas, coal, and oil produced from Federal lands, and then took the following conditions into account:

(1) That an average price of the least expensive alternate energy resource be used for comparison because the least expensive resource would normally be the producer's choice. We chose to use an average because of the differences in price due to quality, availability, and demand for the same resource at different production sites.

(2) That the mine-mouth or wellhead price be used for comparison because geothermal resources are not transportable and must be used without alteration near the site of production. Therefore, the price of the alternate energy source does not include the cost of transportion, processing, or refining.

(3) That the price be determined on a nationwide basis. We chose the nationwide basis because of problems encountered when we attempted to establish prices on a statewide basis: Nevada, for instance, does not produce any significant amount of energy from an alternate source.

Our research concluded that coal is the commodity that meets these conditions. Based on the price of Federal coal, the NTL determines that the value of direct-use geothermal energy is 44 cents per million BTU's.

Measurement

The development of a universally applicable measurement of direct-use geothermal resources is complicated by the diversity of direct uses, but these uses do have one common factor: heat is extracted and used. Therefore, we have based all royalties on the amount of heat extracted.

Virtually all direct uses extract relatively small quantities of heat, and, as shown by the enclosed memorandum, the burden of expensive measuring and recording devices, combined with monitoring and upkeep procedures, would make the use of geothermal energy uneconomic in many cases. For this reason, we have established a break-off point of $12,000 royalty per year to separate the large commerical projects from the small, less economic projects. This break-off point results in two categories: (1) projects that accumulate less than $12,000 royalty per year and (2) projects that accumulate more than $12,000 royalty per year.

1) Less than $12,000

The producer of a project that accumulates less than $12,000 royalty per year has the option of either installing measuring and recording

equipment to determine the outlet temperature or of accepting a reasonable outlet temperature as determined by the Area Geothermal Supervisor. We believe that most projects will accumulate less that $12,000 royalty and that the producer will choose to accept the AGS-determined outlet temperature rather than install expensive equipment. Acceptance of the AGS-determined outlet temperature will not only benefit the producer by reducing over-head costs, but will also benefit the Government by reducing the frequency of inspections by USGS personnel. We estimate that the cost of inspection will not balance the return in royalty until $12,000 per year in royalties is accumulated. The Division cannot afford to concentrate limited manpower on small and remote applications.

2) More than $12,000

The NTL requires producers of projects that accumulate more than $12,000 in royalty per year to install measuring and recording equipment to determine mine the outlet temperature and the volume in relation to time. This requirement places the burden of buying expensive equipment on the producer most able to bear the cost. Chart recorder devices with a 30-day duration are available. The recorders will allow the Government to keep accurate records on large commercial ventures.

Calculation of the Amount of Heat Extracted

The NTL allows the producer to submit other methods for calculating the amount of heat extracted. This option lends a degree of flexibility that we feel is required by the diversity of direct-use projects. The NTL also provides the following suggested formula:

(inlet temperature - outlet temperature) x volume x 8.34 = BTU's

We are using this formula to approximate the amount of heat used. The technically correct form of the formula uses parameters such as density and specific heat content that will cause considerable confusion for the producer. We found that the error introduced by eliminating these parameters from the equation is less than the error introduced by the metering instruments required to measure these parameters. In addition, because of corrosion and scaling problems, direct-use projects will be unable to utilize geothermal resources that have a high density due to total dissovled solids.

The simplified formula provides the following benefits:

(1) The required equipment is relatively inexpensive. We believe that expense is a factor that must be considered because most direct-use projects are experimental and are only marginally economic at this time.

(2) When the producer accepts the outlet temperature as determined by the AGS Office, the inefficient producer is required to pay royalty on heat that is not extracted down to the determined outlet temperature. Conversely, the efficient producer who extracts more heat than the determined minimum will not be charged extra royalty for being efficient. Thus, an AGS-determined outlet temperature will encourage the producer to be efficient and to avoid waste.

Approval of Facilities

GRO Orders are aimed at geothermal operations that produce electricity. Application of these Orders to direct-use geothermal operations would severely limit the use of low temperature resources. Therefore, the NTL supersedes the measuring and royalty calculation provisions of the GRO Orders and notifies the lessee that the Supervisor will approve direct-use facilities on an individual basis.

Conclusion

Because royalties are now due on a direct-use geothermal utilization project, early receipt of your comments will be appreciated.

Enclosures

cc: Cons. Mgr., WR
Cons. Mgr., CR
Cons. Mgr., ER

COOPERATIVE AGREEMENT FOR THE GEOTHERMAL PROGRAM ON NATIONAL FOREST SYSTEM LANDS USDI, GEOLOGICAL SURVEY--USDA, FOREST SERVICE

The following are guidelines for cooperation between Geological Survey and the Forest Service in implementing the Federal geothermal resources program on National Forest System lands, pursuant to the Geothermal Steam Act of 1970.

The Bureau of Land Management is included herein to set out BLM procedures and responsibilities on National Forest System lands in accordance with an existing geothermal resources program, but the BLM is not a signatory hereto.

Abbreviations used hereafter for the various agencies, offices, and reports are as follows:

BLM	USDI, Bureau of Land Management
BLM-SO	USDI, Bureau of Land Management State Office
GS	USDI, Geological Survey
GS-RCM	USDI, Geological Survey, Regional Conservation Manager
AGS	Area Geothermal Supervisor
GS-AG	USDI, Geological Survey, Area Geologist
GS-DG	USDI, Geological Survey, District Geologist
FS	USDA, Forest Service
NFSL	National Forest System Lands
FS-FS	USDA, Forest Service, Forest Supervisor
FS-RF	USDA, Forest Service, Regional Forester
EAR	Environmental Analysis Report (prepared by FS)
EA	Environmental Analysis (prepared by GS)
GEAP	Geothermal Environmental Advisory Panel (Sec. Order 2962)

1. Priorities and Scheduling of Lease Sales and Non-Competitive Leasing on National Forest System Lands (Primary responsibility--BLM)

Selection and scheduling will be consistent with (guided by) national priorities established by the Geothermal Inter-Agency Council. Primary agency contacts are AGS, the BLM-SO involved, and FS-RF.

a. Competitive Lease Sale Scheduling

BLM-SO on its own motion, on recommendation from GS, or through nomination from industry, selects areas for and schedules competitive lease sales in Known Geothermal Resource Areas (KGRA's). Determination of priority of scheduling lease sales is generally based upon the geothermal potential of the area, the area's environmental sensitivity, and industry interest. The BLM-SO consults with GS-RCM, and the FS-RF concerning these factors. If nominations are either solicited or received from industry, BLM-SO sends an information copy of nominations to AGS, Menlo Park, and the FS-RF.

Final decisions on competitive lease sales depend upon findings and conclusions of an EAR or EIS. The BLM-SO consults with the GS-RCM, as to total area to be covered by the EAR. Generally, the area to be covered includes the KGRA, areas in the vicinity with non-competitive lease applications, and all adjacent or nearby land where important lease-related physical/biological effects can be anticipated.

b. Scheduling for Non-Competitive Leasing

Where non-competitive leasing only is involved, BLM-SO consults with AGS, and the FS-RF to determine area, priority, and scheduling of EAR's. The BLM-SO obtains the approval of the FS-RF for proposed EAR scheduling actions. The criteria for scheduling of EAR's includes geothermal potential of the area, its environmental sensitivity, and industry interest. AGS will furnish, upon request by FS-RF, a priority listing of potential geothermal areas.

2. Environmental Analysis Considerations

a. Pre-Lease Environmental Analysis or Report (EAR) (Primary responsibility--FS)

(1) Decisions to lease or not to lease, and on stipulations for leases shall depend upon findings and conclusions of an EAR or EIS. The EAR will be prepared by the FS-FS.

(2) When an area within National Forest System lands is selected and scheduled for consideration for competitive geothermal leasing, or industry applications are received for non-competitive leasing, the BLM-SO initiates action by informing the FS-RF of the need for an EAR. (The FS-RF will inform the FS-FS.) The FS-FS will notify in writing the AGS of the EAR initiation, the area to be covered, and the deadline for contributions. Maximum lead time possible should be provided, with a minimum of 30 days notice. The AGS will furnish FS-FS with technical advice and information for consideration in the EAR, including mitigating measures and recommended stipulations.

(3) FS-FS will furnish a copy of the draft EAR, with recommended special lease stipulations, to the AGS, for review and comments prior to formal submission of the EAR to FS-RF.

(4) The FS-RF will furnish AGS the final FS stipulations which are to be attached to non-competitive leases, or included in the notice of competitive lease sale, for the AGS review and concurrence.

(5) The FS-RF will furnish AGS with two copies of the final EAR.

(6) If the EAR indicates that the proposed leasing would be a major Federal action significantly affecting the quality of the human environment, the FS-RF will prepare an EIS.

(7) Geothermal leases cannot be issued for National Forest System lands unless the EAR indicates that the lease proposal has the consent of the Secretary of Agriculture, and they must be subject to such terms and conditions as the Forest Service may prescribe to insure adequate utilization of the lands for the purpose for which they were withdrawn or acquired.

b. Post Lease Environmental Analysis (EA)
(Primary responsibility--AGS)

(1) The AGS has the primary responsibility for the Environmental Analysis (EA) of a Plan of Operation for a geothermal lease. When the AGS receives a proposed Plan of Operation from a lessee or operator, copies will be provided the FS-FS. The FS-FS will then provide AGS with technical advice and information on biological matters, surface protection and reclamation requirements, and other environmental information relative to the Plan for consideration in preparing the EA.

(2) Any draft EA which GEAP chooses or is requested to review will also be furnished to FS-FS for review and comment.

(3) In every case, AGS will provide a copy of the final EA to BLM-SO, GEAP, and the FS-FS.

3. Competitive Lease Sales on National Forest System Lands (Primary responsibility--BLM)

a. As soon as a KGRA on National Forest System lands is scheduled for competitive lease sale consideration, and at least 90 calendar days prior to the proposed sale date, BLM-SO notifies AGS and the FS-RF. This time is needed by appropriate agencies for:

(1) Defining areas to be considered for lease.

(2) Preparation of an EAR.

(3) Evaluation of legal matters.

(4) Preparing lease stipulations.

(5) Making recommendations (by GS-RCM) for parceling of tracts or rental units and for royalty rates. (To be submitted within 30 calendar days from date of request, whenever possible, to BLM-SO.)

b. GS-RCM prepares a pre-sale geothermal resources economic evaluation for all tracts in the sale. Prior to the scheduled sale the GS-RCM, or his designee is available to meet with the BLM-SO and present the technical evaluation of the offered tracts and discuss the geologic, engineering, and economic factors upon which the evaluation has been prepared.

c. Publication of the Lease-Sale Notice is the responsibility of the BLM-SO. AGS and FS-RF concurrence must be received prior to publication. The BLM-SO sends a copy of the lease-sale notice and lease stipulations to the AGS, and the FS-RF for final review, allowing at least 10 working days for comment.

d. Immediately after the sale, the GS-RCM evaluation committee will meet to study the results of the sale. The committee will review its geologic, geophysical, economic, and engineering data on all tracts and identify those tracts recommended for acceptance and for rejection, supporting the recommendations with appropriate technical information. Immediately following this evaluation, the BLM-SO and GS-RCM committee meet and the GS-RCM, or his designee, presents the GS technical evaluation of--and recommendations on--each tract for which bids have been received. The GS-RCM submits the recommendations to the BLM-SO in writing.

e. BLM-SO sends two copies of the executed lease, including lease terms, to the AGS, and three copies to the FS-RF.

4. Non-Competitive Lease Applications for National Forest System Lands (Primary responsibility--BLM)

a. Serial Register Page

The BLM-SO receives applications for non-competitive leases, prepares Serial Register Pages, and processes applications (at end of filing period) to determine if acceptable and if lands are available. For acquired lands, BLM-SO obtains a title report from FS-RF. The BLM-SO sends an informational copy of the Serial Register Page to AGS and the FS-RF.

b. Competitive Interest Overlaps

After reviewing each month's applications, BLM-SO sends GS two copies (one to AGS and one direct to the GS-AG or GS-DG listed below) of those applications which result in competitive interest overlap as defined by 43 CFR 3200.0-5(k) (3); a copy of the land status plat showing applications and overlaps is also sent to the GS-AG or GS-DG listed below. GS-RCM reviews competitive interest overlap as soon as possible after receipt from BLM-SO. GS-RCM notifies BLM-SO, and will notify the FS-RF, as soon as KGRA'a are defined.

For Applications within States of:	Send overlap information to:
Montana	GS-DG, Billings, Montana
Wyoming	GS-AG, Casper, Wyoming
Utah	GS-DG, Salt Lake City, Utah
Colorado	GS-AG, Denver, Colorado
New Mexico	GS-AG, Roswell, New Mexico
Alaska	Anchorage, Alaska
California, Oregon, Washington Idaho, Nevada, Arizona	GS-AG, Menlo Park, California
Eastern States	GS-AG, Washington, D.C.

c. Environmental Considerations

The FS-FS will prepare an EAR following the prelease procedures outlined in 2(a) of this document.

d. KGRA Clear Listing-Issuance of Lease

Upon receipt of the consent of the FS-RF to lease certain areas, along with the stipulations mutually agreed to by the FS-RF and AGS, the BLM-SO prepares lease forms with attachments and stipulations which are sent to the AGS for final review and concurrence. Upon receipt of AGS concurrence, BLM-SO forwards the lease form for the applicant's signature. Upon receipt of the lease signed by the applicant, BLM-SO forwards lease forms to the AGS for final clear listing. The AGS forwards lease forms to the appropriate GS-AG or GS-DG who then submits a KGRA clear-listing report and returns the lease forms to the BLM-SO. The GS-AG or GS-DG will also provide the AGS with an informational copy of the clear-listing report. The BLM-SO then issues the lease, providing the AGS with two copies, and the FS-RF with three copies, including all stipulations and attachments.

5. Pre-Lease Exploration Permit on National Forest System Lands. (Primary responsibility--FS)

a. Upon receipt of a Geothermal Prospecting Permit Application, FS-FS will forward a copy and any attachments to the AGS. This may include appropriate stipulations or documents relating to access routes across National Forest System lands.

The AGS will notify the FS-FS within 5 working days of any recommended mitigating measures or stipulations. The FS-FS will send AGS a copy of the approved permit.

b. It will be the responsibility of the FS-FS to see that the operator conducts exploration in accordance with regulations and terms of the permit. AGS personnel are available, on request, to assist in supervision of operations under such permit.

c. The FS-FS will send the AGS a copy of a notice of completion or, termination of exploration operations, or equivalent notification.

6. Post-Lease Notice of Intent to Conduct Geothermal Resources Exploration Operations on National Forest System Lands. (Primary responsibility--AGS)

a. Upon receipt of a Notice of Intent to Conduct Geothermal Resources Exploration Operations from an operator on an existing lease (as required by 30 CFR 270.78), the AGS will immediately forward a copy of the Notice to the FS-FS. The FS-FS will recommend any additional surface protection, reclamation requirements, and other protection measures within their area of authority or expertise.

b. It is the responsibility of the AGS to see that exploratory operations on the lease concerned are conducted in accordance with lease terms, regulations, GRO Orders, approved Plan of Operation, where applicable, and Notice of Intent. If the permittee does not comply with surface protection, fish and wildlife protection measures, or reclamation requirements, the AGS will notify the FS-FS in writing of the corrective action taken or recommended. In cases of emergency, where serious surface or environmental damage occurs, or appears imminent, the FS-FS may, if the AGS or his representative is not immediately available, issue a stop order to the lessee or his representative. The FS-FS will then immediately notify the AGS so that he may direct and supervise further necessary corrective action, in cooperation with FS-FS.

7. Plan of Operation and Application for Permit to Drill (APD) on National Forest System Lands (Primary responsibility--AGS)

a. For exploratory wells, and for all other drilling operations, where GS or FS considers such necessary, the AGS will schedule a joint onsite inspection with the lessee and the FS-FS to discuss the proposed operation, proposed access routes over National Forest System lands and other pertinent matters. The operator will normally be encouraged to discuss the proposed action and conduct the onsite inspection with the FS-FS and AGS prior to writing his drilling program and Plan of Operation.

b. Upon receipt by the AGS of an Application for Permit to Drill (Form 9-331c) and a Plan of Operation per 30 CFR 270.34 , the AGS will immediately send a copy of each to the FS-FS. Proprietary information will be deleted from the Plan of Operation as necessary.

c. If FS-FS or AGS consider that additional information is necessary in the Plan of Operation, the AGS shall request the operator to provide such input as deemed necessary.

d. When such additional information is requested, the operator will submit a final Plan of Operation or supplement to the Plan of Operation to the AGS who will forward a copy of same to the FS-FS.

e. The FS-FS will notify the AGS in writing of any special conditions which are recommended for inclusion in the Plan of Operation before it is approved.

f. Upon receipt of the Plan of Operation, an EA will be prepared by the AGS pursuant to 2(b) herein above. The EA prepared for subsequent well operations or for the post-lease Notice of Intent to Conduct Geothermal Resource Exploration Operations may vary in level of detail depending on the nature of the operation, the sensitivity of the area, or other appropriate considerations.

g. The AGS will prepare and sign a letter of approval of the Plan of Operation containing conditions of approval mutually agreeable to the FS-FS and the AGS and send the signed letter to the FS-FS for approval.

h. The FS-FS will sign the letter to complete the joint approval of the Plan of Operation and forward an approved copy to lessee and an executed copy to the AGS. The FS-FS also will forward other documents relating to access over National Forest System lands outside the lease area directly to the operator, with information copies to the AGS.

i. The AGS will then approve the Application for Permit to Drill (Form 9-331c) and furnish copies (with proprietary information deleted as necessary) to the FS-FS.

j. The AGS is responsible for compliance inspections of all operations conducted under the Plan of Operation and Application to Drill in the Area of Operations (30 CFR 270.2(o)). However, FS-FS may inspect operations to insure that conditions of the approved Plan of Operation are being met and will notify AGS of any non-compliance observed. The AGS will seek and utilize advice from FS-FS on surface management and reclamation, and will request inspection assistance when considered necessary within their respective areas of authority or expertise. AGS will be the sole contact with operators except in case of emergency. Necessary FS-FS surface management instructions, notices or orders shall be issued to the operator only through, and with the concurrence of the AGS. FS-FS may issue instructions, notices, or orders directly to the operator only under the following emergency circumstances and conditions:

(1) Emergency situations exist that clearly threaten immediate serious or irreparable damage to the environment and resources or to the health and safety of employees and/or the public; and (2), the AGS representative is not timely available to take the necessary immediate action. The FS-FS in such emergency situations, may order the immediate cessation or correction of activities responsible for the emergency situation and may order repair or correction of damages; such orders to be followed by prompt telephoned and documented notification to the AGS of the action taken so that AGS may supervise further corrective action.

k. The FS-FS will be responsible for all activities outside the Area of Operations within the leasehold on National Forest System lands.

(1) Any desired significant changes in a Plan of Operation must be jointly approved by both FS-FS and AGS.

8. Plans of Operation for Surface Installations or Subsequent Well Work on National Forest System Lands

A Plan of Operation as per 30 CFR 270.34 is presently required for all surface construction operations and subsequent well work. Procedures for approval are as per 7(a) through (h) above. Joint onsite inspections are not required, unless specifically considered necessary by AGS or the FS-FS. The AGS is responsible for compliance inspections in the Area of Operations. FS has the same options covered in 7(j) through (l).

9. Plans of Development, Injection, or Production on National Forest System Lands

The operator is required to submit (1) a Plan of Development prior to entering the development stage of its operation as determined by mutual agreement between the operator and the AGS, (2) a Plan of Injection where fluid injection is proposed, and (3) a Plan for Production prior to commencing production for commercial utilization of the geothermal resource. Procedure for joint FS-FS and AGS approval will be essentially as per 7(a) through (h), described above for the Plan of Operation. The AGS is responsible for compliance inspections in the Area of Operations.

10. Designation of Operator

The AGS will furnish the FS-FS a copy of any Designation of Operator received.

11. Filing and Termination of Bonds

a. BLM-SO routinely advises the AGS of the filing of any lease compliance (3206.1-1(b)) or protection bonds (3206.1-1(c)). The AGS does not permit operations on a lease until advised by BLM-SO that such bonds have been filed.

b. The period of liability under any bond is not terminated by BLM until the AGS, with the concurrence of the FS-FS, has advised the BLM-SO that all terms and conditions, insofar as operations on the lease are concerned, have been fulfilled.

12. Relinquishments

BLM-SO furnishes the AGS a copy and the FS-RF three copies of any lease relinquishment filed for National Forest System lands. The AGS furnishes BLM-SO a report as to satisfactory restoration and abandonment of any affected portion of leased lands.

13. Annual Environmental Report

The AGS will furnish the FS-FS a copy of the lessee's annual report of compliance with environmental protection requirements as required under 30 CFR 270.76.

14. Annual Report of Diligent Exploration

AGS advises BLM-SO of the amount of expenditures considered qualified for diligent exploration pursuant to 43 CFR 3203.5.

15. Designation of Coordinating Offices for Purposes of Agreement

a. For the USDI Geological Survey, the office of the Area Geothermal Supervisor, Conservation Division is designated as the coordinating office.

b. For the USDA, Forest Service, the Washington Office of the Director of Minerals and Geology is designated as the coordinating office.

16. General Provisions

All assistance rendered under this Agreement will be carried out in full compliance with the objectives, policies, and responsibilities of the involved agencies. Any unresolved matters concerning the geothermal program where there is a mutual interest shall be referred for resolution to the next supervisory level involved.

The above cooperative procedures are in accord with Department of the Interior's Tripartite Agreement between BLM, GS, and the U.S. Fish and Wildlife Service.

The AGS and the involved FS-RF's will meet, as necessary, to discuss internal problems which occur as a result of implementing the requirements of this Agreement and to develop strategies for resolving those problems.

This Agreement shall become effective upon its execution by the Chief, Forest Service, and the Director, Geological Survey. At least 3 months prior to the first and subsequent anniversary dates hereof, the GS District Geothermal Supervisors and involved FS Regional Foresters shall notify their respective coordinating offices of any suggested modifications in this Agreement which would improve its workability, reduce duplication of effort, and enhance

the ability of the Agencies to perform their assigned functions relating to the leasing of Federal lands for development of geothermal resources and approval of operations in a more timely manner.

W.A. Radlinski — MAY 15 1978

Acting Director, Geological Survey — Date

Acting Thomas C. Nelson — May 17, 1978

Chief, Forest Service — Date

DEPARTMENT OF THE INTERIOR
U.S. Geological Survey
Conservation Division

NOTICE TO LESSEES AND OPERATORS OF FEDERAL GEOTHERMAL LEASES (NTL-77-01)

Title 30 CFR Part 270.79 (Public Inspection of Records) states:

> Geological and geophysical interpretations, maps, and data required to be submitted under this part shall not be available for public inspection without the consent of the lessee so long as the lease remains in effect.

In accordance with the requirements of said regulations, only that information filed with this office which is of a nonproprietary nature is made available for public inspection. This office has denied and will continue to deny all requests, including those of State regulatory agencies, for access to proprietary data in its custody absent the prior written release of such information by the lessee or operator. However, as there is no such regulatory restriction imposed on lessees and operators, the following guidelines are established with respect to the voluntary release of proprietary information by a Federal geothermal lessee or operator:

I. Lessees and operators should promptly notify the Area Geothermal Supervisor in writing whenever proprietary information on file with this office is no longer considered to be confidential so that it may be made available for public inspection. All such notifications should specifically identify the information being reclassified as nonproprietary data.

II. At its discretion, a lessee or operator may provide copies of any or all information acquired as a result of its operations on a Federal geothermal lease to any party, including State regulatory agencies, subject to such conditions as it may wish to impose in order to preserve the proprietary status of the released information.

III. When a voluntary release of proprietary information is made pursuant to II. above, the lessee or operator should promptly notify this office in writing specifically identifying (1) the information involved, (2) the party to whom the information was given, and (3) the conditions under which the information was released.

IV. At its discretion, a lessee or operator may authorize this office in writing to make proprietary data in our custody available for inspection by outside parties, including State regulatory agencies. Any such authorization must identify the specific information involved and the party or parties who are to be permitted access to such information for inspection purposes. However, unless also specifically authorized in writing, this office will not permit an inspecting party to copy any of the information made available nor will we provide such a party with duplicate copies thereof.

V. This office will continue to maintain, as confidential, all proprietary data in its custody for as long as the involved lease remains in effect, unless said information is released prior to that time in accordance with I. hereof. However, where a lessee or operator voluntarily releases proprietary data, as provided in II. above, or permits such data to be copied or reproduced, as set forth in IV. hereof, this office will not assume the responsibility for assuring that the party receiving such data continues to maintain its confidentiality.

VI. The official records of this office may not be removed from our custody for the purpose of duplication. However, this office may be contacted to arrange for copies of nonproprietary data as well as copies of proprietary data when the affected lessee or operator has provided a written authorization in that regard. When such services are provided, a nominal fee will be charged for all clerical and nonclerical time involved in identifying and retrieving the records from our files and for duplicating the records.

It is our intent in issuing this Notice to (1) clarify the requirements of Title 30 CFR Part 270.79, (2) reduce duplication of records on the part of the involved governmental agencies and the Federal geothermal lessees and operators, and (3) promote, to the fullest extent possible, the continued cooperation of this office with said lessees and operators and our counterparts in concerned Federal and State agencies.

12-20-'77
Date

Area Geothermal Supervisor

APPROVED:

Russell G. Wayland
Acting Chief, Conservation Division

TE OF CALIFORNIA—RESOURCES AGENCY
EDMUND G. BROWN JR., Governor

ARTMENT OF CONSERVATION
/ISION OF OIL AND GAS
)—9th STREET, ROOM 1316
RAMENTO, CALIFORNIA 95814
) 445-9686

April 27, 1979

Mr. Reid T. Stone
Area Geothermal Supervisor
U.S. Geological Survey
Conservation Division, MS 92
345 Middlefield Road
Menlo Park, California 94025

Dear Mr. Stone:

Cooperative procedures practiced during the past several years have reduced paperwork and benefited both the California Division of Oil and Gas (CDOG) and the U.S. Geological Survey (USGS). The resolution of the status of Stockraising Homestead Act geothermal rights now permits those informal procedures, which have worked so well, to be reaffirmed in more precise and formal terms. These procedures should benefit our respective field representatives by allowing them to understand their regulatory jurisdiction and responsibilities more clearly.

In general, it has been the established policy of the CDOG that the USGS is responsible for the issuance of permits for and inspections of exploration and production activities of those geothermal resources belonging to the Federal Government. Furthermore, those geothermal resources not belonging to the Federal Government are under the jurisdiction of the respective local, County, or State agencies. The following statements further clarify the jurisdiction, responsibilities, and cooperative measures.

1. The USGS has the responsibility to permit and inspect all exploration, development, production, and utilization operations where the lessee or his operator is conducting the activity to recover Federal geothermal resources. This responsibility includes all Federal lands and those Stockraising Homestead Act (SRHA) lands where the geothermal resources belong to the United States. If the resource is sold to a third party prior to the utilization on SRHA lands, the permitting authority for plant utilization rests with the appropriate local, County, or State agency. In cases where directional drilling from non-Federal lands into Federal geothermal resources occurs, the USGS is responsible for well permitting and inspection regardless of surface ownership; however, the CDOG shall be consulted for its advice prior to approval of any drilling program. An appropriate site stability analysis with an engineering review by a qualified engineering geologist and/or civil engineer will be conducted on each drill site in unstable terrain. The lessee or operator must provide written assurance to the USGS that legal rights to surface occupancy on SRHA lands have been obtained prior to approval of any permit.

2. The CDOG has the responsibility to permit and inspect all exploration, development, and production operations where the lessee or his operator is conducting the activity to recover geothermal resources from non-Federal lands. In cases where directional drilling from Federal lands into non-Federal geothermal resources occurs, the CDOG is responsible for well permitting and inspection regardless of surface ownership; however, the USGS shall be consulted for its advice prior to approval of any drilling program. An appropriate site stability analysis with an engineering review by a qualified engineering geologist and/or civil engineer will be conducted on each drill site in unstable terrain, pursuant to Section 1931.5, Title 14, California Administrative Code. However, the operator must obtain a surface use permit from the appropriate Federal agency granting the right to access and use of the Federal surface lands for that purpose.

3. Dual completion of a single well that includes both non-Federal and Federal resources will require well permitting by both the USGS and CDOG. However, both agencies will work together to support each other and reduce duplication of records requirements and enforcement activities.

4. Exchange of information regarding site and drilling plans and well permits will continue on the part of both agencies for nonproprietary data. Exchange of proprietary data will require the concurrence of the lessees. Inspection by either USGS or CDOG representatives of activities permitted by the other agency shall be arranged through the regional or district office having jurisdiction over that area. During emergencies, if the regional or district staff having primary well permit authority is unavailable, the regional or district staff of the other agency shall take such action as is necessary to prevent pollution, or damage to persons, natural resources, or property. However, in this case the agency with primary well permitting authority shall be notified as soon as possible to assume jurisdiction.

5. If the CDOG is required to prepare an environmental impact document for a geothermal exploratory project under State law and the USGS is required to prepare an environmental impact document for the same project under Federal law, only one environmental document shall be prepared. That document shall meet the requirements of both the National Environmental Policy Act and the California Environmental Quality Act and shall be completed within 135 days from the date the operator files a complete application with the USGS or the CDOG for a geothermal exploratory project.

We trust this addresses the subject covered in our recent discussions and will provide the basis for our continued cooperative support of geothermal activities.

Sincerely,

M. G. Mefford
State Oil and Gas Supervisor

Concurred by:

Reid T. Stone
Area Geothermal Supervisor, USGS Date: 5-8-79

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Area Geothermal Supervisor's Office
Conservation Division, MS 92
345 Middlefield Road
Menlo Park, CA 94025

OCT 24 1979

Ms. C. Suzanne Reed
Chairwoman Committee
for NCPA No. 2
California Energy Commission
1111 Howe Ave., MS-2
Sacramento, CA 95825

Dear Ms. Reed:

In response to your September 13, letter, we have reviewed your analysis and follow-up discussion regarding jurisdiction over construction and operation of geothermal power plants on Federal leases. Your letter contains several conclusions that we do not feel we can address at this time because strict legal interpretations are not available. Perhaps some of these questions can be discussed at the forthcoming meeting. For those interpretations that are available, however, we can provide you with our views, which are presented in the following discussion regarding standards under which the proposed power plant would be constructed. A short discussion of our jurisdictional experiences with Imperial County is also presented. The following paragraphs also address concerns, as we understand them, you expressed to Mr. Mohorich of my staff at the recent October 11, 1979, Pre-Hearing Conference in Sacramento.

At the outset and to prevent any misunderstanding as to the context of our response, the following discussion pertains only to the siting of electric generating stations on Federal lands pursuant to the permits required under 43 CFR Part 3250 and is exclusive of regulatory activities over leasehold operations, such as those pertaining to wells and steam lines. In addition, our discussion pertains only to the case involving the NCPA No. 2 geothermal project (your Docket No. 78-AFC-2).

The primary statute that is applicable to this project for siting the power plant is the Geothermal Steam Act of 1970 (30 U.S.C. 1001 et seq.). The specific regulations respecting this activity are contained in 43 CFR Part 3250 with corollary regulations regarding Plans of Utilization and Construction Permits in 30 CFR Part 270, as amended. For purposes of implementing the regulations and carrying out the responsibilities of the law, the USGS has developed Geothermal Resources Operational (GRO) Orders, including GRO Order Number 4 - General Environmental Protection Requirements. Within these three authorities are contained the standards by which the USGS regulates the utilization of geothermal resources and the construction and operation of electric generating plants.

Under these authorities, the Federal Government has exclusive responsibility to regulate the siting and operation of power plants on Federally-leased lands. The Geothermal Steam Act does not permit the Federal Government to delegate its responsibilities to State or local agencies in this regard. However, in instances regarding air and water quality control, state and/or local standards are applicable and subsequently enforced by the state and/or local agencies in consultation with the Federal government. In addition, it is our desire to utilize other local standards of those agencies knowledgeable and capable regarding certain construction and/or operation procedures. These state or local agencies may possess a staff and expertise well suited to perform various review, inspection and monitoring functions. Compliance with and enforcement of their recommendations will be the function of the Federal Government. We wish to utilize as much of this local expertise as possible, to both insure that standards are being met and to assure local regulatory agencies of their continuing input to this project. We are particularly anxious to utilize local standards in those matters relating to the immediate human environment; that is, general public and worker health and safety, fire protection, etc.

Therefore, it is our proposal that all standards relating to the following resources or activities be those of state and/or local agencies:

1. Air Quality
2. Water Quality
3. Health
4. Soils (in those aspects that may impact upon water quality)
5. Safety/Worker
6. Safety/Fire Protection
7. Waste Management
8. Civil Engineering - building foundations
9. Structural Engineering - buildings

Standards relating to all other resources or activities would be the responsibility of the Bureau of Land Management (BLM) or the U.S. Geological Survey (USGS). These would include:

1. Cultural Resources - BLM
2. Biological Resources - BLM
3. Geotechnical - USGS
4. Soils (in those aspects not related to potential water quality impacts) - USGS
5. Safety/Handling and Storage of Hazardous, Flammable materials (in consultation with the Environmental Protection Agency) - USGS
6. Noise - USGS
7. Civil Engineering - for those aspects other than building foundations, such as roads - USGS.
8. Structural Engineering - for those aspects other than buildings, such as equipment and piping - USGS.

The above classification is not meant to imply that consultation between all of the agencies involved would not take place. In fact, this consultation would be required in most instances if it is found that the applicant is not complying with certain standards. For example, if certain fire safety codes or standards

are found to be in violation, it will be necessary for the local agency to consult with the USGS prior to initiating any subsequent remedial actions against the applicant, even though those standards regarding fire safety found to be in violation are those of the local agency.

In the matter of our relationship with Imperial County concerning approval of Magma Power Company's geothermal power plant, it is hoped that the following general discussion will serve to further clarify our position. Imperial County has been intimately involved with geothermal development for quite some time and several years ago developed a set of standards and ordinances governing development within the County. These standards and ordinances are aimed primarily at the private sector. However, it is our experience that application of some of these standards to geothermal development on Federal lands has resulted in a comfortable and advantageous working relationship for both the Federal and County interests.

The Survey encouraged and advised their lessee to obtain State, County or local permits as a means of assuring compliance with specific standards which affected the health and safety of employees or the general public. This involved construction permits for permanent buildings, and sanitary, air, or water discharge facilities. For activities or sites off of Federal lands, such as solid waste disposal, encroachment for entering County rights-of-way, etc., the lessee secured normal County approval. However, on Federal lands, road and pit construction, transportation, encroachment and similar permits were covered by Federal (USGS and BLM) regulations.

Thus, the County of Imperial issued permits for permanent buildings and associated structures (such as ponds) and inspected areas for conformance to certain grading standards through their Department of Public Works utilizing various standards contained in the Uniform Building Code. Building inspections were conducted for facilities such as plumbing fixtures, electrical wiring, fire extinguishers, etc. The Department of Public Works also inspected for and permitted encroachment for entering and utilizing County rights-of-way and issued transportation permits on such rights-of-way for oversize or overweight loads. The County's Environmental Quality Control Section of the Health Department issued sanitation permits. Solid waste permits were also administered by the Department of Public Works.

Thus, it can be seen that on Federal lands in the East Mesa region of Imperial County local standards were utilized in many cases. Based on these standards, local expertise was utilized for inspection of and concurrence with certain activities. During this time, ultimate responsibilities was never delegated - it remained with the Federal Government. Rather consultation for joint operational responsibility was carried out to local and Federal satisfaction.

We hope the above discussion clarifies our position regarding our jurisdictional responsibilities respecting the standards under which the proposed NCPA Geothermal Project No. 2 power plant would be constructed. Before we close, however, we would like to address two items contained

In the October 12, 1979, Committee Order, which was issued pursuant to the discussion held at the public Pre-Hearing Conference on October 11, 1979.

First, the USGS wishes to continue our cooperation with other appropriate agencies in developing a coordinated compliance and monitoring program applicable to the proposed project. In fact, it is our belief that we have been and are now cooperating. For example, Mr. Dick Forester, an employee of the U.S. Fish and Wildlife Service assigned to our staff, has been actively involved in the development of just such a coordinated compliance and monitoring program with Mr. James Brownell of your staff and the California Department of Fish and Game. Over the past year, they have been involved in the development of an adequate erosion control program for the protection of biological resources.

With regard to the second point, we look forward to meeting with you to eliminate any delays, exchange information, and develop compliance and monitoring plans. We will be more than pleased to respond to and answer any specific questions the Commission might have.

Sincerely,

Reid T. Stone
Area Geothermal Supervisor

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Area Geothermal Supervisor's Office
Conservation Division, MS 92
345 Middlefield Road
Menlo Park, CA 94025

OCT 25 1979

Mrs. Judith M. Warburg
State of California
Department of Water Resources
P.O. Box 388
Sacramento, CA 95802

Dear Ms. Warburg,

We have reviewed the draft proposal and wish to make the following comments:

1 - this proposal should be in letter form

2 - limit the relationship to DWR and USGS

3 - seventh "WHEREAS" either leave this out or modify it to reflect our intention to honor AB 2644 time limitation of 135 days.

4 - item "1", several exploratory plans may be submitted by the operator. This could require more than on environmental document. For this reason, this proposal should be broadened to include as many studies and of a kind as would seem mutually appropriate.

5 - item "4-D", based on the above, it would seem that the format would be appropriate for the timetable but it seems difficult to set forth a time until each plan has been filed and accepted as complete.

We wish to thank you for your meeting with us on last Friday, October 12, 1979. We appreciate your efforts in expediting the approval and permitting process. We hope these comments will be helpful in drafting what we have called a "Letter of Coordination" (LOC).

Sincerely,

DAVID K. BICKMORE

Reid T. Stone

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Conservation Division
P. O. Box 3539
Santa Rosa, CA 95402

October 16, 1978

Lake County Board of Supervisors
255 North Forbes Street
Lakeport, CA 95453

Gentlemen:

On August 29, 1978, the Board of Supervisors, Lake County, CA, passed the following motion:

> "On motion of Supervisor Gordon and unanimous vote of the Board, if and when the Federal agencies concerned adopt our standards for geothermal land uses, operators will no longer need to apply to the County for land use permits."

The purpose of this correspondence is to put into effect the portion of this motion, applying to the United States Geological Survey, Office of the Area Geothermal Supervisor, District Geothermal Supervisor, Santa Rosa, CA as the local representative of the Federal agency concerned in enforcing the County standards on geothermal areas of operations.

In accordance with the Geothermal Steam Act of 1970, Title 30 of the Code of Federal Regulations, Part 270, Title 43 of the Code of Federal Regulations, Part 3200, the terms of the Geothermal Leases, and Geothermal Resources Operational Orders, we agree to enforce operating standards on Federal lands, which will have as a minimum requirement at least the standards adopted by Lake County. Where State or Federal established standards create higher or stricter requirements, those standards will become the minimum requirement for operations on the concerned lands.

The Lake County standards for geothermal land uses referred to in the motion are found in the following: "Conditions, Procedures, and Performance Standards for Geothermal Regulation," adopted as policy April 13, 1972, as amended August 24, 1972, by the Lake County Planning Commission, and "Lake County Environmental Protection Guidelines," adopted by Resolution No. 78-107 of the Board of Supervisors, as amended April 4, 1978.

It is the intention of the Office of the Area Geothermal Supervisor, District Geothermal Supervisor, Santa Rosa, CA to carry out the spirit of the motion of the Lake County Board of Supervisors, previously listed in this letter, as it pertains to the County standards for geothermal land use on U.S. Government owned land.

As a result of this action taken by the Supervisor, Lake County will no longer require land use permits for geothermal activities by lessees on Federally owned land.

Although it is not the intention to cover environmental matters pertaining to air and water quality, you can be assured that applicable standards will be enforced by this office on all Federal leases.

If County standards or resolutions are changed or modified, we will review those alterations and notify the County as to our ability to enforce those requirements.

Sincerely,

Ted H. Hudson

District Geothermal Supervisor
Santa Rosa, CA

MINUTE ORDER

LAKE COUNTY BOARD OF SUPERVISORS

MEETING OF AUG 29 1978

12. LAND USE PERMIT PROCEDURES - Supervisor Gordon reported on a meeting last week with BLM and USGS representatives regarding geothermal land use permits. Discussion was held concerning a proposed procedure whereby an applicant on Federal land would not have to go through a second procedure, duplicating what the County requires.

On motion of Supervisor Gordon and unanimous vote of the Board, if and when the Federal agencies concerned adopt our standards for geothermal land uses, operators will no longer need to apply to the County for land use permits.

The within instrument is a correct copy of the original on file in this office.
ATTEST: 8/31/78
LOIS R. HESTERBERG
County Clerk and ex-officio Clerk of the Board of Supervisors of the State of California in and for the County of Lake.
By Janet W. Clark
Deputy Clerk

1173 Lake County Cooperation