FINAL REPORT

**CALIFORNIA GEOTHERMAL RESOURCE DEVELOPMENT
ENVIRONMENTAL IMPLICATIONS FOR
ERCDC ENVIRONMENTAL ANALYSIS OFFICE**

MASTER

Date: February 1, 1977
Contract: 150-001
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FOREWORD

While primarily written for action by the California Energy Resources Conservation and Development Commission staff and Commissioners, this report and its appendices were also written for use by other federal, state and local agency personnel and the general public. The objective of the report is to present recommendations for ERCDC's Environmental Analysis Office to process the environmental data necessary for decisions on applications for certification of powerplants. Of necessity, the report also deals with a recommended statewide policy for geothermal energy resource development.

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I. INTRODUCTION

The California Energy Resources Conservation and Development Commission (ERCDC) should take a vigorous, environmentally responsive role in the support of management of geothermal energy resources of California.

This report presents the results of an analysis of the environmental implications for ERCDC Environmental Analysis Office (EAO) in relation to the development of California's geothermal resources. While focusing primarily on environmental implications, particularly the natural, social, and economic elements, the report includes some ERCDC-wide policy and program considerations. The primary thrusts of the work, and consequently of the report, have been in the development of an understanding of the interagency and intergovernmental environmental data and data-management roles and responsibilities and in the formulation of recommendations related thereto.

The balance of this introductory chapter is presented in six sections: Objectives and Scope (A), Limitations (B), The Geothermal Energy Development Process (C), ERCDC Governing Codes (D), Acknowledgements (E), and a summary of the overall report contents (F).

A. OBJECTIVE AND SCOPE

The basic objective of this project has been to identify existing problems and to develop recommended solutions thereto for handling environmental data within and between ERCDC and local, other state, federal, and private entities in relation to geothermal energy resource use. Specifically the contract* called for four tasks:

*Contract #150-001 executed on September 14, 1976 between the California ECDC and James A. Roberts, Ph.D.

Task 1: Review all existing studies on California geothermal resource development and regulation to determine environmental implications for the Environmental Analysis Office.

- A review and analysis of environmental aspects of the Warren-Alquist Act and CEQA as they affect geothermal development and regulation.
- A review and analysis of existing studies by JPL and Battelle to determine the major environmental problems in geothermal resource development.
- A review and analysis of ERCDC work plans and products that deal with the development or regulation of a geothermal resource to determine need for environmental input.
- A review and analysis of other agencies' reports, procedures, or plans that would affect the environmental responsibilities of the Environmental Analysis Office.

Where appropriate this task should include meetings with persons in the local, State or Federal agencies involved to identify existing environmental activities, procedures, permits and regulations and potential areas of conflict with ERCDC environmental activities.

Task 2: Based upon the review and analysis performed in Task 1, the contractor shall:

- Identify and recommend solutions to potential problems in coordinating environmental activities within ERCDC, and between ERCDC and other agencies.
- Identify critical areas that should be worked on first to facilitate orderly development or solve critical coordinating problems and recommend solutions and actions ERCDC should implement.
- Recommend an environmental procedure for the review of geothermal power plants including the consideration of:
 - (a) production well development
 - (b) NOI/AFC/EIR procedures
 - (c) coordination of public agencies that have permitting authority and EIR responsibility
 - (d) inclusion of citizen participation in the decision to license a power plant
- Identify and recommend environmental concerns that should be involved in planning and analyzing the consequences of developing geothermal power plants.
- Include any other conclusions or recommendations about ERCDC environmental activities based on Task 1.

Task 3: Prepare an interim report on November 1, 1976, for input to the first Biennial Report and a final report on February 1, 1977, for presentation to Commissioners and Commission staff on the findings, conclusions, and recommendations and other results of Tasks 1 and 2.

Task 4: Based on the recommendations and conclusions in Task 2, consult with and assist ERCDC staff to:

- Prepare issue papers, background material, and policy options for presentation to the Commission.
- Develop environmental procedures that include the consideration of NOI's AFC's, research and development projects, and long-range planning.
- Develop an effective coordinating mechanism with other governmental agencies who approve or have responsibility for a portion of the resource development.
- Develop, conduct, and evaluate workshops with public agencies, private groups, and citizens to gain input.

B. LIMITATIONS

The work was conducted during the period from August 2, 1976 to January 31, 1977. While excellent cooperation was received from the ERCDC staff, particularly from the members of the Interdivisional Geothermal Committee, the work has been essentially that of one person. Hence, it has not been possible to review "all" possible documents and materials; there are undoubtedly other resources and persons that might have been reviewed or contacted. But the suggestions of the Committee members were solicited throughout the project and were used to expand the materials and suggestions undertaken in the previously cited tasks.

C. THE GEOTHERMAL DEVELOPMENT PROCESS

The most comprehensive explanation of the geothermal process is contained in a recent report from U.S. Geological Survey: "Exploration and Development of Geothermal Resources."* The report covers all aspects

*"Exploration and Development of Geothermal Resources" (With Emphasis on Surface Disturbance) by Rory Raschen and William S. Cook, Conservation Division, Office of the Area Geothermal Supervisor, U.S. Geological Survey, Menlo Park, CA, September 1976.

from "literature search" and other non-field exploration techniques through "ultimate abandonment and land restoration." Table I-1, copied from one of the tables in the report, summarizes the process. The reader is urged to obtain a copy of the full report from the USGS since it is one of the most cogent, if not the most cogent statement of the process. Certainly there will be differences on state or federally administered lands and from operator to operator; however, the typical exploration and development sequence is representative of those that have been observed during the course of this contract.

In addition to the USGS document, the elapsed time required for the geothermal development process typically experienced at the Geysers was evaluated and discussed with supplier and utility personnel. The results of that analysis, including steps in the process, "players", time requirements, and percentage of "total time" required by step are summarized in Table I-2. Again such times are estimates that will undoubtedly vary with different situations and as ERCDC gains experience. The utilities, suppliers, and local agencies, however, expect the times to remain essentially as noted even after the ERCDC has gained processing experience

Note that based on the "low" time estimates, the stage of the process that includes the NOI/AFC would account for about 28% of the elapsed time and construction about 37% of the time. For the "high" estimates the ERCDC would account for about 20% and construction about 34%. The "key" difference would be in time to process permits for temperature probes through the local agencies: 20% versus less than 2%.

In the best case it is expected that the process will take about five years; in the "high" case, the process may take more than seven years.

TABLE 1-1

TYPICAL EXPLORATION AND DEVELOPMENT SEQUENCE

Casual Use Exploration (no surface disturbance and no lease or permit required)

From USGS: "Exploration and Development of Geothermal Resources"

TABLE 1-2

**THE GEOTHERMAL PROCESS
AS ESTIMATED FOR THE GEYSERS REGION
(FOR PRIVATE LANDS)**

Proponent	Action	TIME (Mos)			% of Total		Agency
		Low	Hi	Cum	Lo	Hi	
Explor. Co.	Geophysical pre-exploration	indefinite			-	-	none
Explor. Co.	Permit for Temperature Probes, inc: Dump Permit Air Quality	1	18	1-18	1.6	20.5	County, DOG SWMB APCD
Explor. Co.	Drilling (2 holes)	6	6	7-24	9.4	6.8	-
Explor. Co./ Util.	"Sell" Utility on a contract	3	4	10-28	4.7	4.5	-
Util. Explor. Co.	Prepare NOI or EDS of ... and Prepare Field Devel. Plan	12	12	22-40	18.7	13.6	-
Explor. Co.	Obtain Field Devel. Permit						County
Utility	Obtain Land-use Permit						County
Utility	NOI/AFC	18	18	40-58	28.1	20.5	ERCDC
Utility	Obtain Certificate of Public Necessity						PUC
Utility	Obtain Authority to Construct						APCD
Explor. Co. Utility	Field Development Construct Plant & Transmission Facilities "On-Line"	24	30	64-88	37.5	34.1	-
TOTAL TIME (Mos)		64	88	-	100	100	

However, other factors may influence the elapsed time. They are:

1. No construction activities can be undertaken during a normal four (4) month winter period; and
2. There could conceivably be delays of two (2) to three (3) months for execution of construction contracts after receipt of all construction permits and related items. Usually the utility and exploration companies have tried to anticipate approval times to coordinate their construction bidding to minimize this possible delay; however, now they do not know how to anticipate ERCDC actions.

As a result of these possibilities, some of the first projects requiring ERCDC actions might be delayed bringing the total elapsed time to as much as 7 years and eleven months from when the first formal "action" were taken.

D. ERCDC GOVERNING CODES AND GEOTHERMAL ENERGY RESOURCES

The roles and responsibilities of ERCDC in geothermal matters are derived primarily from Division 15, Energy Conservation and Development, Sections 25000 et seq of the Public Resources Code.* In addition, as are all State agencies, ERCDC has a number of specific roles and responsibilities under Division 13, California Environmental Quality Act as amended, Sections 21000 et seq of the Public Resources Code and as clarified under the California Administrative Code, Sections 15000 et seq, State EIR Guidelines. Sections of the code appropo to geothermal energy resources are included in Appendix A.

The specific language related to the ERCDC's role in geothermal resource use is contained in ERC Sections 25000 through 25903. (See Appendix A, Part 1.) While the code is generally clear on geothermal matters, it is not precise about whether ERCDC's responsibilities are limited to powerplants

*Based on AB 1575 approved by the Governor on May 21, 1974.

or include production (and some argue exploratory) wells. This open question is the subject of additional comment below.

Based on a review of the codes, however, it is possible to draw a number of conclusions regarding ERCDC's role in geothermal energy resources.

They are:

1. Two of the overriding concerns of the legislature when they created ERCDC were:
 - to accelerate development of alternative energy sources including geothermal resources and
 - to include local land-use plans in ERCDC electrical (and related) planning;
2. Forecasts of energy supplies by both utilities and ERCDC shall include evaluation of geothermal resources;
3. For site certification purposes the legislature intended that:
 - (a) only one site need be presented for each geothermal powerplant,
 - (b) not more than a total of 18 months but possibly less than 9 months need be required to process both NOI's and AFC's for geothermal powerplants, and
 - (c) NOI's should address how the proposed powerplant complies with the needs for new or replaced electric power generation capacity; and
4. Regarding research and development, the code is clear that the legislators intended to stimulate the exploration and development of geothermal resources and the identification and solutions of both technical and policy problems related thereto within both state and federal jurisdictions.

In short, it could be concluded that ERCDC was given a specific mandate to expedite the development of California's geothermal energy resources.

It remains unclear whether or not the legislature intended to have ERCDC assume jurisdiction over all geothermal wells. The question remains:

"Are such wells 'appurtenant' facilities of a powerplant?" Clarification of the question is not found in the codes. However, depending on the policy ERCDC adopts related to geothermal resources the question could become an interesting but non-critical academic notion. This question will be considered further in Section IV, Recommendations.

ERCDC, as all other state agencies must comply with the mandates of the California Environmental Quality Act as amended. Division 13 of the Public Resource Code (Section 21000 et seq) constitute the act. Guidelines for the act are contained in State of California, California Administrative Code Title 14. Natural Resources, Division 6. Resources Agency, Chapter 3 Guidelines for Implementation of the California Environmental Quality Act of 1970 (as of December 1976 containing revisions effective January 1, 1977) (Section 15000 et seq). These items were interpreted and adopted by ERCDC as regulations on February 18, 1976.

The recent (December 1976) guidelines as published in the December 14, 1976 edition of the California EIR Monitor* include a number of aspects which relate closely to the comments received from other agencies and included in other reports (discussed in the following chapter of this report) and to recommendations made as a result of this work. Specifically, the referenced sections of the CAC (Appendix A, Part 2) provide guidance for the use of phased EIR's, a phased Master Environmental Assessment (product) as well as phased Master Environmental assessment (process) and joint or simultaneous EIR/EIS documents. Three examples of the latter type of documents are:

*Volume 3, Number 25.

1. SOHIO EIR: Port of Long Beach (local) and Public Utilities Commission (state);
2. Western Contra Costa Wastewater Management Program: U.S. E.P.A. (federal) and West County Agency (local); and
3. Several EIR/EIS reports on Highway Projects: California Department of Transportation (state) and the Federal Highway Administration (federal).

E. ACKNOWLEDGEMENTS

Many people provided excellent assistance and information during the course of the project. In particular, Mr. Ross Deter and Mr. Ron Mearns, who served serially as project coordinators for the Environmental Analysis Office of the Energy Assessment Division of ERCDC, provided access to the information and personnel of ERCDC throughout the contract.

Additional assistance and contacts with State personnel were provided through the Interdivisional Geothermal Committee of ERCDC. The members of that Committee (with Division and current telephone number) are:

Evan Hughes	(Chairperson) (A.I.D.: 322-4635)
Dave Anderson	(A.I.D.: 322-6476)
Dave Hill	(A.I.D.: 322-6476)
Syd Willard	(A.I.D.: 322-6476)
Joe Hemmer	(Conservation: 322-4523)
Anne Mester	(Legal: 322-4926)
Mel Schrecongost	(Siting: 445-8094)
Ron Nichols	(Siting: 445-8094)
James A. Brownell, Ph.D.	(Siting: 322-3811)
E. Ross Deter	(Assessment: 322-2355)
Ron Mearns	(Assessment: 322-2355)
Bob Therkelsen	(Assessment: 322-2355)
Tony Rygg	(Assessment: 322-2355)

Particularly valuable assistance was provided by Dave Anderson (AID) and Mel Schrecongost (Siting) both of whom have had extensive personal experience in geothermal resources in their previous State employment at the Division of Oil and Gas, Department of Conservation.

The other agencies and individuals who were contacted during the project and some additional people who might well be contacted for additional or specific aspects of geothermal resource use are listed in Appendix B.

F. REPORT CONTENTS

The basic substantive contents of this report are contained in the following four chapters and five appendices:

- Chapter II: Existing and Concurrent Geothermal Studies and Programs,
- Chapter III: Problems in Coordinating Geothermal Activities,
- Chapter IV: Recommendations,
- Chapter V: References,
- Appendix A: Extracts from ERCDC Governing Codes,
- Appendix B: Geothermal Contacts,
- Appendix C: U.S.G.S. Office of Area Geothermal Supervisor: Environmental and Safety Effort,
- Appendix D: DRAFT Statewide Geothermal Energy Program, and
- Appendix E: Tax Credit Agreement Between Puget Sound Power & Light Co. and Skagit County (Washington).

II. EXISTING AND CONCURRENT GEOTHERMAL STUDIES AND PROGRAMS

At the present time there are a number of ongoing or recently completed projects and/or studies of California's geothermal resources and their development. This chapter presents a review of those efforts. The two primary efforts by Battelle and JPL are discussed in Section A, twelve other efforts are briefly delineated in Section B; and the major geothermal programs of a number of state, federal and regional agencies are summarized in Section C. Other materials, particularly county ordinances and EIR requirements and guidelines, reviewed and analyzed during the study are listed in Chapter V, References.

A. TWO PRIMARY STUDIES BY BATTELLE & JPL

The two primary recently completed research efforts which deal with geothermal environmental considerations are by Battelle and JPL. The results of these efforts, as evidenced by their reports and conversations with staff members or their consultants, are described in the following pages.

1. Battelle: Human Affairs Research Centers: "Legal, Institutional and Political Problems in Producing Electric Power from Geothermal Resources in California" (August 2, 1976) for ERDA.

The stated objective of the Battelle report "is to identify and analyze the nontechnical problems hampering the production of electricity from geothermal resources and to evaluate possible solutions to these problems." Focusing on the geothermal-environmental data proposals outlined in their report, twenty one problems and solutions are identified. The following

pages present the proposals and this consultant's comments thereon. The number references are as in the Battelle report and page references are shown in (parentheses).

Proposal 14.8.1: Do a Leasehold EIR and Then Require No More Addenda for Subsequent Wells on that Leasehold (pp. 335-336)

Like the Battelle authors, it is this author's opinion that this proposal might be useful for areas contiguous to known producing leaseholds but would probably slow geothermal exploration in the "unproven" KGRA's (all but the Geysers Region and possibly the Imperial Valley Region). This approach if coupled with a phased, Master Environmental assessment (as opposed to a Master Environmental Assessment which is discussed later) could be a useful tool to expedite the EIR process in areas with proven, producing geothermal resources. If adopted by ERCDC, their staff would need to work with local agencies to develop procedures to process such EIR's in relation to powerplant-specific questions.

Proposal 14.8.2: Allow Geothermal Activities to Receive a Negative Declaration. (pp. 336-337)

The Negative Declaration (ND) might be a useful tool in some specific aspects of geothermal exploration: chemical analyses, heat probes, or other actions which would not significantly alter surface conditions. It would not be suitable for those activities which alter large areas by vegetation removal or grading or produce nuisance elements (e.g. air or water pollutants or noise).

There is also some doubt whether ND's on anything short of a leasehold would speed the environmental reporting process since the ND requires an initial study, consultation with all responsible agencies, and public review,

the latter two of which are often the most time-consuming aspects of either the ND or EIR process (Reference Section 15033 and Section 15083 of the California Administrative Code).

Proposal 14.8.3: Grant the Drilling of Geothermal Wells a Categorical Exemption from Some of the Environmental Procedures. (pp. 337-338)

The Battelle report rates this proposal as possibly having a slight time saving effect in the short term. For the same reasons they posed (e.g. public opposition and likely litigation) the proposal seems very unlikely. With the possible exception of one, all counties are interested in overseeing the land-use considerations at every step of the geothermal resource development process.

It is very doubtful, particularly in view of industry opposition to a broadening of the categorical exemptions for oil and gas wells at the most recent CEQA hearings (Sacramento, December 16, 1976), that such a classification will be applied in the near future to geothermal exploration or production wells. There is some argument, however, in favor of a Class 6: Information Collection categorical exemption (Section 15106) for some test probes and shallow exploration wells, particularly if a general anomaly wide assessment had been made on the "what if" question; i.e. the question of what might the impacts be if a resource were actually found?

Proposal 14.8.4: Make the Drilling of Geothermal Wells an Allowable Land Use in KGRA's and Other Areas of High Geothermal Potential. (pp. 338-339)

Battelle estimates that the adoption costs of this proposal "would be low in time, low in money, but very high in trouble." These estimates are all probably low! Based on experience in California in the mid-1960's

it was found that the preparation of general plan elements (and five years later, amendments) was a very time consuming and expensive task. Preparation of such elements or plans has typically taken not less than two years in the most expeditious cases to more than five years when plan elements were controversial.

The counties believe that a "geothermal plan or element" would be very controversial and, while potentially useful in the long run, may be both unnecessary and wasteful until they have reasonable confidence that the resource may indeed be of sufficient value to warrant the commitment of public funds and effort. Then, because of the nature of general planning in California, the appropriate governing codes would probably have to be modified to facilitate such plan development (various including Section 34200, 65000, and 65300 with emphasis on the State Planning Act).

The reader is encouraged to review the document prepared by the Council on Intergovernmental Relations for an appreciation of the processes, products and procedures required for general or comprehensive planning. The report, prepared in 1973 and under current revision by the Governor's Office of Planning and Research (OPR), is entitled: General Plan Guidelines. It should be noted that the existing guideline is not clear on geothermal energy resources (as it is not on other energy resources) but could be interpreted to include such resources in the "conservation element". That element includes the definition: "Conservation is the planned management, preparation and wise utilization of natural resources;" it makes no specific mention of any energy resources.

Proposal 14.8.5: Prepare a "Generic" EIR for the Entire Potential Area in the County and All Wells to be Permitted on that Basis Alone.
(pp. 340-341)

The rationale against such a proposal as the "Generic" EIR seems well stated in the Battelle report; the counties want the step-by-step knowledge afforded by sequential environmental reporting. A broad, common environmental setting, on the other hand, might well expedite county preparation of EIR's or ND's or to develop the rationale to support some form of categorical exemption.

Proposal 14.8.6: Allow EIR's for Wells to Exclude Power Plant Impacts if Leasehold has no Preexisting Producing Wells. (pp. 341-342)

Not too much weight was given to this proposal in the Battelle Report; clearly it does not address the "what if" question. It might be a useful proposal if that question could be addressed in some way prior to exploration and if the overall powerplant impacts were subsequently to be considered in another report once the leasehold were "proven".

Proposal 14.8.7: Speed up the State Clearing House (sic). (pp. 342-343)

Based on a recent review of OPR's role in Environmental data handling and use* and the research related thereto, it seems possible for the Clearing-house function not to cause inordinate delays in processing environmental reports if it were directed by the Director of OPR to facilitate its operations.

*Environmental Data Handling & Use: The Role of the Governor's Office of Planning and Research; James A. Roberts et al, June 1976.

The Clearinghouse has all of the mechanisms to facilitate processing and review of environmental documents. It does not now have the staff required to reduce significantly throughput time nor to provide substantive environmental data coordination. To achieve these ends, were they given higher priorities than at present, would probably necessitate staff augmentation in an organization which is already under stringent personnel limitations.

Proposal 14.8.9: Allow EIR's to be Sent Directly From Counties to the Local Office of the Appropriate State Agencies. (pp. 343-344)

This proposal would require a change in the State Planning codes. However, in many cases the proposal is already in operation on an informal basis and will probably be given more "support" through the "responsible agency" concept recently clarified in the current "State EIR Guidelines" (Section 15039):

"Responsible Agency means a public agency which proposes to carry out a project, but is not the Lead Agency for the project. It includes all public agencies other than the Lead Agency which have approval power over the project."

Proposal 14.8.10: Require Each Lead Agency to Draw up a Set of Uniform Requirements for Geothermal EIR's. (pp. 344-345)

This proposal would be of great help in the geothermal arena; it would be of even greater help if it were to include both Lead Agencies and Responsible Agencies (The partial effectuation of this proposal is the subject of a current project by Jones and Stokes for the Environmental Analysis Office of ERCDC).

Proposal 14.8.11: Have the Lead Agency, Instead of the Applicant,
Hire the Consultant Who Will Prepare the EIR (p. 345)

If done on a voluntary basis (county by county) this probably would have, as stated in the Battelle report, relatively low costs in time, money, and trouble. However, if the proposal were to make such a practice mandatory it would probably be high in all costs. It is not a new proposal having been a thoroughly hashed item during several revisions of CEQA and the guidelines. None the least of the reasons given not to make such a practice mandatory are those cases where the proponents or their consultants do have the best knowledge of an area. Clearly either approach requires knowledgeable, proficient decision makers and clear data guidelines as the backbone for successful reduction in the net time required for environmental and plan reporting.

Proposal 14.8.12: Require Uniform, Reasonable Steps for Complying
with Laws such as the Antiquities Act and the Endangered Species
Act. (pp. 345-346)

Having dealt with these laws on a large number of EIR's and EIS's during the past seven years, it is estimated that there are almost as many sets for compliance as there are interpreters of the laws. To such a list should also be added enforcement of water quality and air quality standards.

Proposal 14.8.13: Require Those Who Appeal Decisions on the Grounds
of EIR Inadequacy to Post Bonds. (pp. 346-347)

The intent of this recommendation would seem to be to eliminate harassment, or nuisance-type opposition to projects. But as stated in the report, such a recommendation could place an inordinate burden on the individuals with legitimate concerns as well as those with spurious

concerns. As noted, this is a politically controversial issue. The solution to the problem, if it is indeed more real than perceived, would seem to lie with the courts.

Proposal 14.8.14: Establish an Administrative Board to Hear Appeals

Based on the Alleged Inadequacy of EIR's. (pp. 347-348)

The arguments against this proposal are cogent and well stated.

It would also seem that two such entities already exist for technical matters:

1. Geothermal Environmental Advisory Panel (GEAP) currently chaired by Max Crittenden of the USGS and which focuses on Federal matters, and
2. Geothermal Resources Board of the State of California which serves under the Secretary for Resources and includes representation from State Lands, PUC, Division of Oil and Gas, Fish and Game, Department of Water Resources, State Water Resources Control Board, Division of Mines and Geology and the Air Resources Board.

It should be noted, however, that the State group has been inactive for sometime and has not served as a technical arbitrator. With expansion to include ERCDC, it could well be an excellent forum for arbitration of technical or interagency jurisdictional appeals.

Proposal 14.8.15: Have the Federal and State Government Help

Collect Baseline Data in Areas Most Likely to be Sites of Geothermal Development. (pp. 348-349)

For some aspects this appears to be a good approach, particularly if applied to non-site-specific and to "what if" problems. Beyond those questions, there is some question of equity in shifting the financial burden from a private entity to the public. This question is included in the recommendations section under tax credits.

Proposal 14.8.16: Increase Staff of Lead Agencies to Give Them
More Time to Review EIR's Before Public Hearings. (pp. 349-350)

The arguments regarding this proposal appear reasonable: neutral effect because of the offsetting possibilities between having more people in the process and therefore more time versus more people to identify problems earlier for earlier solution by the proponents. An alternative approach might be to have the State develop a cadre of experts available to the counties as needed to augment their staff. To be successful such an approach would require management and staffing to ensure continued "quick-reaction" capability by the experts and a "sunset" agreement for when they would "move on". Two vehicles for such a possibility exist in the Geothermal Resources Board were it so inclined and directed and in ERCDC as it is being developed.

Proposal 14.9.1: Resolve the Ambiguity over the Energy Commission's
Possible Mandate to Control the Permitting of All Geothermal Wells.
(pp. 351-353)

The report suggests the effects of two possible interpretations of the Public Resources Code (Section 25120):

1. ERCDC have jurisdiction over all geothermal wells: the report concludes that the legal and political problems related to this interpretation would slow the process; and
2. ERCDC have jurisdiction over production wells only: this option is considered as low in money and time costs and only medium in trouble costs.

As will be noted in a subsequent section on possible ERCDC geothermal policies, there are options which obviate this proposed solution.

Proposal 14.9.2: Have CERCDC Conduct Hearings Jointly With State, Regional, and Local Agencies With Which It Shares Power.

(p. 353)

Concur wholeheartedly.

Proposal 14.9.5: Have CERCDC Provide R & D Support for Geothermal Development. (p. 356)

Concur, particularly for work in providing counties the information they need to act on requests by exploration, development, production, and/or user entities.

Area 14.10 Rules for New Sources of Air Pollution (Proposals 14.10.1 through 14.10.10) (pp. 357-364)

This whole area needs more work and should be the subject of joint ERCDC-ARB-EPA efforts.

Proposal 14.11.2: Use "Expeditors" from the State and Federal Government to Help Smooth the Process of Local Accommodation of Geothermal Development. (p. 366)

This proposal may or may not be workable but as written it presupposes development ("accommodation..."). While possibly effective, another approach, shared responsibility, seems to offer better potential for success; it is discussed in the recommendations.

2. Jet Propulsion Laboratory: "Report on the Status of Development of Geothermal Energy Resources in California" (June 30, 1976) for ERCDC.

The principal value of this report is in its cogent summary of the general status of geothermal resource use in the state. It does not present a summary of the problems for and/or of development. It does serve to identify some general geothermal environmental problems:

1. the mix of entities (local, state, federal and private) involved in the different geothermal region of the state;
2. the problem of too long a time for the State Clearinghouse processing of EIR's;
3. the use of engineering (and other environmental) inspectors on jobs paid for by the proponent;
4. the general difference in the levels of consideration (no less development) in the various parts of the state; and
5. the application procedures now required (in early 1976, the time of the report) in each of the following counties.

By county, the report identified the following significant, specific geothermal-environmental issues:

Sonoma County

1. the development of integrated administrative units for the Geysers KGRA;

Lake County:

1. the county wants to remain a part of the decision making process; and
2. the joint responsibilities of state, federal, and local for a county-wide energy ordinance and related EIR;

Mendocino County:

1. Should the county encourage and support development?
2. When is the best time to do an EIR? (Should it be done as a phased activity, or should it examine the project through the potential of utilization?);
3. How shall the county pass on all costs for energy extraction to the developer and user?
4. Home rule(!);

Colusa County:

1. Problems of access to viable areas; and
2. Possible conflicts with Williamson Act lands;

Napa County:

1. Mitigation of H₂S and SO₂; and
2. Does not want to be committed prematurely;

Imperial County

1. Importance of environmental data coordination resulted in formation of "Imperial County Project Coordinating Council;"

Inyo and Mono Counties:

1. Need for guidance for resource development; and
2. Need for local involvement; and

Northeastern Counties:*

1. Problem of obtaining water discharge requirements from the Lahontan Region;
2. Generally good local-federal relationships though often complex;
3. Communication between regulating bodies (all levels); and
4. Conflicts of managing natural resources for commercial exploitation.

The report also identified on-going research activities in environmental effects and in abatement technology. The report gives programs, sponsors, contractors and funding for each of these areas:

1. Background Studies: ambient environmental conditions;
2. Evaluation/Prediction Techniques: including threshold levels and prediction techniques for determining impacts at different levels of development;
3. Monitoring Techniques: techniques and equipment for monitoring geothermal impacts; and
4. Abatement Techniques: techniques and technology for reducing adverse impacts.

* Lassen, Modoc, Plumas, Shasta, Siskiyou, and Tehama Counties

B. OTHER KEY GEOTHERMAL EFFORTS

Pursuant to the terms of the contract the programs of many other agencies were reviewed. Twelve other documents related to geothermal-environmental programs were found to be particularly valuable. In summary, the documents and related environmental programs are as follows:

1. Economic Analysis of Geothermal Energy Development in California. Vols. I and II. By Stanford Research Institute for ERDA. November 1976.

Analysis of the economic aspects of geothermal resources and their development for the State of California. Reflects some concern for the magnitude of the Long Valley geothermal area showing substantially reduced estimated resource base from U.S.G.S. study on which most other estimates are based (e.g. 200+ MWe vs. 6100 MWe). Little of either volume is devoted to environmental consideration, some question is raised, however, in relation to the actual volume of the water supply including agricultural waste water necessary for geothermal energy development in the Imperial Valley.

2. Environmental Analysis for Geothermal Energy Development in the Geysers Region Draft Report, Vol. I: Summary. By Stanford Research Institute for ERCDC, AID, December 1976. and
3. Master Environmental Assessment for the Geysers-Calistoga Known Geothermal Resource Area Draft Report, Vol. II, by Stanford Research Institute for ERCDC, AID, November 1976.

Both of these works have been commented on directly by the EAO to A.I.D. Division of ERCDC.* In short, they are compilations of data on the KGRA environment. They are unbalanced and uneven in their technical content, poorly documented, and only modestly well organized. They appear best suited as first approximations of a regional environmental setting; not an MEA. The reader would be better served by referring directly to the source documents used to assemble these two volumes.

4. Environmental Data Statement, Geysers Unit 13 (Amended and as used for PUC Draft EIR: PUC, August 1975). PG&E for PUC March 1975.

This document was read and two visits made to the proposed site specifically to observe and photograph mitigation measures under construction and to document those measures for the ERCDC so that their staff and others might be able to reoccupy the site and document the effectiveness of the measures as the project is developed. The 35MM slides taken at the site will be provided to ERCDC under separate cover. In general it would appear that the EDS and EIR fairly present the impacts anticipated during the site preparation phase (that phase of construction observed to date) and accurately document the proposed mitigation measures.

5. DRAFT EIR: Exploration for Geothermal Resources, Boggs Mountain State Forest, Lake County, California. State Lands Commission, October 1976.

This report was received very late in the study (January 13, 1977) and has not been fully reviewed (it is our understanding that the EAO staff is now officially reviewing the draft).

*Including this author's specific comments.

6. Environmental Analysis #23 (Prepared for three (3) Proposed Deep Exploration Holes on Lease CA-963 Republic Geothermal, Inc. Long Valley, California) EA #23 (CA-963) U.S.G.S. November 21, 1975 (Draft) and January 20, 1976 (Final)

This document was reviewed to determine the specific approach taken by the U.S.G.S. in their preparation of EA's. Specific reference copies of the document are available for review at the U.S.G.S. at the address noted in Appendix B. The analysis appears to be a thorough documentation of all environmental issues and the public as well as agency comments on the proposed exploration.

7. Environmental Analysis Report "The Upper Pit River Area Proposed Geothermal Leasing", Bureau of Land Management and U.S. Forest Service, Undated, (c) April 1975.

This document represents a joint effort between the Department of Interior, Bureau of Land Management and the Department of Agriculture, Modoc National Forest, U.S. Forest Service. From discussions with other Forest Service and county personnel, the document is expected to be representative of other forthcoming documents. The comment was made, however, that subsequent documents may not include as many verbatim quotes and reprints of news articles or letters and complete copies of Federal Register items and other published government documents.

8. Guidelines for Thermal Power Plant EIR - Chapter VII, "Describing Environmental Impacts and Mitigation Measures" Jones and Stokes Associates, Inc. for ERCDC, EAO December 1976.

This outline of impact and related mitigation information was reviewed and comments provided to EAO staff. In general it was observed that while

the document had some numbering inconsistencies and tends to emphasize nuclear plants, it does give a reasonable "shopping list" and "suppliers list" for the topics (It is our understanding that the contractor is revising and expanding the work at the present time).

9. Power Plant Siting Report September 1976

and

10. Preliminary Guidelines: Information Required for Geothermal Power Plant Notices of Intent, August 26, 1976 Energy Facilities Siting Division (internal) ERCDC

These documents were reviewed with respect to their implications for environmental data for the EAO. In general, as was emphasized by all sectors of the geothermal community, these guidelines for geothermal NOI's were thought to be much too comprehensive for the NOI level of abstraction pursuant to the appropriate sections of the Public Resources Code (Section 25504). Detailed points were given to the EAO staff directly for their use in internal ERCDC evaluation of Siting Division's draft.

11. Geothermal Loan Guaranty Application Guidelines, ERDA, June 1976.

These guidelines were reviewed and discussed with the staff. Of particular interest is the excellent, brief discussion of the technical and geophysical information needed for the various phases of geothermal development. (pp. IV-15 to IV-21.)

12. "Office of Area Geothermal Supervisor Environmental and Safety Effort", U.S.G.S. undated, received September 1976; includes organization charts for "Pre-Lease Environmental Analysis Record".

These items are included as received as Appendix C. The reader is urged to make direct contact with the U.S.G.S. Environmental and Safety Section for detailed explanation of the materials and exploration of joint or other cooperative environmental analysis programs.

C. SUMMARY OF EXISTING GEOTHERMAL INTERESTS

The following paragraphs present brief summaries of the major geothermal interests in California of the listed federal, state and regional entities.

1. Federal Interests:

The following federal agencies have active geothermal resource interests in California:

Department of Interior: Bureau of Land Management: leasing programs on federal lands;

Department of Interior: U.S. Geological Survey: technical studies in support of other federal agencies (see Appendix C);

Department of Interior: Fish and Wildlife Service: Wildlife and fish impact analysis and related planning studies;

Department of Agriculture: U.S. Forest Service: surface management of National Forest Lands;

Energy Resources and Development Agency: support for academic and private research programs and guarantee program;

Geothermal Environmental Advisory Panel: technical reviews of proposed geothermal activities on federal lands;

U.S. Navy: exploration, technological research and development, and generation plans for use of geothermal resources at China Lakes Naval Weapons Center; and

Environmental Protection Agency: new source emission standards and applications.

2. State Interests

The following state agencies have active geothermal resource interests:

State Lands Commission: leasing programs for exploration and potentially production and use on state lands;

Public Utilities Commission: continuing interest certifying the public necessity and rate aspects of power plants;

Department of Conservation: Division of Oil and Gas: drilling permits and monitoring of drilling operations;

Solid Waste Management Board: waste discharge permits;

Air Resources Board: setting statewide air quality standards;

State Water Resource Control Board: statewide water quality standards;

Department of Conservation: Division of Mines and Geology: technical studies in support of resource evaluations on state lands and general statewide geologic understanding and analysis;

Department of Fish and Game: general environmental impacts and specific impacts on fish and wildlife in the state on all state, federal and private lands;

Office of Planning and Research: facilitation of state-local planning, plan effectuation regarding overall geothermal resource management, and clearinghouse function;

Geothermal Task Force (AB 3590): interagency and public task force on expediting geothermal energy resource development with a joint report to be submitted by Secretary of Resources Agency and Director of OPR;

Geothermal Resources Board: technical coordination of geothermal resource use;

Department of Conservation: Office of the Director: The recently appointed Director, Dr. Priscilla Grew, is personally and professionally interested in geothermal research. She has been named chairperson of the Geothermal Task Force (AB 3590) and will probably take an active role in the Geothermal Resources Board;

Assembly Office of Research: general interest in geothermal resource use;

Department of Water Resources: interests in generation of electricity from geothermal resources as well as general water resource utilization considerations; and

ERCDC: site certification including environmental impact analyses, supply and demand forecasting, and research and development. Specific current projects include:

Alternatives Implementation Division:

Geysers environmental analysis (MEA);
Geysers meteorologic monitoring;
Regional operations research centers;
Susanville leasing project;
Heber heat exchanges;
Modoc-Lassen Low-temperature study;
State-federal interface workshops; and
Heat rejection study

Facilities Siting Division:

Geothermal NOI guidelines and procedures
Geothermal AFC guidelines and procedures

Energy Assessment Division:

Preliminary Report (PRC Section 25305);
Annual Report (PRC Section 25309)
Environmental Manual; and
EIR Guidelines.

3. Regional Interests:

The following state regional entities have active geothermal interests:

Air Pollution Control Districts: establishing and enforcing atmospheric standards;

Regional Water Quality Control Board: establishing and monitoring discharge standards;

Geothermal Resources Impact Projection Study (GRIPS): jointly sponsored Geysers region baseline environmental study. Currently Sonoma, Lake, and Mendocino Counties are co-participants and Napa County is considering participation;

Imperial County Project Coordinating Council: a single county but intergovernmental and private body established to coordinate environmental data; and

Inyo-Mono Interagency Committee: a two-county, intergovernmental forum long concerned with environmental and resource management in the region. Recently taken steps to become more active in geothermal resource utilization.

III. PROBLEMS IN COORDINATING GEOTHERMAL ACTIVITIES

As can be seen from the preceding chapter, there are many entities actively pursuing their interests in use and other management of California's geothermal energy resources. This chapter identifies four classes of problems and related solutions in which the ERCDC is now involved or should consider becoming involved.

They are:

- Class I: Within ERCDC (A);
- Class II: Between ERCDC and local agencies (B);
- Class III; Between ERCDC and other entities (C); and
- Class IV: Between Other Entities (D).

The final section of the chapter (Section E), presents a summary of the high priority, critical problem areas.

A. CLASS I: WITHIN ERCDC

During a recent interview* a scientific and professional observer of the ERCDC in response to the question: "Based on your experience, what should be ERCDC's role in geothermal-environmental matters?", commented that it should be: "Don't Track Mud in the House." Be that as it may, it would seem that the first "opportunity" for ERCDC is to develop a commission-wide (commissioners to and including staff) policy related to geothermal resources. At the present time "viewers" from the outside have no clearcut basis to assess ERCDC's goals in geothermal resource management either for electric or non-electric purposes.

*The source of the remark shall remain anonymous for obvious reasons.

As part of this study, each member of the ERCDC "Interdivisional Geothermal Committee" was surveyed on (a) the goals and projects of his or her Division in relation to geothermal resources and (b) his or her understanding of the goals and projects of the other Divisions in relation to geothermal resources. Preliminary results were shared with the Committee on Monday, October 18, 1976. At present the results, while somewhat inconclusive (semantics play awesome and awful games) and requiring in depth analysis of each response, are indicative of the need for strengthening the interdivisional efforts if clear leadership is to be provided by ERCDC in the geothermal "arena". The specific comments are reflected in the following summary of the "perceived" goals:

A. ALTERNATIVES IMPLEMENTATION DIVISION:

1. As seen by own staffers:

To develop (defined as "facilitating") geothermal resources (to facilitate . . . development),

As rapidly as possible,
Consistant with environmental standards, and

To provide baseline data;

2. As seen by other ERCDC staffers to:

Accelerate the utilization of geothermal energy,
Assist in development of technological solutions,
Provide support for demonstration projects,
Assist in increasing rate of development of energy source, and
Facilitate geothermal development;

B. SITING DIVISION:

1. As seen by own staffers:

Process NOIs expeditiously,
Eliminate problems of multiple permit requirements,
Develop and implement a preliminary site evaluation process, (NOI)
Develop and implement a final site evaluation process (AFC),

Develop a guideline including concerns and procedures for timely processing of NOIs (and AFCs), and
Provide guidance to applicants re: materials needed for application (NOI and AFC);

2. As seen by other ERCDC staffers:

Process NOIs as rapidly as possible (NOI),
Prepare guidelines for NOI process and to process (NOI),
Evaluate objectively technology and environmental suitability of submitted NOIs,
Determine the suitability of a site for geothermal powerplant (NOI),
Identify Key issues (NOI),
Coordinate all processes in and out of Commission that will result in rapid certification (AFC),
Prepare guidelines for AFC process and to process (AFC),
Evaluate suitability of selected site for geothermal powerplant (AFC)
Resolve key issues (AFC), and
Identify design acceptability including mitigation measures and conditions (AFC);

C. ENERGY ASSESSMENT DIVISION:

1. As seen by own (environmental) staffers:

Forecast:

Forecast future power needs and ways to meet them,
Timing of facility, and
Size of facility;

Assessment:

Prepare EIR,
Document planning process,
Identify (for public) issues, consequences and resolution, and
Identify alternatives;

2. As seen by other ERCDC staffers:

Forecast:

Determine how and at what amounts geothermal fits in State,
Forecast future mix of sources (supply) and needs,
Evaluate need for additional powerplants, and
Provide recommendations on mix;

Assessment:

Prepare environmental documents needed to certify powerplants,
Prepare, or cause to be prepared, EIRs,
Analyze potential cumulative impacts,
Protect the natural environment while allowing necessary mitigation for development,
Assess in comparison to other sources, and
Interface with Counties and others to develop EIRs for powerplants.

B. CLASS II: BETWEEN ERCDC AND LOCAL AGENCIES:

As previously reported,* five groups of problems were identified in the relationships of ERCDC with and to local agencies. The groups were:

- organizational problems,
- regulatory/permitting support problems,
- statewide standards/standardization problems,
- technical support problems, and
- "one shot" research problems.

The following table (Table III-1) and paragraphs present a summary of priorities assigned to these problems by the local agencies (1) and ERCDC staff (2) who responded to a questionnaire thereon. The questionnaire was mailed to fifteen counties who were visited by the consultant, and given to eleven ERCDC members of the Interdivisional Geothermal Committee. Ten responses were received: seven county, three staff. No attempt was made to determine the statistical significance of the responses. From observation it is evident that the responding counties (Lake, Modoc, Mono, San Bernardino, Shasta, Lassen, and Imperial) represent a broad spectrum of county interests and experience and that the responding staff members (one each from Siting Division, A.I.D. and Assessment Division) are both knowledgeable and representative.

1. County Priorities:

. By group, the priorities recommended by the counties are:

a. Organizational Problems

1. Define local - ERCDC specific roles and responsibilities regarding geothermal exploration.

*"Interim Report: California Geothermal Resource Development Environmental Implications for ERCDC Environmental Assessment Office", James A. Roberts, November 1, 1976.

TABLE III-1

**ERCDC RELATIONSHIPS TO/WITH LOCAL AGENCIES
INCLUDING PRIORITIES BY COUNTIES & ERCDC STAFF***

PROBLEMS/OPPORTUNITIES	PRIORITIES			
	Counties		ERCDC Staff	
	Rank	Ave.	Rank	Ave.
A. ORGANIZATIONAL PROBLEMS:				
1. Define local - ERCDC specific roles and responsibilities regarding geothermal exploration-development-production environmental analyses.	1	1.4	1	1.0
2. Assist/facilitate regional environmental evaluations and planning.	6	6.3	4	3.5
3. Include counties and other local entities in project planning for research on their areas.	2	3.0	6	4.6
4. Develop regional resource management capability.	5	5.3	7	5.0
5. Develop a permanent, regular means to work with local planning entities.	4	4.0	3	2.0
6. Develop guidelines for when a county (or other local entity) should be the lead agency in geothermal matters.	3	3.0	3	2.0
7. Develop means to consider and solve the problems of interstate "export" of environmental impacts.	10	8.6	10	8.5
8. Develop working relationship on roles and responsibilities between ERCDC and local entities re: regional vs. site-specific impacts.	8	7.0	2	1.3
9. Develop means to assist local agencies in dealing with Federal agencies particularly where they have multiple jurisdictions of the same agency (e.g., several forests in Plumas County).	7	6.3	9	6.7
10. Take "anomaly development" approach to environmental evaluation.	9	8.3	8	5.5
11. Develop process for real, site specific critiques of local EIRs by state agencies.	11	10.0	5	4.0

PRIORITIES			
Counties		ERCDC Staff	
Rank	Ave.	Rank	Ave.

B. REGULATORY/PERMITTING SUPPORT PROBLEMS:

1. Set environmental sanctions and conditions via local use permit process.	2	3.0	4	4.0
2. Develop methods for local agencies to determine for their permitting purposes the subsurface resource characteristics before they are effectively or actually irrevocably committed.	1	1.5	2	2.3
3. Develop means to coordinate ERCDC interests with D.O.G. experience (and local <u>acceptance</u>) for onsite well inspections.	3	3.2	3	2.6
4. Develop recommendations for local entities to enforce "unitizing" for anomaly development/use.	2	3.0	1	1.5

C. STATEWIDE STANDARD/STANDARDIZATION PROBLEMS:

1. Establish environmental standards for geothermal development and related reporting.	1	2.2	2	3.6
2. Define statewide environmental quality standards for air, water, noise for local agencies to meet.	2	2.5	1	2.0
3. Coordinate the development of common application of common statewide agency standards (e.g., ARB).	3	3.5	1	2.0
4. Develop guidelines for a "geothermal element to county general plans."	7	5.6	4	4.3
5. Assist local entities in preparing "Energy Elements and Power Plant Elements" for their plans including county general plans.	6	5.2	3	4.0
6. Assist in development of County ordinances for exploratory, development, and production operations.	4	3.6	6	6.3
7. Provide basis (and means) for development by joint industry-local-state "building permit approach" to geothermal area.	5	4.0	5	5.0

PRIORITIES			
Counties	ERCDC Staff		
Rank	Ave.	Rank	Ave.

D. TECHNICAL SUPPORT PROBLEMS:

1. Develop means for standardization of training and/or qualifications of local agency "Environmental Control Officers" (or whatever called).	11	7.0	9	11.0
2. Assist local agencies in meeting environmental standards particularly where cross local boundaries.	6	5.3	4	5.0
3. Assist in establishing environmental baseline data and data sources, including "what if" question.	1	3.0	1	1.6
4. Build phased environmental record on projects including deferring to an "EIR of record."	7	5.6	2	2.0
5. Serve as a "clearinghouse" of technical data and analyses of the local significance thereof for local agencies.	3	3.7	6	6.0
6. Prepare to prepare or cause to be prepared all geothermal power plant EIRs in <u>some</u> areas for some local entities.	4	4.4	3	4.0
7. Provide technology or provide access to needed by local agencies to evaluate applications, reports, and related documents.	8	5.8	3	4.0
8. Develop and make accessible information on qualified technical consultants.	5	5.2	7	6.7
9. Assist in the development of "front desk" approach to basic geothermal activities faced by planning departments and/or public works departments.	2	3.6	8	7.0
10. Develop means to reimburse local agencies for their staff-time devoted to reviewing applications particularly where they may be or are intervenors.	10	6.2	9	11.0
11. Develop vehicles and/or means for support of local county "anticipatory" environmental analysis (e.g., funding for staff work before an application comes into the agency).	9	6.0	7	6.7

PRIORITIES			
Counties		ERCDC Staff	
Rank	Ave.	Rank	Ave.

E. "ONE-SHOT" RESEARCH PROBLEMS:

1. Support research on the role of local government in planning re: geothermal resource development and <u>in situ</u> use.	1	1.8	7	6.0
2. Conduct research on economic impacts (pro and con) of geothermal resources management.	2	3.0	6	4.3
3. Develop procedures to assess cumulative impacts both within a single jurisdiction and within several air- or water-overlapping (for instance) jurisdictions.	3	3.6	1	1.0
4. Examine the impacts of geothermal on other land uses.	3	3.6	4	2.6
5. Support research on the environmental constraints and sensitivities (particularly economic including market analysis) of both electric and non-electric use of geothermal resources.	4	4.0	3	2.3
6. Provide information on actual and perceived impacts of geothermal resources use on recreation and tourism	6	6.6	2	2.0
7. Provide information on local tax benefits vs. local problems and costs.	5	4.7	5	3.5

2. Include counties and other local entities in project planning for research on their areas.
3. Develop guidelines for when a county (or other local entity) should be the lead agency in geothermal matters.
4. Develop a permanent, regular means to work with local planning entities.

b. Regulatory/Permitting Support Problems

1. Develop methods for local agencies to determine for their permitting purposes the subsurface resource characteristics before they are effectively or actually irrevocably committed.
2. Set environmental sanctions and conditions vial local permit process.
3. Develop recommendations for local entities to enforce "unitizing" for anomoly development/use.
4. Develop means to coordinate ERCDC interests with DOG experience (and local acceptance) for onsite well inspections.

c. Statewide Standards/Standardization Problems

1. Establish statewide environmental standards for geothermal development and related reporting.
2. Define statewide environmental quality standards for air, water, and noise for local agencies to meet.
3. Coordinate the development of common applications of common statewide agency standards (e.g., ARB).
4. Assist in the development of County ordinances for exploratory, development and production operations.
5. Provide basis (and means) for development by joint industry-local-state "building permit approach" to geothermal area.

d. Technical Support Problems

1. Assist in establishing environmental baseline data and data sources including "what if" question.
2. Assist in the development of "front desk" approach to basic geothermal activities faced by planning departments and/or public works departments.
3. Serve as a "clearinghouse" of technical data and analyses of the local significance thereof for local agencies.
4. Prepare to prepare or cause to be prepared all geothermal power plant EIRs in some areas for some local entities.
5. Develop and make accessible information on qualified technical consultants.
6. Assist local agencies in meeting environmental standards particularly where (they) cross local boundaries.

e. "One-Shot" Research Problems

1. Support research on the role of local government in planning re: geothermal resource development and in situ use.
2. Conduct research on economic impacts (pro and con) of geothermal resources management.
3. Develop procedures to assess cumulative impacts both within a single jurisdiction and within several air- or water-overlapping (for instance) jurisdictions.
4. Examine the impacts of geothermal on other land uses.
5. Support research on the environmental constraints and sensitivities (particularly economic including market analysis) of both electric and non-electric use of geothermal resources.

2. ERCDC Priorities:

The ERCDC staff sees the Key problems in each group as:

a. Organizational Problems

1. Define local - ERCDC specific roles and responsibilities regarding geothermal exploration-development-production environmental analyses.
2. Develop working relationship on roles and responsibilities between ERCDC and local entities re: regional vs. site-specific impacts.
3. Develop a permanent, regular means to work with local planning entities.
4. Develop guidelines for when a county (or other local entity) should be the lead agency in geothermal matters.
5. Assist/facilitate regional environmental evaluations and planning.

b. Regulatory/Permitting Support Problems

1. Develop recommendations for local entities to enforce "unitizing" for anomaly development/use.
2. Develop methods for local agencies to determine for their permitting purposes the subsurface resource characteristics before they are effectively or actually irrevocably committed.
3. Develop means to coordinate ERCDC interests with D.O.G. experience (and local acceptance) for onsite well inspections.
4. Set environmental sanctions and conditions via local use permit process.

c. Statewide Standards/Standardization Problems:

1. Define statewide environmental quality standards for air, water, noise for local agencies to meet.
2. Coordinate the development of common application of common statewide agency standards (e.g., ARB).
3. Establish environmental standards for geothermal development and related reporting.

4. Assist local entities in preparing "Energy Elements and Power Plant Elements" for their plans including county general plans.
5. Develop guidelines for a "geothermal element to county general plans."

d. Technical Support Problems

1. Assist in establishing environmental baseline data and data sources including "what if" question.
2. Build phased environmental record on projects including deferring to an "EIR of record."
3. Prepare to prepare or cause to be prepared all geothermal power plant EIRs in some areas for some local entities.
4. Provide technology or provide access to needed by local agencies to evaluate applications, reports, and related documents.
5. Assist local agencies in meeting environmental standards particularly where cross (they) local boundaries.

e. "One-Shot" Research Problems

1. Develop procedures to assess cumulative impacts both within a single jurisdiction and within several air- or water-overlapping (for instance) jurisdictions.
2. Provide information on actual and perceived impacts of geothermal resource use on recreation and tourism.
3. Support research on the environmental constraints and sensitivities (particularly economic including market analysis) of both electric and non-electric use of geothermal resources.
4. Examine the impacts of geothermal on other land uses.
5. Provide information on local tax benefits vs. local problems and costs.

3. Comparison Between County and ERCDC Priorities:

The ERCDC staff priorities are similar to the County priorities in several problem groups and dramatically different in several.

By problem groups the priority rankings are compared as follows:

a. Organizational Problems

Both the ERCDC staff and the Counties agree that the key organizational problem is to "Define local-ERCDC specific roles and responsibilities regarding geothermal exploration-development-production environmental analysis." The balance of the rankings in this group are similar except for the staff ranking of "Develop working relationship on roles and responsibilities between ERCDC and local entities re: regional vs. site-specific impacts" as second while the Counties ranked it eighth.

b. Regulatory/Permitting Support Problems

The counties and ERCDC ranked these problems essentially the same. While there is some difference, in general they are both very similar.

c. Statewide Standards/Standardization Problems

The county and ERCDC staff top three rankings are very similar. The rankings of other four problems are quite different with no direct pattern evident.

d. Technical Support Problems

Both the counties' and ERCDC ranked "Assist in establishing environmental baseline data and data sources" as the highest priority problem in this group. The County thrusts from that rank - ERCDC provide "front desk" support (2) and ERCDC serve as a "clearinghouse" (3) - are quite different from the ERCDC emphasis - phased EIRs (2) and ERCDC staff gear-up to prepare EIRs and provide technology or access to technology to local agencies (both 3).

e. "One-Shot" Research Problems

Of the problem groups, the ranking of the priorities of the research problems show the greatest difference between the counties' and the ERCDC staff. The County 1 and 2 rankings are ranked 7 and 6 by the staff but the middle rankings are essentially the same. The closest high priority problem (ERCDC: first, counties: third) is to "Develop procedures to assess cumulative impacts both within a single jurisdiction and within several air- and water-overlapping jurisdictions."

Otherwise, the counties recommend that ERCDC support research on the role of local government in planning (1) and conduct research on economic impacts (pro and con) of geothermal resources management (2). The ERCDC staff recommend provisions "of information on actual and perceived impacts of geothermal resource use on recreation and tourism" (2) and support of "research on the environmental constraints and sensitivities of both electric and non-electric use of geothermal resources."

C. CLASS III: BETWEEN ERCDC AND OTHER ENTITIES

From meetings with the Division of Oil and Gas, State Lands Commission, Public Utilities Commission, and the other previously listed state entities, it is evident that there is a sizeable group of problems in ERCDC's present and potential relations to/with these agencies. Of greatest immediate concern is coordination of planning efforts. It is recommended that the EAO organize on-going workshops and an interagency-intergovernmental program to coordinate (or work toward coordination of) these agencies.

Specific initial agenda items should include:

goals of agencies re: geothermal resources;

EIR preparation and review practices and documentation

requirements (current and planned);

names and players of the agencies involved with geothermal

(including how and why);

experience to date;
future-work-plans and programs; and
cooperation in hearings (simultaneous or parallel).

As with state agencies, the meetings which have been had and materials which have been reviewed indicate that ERCDC has excellent opportunities for positive synergistic relationships with BLM, USGS, USFS and ERDA. At the present time, ERCDC should organize on-going workshops with the Federal agencies, particularly their technical personnel. EAO should develop procedures in joint, simultaneous EIR/EIS preparation.

The three greatest problems expressed by the private sector are:

- the lack of a clearcut ERCDC policy related to geothermal development;

- the lack of a standardized, appropriate notice of intent/application for certification procedure and related guidelines which would require data commensurate with the specificity of the state of geothermal resource development (exploration through production); and

- the need for clearcut leadership in the geothermal interagency-intergovernmental maze.

Conversely, the private sector felt that these three interrelated areas are ERCDC's greatest opportunities and responsibilities for state-wide leadership.*

D. CLASS IV: BETWEEN OTHER ENTITIES

Finally, it would be possible for ERCDC to facilitate and expedite the interactions that must go on between other agencies. As a focal point

*EAO is urged to conduct workshops directly with the technical interests of the private sector. These organizations have valuable environmental data and are willing to share it with ERCDC.

for state geothermal energy interests ERCDC could arrange for interested parties to meet and resolve different points of view on projects. This would appear to be particularly helpful in relation to:

1. county-federal concerns over land-use issues;
2. county-state environmental quality aspects related to conflicting resource management goals particularly Department of Fish and Game;
3. county-APCD (and other regional entities) concerns about environmental quality particularly uniform application and enforcement of statewide standards;
4. county-county data base and environmental quality considerations;
5. federal-federal (within state) resource management and the implications thereof, particularly socio-economic impacts, on the citizens of the state;
6. federal-state energy policy coordination particularly related to leasing activities on anomaly-wide bases;
7. private-federal-state-local matters related to general non-powerplant-specific aspects of geothermal resource utilization; and
8. internal-county funding problems: providing or facilitating revenues needed to handle the added burdens of geothermal resource utilization on county staffs.

E. SUMMARY OF PRIORITY PROBLEMS

Obviously given its present staffing limitations and legislatively mandated and limited scope of roles and responsibilities, ERCDC cannot simultaneously address all of the problem/solutions identified in this chapter. The following section, then, presents a recommended set of critical "priority problems" for action within ERCDC (1) and between ERCDC and other agencies (2).

1. Priority Problems Within ERCDC

The priority problems for action within ERCDC are to:

- (1) develop a single, comprehensive, coordinated policy regarding geothermal resources;
- (2) develop the technical staff to aide in the development and site certification and evaluation of geothermal resources;
- (3) develop the internal procedures for site certification and evaluation;
- (4) develop a means for regular, systematic incorporation of local interests and concerns in ERCDC operations planning and decision making;

2. Priority Problems With Other Entities:

The priority problems for ERCDC action in its dealings with other entities, or their dealings together, are to:

- (1) promulgate a reasonable NOI/AFC process and related guidelines;
- (2) define specific local agency and ERCDC roles and responsibilities regarding geothermal development;
- (3) establish a uniform means or set of means to assist in the development of environmental baseline data;
- (4) define statewide environmental quality standards for air, water, noise and other environmental quality aspects for local agencies to meet and enforce;
- (5) establish statewide standards for geothermal development and reporting;
- (6) develop means for preparation of joint or simultaneous environmental reports (from initial studies to EIR/EIS);
- (7) develop means to conduct simultaneous hearings with other responsible agencies in the geothermal process (local, PUC, and APCD);
- (8) organize and conduct regularly scheduled, periodic intergovernmental workshops on environmental data and the geothermal process;
- (9) establish (or reactivate) a forum for interchange of technical geothermal data and for arbitration of disputes;
- (10) develop procedures to assess cumulative impacts both within a single jurisdiction and within several jurisdictions;

- (11) develop methods for anomaly-wide resource evaluation;
and
- (12) develop means to enforce anomaly-wide resource management.

IV. RECOMMENDATIONS

This chapter presents a number of recommendations for action by ERCDC for the management of geothermal energy resources in California. Most of the recommendations relate to possible roles and responsibilities of the Environmental Analysis Office of the Energy Assessment Division; all, however, because of their basic nature, relate to the general, over-all roles that ERCDC as an entity could take in relation to the state's geothermal resources. Effectation of such recommendations would obviously involve the EAO.

The recommendations are presented in three groups and are ranked approximately as in the previous chapter on problems for coordination of geothermal activities. The sections are:

A Recommended ERCDC Geothermal Policy and Program (A),
Specific Recommendations for Geothermal Resource Coordination (B), and
Prepaid Tax Credits: A Possible Local Funding Mechanism (C).

A. A RECOMMENDED ERCDC GEOTHERMAL POLICY AND PROGRAM

The most important step that ERCDC could take in the geothermal energy field is to develop and adopt a single, well defined policy for the use of the resource.

Toward that end, in November 1976 the ERCDC Interdivisional Geothermal Committee established a subcommittee to draft a set of policy and program goals and options, that the commissioners might use to adopt a single, statewide, geothermal policy and program. The subcommittee consisted of Dave Anderson from the Alternatives Implementation Division, Mel Schrecongost from the Facilities Siting Division, and this author repre-

senting the Energy Assessment Division*. The draft product, with revisions through December 20, 1976 is included as Appendix D: "DRAFT STATEWIDE GEOTHERMAL ENERGY PROGRAM". The full committee reviewed the draft in early January 1977 and concluded that while the materials did meet the charge given the subcommittee, it needed some additional work to clarify completely the discussion of the "program options" and to expand the introductory remarks, particularly to expand the documentation of the need for adoption of an ERCDC geothermal policy. Because of the work responsibilities of the Commission employee members of the subcommittee, these expanded materials have not yet been prepared nor the draft amended.

It is recommended that the "Draft Statewide Geothermal Energy Program" be amended as soon as possible so that it can:

- (1) be reviewed and modified if necessary by the full ERCDC staff;
- (2) become an ERCDC staff recommendation;
- (3) be reviewed by other agency and private entities active in geothermal resource management in California;
- (4) be officially presented to the Commissioners for their considerations and modification if necessary; and
- (5) be used thereby as the framework for their establishing and adopting a single ERCDC Geothermal Policy.

Recognizing that their recommendations are exclusively those of a subcommittee, neither that of the full Interdivisional Geothermal Committee nor the ERCDC staff, the subcommittee members recommended a Goal Option with related Policy Directives and a single program option. It

* The work was done within the scope of this contract under the provisions of Task 4.

is the opinion of this consultant that their recommendations best meet the problems identified in this study and described in the preceding chapters.

Those recommendations for "An ERCDC Geothermal Policy and Program" are:

GOAL OPTION:

encourage geothermal development.

POLICY DIRECTIVES:

1. Economic Incentives:

advocate economic incentives including:

depletion allowance, intangible drilling expense writeoffs, and other incentives;

2. Research:

promote research on all vital aspects of geothermal development;

3. NOI/AFC/EIR Procedures:

Eliminate NOI process but retain a concurrent AFC/EIR process;

4. Environmental and Permitting Problems:

Advocate the solutions to critical environmental and permitting problems.

5. Demand Forecast:

Require geothermal energy to be substituted as a fuel whenever feasible for proposed oil (and other petroleum products) fired plants. Do not restrict future geothermal electric capacity until after 1995.

6. Coordination and Cooperation:

Actively work with the federal government, other state agencies, and local governments to develop interagency agreements;

7. Facilitation:

Establish an energy commission facilitation team to implement existing solutions; and

8. Demonstration Projects:	Support when possible, with funds or endorsements, those demonstration projects that will do the most for geothermal development.

PROGRAM OPTION (#4): PHASED DEVELOPMENT PROGRAM

1. Brief Description:	ERCDC prepares MEA in cooperation with counties and federal government; counties to certify. ERCDC and county/ies prepare exploratory EIR (to meet NOI requirements); ERCDC leads for AFC process;
2. Conformance With 15 PRC (Energy):	Non-conformance (actually, based on comments received since preparation of the draft, may be in conformance) may need to define extent of jurisdiction and (to) eliminate NOI process (as a separate step);
3. Conformance with CEQA:	Possible conformance, may need minor amendments (to guidelines) to include NOI elements on AFC/EIR (but also may fit well with guidelines adopted January 1, 1977 and cited in Appendix A);
4. Conformance with Other PRC Divisions:	In conformance; and
5. Conformance With Regulations: C.A.C.:	Some agency regulations (particularly ARB and WQCB) will (may?) require modification to be part of a simultaneous interagency, intergovernmental procedure.

PREREQUISITES TO IMPLEMENTING PROGRAM OPTION

1. Set Policy:	Decision by Commissioners to prepare MEA's and EIR's in cooperation with other state, federal and county regulatory agencies;
2. Prepare Interagency Agreements:	Cooperative agreement with all "lead" and "responsible" agencies involved: state, federal and local regulatory agencies;
3. Define "Appurtenant" and "related" facilities (PRC Div. 15):	Possibly need to define; could work without a formal "definition"; and

4. Prepare NOI/AFC/EIR Procedures (Regulations and Guidelines Specific to Geothermal Energy):	Development of regulations and guidelines.

IMPLEMENTATION CONSIDERATIONS FOR PROGRAM OPTION:

1. Time Needed to Implement Option Fully:	1 to 2 years because of numerous cooperative agreements, compromises and possible legislation (based on discussions with federal and local agencies in three of California's geothermal regions, this estimate may be one year or less because of their cooperative spirit and recent CEQA adoptions);
2. Legislation: Draft and Implement:	May be desirable particularly to clarify NOI/AFC/EIR relationships;
3. Non-ERCDC Regulations:	None required;
4. ERCDC Staffing:	moderate, sporadic additions to ERCDC staff or consulting services; estimate 5 to 10 positions (if permanent staff);
5. Facilities: office space and equipment:	moderate, sporadic increase parallel to staff changes; no increase if use consultants; estimate \$3000 to \$6000;
6. Prepare and Implement Cooperative Agreements:	with all involved federal, state and local agencies;
7. ERCDC Develop NOI/AFC/EIR Guidelines, Procedure and Regulations:	Mandatory (!);
8. ERCDC Budget:	Moderate increase expected during peak activity periods; estimate at \$113,000 to \$226,000;*

*Estimated by Anderson and Schrecongast based on 1977-78 budget processes.

9.	Probability of Litigation:	low, no real problems expected; and
10.	Policy Directives Recommended by Subcommittee for Successful Implementation: (see above Policy Directives):	Critical: 3, 6 and 7
Desirable: 1, 2, 4, 5, and 8

As noted in the subcommittee draft, the key features* of the recommended policy and program include:

- (1) An MEA jointly prepared by federal, state and local agencies (which could be certified by the responsible regulatory agencies and used as an environmental data base for the development of EIR supplements);
- (2) EIR supplements (at appropriate levels of specificity) for exploration confirmation and development wells could be written and artified under authority of federal, state, and local agencies;
- (3) EIR supplements for power plants to satisfy federal, state, and local requirements could be written; and
- (4) the approach would provide the greatest amount of flexibility and the least duplication of effort as compared to the other program options.

B. SPECIFIC RECOMMENDATIONS FOR GEOTHERMAL RESOURCE COORDINATION

Many specific recommendations have already been incorporated in

* The concept has been discussed with Norm Hill of the Resource Agency Secretary's Office and found to be in full compliance with the intent and letter of current, operative CEQA guidelines.

the recommended program option. Those recommendations made here are additional items which could facilitate ERCDC's environmental and related roles. The recommendations are presented in two categories: recommendations for actions within ERCDC and recommendations for actions by ERCDC for or in behalf of other entities.

(1) Recommendations for Specific Actions Within ERCDC

The following recommendations are for actions that ERCDC could take internally to facilitate management of California's geothermal resources. Of necessity some of these recommendations overlap with the second category. The recommendations are:

1. establish a permanent interdivisional facilitation team to manage all ERCDC activities in geothermal resources;
2. organize the team to include one responsible person for each geothermal region (Geysers, Imperial, East Sierra, Northeast, and Central Coastal regions);
3. develop a cadre of environmental and technical experts available for use by local agencies upon request;
4. have EAO technical staff meet initially and regularly with USGS Environmental Safety Section and other federal technical staffs;
5. develop Master Environmental assessment (process) commensurate with the phases of geothermal development so that Master Environmental Assessments (products) are developable and certifiable as staged or phased documents having the same level of specificity as the phase of development;
6. assemble a set of standardized environmental data requirements, review considerations, and enforcement procedures for both lead and responsible agencies to serve as a common check-list for proponents;
7. develop mutually acceptable (ERCDC, APCD's, WQCD's and SWMB) standards and enforcement procedures for air and water quality and solid waste discharge;

8. develop procedures for joint simultaneous hearings on environmental matters;
9. establish, publicize and make available a "clearinghouse" of geothermal environmental and related information;
10. develop a permanent technique for biennial updating the geothermal policy and program by formalizing the Interdivisional Geothermal Committee and give them the biennial responsibility of preparing such a document for Commission adoption;
11. include county personnel and representative citizens in workshops with the Interdivisional Geothermal Committee to incorporate their recommendations in the policy and program; and
12. support basic natural, social, and economic environmental research in:
 - 12.1 generic "what if" impacts of geothermal development by geothermal region;
 - 12.2 role of local governments in energy resource planning;
 - 12.3 economic impacts of geothermal development;
 - 12.4 cumulative impacts of geothermal development;
 - 12.5 cross-political-boundary impacts and related utilization of geothermal development; and
 - 12.6 impacts of geothermal development on other land-uses.

(2) Recommendations for Specific Actions by ERCDC for or in Behalf of Other Entities

The following recommendations are for actions by ERCDC to take with other agencies or to facilitate other agencies working together:

1. assist counties in assembling environmental baseline data and answering "what if" question;

2. provide financial and administrative support for counties to conduct pre-application geothermal environmental feasibility analyses and other related analyses;
3. clarify the interests and roles and responsibilities of ERCDC and of the Geothermal Resources Board;
4. clarify the position of ERCDC as the single state entity as the decision maker for all state agencies in geothermal energy resource matters;
5. work with OPR to clarify existing guidelines for conservation element of general plans to include geothermal energy;
6. assist OPR in developing the governing codes to enable the development of specific "energy elements" to local plans;
7. assist counties in conducting public information sessions to inform their constituencies about geothermal development and in obtaining public inputs on geothermal matters for the decision making process;
8. assist counties in the preparation of energy elements and/or ordinances and related environmental reports thereon;
9. assist local agencies in documenting the below-ground resources in their regions;
10. assist local water quality agencies in the development of appropriate discharge standards;
11. develop a list of qualified geothermal and environmental consultants available for local agencies;
12. assist local agencies in the development and training of environmental inspectors for employment by local entities;
13. assist Department of Conservation in the clarification of geothermal energy resource use implications on Williamson Act lands; and
14. assist counties in the development of standardized "front desk" + "building permit" approaches to exploratory and other well applications for land-use permits.

C. PREPAID TAX CREDITS: A POSSIBLE LOCAL FUNDING MECHANISM

A final specific recommendation, which is closely related to those previously recommended action ERCDC could take to facilitate local efforts, is for ERCDC to analyze and develop appropriate regulations for statewide, local prepaid tax credits for environmental impact analyses and natural, social, or economic impact mitigation. Such an approach was developed and used by Puget Sound Power and Light Company and Skagit County, Washington, to provide funds to mitigate impacts prior to the completion of a power facility.

Appendix E presents detailed extracts from the agreement Puget and Skagit reached. Discussions with both the County and the Utility indicate that the system is working. It goes without saying that facilitation of such a system in California could provide greatly needed, valuable financial assistance to local agencies.

V. REFERENCES

The following documents and files were used in the preparation of this report. It should be noted that the materials are all open files except where noted as "personal files". In the latter cases, the files are referenced to the appropriate state employee. For organizational purposes the references are listed in two categories: General References (A) and Materials Received from Counties (B).

A. GENERAL REFERENCES*

Battelle Memorial Institute: "Draft of a Report on Legal, Institutional, and Political Problems in Producing Electric Power from Geothermal Resources in California: (1976).**"

Jet Propulsion Laboratory: "Report on the Status of Development of Geothermal Energy Resources in California". Rev. A, June 30, 1976.

_____: "Impediments to Geothermal Development in Lake County, California" (E.T. Hussey) working Paper 5, December 1, 1976.

_____: "Internal Operating Procedures for Public Agency Involvement in Geothermal Development in Lake County, California" (E.T. Hussey) Working Paper 6, November 29, 1976.

University of Southern California Law Center: "Geothermal Energy and the Law (plans for) a Workshop" (Feb. 3-5, 1975).

Lake County Air Pollution Control District and Environmental Systems and Services, Inc.: (Proceedings) "Geothermal Environmental Seminar" (Nov. 14-15, 1975).

BLM Susanville District and U.S.F.S. Modoc National Forest: "The Upper Pit River Proposed Geothermal Leasing EAR" Draft; Vol. 1 (c. 1975).

E.P.A.; Region IX: "New Source Review Application Requirements" 7-9-76.

USGS, BLM, U.S.F. & W.S.: "Memorandum of Understanding for the Geothermal Program (:). Cooperative Procedures in the Geothermal Program" (1976).

* Listed in the approximate order they were received and reviewed except where a multiple listing for a single entity.

** Undated report, estimated dates shown in parenthesis ().

USGS: "Geothermal Resources Operational Orders", January 1976.

_____ : "Geothermal Steam Act of 1970 and Regulations on the Leasing of Geothermal Resources," May 1975.

_____ : "The Geothermal Environmental Advisory Panel (:) First Annual Report (June 1, 1974 - June 30, 1975)", September 1975.

_____ : "The Geothermal Environmental Advisory Panel (:) Second Annual Report (July 1, 1975 - June 30, 1976)", July 1976.

_____ : U.S. Department of Interior Geothermal Environmental Advisory Panel Working Group on Environmental Baseline and Monitoring: "Guidelines for Acquiring Environmental Data for Geothermal Resource Development on Federal Leased Lands" (Final Draft for Review by GEAP) (August 1976).

_____ : "Exploration and Development of Geothermal Resources" September 1976.

_____ : "Pre-lease Environmental Analysis Report" (Process Flow Charts and Organization Charts) March 15, 1975 (with annotated updates by Section Chief, Environmental and Safety Section; September 14, 1976).

_____ : "Environmental Analysis (Prepared for one 2000 foot deep temperature gradient hole on Lease N-8385 Phillips Petroleum Company Washoe County, Nevada (July 1976).

_____ : "Environmental Analysis" (Prepared for three (3) Proposed Deep Exploration Holes in Lease CA-963 Republic Geothermal, Inc. Long Valley, California), January 20, 1976.

E.R.D.A.: (Memorandum) "Use of Loan Guarantees for Resource Exploration", Draft 8-9-76.

_____ : "Geothermal Loan Guaranty Application Guidelines", June, 1976.

_____ : (Federal Register Vol. 41, No. 103, pp. 21433-21440) "Geothermal Energy Research, Development, Demonstration and Production (:) Federal Guarantees on Loans", May 26, 1976.

U.S.F.S.: "Geothermal Reference Sheet" Project report on current USFS, BLM preparation of environmental statement on the Long Valley KGRA), September 10, 1976.

State of California, D.O.G.: "Proceedings: Workshop on Environmental Aspects of Geothermal Resources Development" (Nov. 20-22, 1974).

_____, _____: "Geothermal Well Drilling and Completion Practices in California including Casing and Abandonment Programs and Examples of Blowouts" (1974).

_____, S.L.C.: "Geothermal Resources Program (:): A Dynamic Approach to Alternative Energy Development." (September 1975).

_____, _____: Draft EIR, "Exploration for Geothermal Resources, Boggs Mt. State Forest, October 1976.

_____, D.F.G.: "Department of Fish and Game Statement for Hearing Subcommittee on Geothermal Resources, State Lands Commission", September 17, 1975.

_____, _____: P.U.C.: "Statement by H.T. Sipe, Chief Environmental Engineer (:): on Geothermal Resource Utilization" (September 1975).

_____, _____: P.U.C.: Draft EIR Geysers Unit 13 with PG&E Environmental Data Statement; March, 1975.

_____, _____: D.W.R.: "Water and Power from Geothermal Resources in California: (including Appendix A: Legal and Institutional Problems), December, 1974.

_____, Division of Mines and Geology: "Engineering Geology of the Geysers Geothermal Resource Area" Special Report 122, 1976.

_____, _____: "Fault Map of California" (including) Volcanoes, Thermal Springs and Thermal Wells. 1975.

_____, ERCDC: "Preliminary Guidelines: Information Required for Geothermal Power Plant Notices of Intent", 8-26-76 (Draft).

_____, _____: "Presentation to the Assembly Committee on Energy. . .", March 15, 1976.

_____, _____: "Power Plant Siting Report" (Draft), September 1976.

_____, _____: "Staff Proposed Electricity Forecasting and Planning Report" Volume II, October 1976.

_____, _____: "Environmental Protection (:): Implementation of the California Environmental Quality Act of 1970", February 18, 1976.

_____, S.W.M.B.: "Procedure for Implementing S.B. 1797 (1974)" (Solid Waste Disposal Sites) (1975).

_____, Resources Agency: (correspondence): Union Oil to Claire Dedrick and Response Thereto (December 1975).

_____, ____: "Adopted Amendments to Guidelines for Environmental Impact Reports", September 30, 1976.

_____, OPR: "General Plan Guidelines", September 1973.

_____, ____: "Guidelines for Preparation and Content of Noise Elements of the General Plan", February 1976.

_____, ____: "State and Local Permit Study (:) An Analysis of Administrative Factors Affecting Geothermal Development at the Geysers" (February 26, 1976).

Miscellaneous Correspondence Related to OPR Study (Personal File: Gary Palo: Siting Division):

- (1) Correspondence: "PG&E to Assemblyman Leo T. McCarthy", January 13, 1976.
- (2) "A Phased, Single EIR Process for Geothermal Field Exploration, Development and Production" Proposed by Geothermal Task Force of the Northern California Regional Conservation Committee of the Sierra Club (1976).
- (3) "Proposal for the Rapid Permitting of Geothermal Exploratory Wells" Prepared by D.O.G., 2-6-76.
- (4) Correspondence: Comments on "OPR's Report - State and Local Permit Study - at the Geysers" by Lewis A. Moran to Gary Weatherford (undated).
- (5) Correspondence: Same subject: by William H. Lewis, Jr. Executive Officer, ARB to William G. Kirkham, OPR, April 29, 1976.
- (6) Correspondence: Same subject: by Rick Frank, ERCDC Legal Office to Gary Palo, March 26, 1976.
- (7) Correspondence: Same subject: by Richard Maullin to Bill Press, Director OPR, May 12, 1976.

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_____ : Economic Analysis of Geothermal Energy Development in California Vols. I and II; November, 1976.

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Western Energy Company (Martin A. White): "A Report on Mitigation and Monitoring of Socio-Economic Impact of Large Scale Energy Development Projects" (Colstrip Montana), December 17, 1976.

The Ben Holt Co.: Quarterly Technical Progress Report: "Geothermal Space/Water Heating for Mammoth Lakes Village, California", 13 September - 12 December, 1976.

B. MATERIALS FROM COUNTIES

1. IMPERIAL VALLEY REGION:

A. Imperial County:

1. "Terms, Conditions, Standards, and Application Procedures for Initial Geothermal Development (in) Imperial County", May, 1971.
2. "Discussion of Draft Geothermal Element" (to County General Plan), 7-28-76.
3. "Final Environmental Impact Report for Geothermal Exploratory Permit for Union Oil Company", September 13, 1976.
4. "Planning for Resource Development: Geothermal Energy in Imperial County, California", (Research Proposal) Date Awarded: June 26, 1975.
5. "Rules and Regulations (:) Imperial County Air Pollution Control District", 4-27-76.

B. Riverside County:

1. "Rules to Implement the California Environmental Quality Act of 1970", 1-28-75.
2. "Section 18.29, Public Use Permits" (Excerpt from County Codes), 4-5-73.

II. "GEYSERS" REGION:

A. Lake County:

1. "Lake County Planning Department (Use Permit) Application Form", undated.
2. "Lake County Planning Department (:) Instructions to Applicant", 8-20-75.
3. "Guidelines and Procedures" (EIR), 1972.
4. "Lake County Planning Commission Outline (with elaboration) (of) Environmental Impact Statement", undated.
5. "Lake County Environmental Protection Guidelines", September 4, 1975.
6. "Lake County Planning Department Environmental Assessment", 3-3-76.
7. "Public Opinion in Cobb Valley Concerning Geothermal Development in Lake County, California" (Larry Vollintine and Oleh Weres, LBL) June, 1976.

B. Mendocino County:

1. "Initial Study Project Description", undated.
2. "Mendocino County Planning Commission (:) Exhibits Required with each Use Permit and Variance Application", undated.

C. Napa County:

1. "Geothermal Exploration and Development" (staff memorandum), April 25, 1974.
2. "Geothermal Exploration Permits" (staff memorandum), March 27, 1974.
3. "Behavior of H₂S in the Atmosphere and Its Effects on Vegetation", March 22, 1976.
4. "Subjects to Consider in Geothermal Ordinance", undated.
5. "... Use Permit Controls for Geological and Geothermal Exploration and Development. . .", 5-15-74.
6. "Ordinance #499 Regulating Oil, Gas, and Geothermal Resources", May 1976.

D. Sonoma County:

1. "A Draft Environmental Impact Report for Burmah Oil and Gas Company Aidlin - Gouvea Leasehold (Part I) in Sonoma County, California", July 5, 1976.

E. Yolo County:

1. "Environmental Review", undated, introduction to procedure.
2. "Initial Statement" Environmental Review Process, undated, checklist.
3. "County of Yolo Environmental Impact Report Outline", undated.

F. Glenn County:

1. "Environmental Review Procedure", April 3, 1973.

G. Colusa County:

(contact made but no materials received: "follow state guidelines".)

III. EAST SIERRA REGION:**A. San Bernardino:**

1. "Comments on Draft Environmental Analysis Record - Proposed Geothermal Leasing in the Randsburg, Spangler Hills and South Searles Lake Areas", June 3, 1976.
2. "General Outline for Specific Project E.I.R.s", 1-15-76.
3. "Environmental Administrative Guidelines for Local Entitites", March 18, 1974.
4. "Notice of Negative Declaration (:) Environmental Review Committee (:) Phillips Petroleum Company Site Approval for Shallow Gradient Hole Drilling (Red Mountain area)", May 12, 1976.

B. Mono County:

(Contacted but no materials assembled, "use state guidelines as is.")

C. Inyo County:

1. "Geothermal Resource Development" (Ordinance), 1-15-74.
2. "EIR Guidelines", (draft) January, 1977.

IV. NORTHEASTERN REGION:

A. Plumas County:

1. "Public Utility Facilities", undated.
2. "Proposed 1975 Environmental Impact Guidelines and Procedures for Implementation of the California Environmental Quality Act of 1970", 1975

B. Lassen County:

1. Zoning Ordinances (current), undated.
2. "Contents of Environmental Impact Reports", undated.
3. "Preliminary Environmental Assessment Questionnaire", undated.
4. "Resolution Establishing Procedure for Review of Environmental Impact", 22 April 1975.
5. "Proposed New Agricultural Zoning District", undated.

C. Modoc County:

1. "Terms, Conditions, Standards and Application Procedures for Initial Geothermal Development (in) Modoc County", May, 1974.
2. "Modoc County Procedures for Environmental Review", May 19, 1975.

D. Siskiyou County:

1. "Use Permit and Environmental Review Application", undated.
2. "Siskiyou County Guidelines for Implementation of the California Environmental Quality Act of 1970, as Amended May 14, 1974."

E. Shasta County:

1. "Unclassified or "U" Districts" (Zoning), undated.
2. "Environmental Information Form", undated.
3. "Guidelines for the Preparation of Environmental Impact Reports for Shasta County", December 9, 1974.

F. Tehama County:

1. "Use Permit Application", undated.
2. "Environmental Checklist Form", undated.

V. CENTRAL COASTAL COUNTIES:**A. Santa Clara County:**

1. "Guidelines for the Preparation of the Environmental Impact Reports on Privately Sponsored Projects", undated.

B. Merced County:

1. "Draft Environmental Impact Report: Delhi Orchards Storage of Trusses", undated (1976).

C. Stanislaus County:

("Use state guidelines")

D. Ventura County:

("No special geothermal materials.")

APPENDIX A

**EXTRACTS FROM ERCDC
GOVERNING CODES**

PART I: PRC Section 25000 et seq

PART 2: CAC Section 15000 et seq

APPENDIX A:**PART 1:****EXTRACTS FROM SECTIONS 25000****et seq and PUBLIC RESOURCES CODE:****Energy Conservation and Development.**

From Chapter 1, Title and General Provisions:

Section 25003. The Legislature further finds and declares that in planning for future electrical generating and related transmission facilities, state, regional, and local plans for land use, urban expansion, transportation systems, environmental protection, and economic development should be considered.

Section 25004. The Legislature further finds and declares that there is a pressing need to accelerate research and development into (and of) alternative sources of energy and into improved technology of design and siting of power facilities.

From Chapter 2, Definitions:

Section 25101. "Applicant" means any person who submits an application for certification pursuant to the provisions of this division.

Section 25102. "Application" means any request for certification of any site and related facility filed in accordance with the procedures established pursuant to this division.

Section 25109. "Energy" means work or heat that is, or may be, produced from any fuel or source whatsoever.

Section 25110. "Facility" means any electric transmission line or thermal power plant, or both electric transmission line and thermal power plant, regulated according to the provisions of this division.

Section 26116. "Person" means any person, firm, association, organization, partnership, business trust, corporation or company. "Person" also includes any city, county, public district or agency, the state or any department or agency thereof, and the United States to the extent authorized by federal law.

Section 25119. "Site" means any location on which a facility is constructed or is proposed to be constructed.

Section 25120. "Thermal powerplant" means any stationary or floating electrical generating facility using any source of thermal energy, with a generating capacity of 50 megawatts or more, and any facilities appurtenant thereto.

Section 25121. "Fuel" means petroleum, crude oil, petroleum product, coal, natural gas, or any other substance used primarily for its energy content.

From Chapter 3 State Energy Resources Conservation and Development Commission:

Section 25214.3 (a) The commission shall compile relevant local, regional, state, and federal lands use, public safety, environmental, and other standards to be met in designing, siting, and operating facilities in the state; except as provided in subdivision (d) of Section 25402 (*), adopt standards, except for air and water quality, to be met in designing or operating facilities to safeguard public health and safety which may be different from or more stringent than those adopted by local, regional, or other state agencies, or by any federal agency if permitted by federal law; and monitor compliance and ensure that all facilities are operated in accordance with this division.

(b) The local, regional, and other state agencies shall advise the commission as to any change in its standards, ordinances, or laws which are pertinent and relevant to the objective or carrying out the provisions of this division.

From Chapter 4, Planning and Forecasting:

Section 25300. Every electric utility in the state shall prepare and transmit to the commission...a report specifying 5-, 10-, and 20-year forecasts or assessments of loads and resources for its service area. ...include... (a) A tabulation of estimated peak loads, resources ... (c) A list of facilities which will be needed to serve additional electrical requirements ...the anticipated types of fuel ... (d) A description of additional system capacity which might be achieved through, ... (1) generating or transmission efficiency ... (4) other improvements in efficiencies of operation ...

Section 25305. Within six months after receipt of the reports specified in Section 25300, the commission shall prepare and distribute a preliminary report, setting forth its findings and conclusions regarding the accuracy and acceptability of the electric utilities' forecasts. ...

Section 25309. Beginning January 1, 1977, and every two years thereafter, the commission shall transmit to the Governor and the Legislature a comprehensive report designed to identify emerging trends related to energy supply... (g) Assessment of the energy resources available to the state, including among others, fossil fuels and nuclear, solar and geothermal energy resources.. and (k) Recommendations to the Governor and the Legislature for administrative and legislative actions...

From Chapter 6, Power Facility and Site Certification:

Section 25500. In accordance with the provisions of this division, the commission shall have the exclusive power to certify all sites and related facilities in the state, except for any site and related facility proposed to be located in the permit area, whether a new site and related facility or a change or addition to an existing facility. The issuance of a certificate

* Section 25402 refers to energy conservation actions of the commission.

by the commission shall be in lieu of any permit, certificate, or similar document required by any state, local, or regional agency, or federal agency to the extent permitted by federal law, for such use of the site and related facilities, and shall supersede any applicable statute, ordinance, or regulation of any state, local, or regional agency, or federal agency to the extent permitted by federal law.

Section 25501.5 The Legislature finds and declares that the following proposal sites and facilities with the associated estimated generating capacities meet the requirements of subdivision 1b) of Section 25501 (exemption):

(a)...PG&E...geothermal plant(s)...commonly known as (1) Geysers Unit 12... (2) Geysers Unit 14. . (3) Geysers Unit 15... (4) Geysers Unit 13... (5) a geothermal powerplant having a generating capacity of 110 megawatts, planned for operation in 1978, to be located in Sonoma County or Lake County...(6) planned for operation in 1979, to be located in Sonoma County or Lake County. . (f) Four (7 to 10) geothermal powerplants. . City of Burbank ...in Imperial County... (g) Four (11-14) geothermal powerplants...City of Burbank...in Inyo County... (and) (h) Two (15-16) geothermal powerplants ...by the Northern California Power Agency...in Sonoma County.

Section 25502. Each person proposing to construct a thermal powerplant or electric transmission line on a site shall submit to the commission notice of intention (NOI) to file an application for the certification (AFC) of such site and related facility, or facilities the notice shall be an attempt primarily to determine the suitability of the proposed sites to accommodate the facilities and to determine the general conformity of the proposed sites and related facilities with standard (sic) of the commission and forecasts adopted pursuant to Section 25216.3 and 25309. The notice shall be in the form prescribed by the commission and shall be supported by such information as the commission may require.

Section 25504. The notice of intention shall include a statement by the applicant describing the location of the proposed sites by section or sections, range and township, and county; a summary of the proposed design criteria of the facilities; the type or types of fuels to be used; the methods of construction and operation; the proposed location of facilities and structures on each site; a preliminary statement of the relative economic, technological, and environmental advantages and disadvantages of the alternative site and related facility proposals; a statement of need for the facility and information showing the compatibility of the proposals with the most recent biennial report issued pursuant to Section 25309; and any other information that an electric utility deems desirable to submit to the commission.

Section 25506.5 The commission shall request the Public Utilities Commission, for sites and related facilities requiring a certificate of public convenience and necessity, to make comments and recommendations regarding the design, operation, and location of the facilities designated in the notice in relation to the economic, financial, rate, system reliability, and service implications of the proposed facilities.

Section 25540. If a person proposes to construct a geothermal power-plant and related facility or facilities on a site, the commission shall not require three alternative sites and related facilities to be proposed in the notice (*). In considering the proposed construction of a geothermal power-plant and related facilities on a site, the commission shall issue its findings on the notice as specified in Section 25516 within nine months from the date of filing of such notice, and shall issue its final and (sic) decision on the application as specified in Section 25523 within nine months from the date of filing of the application for certification, or at such later time as is mutually agreed by the commission and the applicant or person submitting the notice.

Section 25541. The commission may exempt from the provisions of this chapter thermal powerplants with a generating capacity of up to 100 megawatts and modifications to existing generating facilities which do not add capacity in excess of 100 megawatts...

From Chapter 7, Research and Development:

Section 25600. The commission shall develop and coordinate a program of research and development in energy, supply, consumption, and conservation and the technology of siting facilities and shall give priority to those forms of research and development which are of particular importance to the state, including, but not limited to, all of the following: ...(c) Exploration and accelerated development of alternate sources of energy, including geothermal and solar energy resources. ...

*As is required for non-geothermal, thermal powerplant notices.

APPENDIX A:**PART 2:****EXTRACTS FROM SECTIONS 15000****et seq CALIFORNIA ADMINISTRATIVE****CODE: "GUIDELINES FOR IMPE-****MENTATION CALIFORNIA ENVIRON-****MENTAL QUALITY ACT OF 1970"**

(As of December 1976 containing amend-
ments effective 1 January 1977)

Section 15063. Federal Projects:

- (a) In regard to any proposed federal project in this State which may have significant effect on the environment and on which the State officially comments, the State officials responsible for such comments shall include in their comments, a discussion of matters specified in Section 15143 of these Guidelines.
- (b) In cases where these Guidelines require the preparation of an EIR by a Lead Agency and an EIS has been or will be prepared for the same project pursuant to the requirements of the National Environmental Policy Act of 1969 and implementing regulations thereto, all or any part of such statement may be submitted in lieu of all or any part of an EIR required by these Guidelines, provided that the EIS or the part thereof so used, shall comply with the requirements of these Guidelines. In cases where the federal EIS is used, discussion of mitigation measures, growth-inducing impact, and energy conservation will have to be added or supplemented if the EIS does not include an adequate discussion of these elements.

Section 15067 Subsequent EIR:

Where an EIR has been prepared, no additional EIR need be prepared unless:

- (a) Substantial changes are proposed in the project which will require major revisions of the EIR, due to the involvement of new environmental impacts not considered in a previous EIR on the project.
- (b) There are substantial changes with respect to the circumstances under which the project is to be undertaken, such as a change in the proposed location of the project, which will require major revisions in the EIR due to the involvement of new environmental impacts now covered in a previous EIR.

Section 15068. Use of A Single EIR:

The Lead Agency may employ a single EIR to describe more than one project if such projects are essentially the same in terms of environmental impact. Further, the Lead Agency may use an earlier EIR prepared in connection with an earlier project to apply to a later project, if the circumstances of the projects are essentially the same. Lead Agencies may elect to write EIRs in advance for entire programs or regulations, in order to be prepared for project applications to come. Whenever an agency chooses to utilize any of these alternatives, however, it must find that the environmental treatment in an EIR and that the EIR will adequately cover the impacts of any single project. If these tests are not met, an agency should supplement the EIR it prepares for a program to apply it to an individual project.

Section 15068.5. Use of A General Plan EIR With Subsequent Projects:

The EIR on a general plan may be used as the foundation document for EIRs subsequently prepared for specific projects within the geographic area covered by the general plan. The subsequent EIRs may reference and summarize material in the EIR on the general plan for the description of the environmental impacts as applies to the specific project. Detailed information in the EIR on the specific project may be limited to a description of the project, the specific environmental setting and those impacts which are not adequately described for the specific project in the EIR on the general plan for part of its description of the environment and the environmental impacts, copies of the EIR on the general plan shall be made available to the public in a number of locations in the community and to any clearing-houses which will assist in public review of the EIR. The purpose of this section is not to restrict analysis of environmental issues but is to avoid the necessity for repeating detail from a General Plan EIR.

Section 15069. Multiple and Phased Projects:

Where individual projects are, or a phased project is, to be undertaken and where the total undertaking comprises a project with significant environmental effect, the Lead Agency must prepare a single EIR for the ultimate project. Where an individual project is a necessary precedent for action on a larger project, or commits the Lead Agency to a larger project, with significant environmental effect, an EIR must address itself to the scope of the larger project. Where one project is one of several similar projects of a public agency, but is not deemed a part of a larger undertaking or a larger project, the agency may prepare one EIR for all projects, or one for each project, but shall in either case comment upon the cumulative effect.

Section 15069.5. Staged EIR:

- (a) Where a large capital project will require a number of discretionary approvals from governmental agencies and one of the approvals will occur more than two years before construction will begin, a staged EIR may be prepared covering the entire project in a general form. The staged EIR should evaluate the proposal in light of current and contemplated plans and produce an informed estimate of the environmental consequences of the entire project. The aspect of the project before the public agency for approval shall be discussed with a greater degree of specificity.
- (b) When a staged EIR has been prepared, a supplement to the EIR shall be prepared when a later approval is required for the project, and the information available at the time of the later approval would permit consideration of additional environmental impacts, mitigation measures of reasonable alternatives to the project.

- (c) Where a statute such as the Warren-Alquist Energy Resources Conservation and Development Act provides that a specific agency shall be the Lead Agency for a project and requires the Lead Agency to prepare an EIR, a responsible agency which must grant an approval for the project before the Lead Agency has completed the EIR may prepare and consider a staged EIR.

Section 15069.6. Master Environmental Assessment:

- (a) General.

A local agency may prepare a master environmental assessment for all, or a portion of, the territory within its jurisdiction in order to provide data and other information which may be used or referenced in EIRs or Negative Declarations.

- (b) Contents.

A master environmental assessment should contain an inventory of the physical and biological characteristics of the area for which it is prepared and may contain such additional data and information as the local agency determines is useful or necessary to describe environmental characteristics of the area, including identification of existing levels of quality and supply of air and water, and generalized incremental effects of different categories of development projects by types, scale, and location.

- (c) Preparation.

A master environmental assessment shall be adopted and certified as adequate by resolution of the legislative body of the local agency, following the provisions for public notice and opportunities for review and comment as set forth in these Guidelines for EIRs and Negative Declarations. The information contained in a master environmental assessment shall be reviewed periodically and revised as needed so that it is accurate and current. When advantageous to do so, master environmental assessments may be prepared through a joint exercise of powers agreement with neighboring local agencies or with the assistance of an appropriate Council of Government.

- (d) Uses.

- (1) A master environmental assessment can identify the environmental characteristics and constraints of an area. This information can be used to influence the design and locations of individual projects.
- (2) A master environmental assessment can provide a central source of current data and information for use in preparing individual EIRs and Negative Declarations.

- (3) A master environmental assessment can be referenced and summarized in EIRs and Negative Declarations.
- (4) A master environmental assessment shall assist in identifying long-range, areawide, and cumulative impacts of individual projects proposed in the area covered by the assessment.
- (5) A master environmental assessment may assist in the formulation of a city or county general plan or any element of such a plan through the identification of environmental characteristics and constraints and facilitate the formulation of policies that are respective of these characteristics and constraints.

(e) **Clearinghouse Review.**

Master environmental assessments and revisions and amendments to assessments shall be forwarded to the State Clearinghouse for the review by and information of state agencies to assist the state agencies in the subsequent review of environmental documents on individual projects.

Section 15072. Feasibility and Planning Studies:

A project involving only feasibility or planning studies for possible future actions which the agency, board, or commission has not approved, adopted, or funded does not require the preparation of an environmental impact report but does require consideration of environmental factors as required by Section 21102 of CEQA.

Section 15106. Class 6: Information Collection (Categorical Exemption):

Class 6 consists of basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource. These may be for strictly information gathering purposes, or as part of a study leading to an action which a public agency has not yet approved, adopted, or funded.

Section 15147. Degree of Specificity:

The degree of specificity required in an EIR will correspond to the degree of specificity involved in the underlying activity which is described in the EIR.

- (a) An EIR on a construction project will necessarily be more detailed in the specific effects of the project than will be an EIR on the adoption of a local general plan or comprehensive zoning ordinance because the effects of the construction can be predicted with greater accuracy.
- (b) An EIR on projects such as the adoption or amendment of a comprehensive zoning ordinance or a local general plan should focus on the secondary effects that can be expected to follow from the adoption, but the EIR need not be as detailed as an EIR on the specific construction projects that might follow.

Section 15148. EIR As Part of General Plan:

- (a) The requirements for an EIR on a local general plan, element, or amendment thereof will be satisfied by the general plan or element document, and no separate EIR will be required if:
 - (1) The general plan addresses all the points required to be in an EIR by Article 9 of these Guidelines.
 - (2) The document contains a special section or a cover sheet identifying where the general plan document addresses each of the points required.
- (b) Where an EIR has been prepared for a general plan, element, or amendment, the EIR shall be forwarded to the State Clearinghouse for review pursuant to Section 15161.6.

Section 15149. Incorporation By Reference:

- (a) An EIR may incorporate by reference all or portions of another document which is a matter of public record or is generally available to the public. Where all or part of another document is incorporated by reference, the incorporated language shall be considered to be set forth in full as part of the text of the EIR.
- (b) Where part of another document is incorporated by reference, such other document shall be made available to the public for inspection at a public place or public building. The EIR shall state where the incorporated documents will be available for inspection. At a minimum, the incorporated document shall be made available to the public in an office of the Lead Agency in the county where the project would be carried out or in one or more public buildings such as county offices or public libraries if the Lead Agency does not have an office in the county.
- (c) Where an EIR uses incorporation by reference, the incorporated part of the referenced document shall be briefly summarized where possible or briefly described if the data or information cannot be summarized. The relationship between the incorporated part of the referenced document and the EIR shall be described.

APPENDIX B:

GEO THERMAL CONTACTS

APPENDIX B GEOTHERMAL CONTACTS

In consideration of geothermal resource management, contacts must be made with a wide range of local, State, and Federal agencies and private entities. This appendix presents a list of contacts for geothermal operations in California. Except where noted, each of these people was contacted one or more times during the the course of this project. Most of the people were of great help; all would be important for others to meet and to work with in geothermal resource use in the various, appropriate areas of the state.

A. LOCAL AGENCY CONTACTS

The list of local agency contacts are presented by geothermal region (Geysers, Imperial, etc.). Some of the specific concerns of the agencies in regard to geothermal matters are also presented as notes to the contact list.

1. Geysers Region (Greater Seven-County Area):

Agency: Colusa County
Name: George Holeman (Dept. of Public Works)
Phone No.: 916-458-5186
Address: 546 Jay Street, Colusa County Court House,
 Colusa, CA 95932

Remarks: No activity to date. Are interested but not much experience. Are having technical staff "track". Seemed willing to work on a coop basis.

Agency: Glenn County
Name: Christy Leighton (Environ. Planner)
Phone No.: 916-934-3388
Address: County P. Dept., Willows, CA

Remarks: No potential known; no policy to date (nor expected) no devel. or expl. opns. to date. Would follow existing EIR process. "Don't concern ourselves if it is in the F.S. area" (Note: If possible in County, likely in the F.S. area).

Agency: Lake County Planning Department
Name: Don Johnson, Planning Director
Phone No.: 707-263-2221
Address: 255 North Forks Street, Lakeport, CA 95453

Remarks: Proregional approach - want to have local control on site-specific and land-use issues. Would be responsive to "State standards" and believe State should help re: regional envr. baseline studies.

Additional Lake County Contacts are:

- (1) Larry Vollintine
Planner
- (2) Mark A. Walters
Environmental Control Officer
- (3) Beverly J. Westphal
Senior Planning Technician
707-263-2221
- (4) Fayne Tucker
Air Pollution Control Director
707-263-2391

Agency: Mendocino County Planning Department
Name: Jerry Heath and Bill Borges* (Assistant Planner)
Phone No.: 707-462-1402
Address: Mendocino County Court House; Ukiah, CA 95482

Remarks: Favorably inclined toward phased and regional approach. Tend to follow Sonoma County re: areas of study (Min. 500 acres) and will look to Lake County for technical experience. Very small staff.

Agency: Napa County Cons., Devel. & Planning Dept.
Name: Stephen Rae (Envr. Specialist)
Phone No.: 707-224-8388
Address: 1121 1st Street, Napa, CA 94558

Remarks: Individually tend to be a "do-it-yourselfers" but suspect County will want to cooperate in regional approach so long as they have say in site-specific and land-use issues.

*No longer employed by County.

Agency: Sonoma County
Name: Tom Cordill (Envr. Specialist)
Phone No.: 707-527-2412
Address: 2555 Mendocino Avenue, Santa Rosa, CA 95401
Remarks: Very pro-resource management units (geographic and single resource) approach. Feel they would be supportive of regional-phased approach min. size approach to expl. wells (500+ acres). Already geared for phased EIRs and part of GRIPS effort.

Agency: Yolo County
Name: Janet Ruggiero (Assoc. Planner)
Phone No.: 916-666-8556
Address: Co. P. Dept. 292 West Beamer, Woodland, CA 95695
Remarks: "No guidelines, no applications yet; several months ago had a brief staff discussion". Would use initial study to decide whether EIR or N.D. necessary. Don't expect much if any activity.

2. Eastern Sierra Region:

Agency: Inyo County
Name: Roger Glidden (Asst. Director, Public Works)
Phone No.: 714-878-2411
Address: Courthouse, Independence, CA 93526
Remarks: They have a G/T ord. and specific EIR requests. Seem willing to consider regional approach but are also concerned re: Navy interests.

Agency: Mono County
Name: Bob Sandy (Planning Director)
Phone No.: 714-932-7911
Address: Courthouse, Bridgeport, CA 93517
Remarks: Will rely heavily on State for EIRs; have very small staff and have worked closely with DOG to date. Will want review responsibility regarding site-specific and land-use issues.

Agency: San Bernardino County
Name: Charles Bell (Environmental Analyst) and
 Steve Wilson (Energy Coordinator)
Phone No.: 714-383-1417
Address: 1111 East Mill Street, San Bernardino, CA 92415

Remarks: (Bell) is knowledgeable of regional concerns
 and very interested in Co. and site-specific
 resp. along with land-use concerns. Is inclined
 to feel county will want "joint-leadership" type
 approach to EIRs.

3. Northeast Region:

Agency: Lassen County
Name: Mark Totten (Planning Director)
 Pete Lupke (Planner)
Phone No.: 916-257-2825
Address: County Court House, Susanville, CA 96130

Remarks: Now have proponent do a "preliminary environmental
 assessment"; are favorably inclined toward
 regional evaluations. Appear fully pro-energy
 devel. at both staff, Comm. and Board level.

Agency: Modoc County
Name: Jerry Grove (Public Works Director)
 Les McKenzie (Planner)
Phone No.: 916-233-3215
Address: 202 W. 4th, Alturas, CA 96101

Remarks: Now have a "geothermal guideline" for county.
 Are interested in the secondary (incl. market)
 problems of non-electric geothermal development.
 Would like to see EIR steps be joint local-State
 approach.

Agency: Plumas County
Name: Larry Fites (Planning Director)
 Ken Casaday (Environmental Planner)
Phone No.: 916-283-2000
Address: P.O. Box 437, Quincy, CA 95971

Remarks: Expect to look to ERCDC for regional questions
 and to have (active) "local control" re: site
 specific questions and land-use considerations.

Agency: Shasta County
Name: James Cook (Planner)
 Don Chamberlin (Planning Director)
Phone No.: 916-246-5532
Address: County Office Building, 1855 Placer Street,
 Redding, CA 96001

Remarks: Of all the N.E. area the least concerned and least prepared. They feel that if there is any G/T resource it will be covered by USFS or BLM documents.

Agency: Siskiyou County
Name: Fran Anderson (Planner)
 David Hedberg (Planning Director)
Phone No.: 916-842-3531
Address: County Office Building, Yreka, CA 96097

Remarks: Favorable for regional studies with State as lead or co-lead depending on "site-specificity." (Obs: all new planning staff not much experience with geothermal technology.) (good people)

Agency: Tehama County
Name: George Robeson (Planner)
 Robert McCulloch (Planning Director)
Phone No.: 916-527-2200
Address: County Court House, Red Bluff, CA 96080

Remarks: Concerned re: G/T and recreation interactions and effects. Supportive of regional approach (2 or more county) impacts; want site-specific concerns at county level.

4. Imperial Valley Region:

Agency: Imperial County
Name: David E. Pierson (Director, Public Works)
 Richard Mitchell (Planning Director)
Phone No.: 714-352-3610
Address: Courthouse, El Centro, CA 92243

Remarks: Very knowledgeable technically. Concerned that get unitized-anomolywide-approach to development and related documents. Want to look toward "building permit" approach.

Agency: Riverside County
Name: A.E. (Jack) Newcomb (Planning Director)
 Anthony Brown (Engineering Geologist)
Phone No.: 714-787-6181
Address: 4080 Lemon Street, Room 101, Riverside, CA 92501

Remarks: Are supportive of pre-application resource related studies. Concerned re: costs of reviewing applications. Appear willing to participate in regional approach with reserve to do their site-specific concerns.

5. Central-Coastal Region:

Agency: Merced County
Name: John Balestery (Planner)
Phone No.: 209-726-7254
Address: Merced County Planning Department, 2222 M Street, Merced, CA 95340

Remarks: No action, no guidelines re: G/T; have EIR outline which follows State guideline. Know of no potential Geothermal resources in the county either warm or hot.

Agency: Santa Clara County
Name: Mary Lou Ficklin & Bob Sturdivant
Phone No.: 408-299-2521
Address: Santa Clara County Planning Department, 70 West Hedding, San Jose, CA 95110

Remarks: Know of non-elect (at least) potential at Geology Hot Springs and near Alum Rock Park area. Have no guidelines or ordinances to date: will send EIR requirements. Very coop re: non-electric possibilities particularly.

Agency: Stanislaus County
Name: Bob Kachel
Phone No.: 209-526-6330
Address: 1100 H Street, Modesto, CA 95354

Remarks: No Geothermal ordinances or guidelines at all; follow state guidelines for EIRs; no special EIR requirements. No knowledge of any resource in the county.

Agency: Ventura County
Name: Ralph Hinds
Phone No.: 805-648-6131, Ext. 2811
Address: Envr. Res. Agency, 625 E. Santa Clara, Ventura,
 CA 93003

Remarks: No guidelines or ordinances now; no action
 to date. Doubtful resource. For specific information
 on geologic resource he suggests Carl Hinderer
 (Planning Dept. Ext. 2471) or Blaise Cilweck
 (County Soils Eng. Ext. 2057).

B. STATE CONTACTS

All of the ERCDC personnel noted in the introduction should be
 considered as "state contacts". Other state with whom contact was or
 might be made regarding geothermal matters are as follows.

1. Resources Agency (all Sacramento unless noted):
1416 Ninth Street, Sacramento, CA 95814

Department of Forestry:* Clifford E. Fago
 Staff Forester
 916-445-5571

Department of Conservation: Paul Cox
 Programs Office
 916-322-4998

Division of Mines & Geology: Carl J. Hauge**
 Geologic Data Office
 916-445-5571

Recommended Additional contacts:

Forest Bacon,
 District Geologist (Sacramento)
 Perry Amimoto (EIRs)
 Trinda Bedrossian-Ristel
 (Geysers area: 415-557-2463)

Division of Oil and Gas: (1) Doug Stockton***
 916-445-9686
 (2) Don Lande
 District Geothermal Engineer
 Suite 309-N
 5199 E. Pacific Coast Highway
 Long Beach, CA 90804
 213-590-5311

*At time of meetings was Division of Forestry, Department of Conservation

**Now on special assignment to Department of Forestry.

***Conacted when in Long Beach, now at H.Q. in Sacramento.

Dept. of Fish & Game: (1) Robert Tharratt
Environmental Services
Branch
916-445-5183
(2) Richard Forester
Geothermal Coordinator
916-445-1383

Secretary's Office: Norm Hill
(EIR Coordinator)
916-445-9134

2. Other State Organizations Contacted:

Public Utilities Comm.: (1) John Dutcher
350 McAllister Street
San Francisco, CA 94102 (2) Environmental Branch
Robert Moeck
Chief, Envr. Branch
415-557-3938

State Lands Department: (1) Charles Priddy
100 Oceangate, Suite 300
Long Beach, CA 90802 (2) 213-590-5211
Recommended:
Don Everitts
213-590-5201

Office of Planning & Research: Bill Kirkham
1400 10th Street
Sacramento, CA 95814 Susan Brown
916-445-0613

Solid Waste Mgmt. Board: (1) Wendy Reid*
1709 11th Street (2) Chuck Rich
Sacramento, CA 95814 Geothermal Coordination
322-2665

Dept. Food & Agriculture: Dr. Gordon Snow
1220 "N" Street
Sacramento, CA 95814 Special Assistant
916-445-6719

3. Other Suggested State Contacts (all Sacramento):

Air Resources Board: (1) George Taylor
P.O. Box 2815
Sacramento, CA 95812 (2) 322-2894
Alan Goodley
322-6020

Department of Transportation: Carl E. Forbes, P.E.
1120 "N" Street
Sacramento, CA 95814 Chief Engineer
916-445-2470

*Now with Long Range Facilities Planning, Department of General Services.

Board of Equalization:
1020 "N" Street
 Sacramento, CA 95814

Bob Paschall
 916-445-4982

State Water Resources
Control Board:
1416 9th Street
 Sacramento, CA 95814

Alvin Franks
 916-322-4548

Department of Water Resources:
1416 9th Street
 Sacramento, CA 95814

Lloyd Harvego
 916-445-9200

C. **FEDERAL CONTACTS**

Personnel and agencies in the federal sector with whom contact was made or is recommended are as follows.

1. **Environmental Protection Agy.:** **James E. Grove IV**
100 California Street Environmental Engineer
 San Francisco, CA 94111 415-556-4723
2. **Energy Research & Devel. Administration:**
 - (1) **Lawrence Falick**
1333 Broadway ERDA, Washington, D.C. 20545
 Oakland, CA 94612 202-376-4899
 - (2) **Joseph Cullen**
 Geothermal Loan Guarantee
 415-273-7151
 - (3) **Diane Nastich**
 Geothermal Loan Guarantee
 415-273-7946
3. **U.S. Forest Service:**
 - (1) **Ed Horton**
 Regional office
 630 Sansome Street
 San Francisco, CA 94111
 415-556-4310
 - (2) **Mr. Robert Rice**
 Forest Supervisor
 Inyo N.F.
 - (3) **Charles McDonald**
 Inyo N.F.
 Bishop, CA 93514
 714-873-5841

4. Bureau of Land Mgmt.:
2800 Cottage Way
 Room E-2841
 Sacramento, CA 95825
 - (1) John Moon
 - (2) Joan Russell
916-484-4636

5. U.S. Geologic Survey:
345 Middlefield Road
 Menlo Park, CA 94025
 - (1) Max Crittenden
Chairman, GEAP
415-323-8111
 - (2) Dwayne Hull
Deputy Area Geothermal
Supervisor
 - (3) Sie Ling Chiang
Chief Environmental (Office)
415-323-8111, Ext. 2841
 - (4) Rory Raschen
415-323-8111, Ext. 2093

(Also: Reid Stone
Area Geothermal Supervisor)

6. Fish and Wildlife Service:
2800 Cottage Way,
 Room E-2720
 Sacramento, CA 95825

William Spaulding
916-484-4657

7. U.S. Navy, China Lake N.W.C.:
China Lake, CA 93555

Tom Dodson
Envr. Engr. Office
714-939-3639

Recommended:

- (1) Carl Austin
Chief
- (2) Jim Quimette
- (3) Tilly Barling
- (4) Adm. R.G. Freeman
Base Cmdr.
- (5) Dr. Peter Waterman
Undusec Navy/Energy
Washington, D.C.
- (6) Dr. Leonard
Code 32
Head, Propulsion Dept.
- (7) Richard Fulmer
Code 32407
Energy Coordinator

D. PRIVATE CONTACTS:

Only a representative sample of private parties or organizations interested in geothermal resources were contacted during the study. The following lists, therefore, summarize the contacts actually made and list additional organizations that might be contacted regarding their specific interests. The reader is also urged to review the previously cited JPL report ("Report on the Status of Development of Geothermal Energy Resources in California) for contacts by geothermal region.

1. Geothermal Suppliers:

<u>Union Oil Company:</u>	(1)	Vane Suter
1250 Coddington Center	(2)	Warren Smith
Santa Rosa, CA 95406		Environmental Engineer
		707-542-9543
<u>Aminoil U.S.A.:</u>	(1)	George A. Frye
1150A Coddington Center	(2)	C.E. (Bill) Woods
Santa Rosa, CA 95406	(3)	Tom Box
		707-527-5332
<u>Magma Power Co.:</u>		Ted Wilmsen
P.O. Box 11687		707-527-8947
Santa Rosa, CA 95406		
<u>Republic Geothermal:</u>	(1)	Jim Scheidenberger (Manager)
2544 Cleveland Avenue		707-527-7755
Santa Rosa, CA 95401	(2)	Jan C. Kielpinski (Attorney)
<u>Phillips Pet. Co.:</u>		Robert L. Wright
Box 752		714-755-0131
Del Mar, CA 92014		
<u>AMAX, Inc.:</u>		Jeff Todd
4704 Harlan Street		Field Ecologist
Denver, Colorado 80212		303-433-6151

2. California Utilities:**Sacramento Municipal Utility District:**

6201 S Street	(1)	Ken Mellor
Sacramento, CA 95813	(2)	Bob Connelly
		Engineer
		916-452-3211

PG&E:
77 Beale Street
 San Francisco, CA 94106

- (1) Elmer Hall
Siting Division (Ext. 2875)
- (2) Sheraz Kadereli (Ex. 1361)
Planning: Land Division:
- (3) Phil Weiss (Ext. 2483)
Local Permitting
- (4) Jim Whitacre
Environmental Planning
- (5) Frank Burney
Long Range Planning
415-781-4211
- (6) Carl J. Weinberg
Supervising Engineer
Dept. of Engineering Research
3400 Crow Canyon Road
San Ramon, CA 94583

San Diego Gas & Electric: (1)
101 Ash Street
 San Diego, CA 92112

- (1) Joe Dietz
Chief M.E. Department
- (2) J.E. (Jack) Russ III
Associate Engineer
714-232-4252

Los Angeles Department
of Water and Power:
111 North Hope Street
 Los Angeles, CA 90051

- (1) J.M. (Jerry) Matosec
Sr. Res. Devel. Engr.
213-481-4345
- (2) Jim Wickser
Mgr. L.A. Aqueduct Div.
- (3) Lloyd L. Anderson
Staff Engineer
L.A. Aqueduct Division
714-878-2451
(Independence)

3. Others Contacted:

The Ben Holt Company:
201 South Lake Avenue
 Pasadena, CA 91101

- (1) Craig Racine
Project Manager
- (2) Anker Sims
Vice President
213-684-2541
Regarding their Mono-Long
Valley Non-elect. Study

Jet Propulsion Lab.: (1)
Building 79 (2)
 Pasadena, CA 91101

Ron Granit
 Elaine Hussey
 Energy & Envr. Analysis
 Group
 213-354-4321/2091

Crocker National Bank:
San Diego District
 190 Broadway
 San Diego, CA 92101

C. Joseph Crane
 Senior V.C. and District
 Br. Admin.
 (Imperial Valley-San Diego
 area)
 714-236-8529

U.C. Los Alamos Scientific
Laboratory: (1)
 P.O. Box 1663
 Los Alamos, NM 87545

Edward L. Kaufman
 505-667-7880

(2) John Rowley
 505-667-6722

Stanford Research Institute:
Menlo Park, CA 94025

Dr. Ronald K. White
 415-326-4819

Puget Sound Power & Light Co.:
Puget Power Bldg.
 Bellevue, Washington 98009

Wm. J. Finnegan
 Director, Conservation
 & Environmental Affairs
 206-454-6363

Recommended also:
 F. Theodore Thomsen
 Attorney
 Perkins, Coie, Stone, Olson
 & Williams
 1900 Washington Bldg.
 Seattle, WA 98101

Regarding their Skagit
 county project including
 tax credit program.

Western Energy Co.:
Colstrip, Montana 59323

Martin A. White
 Project Manager
 Colstrip Project
 Regarding their new-town/
 removable town planning.

4. Other Possible Contacts:

Southern California Edison
 Box 800
 Rosemead, CA 91770

Mel Swinney
 Fuel Supply Department
 213-572-2617

Electric Power Research Inst.: Vasil Roberts
Palo Alto, CA 94304 415-493-4800

Regional Geothermal Supplier Interests:

Geysers Region:	Geothermal Kinetics McCulloch Oil Thermal Power Co. Getty Oil Co. Sulphur Bank Geothermal Power Co. Shell Oil Co. Sun Oil Co. Cordero Mining Co. Pacific Energy Co. Signal Oil and Gas Co. Geothermal Resources Intl. E.B. Towne Aminoil* Union Oil Co.* PG&E* Magma Energy Co.* Republic Geothermal*
East Sierra Region:	U.S. Navy* U.S.G.S.* Geothermal Resources Intl. Getty Oil Co.
Northeast Region:	Magma Power* American Thermal Res. Inc. Gulf Oil Corp. Kelly Hot Springs Phillips Petroleum*
Imperial Region:	Imperial Magma Chevron Oil Magma Power Republic Geothermal* Q.B. International Union Oil Co.* Magma Energy Co.* New Albion U.S. Bur. of Rec. California DWR San Diego Gas & Electric* LA DWP*

*Contacted

APPENDIX C:

**U.S.G.S. OFFICE OF AREA GEO-
THERMAL SUPERVISOR: ENVIRON-
MENTAL AND SAFETY EFFORT**

U.S.G.S.: UNDATED

OFFICE OF AREA GEOTHERMAL SUPERVISOR
ENVIRONMENTAL AND SAFETY EFFORT

The office of Area Geothermal Supervisor was established in 1974, and the organizational structure started to take place in early 1975. The Environmental and Safety is one of the five sections designed to achieve the various objectives of the Office of Area Geothermal Supervisor. This Section is to achieve one of the three mineral leasing objectives, namely Protection of Environment. The establishment of the Environmental and Safety Section in an Area Office represents a new concept, and its operation has no precedent.

SCOPE OF EFFORT

To achieve the environmental protection objective of the leasing program the Section assumes certain responsibilities. The responsibilities may be briefly described with respect to pre-lease, post-lease and Post-EA activities.

Prior to the issuance of leases, the surface management agencies prepare Environmental Analysis Record or Report (EAR) for the entire lease application area. During this stage, the Area Office provides the surface management agency input in the areas of the GS expertise, namely: geology, geological hazards, water resources (hydrology), geothermal operational problems, and mitigating measures. The Section coordinates the input and is the principal contributor to the input.

After leases are issued a series of Environmental Analyses (EA) are performed by the Section for the leases on which Plan of Operation are proposed by the lessee. The Section sends all interested parties the Plan, invites them for a joint field inspection, and solicits their comments on the proposal. These comments are properly considered in the preparation of the EA. The EA preparation is an interdisciplinary effort requiring good cooperation of generalists and specialists, and must be timely and well coordinated. A good EA assures an adequate approved Plan of Operation which provides proper measures for mitigating environmental impacts.

Subsequent to the approval of the Plan of Operation, the Section monitors the field operation to ensure compliance with approved Plans, Regulations, Geothermal Resources Operational Orders, Lease terms, and Special Lease Stipulations, and Conditions of approval identified by the environmental analyses. Federal, State and Local air, water, and waste disposal standards must be met during the exploration, development, and production stages. The Section also conducts independent investigations on pollution incidents and accidents, and reports the events. For serious events which have recurrent potential, the Section prepares for issuance of environmental or safety alerts.

PRE-LEASE ENVIRONMENTAL ANALYSIS RECORD

PRE-LEASE
EXPLORATION PERMIT
(BLM Responsibility)

Figure 1.

WORKING PROCEDURE FOR PRE-LEASE EAR

FLOW CHART ON PLAN OF OPERATIONS & APD

POST-LEASE
EXPLORATION PERMIT
(USGS Responsibility)

MEMBERS:

Depts. of Defense, Labor, Agriculture
Bureau of Land Management, Geological Survey,
Sport Fisheries & Wildlife, Mines, Reclamation, Outdoor Recreation,
Office of the Solicitor, National Park Service,
Environmental Protection Agency

EXOFFICIAL MEMBERS

Sierra Club, State, County Agencies,
Industries and other interested groups.

WORKING PROCEDURE FOR POST-LEASE EA

Exhibit 1 Reporting & Alert Issuance Procedures

**CONSERVATION DIVISION
WESTER REGION
WESTERN AREA
ORGANIZATION CHART**

MARCH 13, 1973

not up to date

MANAGER, CENTRAL REGION

**OFFICE OF THE AREA GEOTHERMAL SUPERVISOR
MENLO PARK, CALIFORNIA**

AREA SUPERVISOR
Supervisory Physical Scientist (Stone)
DEPUTY SUPERVISOR
Supervisory Physical Scientist (Hull)
Secretary
(Lynch)

EVALUATION SECTION

SECTION CHIEF
Supervisory Physical Scientist (Vacant)
Petroleum Engineer (Vacant)
Engineer (MacGillivray)
Geologist (Reed)
Geophysicist (Sanders)
Geophysicist (Riley)
Clerk-Typist (Vacant)

ENGINEERING SECTION

SECTION CHIEF
Supervisory Petroleum Engineer (Hettler)
Mechanical Engineer (Champlain)
Geologist (Raschen)
Petroleum Engineer (Hammelt)
Petroleum Engineer (Bain)
Petroleum Engineer (Vacant)
Clerk-Typist (Bradley)

TECHNICAL SERVICES SECTION

SECTION CHIEF
Supervisory Physical Scientist (Cargill)
Physical Scientist (Koorlela)
Systems Analyst (Blakley)
Technical Writer (Sam)
Accountant (Shal)
Cartographic Technician (Menendez)
Clerk-Typist (Osborne)

ENVIRONMENTAL AND SAFETY SECTION

SECTION CHIEF
Supervisory Hydrologist (Chang)
Chemical Engineer (Vem)
Physical Scientist (Fuersten)
Geologist (Sauer)
Biologist (Baker)
Environmental Scientist (Riley)
Clerk-Typist (Nease)

OPERATIONS AND FIELD COORDINATION SECTION

SECTION CHIEF
Supervisory Physical Scientist (Boudreau)
Petroleum Engineer (Gilbert)
Petroleum Engineering Technician (Ward)
Clerk-Typist (Jamison)

LEGEND

— Line Supervision
- - - Technical and Functional Supervision
... Program Coordination and Concurrence

SALT LAKE CITY DISTRICT

DISTRICT SUPERVISOR
Supervisory Petroleum Engineer (Dull)

PORTLAND DISTRICT

DISTRICT SUPERVISOR
Supervisory Petroleum Engineer (Hudson)

RENO DISTRICT

DISTRICT SUPERVISOR
Supervisory Petroleum Engineer (Jones)
Petroleum Engineering Technician (Dallan)
Clerk-Typist (Alteburn)

USGS AREA and DISTRICT GEOTHERMAL OFFICES

NOTE: Geothermal lease operations in the Bureau of Land Management's Utah District, CA and in all of the U.S. Geological Survey Eastern Region are administered by the Area Geothermal Supervisor in Menlo Park, CA.

APPENDIX D:

**DRAFT, STATEWIDE GEOTHERMAL
ENERGY PROGRAM**

Draft prepared by Dave Anderson (AID),
Mel Schrecongost (Siting) and James
A. Roberts (Consultant to Assessments)
working as a subcommittee of
ERCDC Interdivisional Geothermal
Committee.

ERCDC: 12-20-76

DRAFT
STATEWIDE GEOTHERMAL ENERGY PROGRAM

Developed By A
Subcommittee Of The Commission's
Interdivisional Geothermal Committee

Energy Resources Conservation and Development Commission
Sacramento
12/20/76

STATEWIDE GEOTHERMAL ENERGY PROGRAM

General Background

Geothermal energy, with its unique characteristics, unproven economics and status of technology development, poses several development problems that are not associated with the development of more conventional forms of energy, i.e.:

1. Geothermal energy must be utilized in proximity to where it is found because it cannot be transported economically over any great distance. Therefore, it is expedient and almost necessary to construct the power plant among the producing wells;
2. Insufficient time has elapsed in the U.S. to allow the development of a comprehensive history for hot water reservoirs (the most common type) that could provide strong assurance to utilities that geothermal development, is economically feasible and that reservoir life can be assured;
3. The exploration techniques for geothermal energy have not as yet been developed to the level existing in the petroleum industry. Therefore, geothermal exploration is a more risky and costly business.

Subcommittee

In November 1976 the Energy Commission's Interdivisional Geothermal Committee established a subcommittee charged with the development of goal and program options and implementation considerations for a geothermal program. The objective of the subcommittee is to present a package to the Commissioners for

their selection of goals and program option that the staff can develop into a comprehensive "Statewide Geothermal Energy Program". This action is necessary to clarify Division 15 of the PRC (the enabling legislation for the Energy Commission) regarding the regulation of geothermal resources, to solve the numerous interface problems that exist between geothermal regulatory agencies, and to provide the state and the geothermal industry with one program for development.

Attached are three charts developed by the subcommittee that graphically depict goal- and program-options and implementation considerations for the development of a comprehensive program. The charts have been placed in a series (first) to facilitate the selection of a geothermal goal option, (second) to allow the selection of a program option to augment the goal option selected, and (third) to provide an outline of the considerations that must be taken into account for the implementation of the statewide program.

Goal Options For Geothermal Development (Chart 1)

Chart 1 has three columns: each shows a different set of policy directives for each of the goal options shown. It is the intent of the subcommittee to depict this information in a manner that would allow the selection of specific policy directives; i.e., A1, A2, B3, etc., that would be applied to the program option selected from Chart Number 2.

Geothermal Program Options (Chart 2)

The program options as shown on Chart Number 2 are in outline form. A more detailed description of each is included in the following text. In reading Chart Number 2, the left-hand column indicates the primary applicable statutes and regulations; the balance of the chart shows the conformance or nonconfor-

mance of the program options to these statutes. In addition, Chart Number 2 has a second section listing prerequisites to implementing each program option, including: policy decisions, interagency agreements, definition of "appurtenant" and "related" facilities, and development of NOI/AFC procedures.

Implementation Considerations (Chart 3)

Chart 3 is included to allow comparison of the implementation ramifications of each program option.

Staff Background Observations

Members of the Interdivisional Geothermal Committee, including two members of the subcommittee, have extensive backgrounds in the field of geothermal operations and regulation. As a result of that experience, six basic considerations were included in the decision-making process used to prepare this geothermal development package:

1. The development of geothermal energy will require a massive and successful cooperative effort;
2. Compromises will have to be developed and implemented on all levels;
3. Adverse environmental impacts, which may be coincident with geothermal development, will have to be minimized;
4. A program for development must be cost effective and responsible to the tax payer and/or energy consumers;
5. Government is obligated to support initial research and development projects; and

6. Government must provide responsible regulations and regulators.

Subcommittee Recommendation (See Charts 1 and 2, attached)

It is the opinion of the subcommittee that the goal option of the Commission for geothermal development should be to encourage geothermal development (Goal Option A). Accordingly it is their further opinion that the policy directives most reflective of this goal are A1 through A8 and that the program option most reflective of the goal and policy directives is Program Option 4 with the interim use of Program Option 6 while Program Option 4 is under development.

Program Option No. 1 - TOTAL GEOTHERMAL REGULATORY JURISDICTION

Features

This program would place the responsibility for all geothermal regulation with the Energy Commission. It would provide that the Commission take over all regulatory responsibility of all state and county agencies including land use decisions for both electrical and nonelectrical end uses of geothermal energy. It would not provide for jurisdiction over projects on federal lands nor would it provide for jurisdiction over air or water quality.

This program differs from Program Option No. 2 in that direct jurisdiction is provided; Program Option No. 2 provides for jurisdiction only through the EIR/NOI/AFC processes.

Implementation

This option would depend upon the Commission's success in implementing a massive legislative package approved without major state and county opposition or amendments - or passed in spite of opposition. It would take approximately three to four years to make the option fully operational; costs to the Commission in terms of budget, staff and facilities would increase greatly. In addition to developing NOI/AFC/EIR procedures, the Commission would have to adopt, or review and amend existing regulations of other agencies and use them to suit its expanded jurisdiction.

Energy Commission Control

This option provides the Commission with the greatest degree of control over exploration, development, power plants and other end uses of geothermal energy.

It provides the greatest legal basis for the Commission to speed or retard the development of the resource. Of all the options, only this one gives the Commission direct control over what the geothermal electrical capacity will be in California. It also allows the Commission to provide direction for reducing oil and natural gas use in favor of geothermal energy in nonelectrical applications.

Regulatory Overlap

Assuming the passage of suitable legislation, this program would eliminate nearly all duplication of effort. If implemented, it would streamline and make the permitting process more efficient. The Commission would still have to take the initiative in working out formal cooperative agreements with Federal and Air and Water Quality agencies to eliminate completely regulatory overlap and confusion. Probably the regulatory confusion that existed during 1972-1975 would be repeated during the changeover to this program.

Environment, Public Health and Safety

This program would provide the Commission extensive and direct responsibility in establishing statewide standards for all geothermal projects at the earliest possible time. The standards would be uniformly applied in all areas of the state for all types of projects.

Electrical Planning - Open Planning

This program would provide the greatest amount of information at the earliest possible time to be used as a basis for electrical planning. Open planning and open decision-making would be an integral part of this program from the initial exploratory wells to the power plant (or greenhouse, heating plant, etc.).

Subcommittee Opinion

This program comes closer to "One Stop Shopping" than any other; conversely, it has the potential for "One Shop Stopping".

Program Option No. 2 - LEAD AGENCY ALL GEOTHERMAL EIRs

Features

This program would provide that the Energy Commission be the lead agency for all geothermal EIRs except for projects on federal lands. The program would not require that prior to drilling a distinction be made between wells capable of producing electrical power and those that are not. After a well or well group has been drilled and tested, the Commission would be required to make a decision on whether the project is electrical or nonelectrical. If electrical, the Commission's NOI/AFC process and any needed supplemental EIRs would begin. If the resource were not capable of generating electricity, all jurisdiction would be returned to the county and other responsible state agencies.

This Program Option differs from Program Option No. 1 in that the Commission would extend its jurisdiction only in the EIR process and would usurp no other county or state agency jurisdiction. It differs from Program Option No. 3 in that Program Option No. 3 requires the Commission to be lead agency only for electrical projects or wells.

Implementation

This program would require legislation prior to implementation; it would be concerned mainly with the Commission's role in the EIR process and defining "related" and "appurtenant" to include all geothermal wells. If all that is needed is for OPR to name the Commission as lead agency, the time for implementation could be as little as six months; however, legislation to affirm or establish Commission jurisdiction over geothermal wells could take two years. Commission staff would have to be enlarged significantly to pre-

pare EIRs or review and certify them for both electrical and nonelectrical projects. In addition to developing NOI/AFC/EIR regulations, the Commission would have to enter into formal cooperative agreements with federal, state, and local agencies.

Energy Commission Control

This program, although not "one-stop shopping" gets the Commission into the planning process early and would permit rapid, uniform EIRs on a statewide basis. Some control over the rapidity of permitting of both the electrical and nonelectrical uses of geothermal energy would be gained. Permits by other state agencies for the exploratory and development well stages would be required and Commission control over these phases would be limited to the control gained or lost through cooperative agreements.

Regulatory Overlap

The Commission would have little direct control over the amount of regulatory overlap but having lead agency status and the ability to prepare phased EIRs would remove any EIR overlap with county agencies and could bring about definition of the type and depth of information required in the Commission's NOI/AFC procedures.

Environment, Public Health and Safety

Having lead agency status would provide the Commission with a strong tool to ensure that these aspects are adequately considered for all projects in every area of the State. Standards set by the Commission could be uniformly applied and project sponsors would quickly become aware of the rules and guidelines and include them in their preliminary planning.

Electrical Planning - Open Planning

This program would provide the Commission with a foreknowledge of potential availability of geothermal energy for electrical generation and of the potential for reducing oil and gas demand by substituting geothermal energy. The present open planning process of the Commission would be extended to all EIRs and would provide meaningful and direct public participation in planning for geothermal energy projects.

Subcommittee Opinion

This program would provide the Commission staff with an early responsibility in the geothermal exploratory well and development well phases, not envisioned under the present concept of the Commission's NOI/AFC/EIR process. Lead agency status for all types of geothermal projects would obviate the need to determine end-use of the well prior to drilling. It does not solve the problems of when, if, or for how long the drilling of additional wells should cease while the need for, and environmental acceptability of, a future plant is being determined. This program may be well received by counties where geothermal development is just beginning but would probably be opposed in counties where staff and procedures are well developed.

Program Option No. 3 - LEAD AGENCY FOR EIRs ON GEOTHERMAL ELECTRICAL PROJECTS

Features

This program's main feature is that the Commission would have lead agency status for geothermal EIRs for electrical projects. It would also provide the Commission with an early responsibility in the total project but would limit the responsibility to projects whose end product would be electricity.

The Program Option differs from Program Option No. 4 in several ways:

1. In this program no provision for an MEA's is made;
2. In this program no provision for altering the Commission's NOI/AFC process is made; and
3. In this program flexibility is not as great.

This Program differs from Program Option No. 2 in that No. 2 includes but electrical and nonelectrical projects.

Implementation

As little as six months would be required for implementation if internal decisions of the Commission and (OPR) can establish the Commission as lead agency. It could take 2 years if legislation were required to establish or confirm Commission jurisdiction over roads, pipelines and wells associated with a power plant. A method to distinguish between electrical and nonelectrical projects would be mandatory and must be conceived and developed. A small to moderate increase in Commission staff, budget and office space would be required because Commission EIRs would include information on wells, pipe-

lines, and roads in addition to the power plant. As with all other programs, except Program Option No. 7, NOI/AFC/EIR guidelines, regulations and procedures would need to be developed.

Energy Commission Control

Lead agency status would provide only indirect control; decisions based on the EIR would still have to be made by responsible agencies. This program would provide no direct control for the Commission to promote or hinder non-electrical uses of geothermal energy. The Commission would not directly affect the amount of geothermal electrical capacity except in a negative sense (denial of a license for a plant). Lead agency status would provide a mechanism for the Commission to involve itself in the planning and decision-making process of the steam developer and not simply the utility. Control would be gained or reduced through cooperative agreements.

Regulatory Overlap

This program would reduce duplication of EIRs but any further reductions of regulatory overlap would depend upon the successful negotiation of cooperative agreements and contracts. As in Program Option No. 2, involvement in the early EIR would enable the Commission to define the type and depth of information required in the Commission's NOI/AFC process.

Environment, Public Health and Safety

Having lead agency status on electrical projects would expand the Commission's ability to ensure both consideration and uniformity of these aspects for the entire electrical project - not just the power plant.

Electrical Planning - Open Planning

Firm, early information about the potential geothermal electrical capability for all areas of the state undergoing exploration by resource developers could be developed and used in statewide electrical planning. The Commission's present open planning process would be extended to the exploratory well and development well stages of geothermal development and not restricted to the power plant stage.

Subcommittee Opinion

This program would provide the Commission with early responsibility in the geothermal exploratory well and development well stages not presently a part of the Commission's NOI/AFC/EIR process. No responsibility is provided for nonelectric projects at any stage in their development. The difficult decision on whether a proposed project is electrical or nonelectrical in nature would have to be made very early, when information is scarce or unavailable. Again, it does not solve the problems of when, if, or for how long the drilling of additional wells should cease while the need for, and environmental acceptability of a future plant is being determined.

Program Option Number 4 - PHASED DEVELOPMENT PROGRAM**Features**

This program features a total cooperative effort of all involved regulatory agencies. It would allow the state to get involved at the very start of a project through a Master Environmental Assessment (MEA) or during the development of EIRs for exploratory and/or development well drilling. It would provide the greatest amount of flexibility and the least duplication of effort. The components of this program include:

1. An MEA jointly prepared by the federal, state and local agencies (which could be certified by the responsible regulatory agencies and used as an environmental data base for the development of EIR supplements);
2. EIR supplements for exploration, confirmation and development wells to be written and certified under authority of federal, state, and local agencies; and
3. EIR supplements for power plants to satisfy federal, state and local requirements. The Commission could enter the process at either step one or two above.

This program would require the elimination of the NOI procedure. Eliminating the NOI procedure would allow rapid permitting of exploratory and confirmation wells; e.g., the resource supplier would not be required to go through the entire NOI process prior to exploration and confirmation well drilling. The AFC/EIR procedure would remain as is and the power plant licensing decision would come before the drilling of any development wells.

This program differs from Program Option No. 3 in the following ways:

1. NOI/AFC/EIR procedures would be considerably altered from the format suggested in the law;
2. It would provide for an MEA thus reducing procedural problems and delays in permitting; and
3. It would provide for a phased EIR approach which is consistent with present environmental procedures as outlined in CEQA.

This program differs from Program Option No. 5 in the following ways:

1. It would allow up-front involvement which would provide for early planning;
2. It would require total cooperation and coordination; and
3. It would lessen the chances for duplication of effort.

Implementation

This program could be implemented within one year (the time it would take to negotiate and implement numerous interagency agreements and develop new NOI/AFC procedures); however, some legislation may be required to make the NOI/AFC/EIR procedures specific to geothermal energy (hence the two years as shown on Chart 3). The total cooperation and coordination aspects of this program will require the up-front services of a facilitation team.

Commission Control

This program is about midway between total control (Program Option No. 1) and no control (Program Option No. 7). Its greatest strength does not lie in the

area of direct control, but in the area of compromise and cooperation to get the job done. If implemented properly, delays due to legal confrontations should not take place because all involved parties should understand their roles.

Regulatory Efficiency

This program, except for Program Option No. 1, could be the most efficient in that duplication of effort should be all but eliminated.

Environment, Public Health and Safety

The environmental public health and safety aspects involved in the execution of this program would be shared by all of the regulatory agencies, including the Commission, throughout the entire project.

Subcommittee Opinion

This program provides for the achievement of regulatory efficiency, planning, and acceptable environmental control through cooperative agreements. Its success depends entirely upon the degree of cooperation achieved. It may be necessary to use Program Option No. 6 during the period of time that it would take to implement Program Option No. 4.

Program Option No. 5 - ENERGY COMMISSION ENTERS AFTER NOI SUBMITTED

Features

Under this program, no Energy Commission action is initiated until a utility files an NOI. This program is based on the NOI/AFC/EIR procedures, as incompletely stated in the law and includes the jurisdiction over the remaining development wells, roads, pipelines, and other appurtenant features after the NOI is filed. It would provide for total field planning following the filing of an NOI as the Commission at that time would become the lead agency.

This program differs from Program Option No. 4 in that the NOI/AFC/EIR procedures are essentially as stated in the law (not combined in an MEA and subsequent EIRs). It differs from Program Option No. 6 in that the Commission will regulate the remaining development wells, pipelines, roads, etc.

Implementation

This program could be implemented within a few months, depending on the length of time that it would take the Commission to declare that it has the regulatory jurisdiction over development wells, pipelines, roads and other appurtenant facilities to a power plant. However, the issuance of such a declaration by the Commission would probably be challenged by local government and some state agencies causing the preparation and passage of legislation that could take up to two years. This problem could almost be circumvented through the development of interagency agreements, however, this could take as long as six months to a year.

Commission Control

This program would provide the Commission with regulatory control only after the submittal of an NOI, but the control includes the development wells, pipelines, roads and other appurtenant facilities as well as the power plant. It would not provide for total energy planning within the state because the Commission entrance into the regulatory process would be controlled by a utility's submission of an NOI.

Regulatory Efficiency

The regulatory efficiency, other than that directly related to the power plant and appurtenant facilities (i.e., development wells, pipelines, roads, etc.), would be dependent on the internal ability of those agencies with regulatory jurisdiction to streamline their procedure and develop interagency agreements to lessen the duplication of effort. In addition, it would be highly desirable to develop a strong liaison between the Commission and county governments in respect to the development of pre-NOI/AFC/EIRs that could be augmented and used as a plant site EIR by the Commission.

Environment, Public Health and Safety

The environment, public health and safety aspects not covered under the Commission's power plant regulatory jurisdiction (including appurtenant facilities) would be retained by the existing regulatory agencies.

Electrical Planning - Open Planning

This program would not allow the Commission to get involved in the early planning of a project.

Subcommittee Opinion

This program is not totally responsible to the tax payers and/or energy consumers in that a combined coordination and cooperation effort is not provided for, thus some duplication of effort and regulatory delays will continue to occur. In addition, the program does not allow the Commission to specify the point at which it enters the process. Since a utility could file an NOI any time between the completion of a discovery well and the completion of the final development well, the Commission's control would depend on when the utility decides to file.

Program Option No. 6 - JURISDICTION LIMITED TO POWER PLANT ONLY**Features**

The most important feature of this program is that the Energy Commission disassociates itself from all aspects of geothermal regulation except those directly related to the power plant (commonly referred to as "within the fence" regulation). This option exempts the Commission from regulating wells and attendant features such as pipelines, roads and other related facilities. The regulation of the non-power plant features would be continued by the present regulatory agencies; i.e., Division of Oil and Gas, State Lands Division, and other agencies. Some cooperative agreements with state and local regulatory agencies and with the federal government could be needed.

This program differs from Program Option No. 5 in that the Commission will not regulate development wells, pipelines, roads etc.-- only the power plant. It differs from Program Option No. 7 in that the power plant siting jurisdiction is retained by the Commission and not legislated to the PUC.

Implementation

This program could be implemented faster than any other (two months) because the work required to prepare NOI/AFC/EIR procedures and guidelines would be reduced to match the reduced regulatory jurisdiction. It is anticipated that implementation would also be speeded because of lessened opposition from most state and local agencies. Conversely, implementation could be delayed up to two years if legislation were required to remove the "one-stop shopping" mandate from Division 15 of the PRC.

Commission Control

This program restricts the Commission control to power plants only. It does not provide for total energy planning within the state as the Commission enters the regulatory process after the drilling of the exploratory and development wells when the NOI is filed.

Regulatory Efficiency

The regulatory efficiency other than that directly related to the power plant siting would depend on the internal ability of those agencies with regulatory jurisdictions to streamline their procedures and develop interagency agreements to lessen the duplication of effort. In addition, it would be highly desirable to develop a strong liaison between the Commission and the county governments with respect to the development of pre-NOI/AFC/EIRs that could be augmented and used as a plant site EIR by the Commission.

Environment, Public Health and Safety

The environment, public health and safety aspects not covered under the Commission's power plant regulatory jurisdiction would be retained by the existing regulatory agencies.

Electrical Planning - Open Planning

This program would not allow the Commission to get involved in the early planning of a project.

Subcommittee Opinion

This program is not totally responsible to the tax payers and/or energy consumers in that a combined coordination and cooperation effort will not be

provided for, thus duplication of effort and regulatory delays will continue to occur. This program is considered by the subcommittee to be second best to Program Option No. 4 and should be considered as an interim if needed during the implementation of Program Option No. 4. It would be the fastest and least expensive to implement.

Program Option No. 7 - ENERGY COMMISSION DOES NOT REGULATE

Features

This program if implemented would remove geothermal regulatory jurisdiction from the Energy Commission and place it with the Public Utilities Commission and other state and local agencies. This action would essentially re-establish regulation of geothermal energy in the framework that existed prior to the enactment of AB 1575.

This program is the opposite of Program Option No. 1 and it differs drastically from the next closest program (No. 6) in that the Commission relinquishes all regulatory jurisdiction. It does not address the problem of who will have jurisdiction over federal geothermal power plants in California.

Implementation

Implementation would depend upon the ease of amending Division 15 of the PRC to remove the geothermal jurisdiction and to provide legislation to place the power plant regulatory authority back under the Public Utilities Commission. CEQA and other PRC Divisions and local regulatory jurisdiction would essentially remain unchanged.

The implementation of this program could take up to two years depending on its acceptance by the Legislature, other regulatory entities and the public.

Commission Control

This program removes control of any aspect of geothermal energy, including power plant siting, from the Commission.

Regulatory Efficiency

The efficiency of this program would be at least as good as the "program" that was in effect prior to the time the Commission acquired the regulatory authority over power plant siting (1975). Recent amendments to CEQA have the potential for eliminating this duplication. Furthermore, many of the pre-Commission program problems have been solved through developer-utility-government agency working agreements during the past two years.

Environment, Public Health and Safety

All environment, public health and safety aspects of geothermal development would be transferred from the Commission to the Public Utilities Commission or retained by the existing regulatory agencies.

Electrical Planning - Open Planning

This program would not allow the Commission to get involved in the early planning of a project.

Subcommittee Opinion

In counties where staff and procedures are well developed, this program could speed permitting; however, in counties where geothermal development is just beginning, this program could slow the permitting process while local permitting procedures are being developed.

Chart 1
12/20/76

GOAL OPTIONS FOR GEOTHERMAL DEVELOPMENT

Encourage Geothermal Development	Neutral Toward Geothermal Development	Hinder Geothermal Development
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POLICY DIRECTIVES

	A	B	C
1. Economic Incentives	Advocate economic incentives • Depletion allowance • Intangible drilling expense write-offs • Other incentives	Allow the development of economic incentives to run its natural course *	Oppose existing incentives and propose new disincentives for geothermal development
2. Research	Promote research on all vital aspects of geothermal development *	Allow geothermal research to run its natural course	Oppose geothermal research
3. NOI/AFC/EIR Procedures	Eliminate N.O.I. process - retain concurrent AFC/EIR process.	Combine NOI/AFC request Secretary for Resources to consider as a functional EIR	Require separate NOI/AFC/EIR phases *
4. Environmental and Permitting Problems	Advocate the solutions to critical environmental and permitting problems *	Allow the solutions to critical environmental and permitting problems to develop naturally	Oppose the development of solutions to critical environmental and permitting problems
5. Demand Forecast	Require geothermal energy to be substituted as a fuel whenever feasible for proposed oil fired plants. Do not restrict future geothermal elect. capacity until after 1975	Require geothermal energy to comply with all aspects of forecast demand *	Do not consider geothermal energy as alternate fuel. Restrict amount of new geothermal elect. capacity.
6. Coordination and Cooperation	Actively work with the Federal government, other state agencies, and local governments to develop interagency agreements *	Allow the development of Federal, state and local governmental agency agreements to develop naturally	Oppose the development of Federal, state and local governmental agency agreements
7. Facilitation	Establish an Energy Comm. facilitation team to implement existing solutions	Allow the solution of problems to develop naturally *	Oppose the development of solutions to problems
8. Demonstration Projects	Support when possible, with funds or endorsements, those demonstration projects that will do the most for geothermal development *	Provide no support to geothermal demonstration projects	Oppose geothermal demonstration projects
* Indicates apparent Comm. policy - position within column indicates degree of implementation (highest to left, lowest to right)			

STATE ENERGY COMMISSION GEOTHERMAL PROGRAM OPTION

Greater Jurisdiction - Lesser

Chart 2
12/20/76

	1	2	3	4	5	6	7
	Total Geothermal Jurisdiction	Lead Agency - All Geothermal E.I.R.'s	Lead Agency - Elect. E.I.R.'s Only	Phased Development Program	Energy Comm. Enters After N.O.I. Submitted	Jurisdiction Limited To Power Plant Only	Energy Comm. Does Not Regulate
Conformance with Applicable Statutes	Jurisdiction over all geothermal projects: electric and non-electric. Total State regulation under the Energy Comm. A.R.B. and W.R.C.B. excluded. Fed. jurisdiction excluded	Lead Agency for all geothermal projects until electric/non-electric use is determined Non-electric excluded following determination Fed. jurisdiction excluded	Lead Agency for electrical projects only Fed. jurisdiction excluded	Comm. prepares MEA in cooperation with Counties and Fed. Govt.; Counties to certify. Comm. and Counties prepare exploratory EIR (to include NOI requirements) Comm. A.F.C. process	Energy Comm. enters process upon submittal of N.O.I. Lead Agency status on remainder of project	Energy Comm. jurisdiction restricted to N.O.I./A.F.C./EIR for power plant only	Energy Comm. has no jurisdiction over geothermal energy - electric or non-electric P.U.C. retains authority over power plant siting
Energy Commission Division 15 P.R.C.	<u>Non-Conformance</u> New amendments, legislation required to increase Energy Comm. jurisdiction	<u>Non-Conformance</u> Legislation may be needed to affirm exploratory wells (elect. and non-electric) under Comm. jurisdiction	<u>Partial Conformance</u> Legislation may be needed to affirm that exploratory wells are under Comm. jurisdiction	<u>Non-Conformance</u> May need to define extent of jurisdiction and eliminate NOI process	<u>Possible Conformance</u> May need new legislation to confirm Comm. jurisdiction over wells, pipe lines etc.	<u>Possible Conformance</u> May need to define intent of Chapter 1	<u>Non-Conformance</u> New legislation needed to remove geothermal plants from Comm. jurisdiction
C.E.G.A. Division 20 P.R.C.	<u>Possible Conformance</u> C.E.G.A. finds Comm. as Lead Agency or amends C.E.G.A. to make Comm. Lead Agency	<u>Possible Conformance</u> C.E.G.A. finds Comm. as Lead Agency or amends C.E.G.A. to make Comm. Lead Agency	<u>Possible Conformance</u> Confirms only if all wells are considered by the commission to be "related" facilities	<u>Possible Conformance</u> May need minor amendments to include NOI elements	<u>In Conformance</u>	<u>In Conformance</u>	<u>Partial Conformance</u> P.U.C. retains power plants, Counties and Lead agencies regulate wells
Other P.R.C. Divisions	<u>Non-Conformance</u> Several P.R.C. Divisions must be amended (C.D.B., S.L.D. etc.)	<u>Possible Conformance</u> Might need to amend some P.R.C. Divisions	<u>Possible Conformance</u> Might need to amend some P.R.C. Divisions	<u>In Conformance</u>	<u>Possible Conformance</u> Might need to amend some P.R.C. Divisions (C.D.B., S.L.D. etc.)	<u>Possible Conformance</u> Might need to amend some P.R.C. Divisions (S.L.D. etc.)	<u>Partial Conformance</u> P.U.C. retains jurisdiction. All other permitting jurisdiction retained
Regulations - California Administrative Code	Existing regulations must be amended to conform to new law excluding A.R.B. and W.R.C.B.	Some agency regulations will require amendments	Some agency regulations will require amendments	Some agency regulations will require amendments to include NOI process	Some agency regulations will require amendments	Some agency regulations will require amendments	New regulations must be drafted by affected agencies

PREREQUISITES TO IMPLEMENTING EACH PROGRAM OPTION

Set Policy	Decision by Comm. to regulate major portion of geothermal development	Decision by the Comm. to become the Lead Agency for all geothermal projects	Decision by Comm. to regulate those wells only for power generation	Decision by Comm. to prepare MEAs and EIRs in cooperation with other State, Federal and County regulatory agencies	Decision by Comm. to enter process only after Utility submits NOI	Decision by Comm. to exclude all regulatory operations not directly related to the power plant from Comm. jurisdiction	Decision by Comm. to get out of geothermal regulations entirely
Prepare Inter-Agency Agreements	Cooperative agreements needed with A.R.B., W.R.C.B. and Fed. Government	Cooperative agreements needed with all involved State, Fed. and County regulatory agencies	Cooperative agreements needed with all involved State, Fed. and County regulatory agencies	Cooperative agreements with all involved State, Fed. and County regulatory agencies	Cooperative agreements with all involved State, Fed. and County regulatory agencies	Cooperative agreements with some State and local regulatory agencies needed and Fed. Govt. when needed	No cooperative agreements needed by the commission
Define "dependent" and "related" facilities as used in Div. 15	New legislation would provide the need for definitions	Lead Agency status for all geothermal projects obviates the need for definitions	Lead Agency status for all geothermal projects obviates the need for definitions	Possible need to define	Must be defined to include development wells, pipelines, roads etc.	With restricted Comm. jurisdiction, definitions are not needed	Not needed
NOI/A.F.C. procedures (reg. 15 and 20 P.R.C.) E.I.R. 15 to geothermal energy	Development of regulations and guidelines required	Development of regulations and guidelines required	Development of regulations and guidelines required	Development of regulations and guidelines required	Development of regulations and guidelines required	Development of regulations and guidelines required (wells not included)	Not necessary to develop

Chart 3
12/20/76

IMPLEMENTATION CONSIDERATIONS

GEOHERMAL PROGRAM OPTIONS

	1	2	3	4	5	6	7
Time Needed to Fully Implement Option	3 to 4 years - Massive legislation needed	6 mo. to 2 years - Some legislation needed	6 mo. to 2 years - Comm. and O.P.R. internal decisions or legislation needed	1 to 2 years - Numerous cooperative agreements and compromises must be made. Possible legislation	3 mo. to 2 years - Comm. internal decision or possible legislation required	2 mo. to 2 years - Development of NOI/AFC procedures or possible legislation needed.	2 years + A great deal of legislation needed
Legislation - Draft and Implement	Mandatory	Mandatory	Possibly needed (desirable)	Needed (desirable) NOI/AFC/EIR relationships	Desirable (for well jurisdiction)	Needed (desirable) NOI/AFC/EIR relationships	Mandatory
Legislation - Draft and remove - Fed., State and local (Comm. not included)	Mandatory	Mandatory with Federal government/St. Lands Div. Desirable with State agencies.	Mandatory with Federal government/St. Lands Div. Desirable with State agencies.	Not Required (Comm. CEQA guidelines need to be developed)	Possibly required with State Lands Division	Not required	Required by P.O.C.
Commission Staffing	Very large addition to Comm. staff (35-80 positions)	Large addition to Comm. staff (15-35 positions)	Moderate addition to Comm. staff (10 to 20 positions)	Moderate sporadic addition to Comm. staff or consulting services (5 to 10 positions)	Very small increase in Comm. staff (2 to 5 positions)	No change in Comm. Staffing. Reduction in overtime and consulting services	Very small reduction in Comm. staff (2-5 positions)
Facilities (Commission) - office space and equipment	Large increase in office space (Sacramento elsewhere) (\$65,000 to 90,000)	Large increase in office space (Sacramento only) (\$11,000 to 36,000)	Moderate increase in office space (\$6,000 to 12,000)	Moderate sporadic increase with Comm. staff, no increase with consultants (\$3,000 to 6,000)	Very small increase in office space (\$1,200 to 3,000)	No change	Very small reduction in office space
Prepare and Implement Cooperative Agreements	Only with A.R.B., S.W.R.C.B. and Federal Agencies	With all involved Federal, State and local agencies	With all involved Federal, State and local agencies	With all involved Federal, State and local agencies	With all involved Federal, State and local agencies	With some State and local agencies and with Federal when needed	Not needed
Comm. Only Develop NOI/AFC/EIR Procedures, Regulations and Guidelines Specific to Geo Thermal	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Not needed
Budget - Energy Commission	Very large increase (\$1.2 - 1.8 million)	Large increase (\$380,000 to 770,000)	Moderate increase (\$226,000 to 452,000)	Moderate increase during peak activity periods (\$113,000 to 226,000)	Very small increase (\$4,000 to 113,000)	Very small decrease (overtime and consulting services only - \$25,000)	Small decrease (\$46,000 to 113,000)
Possibility of Litigation	High - Local control issue	Moderate - Local control issue	Moderate - Local control issue	Low - No real problems seen	Low - Except for well jurisdiction	Low - Increase in local jurisdiction	Moderate - Some control objections
Policy directives recommended by the Subcommittee as prerequisites to implementation	Critical A3 Desirable A1,2,4,3,6,7+8	Critical A3,6 and 7 Desirable A1,2,4,5 and 8	Critical A3,6 and 7 Desirable A1,2,4,5 and 8	Critical A3,6 and 7 Desirable A1,2,4,5 and 8	Critical A3,5,6 and 7 Desirable A1,2,4, and 8	Critical A3,5,6 and 7 Desirable A1,2,4, and 8	None Applicable

APPENDIX E:

**TAX CREDIT AGREEMENT BETWEEN
PUGET SOUND POWER & LIGHT CO.
AND SKAGIT COUNTY (WASHINGTON)**

**Provided by Puget Sound Power & Light
Co.: April 1974.**

ARTICLE 5Economic Effects

5.1 Payments in Lieu of Property Taxes. If Puget voluntarily transfers any ownership interest in the Project to any municipality, public utility district, or other third party and solely as a result of such transfer the amount received by the County (which for the purposes of this Article 5.1 shall include all taxing districts within the County) from property taxes, privilege taxes and payments in lieu of taxes on account of the Project is less for any given year than the amount that the County would have received from property taxes on the Project had Puget remained the sole owner of the Project, Puget shall require the third party to make, or shall itself make, a payment in lieu of taxes to the County equal in amount to the deficiency suffered by the County, provided, however, that Puget shall have no obligation under this Article 5.1 if and to the extent any third party acquires the Project or any interest therein by condemnation or otherwise than by a voluntary transfer.

5.2 Construction Impact Payments to School Districts. It is expected that the contractors and subcontractors on the Project, as well as secondary service organizations, will hire some nonresident workers who will move to the County during the construction period and whose children will attend school in the County. It is recognized that additional costs may be incurred by one or more of the school districts in the County in accommodating such children and that, in any given district during any given year during the construction period, such additional costs may exceed any increased tax revenue the district will receive that year as a result of the construction of the Project or its secondary effects. To assist the districts in meeting any such excess costs they may incur, Puget agrees to make construction impact payments for their benefit as follows:

(a) Definitions. For the purposes of this Article 5.2, the following definitions shall apply:

- (1) The term "new-resident construction worker" means any construction worker who (i) resides in the County and (ii) is working directly on the Project as an employee of a construction contractor or subcontractor and (iii) did not reside in the County for more than 30 days during the 6 months immediately preceding the month during which he first started work on the Project.

- (2) The term "construction period" means the first month during which the number of construction workers on the Project exceeds 50 and every month thereafter during which the number of construction workers on the Project exceeds 50.
- (3) The term "construction impact student" means any student who, on the first school day of any regular school month during the construction period, is enrolled in any public school in the County and who, on that day, resides in the County with a parent or guardian who is, on that day, a new-resident construction worker.

(b) Maintenance and Operation Costs. To assist each school district in the County in meeting whatever additional maintenance and operation costs it may incur as a result of increased enrollment during the construction period, Puget shall make a monthly payment for each construction impact student who is enrolled in the district on the first school day of any regular school month during the construction period. The monthly payment for each such student shall be an amount equal to the district's monthly rate, determined as provided below, for the district's fiscal year involved, July 1 through June 30, multiplied by the secondary impact factor of 1.5. For any given fiscal year, the district's monthly rate shall be either its special levy monthly rate, determined as provided in (1) below, or its adjusted lump sum monthly rate,

determined as provided in (2) below, whichever rate is greater for the district for the fiscal year involved:

- (1) Special Levy Monthly Rate. For any given fiscal year, the district's special levy monthly rate shall be determined by dividing the total revenue received by the district during that fiscal year from its special levies for maintenance and operation costs, if any, by the district's total full time equivalent average enrollment for that fiscal year, thus producing a yearly rate, and by then dividing the yearly rate by 9, thus producing the district's special levy monthly rate for that fiscal year.
- (2) Adjusted Lump Sum Monthly Rate. For any given fiscal year, the district's adjusted lump sum monthly rate shall be determined by multiplying the base year lump sum monthly rate of \$30.00 by the cost escalation/deescalation fraction for the district for that fiscal year, determined as provided in paragraph (j) of this Article 5.2, thus producing the district's adjusted lump sum monthly rate for that fiscal year. The base year is the 1973-1974 fiscal year.

It is recognized that the secondary impact factor of 1.5 is an agreed adjustment to assist each district in meeting whatever additional maintenance and operation costs or other costs it may incur in accommodating however many new students, other than construction impact students, may enroll during the construction period as a result of the construction of the Project or its secondary effects, including, but not limited to,

children of persons who may move to the County as a result of the construction of the Project but not be employed directly on such construction.

(c) Capital Costs. It is anticipated that present school facilities will be adequate to accommodate all students during the construction period. However, if and to the extent this does not prove to be true, Puget agrees to make the following additional payments to assist the districts in providing additional facilities:

(1) Portable Classrooms. To the extent it becomes necessary and practicable, as a direct result of increased enrollment from construction impact students, to provide additional classroom space for such students by using portable classrooms, Puget agrees to pay the reasonable cost of using such portable classrooms during the construction period, including the cost of leasing or purchasing the portable classrooms and the cost of moving the portable classrooms onto school campuses, removing them from the campuses, and restoring the sites of the portable classrooms to their original condition. Portable classrooms shall be used in any given school district at the discretion of the district, and shall not exceed two such classrooms per school campus without the approval of the district. It is recognized, however, that increased enrollment resulting from construction impact students may require more than two portable classrooms at any given school campus. To the extent it becomes necessary and practicable to construct a new school campus out of portable units, then and in that event, Puget agrees to

pay the reasonable cost of constructing a portable school campus, including portable support buildings, administration offices, physical education facilities and all other buildings and facilities usually and normally associated with portable school campuses.

- (2) Transportation. To the extent it becomes necessary and practicable, as a direct result of increased enrollment from construction impact students, to transport such students from one school to another, so as to distribute such students among those schools that may have existing classroom space available, Puget agrees to pay the reasonable cost of providing such transportation during the construction period, including the cost of leasing or purchasing buses.
- (3) Reopening Existing Buildings. To the extent it becomes necessary and practicable, as a direct result of increased enrollment from construction impact students, to reopen school facilities which have been closed due to lack of enrollment, obsolescence, or lack of funding, Puget agrees to pay the reasonable cost of reopening said facilities, including any reasonable remodeling or reconstruction required in order to insure that said buildings comply with applicable local, state and federal law.

(d) General. The most practicable method of accommodating increased enrollment in any given school district during the construction period, whether by using portable classrooms, transporting students to another school, or reopening existing buildings, shall be determined by the district, but in making its determination the district shall exert every reasonable

effort to minimize the costs to be paid by Puget. In determining whether any particular cost due under paragraph (c) of this Article is a direct result of increased enrollment from construction impact students, any increased enrollment resulting from any other temporary or abnormal cause shall be taken into account and the costs involved shall be equitable prorated between such causes on such basis as the district shall determine. The districts shall also exert every reasonable effort to avoid billing Puget for any costs under paragraph (c) that duplicate maintenance or operation costs intended to be covered by the payments provided for in paragraph (b).

(e) Advance Payments. At such time as any district has a reasonable basis for estimating any amounts that will become due it under this Article in the future, but not to exceed the next 6 months, such district may apply for an advance payment on account of such estimated amounts. After the first such advance payment has been made for any given district, subsequent advance payments for such district shall be adjusted, based on the best data then available, to reflect any underpayments or overpayments on preceding advance payments.

(f) Annual Final Payments. By October 1 after the close of each fiscal year for which Puget may owe any district any

amount under this Article, Puget and each district involved shall furnish to each other all data necessary to determine the total amount, if any, due the district under this Article for such fiscal year, and Puget and the district shall exert every effort to agree upon such amount. If they fail to reach agreement within 60 days after the above stated date, the total amount due shall be determined by arbitration, as provided below. If the total amount due any district, as determined by agreement or arbitration, differs from the total of the advance payments, if any, that were made by Puget for the district for the fiscal year involved, any underpayment shall be paid by Puget and any overpayment shall be refunded to Puget, in either case without interest.

(g) Arbitration. Any dispute between Puget and any school district as to the total amount due under this Article for any fiscal year shall be resolved by three arbitrators in an arbitration proceeding under RCW 7.04. Within 30 days after service of any notice of intention to arbitrate, one arbitrator (who shall act as chairman) shall be appointed by the Board of County Commissioners, one by Puget, and one by the district. Puget and the district shall each bear their

own costs and attorneys' fees in connection with the arbitration and the other costs of the arbitration shall be shared equally. The decision of the arbitrators shall be final and binding on Puget, the district, and all other persons and parties having an interest in the matter.

(h) Invoices and Payments. Itemized invoices shall be submitted directly to Puget for all amounts due under this Article, and each invoice shall be accompanied by an itemized statement and reasonable supporting documentation from each district covered by the invoice. All invoices shall be paid within 30 days after receipt. All payments shall be made to the County Treasurer, who shall promptly disburse the same to the districts for whose account they were made.

(i) Information and Procedures. To assist the districts in their planning, and to facilitate the administration of this Article, Puget shall furnish to the Superintendent of each district, as far in advance as feasible, an estimate of the number of construction workers expected to be on the Project during the coming months, and shall report the actual total for each month as soon as it is available. Puget shall also furnish, and keep up-to-date, a list of the construction contractors and subcontractors on the Project, and such other information pertinent to the administration of this Article as may be available. Also, prior to the commencement of construction, and upon the request of Puget, the County Treasurer, the Superintendent of each school district in the County and

Puget shall meet and agree upon appropriate procedures and forms to be used in the administration of this Article.

(j) Cost Escalation/Deescalation Fraction. For any given fiscal year, the cost escalation/deescalation fraction for any given school district shall be the fraction the denominator of which is the district's maintenance and operation cost per student rate for the base year, the 1973-1974 fiscal year, and the numerator of which is the district's maintenance and operation cost per student rate for the fiscal year involved. The district's maintenance and operation cost per student rate for the base year and for the fiscal year involved shall be determined, respectively, by dividing the district's total maintenance and operation costs for the year by the district's total full time equivalent average enrollment for the year.

In the event of failure of a special levy maintenance and operation election, the school district so affected may elect to substitute the State average net cost per pupil as determined by the State Superintendent of Public Instruction in lieu of the district's actual maintenance and operation cost per student rate for the fiscal year involved (numerator) on the condition that the State average net cost per pupil as determined by the State Superintendent of Public Instruction for the base year 1973-74, is substituted for the denominator.

(k) Credits Against Future Taxes. With respect to Sedro-Woolley School District No. 101, so long as all or any part

of the Project is situated within the boundaries of such district, as such boundaries may be changed from time to time, and with respect to any other school district the boundaries of which, as they may be changed from time to time, encompass all or any part of the Project, each such district, by accepting payments hereunder, agrees that all payments made pursuant to this Article for the benefit of such district shall be deemed to be prepayments of and shall be credited against any future special levies or other property taxes that may be levied on the Project by or for the direct benefit of such district, provided, however, that the amount credited in any given year shall not exceed 20 percent of the amount levied on the Project that year. Any credits in excess of said percentage limitation shall be carried forward for credit in subsequent years. If for any reason the crediting against future taxes contemplated by this paragraph (k) is not possible, the district or districts affected agree to negotiate in good faith with Puget to agree upon an equitable reduction of the payments provided for in this Article to reflect any increased tax revenues from the Project that are of direct benefit to such districts.

Construction Impact Payments for Law Enforcement. It is

expected that the contractors and sub-contractors on the Project will hire some non-resident construction workers who will move to the County during the construction period, and that as a direct result, increased burdens will be placed upon law enforcement agencies in the County. To assist law enforcement agencies in meeting this increased burden, Puget agrees to make Construction Impact Payments for their benefit as follows:

- (a) Definitions. For the purposes of this Article the following definitions shall apply:
1. The term, "Law Enforcement Agency", means the office of the Skagit County Sheriff and all police offices existing within incorporated municipalities located in Skagit County.
 2. The term, "construction period", means the first month during which the number of construction workers on the Project exceeds 50 and every month thereafter during which the number of construction workers on the Project exceeds 50.
- (b) Commission - Appointment. There is hereby appointed a Commission which shall consist of the following individuals: The Sheriff of Skagit County, the Chief of Police of the City of Sedro Woolley, the Presiding Judge of the Superior Court of Skagit County.
- (c) Duties of Commission. During the construction period, the Commission shall meet at regular intervals, but in any event, not less than once per year, to determine

the financial impact of increased population resulting from construction of the Project upon law enforcement agencies in the County. The Commission shall express such impact in terms of increased costs reasonably anticipated or incurred by law enforcement agencies in the County. Such costs shall include the costs of maintenance and operation, personnel and acquisition of equipment, together with all costs directly associated therewith, such as employee benefits paid by law enforcement agencies.

- (d) Reasonableness. The Commission shall use every effort to insure that costs as determined above shall reasonably reflect the increased burdens placed upon law enforcement agencies, if any, as the direct result of construction of the Project.
- (e) Certification to Puget. After determining costs as set forth above, the Commission shall certify such amounts to Puget on an annual basis. Such certification shall occur so as to coincide as nearly as possible with preparation of budgets by the various law enforcement agencies.
- (f) Invoices and Payments. The County Treasurer, on behalf of the law enforcement agencies, shall issue itemized statements to Puget for all amounts due under this

Article, and each statement shall be accompanied by reasonable supporting documentation from the agencies covered by this invoice. All statements shall be paid within 30 days after receipt. All payments shall be made to the County Treasurer, who shall promptly disburse the same to the agencies for whose account they were made.

- (g) Credits Against Future Taxes. All payments made by Puget pursuant to this Article shall be deemed to be prepayments of estimated future taxes deposited pursuant to RCW 36.32.120(4) for the benefit of the law enforcement agency for whose account they were made and shall be credited against any future general levy property taxes that may become due the following year or thereafter from the owners of the Project for the benefit of such agency.