MASTER

CALIFORNIA ENERGY COMMISSION

FINAL REPORT

ON THE

NORTHERN CALIFORNIA POWER AGENCY'S

NOTICE OF INTENTION

TO SEEK CERTIFICATION FOR

GEOHERMAL PROJECT NO.1

79-NOI-1
MARCH 1980

P800-80-005

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February 29, 1980

The California Energy Resources Conservation and Development Commission, through the Commission Committee assigned to the Northern California Power Agency's Notice of Intention to file an Application for Certification of the NCPA Geothermal Project No. 1 (79-NOI-1), hereby submits its Final Report pursuant to Public Resources Code section 25514.

A handwritten signature in cursive script that reads 'Ronald D. Doctor'.

RONALD D. DOCTOR, Commissioner
and Presiding Member of the
Committee

A handwritten signature in cursive script that reads 'James A. Walker'.

JAMES A. WALKER, Commissioner
and Member of the Committee

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I. INTRODUCTION

A. The Final Report

On June 18, 1979, the Northern California Power Agency (NCPA or Applicant) filed with the California Energy Commission a Notice of Intention (Notice or NOI) to file an Application for Certification (AFC) for their Geothermal Project No. 1. The proposed project involves the construction of a 66 MW geothermal power plant and associated facilities to be located in the Cobb Valley area of Lake County. NCPA also intends to develop the geothermal steam needed to operate the facility.

1. Contents

This Final Report on the NCPA Geothermal Project No. 1 has been prepared pursuant to California Public Resources Code section 25514. It presents the Findings of Fact and Conclusions of Law on issues considered and adopted by the Committee assigned to conduct proceedings on the Notice. In addition, the Report contains a description of the proposed project (section I. B.), a summary of the proceedings to date (section I.C.) and a list of the Committee's views of what further information must be provided for the AFC, (Appendix B).

Pursuant to PRC sections 25514 and 25540, the Report presents findings and conclusions on:

- a) The project's conformity to the forecast of statewide and service area electric power demands;

- b) The degree to which the proposed site and facility conform with applicable local, regional, state, and federal standards, ordinances, and laws; and
- c) The safety and reliability of the facility.

2. Burden of Proof and Evidentiary Basis

In administrative proceedings, the proponent of a project, in this case the Applicant, has the burden of proof, i.e. he must demonstrate by a preponderance of the evidence that his position can be justified to the trier of fact. Any information put forward by the Applicant may be challenged by other participants in the proceeding. Through cross-examination or sponsorship of independent evidence, others may call into question the credibility of the Applicant's assertions or offer alternative grounds for the decision. Thus, any evidence presented other than the Applicant's may be subjected to the same type of scrutiny and review. In reaching its decision, the Commission must find that NCPA has met its burden of proof with respect to meeting the statutory requirements.

The Final Report is based on matters entered into the record during the proceedings on this NOI. All relevant and material evidence presented at the nonadjudicatory hearings, the appropriate verified sections of the Notice of Intention (NOI), the Summary and Hearing Order, comment on the NOI by local, regional, state or federal agencies, and comments of interested members of the public, either presented at hearings or transmitted to the Committee through the docket, constitute the basis for the findings and conclusions reached in this Report.

3. Opportunity for Response

Responses to the Final Report may be filed with the Committee at a public conference on March 7, 1980, to consider amendments to the document. Each party should take advantage of this opportunity to comment on, or express its intent to contest, or amend any Findings or Conclusions contained in this Final Report.

The hearing conducted following the issuance of this Report will lead to the full Commission hearing for approval or disapproval by the Commission of the Notice. If the Notice is approved, NCPA may then file an Application for Certification of the NCPA Geothermal Project No. 1. Following further proceeding on the Application, the Commission will act to grant or deny certification of the facility.

Any person who, after reading this Final Report, feels he or she may have an interest in addressing the Committee or the full Commission at the hearings on the Report may gain assistance in doing so by calling Dan Parker of the Commission's Public Adviser's Office at (916) 920-6906 or toll free (800) 852-7516.

B. Description of the Proposed NCPA Geothermal Project No. 1

1. The Applicant

The Northern California Power Agency is a joint powers agency organized to provide electrical power to its members, which include the Cities of Redding, Roseville, Biggs, Gridley, Ukiah, Healdsburg, Alameda, Lodi, Lompoc, Palo Alto and Santa Clara. The Plumas-Sierra Rural Electric Cooperative is an associate member. The Agency is

governed by a Board of Commissioners made up of officials from each of the member cities. Thus far, NCPA has purchased, rather than produced, all the power necessary to supply its members. The 66 MW provided by the proposed project will be used to meet baseload requirements at what the Applicant anticipates to be considerable savings in the cost of electricity over the life of the project.*

2. The Facility

The NCPA Geothermal Project No. 1, proposed for construction in The Geysers area of Lake County, is a dry steam geothermal power plant with a gross operating capacity of 66 MW. It is designed to consist of two 33 MW turbine/generator units and their auxiliary equipment. In addition to the turbine/generator building, the proposed power plant will include a Stretford H₂S abatement system, backup surface condenser, cooling tower, substation, service, and storage facilities. The plant is scheduled for operation in 1985.

The Applicant's first choice for transmission lines to connect the power plant with main transmission lines out of the area is the use of a 230 kV tap-line from the plant site to the proposed Department of Water Resources (DWR) Bottle Rock Plant.** Such a tap-line would be 1.5 miles long, consisting of steel lattice type transmission towers. At this time the major transmission facilities in The Geysers are

*NCPA has also applied to the Energy Commission for certification of a 110 MW geothermal power plant. Final action on the Application for Certification is expected in March 1980.

**This plant is in the AFC proceeding stage before the Commission.

owned by Pacific Gas and Electric (PG&E).* It will therefore be necessary for NCPA to enter a wheeling agreement with PG&E and DWR in order to wheel their power into the Northern California integrated transmission system.

3. The Site

The NCPA Geothermal Project No. 1 is located on private lands within Lake County, California. The project site is in the northern extension of The Geysers Known Geothermal Resource Area (KGRA). The steam supply leasehold consists of approximately 1,400 acres distributed irregularly in Sections 20, 21, 22, 28, 29, 30, 32, and 33 of Township 12 North, Range 8 West of Mount Diablo Base and Meridian, and centered principally in Sections 28 and 29.

The leasehold straddles Bottle Rock Road at the community of Glenbrook. Approximately 2-3/4 miles to the southeast is the community of Cobb and the town of Kelseyville is 10 miles to the northwest. The City of Lakeport, located about 16 miles northwest of the project, is the only incorporated city in Lake County and is the county seat.

Of the three plant site locations identified by the Applicant, site 3 has been identified by both Staff and Applicant as the most environmentally acceptable. The site is located at an existing topographic knob from which a flat plant site will be established. This will be done through reduction of the knob and engineered fill at the perimeter of the site. Due to the nature of the steam resource, a geothermal power plant must usually be located within one mile of all production wells feeding it. Plant site 3 meets this requirement.

*PG&E has applied to construct an additional major transmission line into the area.

PROJECT VICINITY MAP

NCPA NO.1 LEASEHOLD

4. The Steam Field

A large reservoir of geothermal steam exists in The Geysers Known Geothermal Resources Area (KGRA). This natural resource is presently being used by PG&E to generate 663 MW of electric power.

Well sites must be located according to the underlying geologic structures from which the geothermal steam sources may be developed. However, the steep slopes, poor accessibility and environmental constraints of The Geysers area limit the number of suitable areas for drilling. As a result, once a successful well site has been found, numerous wells may be drilled from a single drilling pad in order to develop the steam source with minimum disturbance to the immediate area.

As originally filed in the NOI, this project was to have received steam supplied by Resources Funding Limited (RFL). However, since the filing of the NOI, RFL has filed for bankruptcy. NCPA is presently negotiating with the bankruptcy trustee to take over the RFL steam development lease. *

C. Summary of the Hearing Record

On June 18, 1979, the Northern California Power Agency (NCPA) filed with the Commission a Notice of Intention (NOI) to file an Application for Certification (AFC) for its geothermal Project No. 1. On July 18, 1979, the full Commission voted to accept the NOI subject to the condition that

*To date NCPA has drilled one well and has not as yet produced sufficient steam from the well to be considered commercial quantity.

NCPA provide additional information to adequately meet the NOI filing requirements. The supplemental information was submitted, as required, by August 31, 1979.

Subsequent to accepting the NOI, the Commission appointed a Committee to conduct proceedings on the NOI. Due to the departure of several Commissioners and their subsequent replacement, the Committee was modified and is now composed of Commissioner Ronald D. Doctor, presiding, and Commissioner James A. Walker.

The County of Lake and Camp Beaverbrook both petitioned the Committee for leave to intervene in the NOI proceedings. Both were granted leave to intervene shortly thereafter. Once granted intervenor status, these entities became full parties to the proceedings, with all the rights and obligations of any other party.

Between July and November of 1979 Staff and the Applicant participated in five informal public workshops, held in Sacramento and Lakeport to discuss issues related to the proposed project. As a result of those workshops, Staff prepared a series of position papers on all relevant issues. The workshops were designed to assist Staff and the Applicant in resolving issues on which there was agreement and identifying areas which require further information. In this way the parties avoided unnecessary litigation of issues not actually in dispute. However, the workshops are not intended to foreclose issues, and the Committee is not bound by the joint agreements resulting therefrom. Nevertheless, the Committee gives great weight to settlements reached between Staff and the Applicant.

Timeline of Events

Site Visit	April 19, 1979
NOI Filed	June 18, 1979
Commission Accepted NOI	July 18, 1979
Public Workshops	July 23 and August 10, 1979
Informational Hearing	August 24, 1979
NOI Supplement Submitted	August 28, 1979
Prehearing Conference Statement Workshop	October 1, 1979
Second Informational Hearing and Site Visit	October 12, 1979
Prehearing Conference Statement Workshops	October 24, 1979
Prehearing Conference	November 8, 1979
Public Workshop on Air Quality	November 9, 1979
Nonadjudicatory Hearings	November 19 and 20, 1979
Summary and Hearing Order	December 21, 1979
Public Conference on Summary and Hearing Order	January 10, 1980
Hearing on Financing and Economics	February 5, 1980
Final Report	February 29, 1980
Committee Conference on Final Report	March 7, 1980
Commission Hearing and Decision on Final Report	March 12, 1980

Pursuant to Public Resources Code Section 25509, the Committee conducted public Informational Presentations on August 24, 1979, and October 12, 1979, in Lakeport so that Staff and the Applicant could explain the project to all interested agencies and members of the public. During these hearings, the Committee afforded the public the opportunity to ask questions of the Staff and NCPA and invited general comments and expressions of concern about the proposed project. To provide further understanding of the proposed facility and its location, site visits were conducted on April 19, 1979, and on October 12, 1979. The Staff, Applicant, and any members of the public who wished to attend explored the proposed drilling pad and power plant site.

The Committee held a Prehearing Conference in Sacramento on November 8, 1979, to consider the Staff's and NCPA's Joint Statement of Findings and Conclusions and to identify areas of concern to those interested in the proceeding. Camp Beaverbrook indicated its concern over the proposed facilities' possible impact on air quality noise, biological resources, and public health, specifically regarding the impact which airborne steam pollutants could have on the health of young active children attending the camp. Lake County, represented by the Public Advisor's Office, expressed its intent to intervene in the proceedings.

The Committee conducted public Nonadjudicatory Hearings on November 19 and 20, 1979, in Lakeport. These hearings provided further understanding of the facilities, allowed input from the public, parties and governmental agencies regarding the impacts of the plant and offered the Committee an opportunity to explore alternatives where needed. At the hearings the Staff and Applicant each presented their respective positions, and made

formal offers of proof in the form of written testimony and supporting documents. These formed the evidentiary basis for the respective positions. The Committee afforded those present the opportunity to challenge, rebut or cross-examine the witness for each subject area.

As an intervenor in the case, Lake County was represented throughout most of the two day hearing and frequently exercised its right to question witnesses. During the course of the hearings the Committee received statements from Lake County representatives Don Pape of the County Planning Department, Mary Jadiker of the Planning Commission, Doris Wilcox from the Board of Supervisors and County Tax Assessor Verdon Strong. Camp Beaverbrook was represented throughout the hearings by camp co-owner Lynn Garrison, who also questioned witnesses.

During the presentation on air quality it became clear that the Lake County APCO and NCPA disagreed on whether NCPA must conduct a cumulative air quality analysis of the project's impact along with that of other power plants in Cobb Valley.* The Committee later heard testimony from Bob Reynolds, Lake County Air Pollution Control Officer, to the effect that he would seek a cumulative air analysis of the project. In addition, Lake County revised a number of concerns regarding the impacts which the proposed project would have on the county in terms of land use, tax revenues and maintenance of Bottle Rock Road.

Following the Nonadjudicatory Hearings and publication of the Summary and Hearing Order, Lake County petitioned the Commission to consolidate the proceedings for NCPA Project No. 1 with those of the California Department

*These plants include PG&E Geysers 17 and DWR Bottle Rock.

of Water Resources' Bottle Rock Geothermal Project. The Commission agreed to hear Lake County's petition on January 16, 1980. However, prior to that date, the Department of Water Resources (DWR) requested that proceedings on its project be suspended. The effect of the suspension was to make a cumulative analysis of the two projects infeasible within the statutory time limits for the project proceedings. As a result of the suspension, Lake County ultimately withdrew its petition to consolidate the cases.

In an effort to avoid prejudging Lake County's petition on consolidation, the Committee did not decide in the Summary and Hearing Order whether the issues of air quality and socioeconomics would require further evidentiary hearings during the NOI. However, the Committee subsequently determined that Lake County had not made a sufficient showing to require adjudication at this stage in the siting process. Such a determination does not limit the county's right to again raise any relevant issue during the AFC stage of the process.

After publication of the Summary and Hearing Order, the Committee held a public conference for the receipt of comments and amendments to the proposed findings presented in the Summary and Hearing Order. Energy Commission Staff, NCPA, Lake County and Camp Beaverbrook all submitted comments and were present at the conference. The parties summarized their respective comments and reacted to the views expressed by each party. At the close of the conference, all parties were invited to respond within 7 days in writing to the views presented at the conference.

Due to the nonavailability of key Commission Staff during the first non-adjudicatory hearings, the issues of financial and economic impacts were

addressed in a separate, nonadjudicatory hearing held on February 5, 1980. At that time both the Staff and Applicant testified that NCPA's financing plan for the project was feasible and within accepted utility industry standards. Staff and the Applicant also agreed that even under the most conservative assumptions the project would result in an economic savings to NCPA over the purchase of electricity from other companies.

At this third and final day of adjudicatory hearings, the Committee provided Lake County an additional opportunity to state for the record its concerns regarding the county's ability, under current laws, to make use of the tax revenues which the project will generate. Lake County offered the testimony of three witnesses on this topic. At the close of the hearing, the Committee ordered all parties to submit closing briefs with proposed findings and conclusions for the Committee's consideration. The arguments contained in these final briefs were evaluated, along with the rest of the proceeding record, during the preparation of the Committee's Final Report.

II. PROJECT ACCEPTABILITY ISSUES

A. Introduction

Public Resources Code Section 25514 requires that the Final Report analyze the principal significant environmental effects of each siting proposal, discussing alternatives and mitigation of adverse effects. However, Public Resources Code Section 25540 eliminates the requirement that geothermal plant NOI's contain alternative sites. While NCPA has three candidate power plant sites within their leasehold, both the Staff and Applicant have taken the position that considering all site characteristics, plant site No. 3 is the most desirable. Therefore, the analysis of site related issues which follows will focus on plant site No. 3.

The Final Report is intended to analyze the environmental issues which should be addressed in the NOI. The principal environmental effects of the project are described along with reasonable alternatives and mitigation measures to reduce any substantially adverse impacts. In addition, the document sets forth proposed findings of fact and conclusions of law on matters relevant to the final report. Many of the requirements for mitigating impacts of the project can be found in Appendix B.

B. Applicable Laws

Public Resources Code section 25514(a)(2) requires that the Final Report include findings and conclusions regarding the conformity of the facility to:

(t)he provisions of any state law or local or regional ordinance or regulation, including any long-range land use plans or guidelines adopted by the state or by any local or regional planning agency which would be applicable but for the exclusive authority of the Commission to certify sites and related facilities...

During the nonadjudicatory hearings the Staff and Applicant presented evidence which identified the applicable federal, state and local laws, standards and ordinances. In addition, the Committee received the comments of relevant public agencies regarding the likelihood of the project's conformity with applicable laws. Based on the evidence presented in the hearing record, the Committee is able to find that the proposed site and related facilities have the capability of conforming to all applicable laws, standards, and ordinances identified during the proceedings.

Findings and Conclusions--Applicable Laws

Findings of Fact

1. To the extent possible, all applicable laws, standards, and ordinances have been identified during the NOI phase of this proceeding and are contained in the hearing record.
2. The facility can be constructed in conformance with these laws, etc., either as proposed by the Applicant or under the conditions imposed in the NOI decision.
3. Further scrutiny will be needed during the AFC phase to ensure continued compliance due to possible changes in the interpretation of some of these laws.

Conclusion of Law

1. The Applicant has the capability of conforming to all applicable laws, standards, and ordinances identified during this proceeding.

C. Site Related Issues

1. Air Quality

As a result of the relatively high concentration of hydrogen sulfide in most sources of geothermal steam and the air mixing features in the Cobb Valley, air quality is a major issue in these proceedings. The Committee's concern is not diminished by the fact that, to date, the Applicant has not discovered steam in commercial quantities sufficient for air quality analysis. Energy Commission regulations allow the Applicant to progress through the NOI process without a proven steam resource. However, there must be a showing of reasonable likelihood that the Applicant will be able to comply with air quality standards for the area.

H₂S emissions from the plant are restricted by (1) legal limits on the amount which a plant may emit per gross megawatt hour and (2) prohibitions against a new plant making a measurable contribution to existing violations or causing new violations. (See finding no. 3 which follows.) The NCPA 1 plant is presently scheduled to emit no more than 100 grams per gross megawatt hour. This will be accomplished through the use of a Stretford H₂S abatement system and a H₂O₂/Fe catalyst condensate treatment system.

At the nonadjudicatory hearings testimony was received regarding the inability of the surface condenser at PG&E's Geysers 15 to partition the percentage of noncondensibles originally anticipated. A similar abatement unit is planned for use at NCPA 1. The Committee was also informed of the possibility that NCPA's permissible level of H₂S

emission could be drastically reduced because of the levels of H_2S produced by the operation of The Geysers 17 and DWR Bottle Rock plants. This reduced emissions level would only be required if the Lake County APCO interprets a "new source" to refer to all new sources of H_2S emissions. Such interpretation would limit H_2S emissions from all (rather than each) new geothermal power plants to 5-10 part per billion. NCPA feels that Rule 602 cannot be interpreted in such a restrictive manner. Another important unknown is the H_2S content of NCPA's as yet unproven steam resource. NCPA has agreed to provide complete information on the H_2S content in the steam resource for an AFC determination.

While these questions remain unanswered, NCPA has nonetheless stated its belief that compliance with applicable air quality standards is possible. NCPA has also made clear its intention to meet these standards. Analysis by Staff and Lake County Air Pollution Control District (APCD) indicates that under a number of scenarios the project can be made to comply. However, adequate air quality information will not be available within the time constraints of the NOI process. Therefore, information indicating the project's ability to comply with all air quality regulations must be submitted at the time of the AFC.

At the Committee-sponsored conference on the Summary and Hearing Order, Lake County APCO Bob Reynolds offered a number of proposed corrections to the Committee's findings on air quality. He stated that the County's main air quality concerns with the project at this stage were 1) the need for an adequate air quality analysis based on

a commercial steam sample, and 2) the County's desire to conduct a cumulative analysis of NCPA 1 in conjunction with other Cobb Valley geothermal plants. He noted for the record, however, that Lake County's concerns would not, in his opinion, preclude approval of the NOI on the basis of air quality.

Based on the evidence of record and the Applicant's guarantees to provide further air quality information during the AFC, the Committee determined that there was no need for further adjudication of this issue and that a reasonable reliance may be placed on the project's ability to comply with air quality standards.

Findings and Conclusions--Air Quality

Findings of Fact

1. NCPA 1 is scheduled to begin operation in 1985.
2. NCPA 1 will have a gross operating capacity of 66 MW.
3. The Energy Commission Staff has not yet received information on the power plant steam supply. Prior to or at the AFC filing, NCPA must provide the Staff with a complete analysis of steam from at least one well capable of production in commercial quantities including but not limited to all available information on 1) the actual concentration of H₂S in the steam, and 2) variation in the flow and composition of the steam.
4. Lake County APCD Rule 602 prohibits new source emissions which would result in "the violations or measurable contribution to an existing violation" of any local, state, or federal air quality standard.
5. Occasional H₂S air quality violations may be occurring in the area impacted by the proposed project.
6. At the time NCPA 1 is scheduled to begin operation, plant operation must not exceed 100 grams/gross MW hours (14.55 lbs/hr) pursuant to Lake County APCD Rule 421.2(a)(2).
7. The Cobb Valley Tracer Study indicates that, during deep mixing conditions, an emission rate of 100 grams per gross megawatt hour from NCPA's proposed plant would result in a "measurable contribution to an existing violation" or result in a new violation.
8. Local air quality in the project area is now being affected by geothermal emissions to such a degree that the Lake County Air Pollution Control District (LCAPCD) has determined significant levels of contaminants are present in the Cobb Valley and adjoining areas. These contaminants are deemed a public nuisance and may have possible health effects which are not completely understood at this time.
9. Anticipated cumulative air quality impacts of other proposed local geothermal plants, in combination with NCPA 1, may force NCPA to greatly reduce its proposed H₂S emissions in order to avoid a measurable impact under worst case conditions. Such reductions would result from the Lake County APCD's proposed interpretation of Rule 602 limiting all geothermal development to no more than 5-10 parts per billion H₂S emissions. This interpretation is objected to by NCPA, and is not supported by the Commission staff.
10. The environmental impacts of emitting 14.55 lbs/hr may be legally unacceptable. NCPA agrees that, if required by the APCD, it will accept a more stringent emission rate.
11. Federal Prevention of Significant Deterioration (PSD) requirements may apply to NCPA 1. The EPA may require NCPA to employ best available control technology (BACT) for H₂S.

12. NCPA has proposed to comply with the applicable H_2S emissions limitations by employing a surface condenser and Stretford H_2S abatement system.
13. A Stretford system, if correctly sized, will treat 99+ percent of that H_2S which reaches the system in the gas stream.
14. NCPA agrees to provide detailed information at the filing of the AFC on the design criteria and the capacity of the Stretford unit to treat H_2S .
15. The amount of H_2S which reaches the Stretford system is dependent on the amount of H_2S which the surface condenser is able to partition out of the steam and into the gas stream.
16. At the filing of the AFC, NCPA agrees to make specific proposals for condensate treatment systems which will be used, should the operating data concerning surface condensers indicate that the partitioning efficiency of such surface condensers is not sufficient to meet the applicable emissions limitation.
17. The air quality affects of NCPA 1 as described by the Cobb Valley Tracer Study are predicated on locating the plant at site number three. Selection of a new site may require an additional air quality analysis.

Conclusions of Law

1. Applicant shall furnish, at or before the filing of the AFC, the information described in Findings 3, 14, and 16.
2. The project can be constructed so as to comply with all emission limitations.

2. Hydrology and Water Resources

The Committee received testimony and supporting documents showing that after initial start up the proposed facility will not use any water for its cooling towers other than steam condensate. Relatively small amounts of water will be drawn from wells or from Kelsey Creek for landscaping and other uses. NCPA testified that the amount needed annually for such uses would not exceed the comparable water demands of two suburban households. If necessary, domestic water may also be trucked to the site. Drainage and runoff systems will be designed for 100 year flood capacity, and berms will be used around the site to contain spills and direct runoff.

Lake County representative Don Johnson expressed the County's concern that geothermal development could lead to the gradual transference of vapors from the steam field into the Kelsey Creek Water Basin. The County is interested in generating more information on the subject. However, to date the Committee has received no evidence of transference from drilling on this site or on any other in The Geysers KGRA. Testimony on the subject by Gordon Needham, representing the Applicant, indicates that presently mandated precautions for drilling are adequate to prevent transference between the steam field and groundwater resources.

Staff and Applicant both testified as to the adequacy of the hydrology plans and the insignificance of the project's use of water resources.

Findings and Conclusions--Hydrology and Water Resources

Findings of Fact

1. The Applicant proposes to utilize condensed geothermal steam for the plant cooling water supply.
2. The total plant operating need for fresh inland water has been annually estimated at approximately 10 acre-feet during construction and 4 acre-feet for domestic and landscaping uses.
3. The source for the necessary fresh water will be from either trucking water from existing water sources, getting a permit to use water from Kelsey Creek, or drilling of a water well nearby. In any event, the impacts on local water resources would be minimal.
4. The plant site storm drainage system is to be designed for a 100 year storm.
5. The preferred plant site is located 175 feet above Kelsey Creek. There is little surrounding watershed which would generate overland flows, and there is no possibility of flood from Kelsey Creek.

Conclusions of Law

1. The construction and operation of the plant would not adversely affect fresh water resources.
2. The protection of the plant from flooding is adequate.

3. Water Quality

The Committee received testimony at the nonadjudicatory hearings indicating that all surplus cooling tower water would be reinjected into the steam reservoir, with no geothermal water discharge entering any surface waters. Impermeable berms and drains around the critical plant areas will contain all anticipated spills and rainwater runoff will be directed to monitored settling ponds before flowing into Kelsey Creek. In response to Lake County's concern that the power plant will be located on a steep slope overlooking Kelsey Creek, NCPA witness Gordan Needham testified that drainage at the site will be to the east, away from Kelsey Creek. Staff indicated its approval of the NOI-proposed plan for spill containment, water quality monitoring, waste water disposal and plume drift analysis.

The plant will use a low-drift cooling tower to limit the amount of condensate droplets carrying harmful airborne salts for short distances. According to Staff the only available information on the impacts of such plume drift shows that the chemicals in the drift have minimal effects on surrounding water supplies. Most are washed from the nearby soils with each rainy season.

Findings and Conclusions--Water Quality

Findings of Fact

1. The Stretford effluent and cooling tower sludge are likely to contain substances which are classified as toxic and hazardous.
2. The Stretford effluent will be divided into sulfur and the Stretford purge stream. The latter will either be reinjected or disposed of at an approved disposal site. The former will be temporarily stored at the site and disposed of at an approved disposal site.

3. The steam condensate will be utilized for cooling water and the excess will be reinjected.
4. The cooling tower emissions are likely to contain certain toxic chemicals. It is unlikely that these emissions would be deposited or otherwise reach surface waters in such quantities as to cause a violation of water quality standards.
5. NCPA will conduct a water quality monitoring program required by the Lake County use permit; this program will include the monitoring of bio-chemical oxygen demand, suspended solids, and heavy metals in the drainage channel below the sedimentation pond.
6. During the AFC, NCPA may be requested to participate in developing a regional monitoring program for the Kelsey Creek watershed in which the potential effects of the proposed DWR Bottle Rock and NCPA 1 facilities are evaluated.
7. NCPA has proposed to construct a retention barrier to surround critical plant areas to contain any spills. The barrier will be impermeable and have a volume larger than any anticipated spill and greater than the quantity of condensate in the cooling tower basin above the plant site ground level. A catch basin with pump facilities and alarm devices will be constructed to pump any condensate spills back to the cooling tower basin. The area within the retention barrier shall be lined with an impermeable barrier. Prior to or at the time of the filing of the AFC, NCPA agrees to submit:
 - a) The detailed design criteria for the retention barrier and liner to assure that the lining has a permeability of less than 1×10^{-6} cm/sec;
 - b) The volume of the retention basin surrounding the cooling tower basin and volume of any other spill retention basin(s); and
 - c) The maximum anticipated spill, including criteria for determining this volume and analysis that the retention basin will contain this volume.
8. NCPA has proposed to line and berm the Stretford area with tar or epoxy-coated concrete. NCPA has stated that the bermed area will drain to a sump from which spilled material or rainwater can be pumped to the cooling tower basin or to trucks for off-site disposal. However, these facilities have not been designed. Therefore, prior to or at the filing of the AFC, NCPA agrees to provide details regarding construction of the Stretford area lining and should describe operation of spill containment and disposal system.
9. Domestic waste water will pass through a septic tank into the reinjection system downstream from the condensate collection pond and will be injected into the geothermal reservoir without adversely impacting water quality. Wastes injected into the geothermal reservoir are disinfected by the high temperature and are separated from fresh water aquifers by well casings required by the State Division of Oil and Gas, and natural barriers.

10. Because NCPA has proposed facilities to prevent discharges and has not proposed any permanent on-site waste disposal, the Central Valley Regional Water Quality Control Board (CVRWQCB) will not require the Applicant to file a report of waste discharge. However, the CVRWQ has requested that the Applicant submit a spill contingency and reporting plan. NCPA agrees to provide this plan prior to or at the time of filing the AFC.
11. NCPA agrees to comply with all the provisions of the Porter Cologne Water Quality Act.

Conclusion of Law

1. The proposed project can be designed to prevent discharges of any toxic or hazardous material into surface waters in quantities sufficient to affect water quality.

4. Waste Disposal

During the nonadjudicatory hearings the Applicant presented evidence regarding the amount of waste materials which would be generated by the proposed project. Most of this waste will be generated by the Stretford H₂O abatement system and the secondary abatement system. Additional wastes will be generated in the cooling towers. NCPA testified that these and other waste materials generated at the plant site will be trucked to a licensed disposal facility.

Findings and Conclusions--Waste Disposal

Findings of Fact

1. Approximately 1,222 cubic yards of waste per year will be produced from the Stretford system. The hydrogen peroxide secondary abatement system will produce approximately 122 cubic yards of waste per year. An estimated 74 cubic yards of cooling tower sludge will have to be removed annually.
2. NCPA agrees that these wastes as well as all toxic or hazardous chemicals and waste oil must be collected and disposed of on an appropriately licensed site. The Stretford purge stream may be disposed of by reinjection.
3. There is adequate capacity at local disposal sites for the disposal of all wastes that may be produced by the proposed facility.
4. Prior to or at the time of filing the AFC the Applicant agrees to provide the specific details for discharge of solid wastes, including location of discharge facilities proposed for use and an analysis of the facilities' volume capacity.

Conclusions of Law

1. The Applicant must comply with the requirements of Finding 4.
2. The proposed project will be able to dispose of waste materials in an acceptable manner.

5. Geology and Seismicity

The Applicant has identified all areas near the plant site which show evidence of fault zones or potential seismic activity and will site all structures away from these areas. Evidence developed in a specific Energy Commission sponsored workshop indicates that the nearby Callayomi Fault is not considered to be a major seismic threat to geothermal development in The Geysers KGRA. The fault will, however, be incorporated into a seismic model which considers local sources of seismicity. The more distant Maacama Fault will probably determine the design standards for maximum credible earthquake. The Applicant agreed to provide further analysis of earthquake possibilities at the time of the AFC.

The Committee also received detailed testimony at the nonadjudicatory hearings indicating that, presently, steam removal in The Geysers area has virtually no impact on engineering design for seismicity and that the low reinjection water pressures likewise pose no threat to ground stability. This may be due to the extremely hard rock formations in the area, which are characteristic of a dry steam field.

Findings and Conclusions--Geology and Seismicity

Findings of Fact

1. Known major fault zones potentially affecting the project site include the Hayward, Calaveras, Concord, Green Valley, Rodgers Creek, Maacama, Cobb Valley Callayomi, and Nocti Bay Fault.
2. An active fault, as defined by the State Mining and Geology Board, is one "which has had surface displacement within Holocene Time (approximately the last 11,000 years)." The Energy Commission staff accepts the validity of the above definition.
3. Recent evidence (USGS Open File Report, 78-597), has indicated that strike-slip fault creep may have occurred along the Callayomi Fault Zone, indicating its potential for seismic activity.

4. NCPA agrees to make site-specific geotechnical evaluation and seismic analysis prior to final selection of the plant site. This evaluation and analysis will provide the basis for design criteria and construction procedures to eliminate or reduce identified geologic hazards and impacts, and will consider the possibility of ground surface rupture on the Callayomi Fault.
5. The proposed power plant site No. 3 will be developed adjacent to well pad "A" and will use the same access road. The flat plant site will be established by reduction of existing terrain to the same basic elevation as the drill pad. All major structures of the plant will be located on the exposed base rock, assuring integrity of foundations. Engineered fill will be required only at the periphery of the plant site.
6. Well pad "A" and plant site No. 3 are the most desirable sites from a geologic standpoint.
7. There is much uncertainty about the Callayomi Fault, which runs through the project leasehold. The Applicant agrees that its potential for activity must be considered in any seismic design analysis. Justification for seismic design will be provided in the Reliability section of the AFC.
8. In formulating seismic design criteria, it will be necessary for the Applicant to analyze all "active" and "potentially active" faults which may produce earthquakes of sufficient magnitude to have an effect upon the plant. The Applicant agrees to provide this analysis prior to or at the AFC filing.

Conclusion of Law

1. No geologic conditions within the leasehold preclude the siting of a geothermal power plant, so long as the plant is not constructed across any of the potentially active branches of the Callayomi Fault Zone.

6. Soils

Staff and Applicant have identified a series of mitigation measures to protect and retain the thin top soil and disturbed cuts around the plant site. A series of revegetation steps will be taken by the Applicant along with the monitoring of siltation rates. The Committee also heard testimony from Lake County regarding some of the soil erosion problems at the site. The County recommended that revegetation measures be planned for the south facing slope created by fill from power plant site excavation. As a result, the Committee directed the Applicant to include a revegetation plan for both the south and west plant site slopes as part of its AFC submittal.

Findings and Conclusions--Soils

Findings of Fact

1. The conversion of watershed lands to industrial use in the KGRA soils creates a significant potential for erosion and subsequent sedimentation.
2. Inadequate data exists on erosion rates or sediment yield for the KGRA.
3. NCPA agrees that design and construction for the sedimentation pond will comply with the regulations of the California State Department of Conservation Resources Agency, "Erosion and Sedimentation Control Handbook," Section 92.
4. NCPA agrees to implement the following mitigation measures to control soil loss and erosion:
 - a) The temporary and permanent measures outlined in the NOI at pages V-II5 through V-II8.
 - b) The requirements contained in the Waste Discharge Requirements for Nonsewerable Waste Disposal to Land-Disposal Site Design and Operation Information (January 1978) by the California State Water Resources Control Board.
 - c) Quantification of the amount of sediment removed from the proposed sedimentation basin(s) and an annual report of this information to both CEC and the Central Valley Regional Water Quality Control Board (CVRWQCB).

5. The CEC soils staff, in consultation with the Central Valley Regional Water Quality Control Board agree that mitigation measures proposed by NCPA appear to be acceptable. However, no specific schedule or design for implementation has been designated. NCPA agrees to provide prior to or at the time of the AFC the specific designs and schedules for the implementation of the measures outlined in Finding 4 above. NCPA also agrees to submit at the time of filing the AFC a plan for revegetating the slope created by cutting and filling at the power plant site.

Conclusions of Law

1. The Applicant shall implement the mitigation measures outlined in Finding No. 4.
2. Applicant shall provide, prior to or at the time of filing the AFC, the information required in Finding 5.
3. If the mitigation measures in Finding Number 3 are implemented, this project will comply with the applicable standards.

7. Biological Resources

The Committee received testimony relating to biological resources from Mr. Hari Modi, the Applicant's project engineer. Mr. Modi stated that a thorough search of the leasehold had been conducted in 1977 by Dr. Neilson of Ecoview to determine the existence of rare and endangered species. Those studies, Mr. Modi advised the Committee, failed to reveal the presence of either rare plant species or endangered wildlife. NCPA agreed to provide a detailed plan at the AFC, including a wildlife management program necessary to mitigate biological impacts in the project area. Staff noted its desire that further studies be done prior to filing the AFC. In response, the Committee directed the parties to establish a schedule for such studies to better assess the project's impact on wildlife and to plan for necessary mitigation of the impacts. The additional biological studies, which Staff and the Applicant agree must be done by the filing of the AFC, are listed in Appendix B.

Findings and Conclusions--Biological Resources

Findings of Fact

1. A portion of the project leasehold has been designated as a botanically unique area by the California Natural Areas Coordinating Council (CNACC). This botanically unique area may contain the Lake County Dwarf flax, (Hesperolinon didymocarpum), glandular dwarf flax, (Hesperolinon adenophyllum), and white sedge, (Carex albinda bailey). The Lake County dwarf flax is listed as endangered by the California Native Plant Society (CNPS), rare by California, and is proposed for listing as endangered by the federal government. The glandular dwarf flax is listed as rare by CNPS and is a candidate species for federal listing. The white sedge is listed as endangered by CNPS and is proposed for listing as endangered by the federal government.
2. In this AFC filing, NCPA agrees to include a detailed plan, including a wildlife management plan, of those measures necessary to mitigate biological impacts in the project area.

3. Prior to the filing of the AFC, NCPA agrees to identify on a map CNACC natural area No. 171210 and any anticipated project activities which will occur in that area.
4. The applicable legal standards in this area include:
 - a) California Fish and Game Code, sections 900-903, 2050-2055, 3511, 4700, 5000, 5050, 5515.
 - b) The Endangered Species Act of 1973, 16 U.S.C., sections 1531-1543.
5. The leasehold biological survey conducted by NCPA and other information submitted for the record is adequate to satisfy the requirements of the NOI.
6. The Staff of the California Energy Commission and the Northern California Power Agency agreed that the utility's AFC filing will provide specific answers and information on the following biological resources matters.
 - a) How were the locations of potential populations of rare and/or endangered plant species tentatively identified before field surveys of the leasehold were undertaken? Describe the methods used in the follow-up field surveys that resulted.
 - b) List the days plant surveys were conducted and the areas of the leasehold that were covered on those days.
 - c) At the November 20, 1979, nonadjudicatory hearing, NCPA testified that the rare plant surveys conducted for the NCPA/RFL Cobb Valley Geothermal Project EIR were more intensive at the proposed well pad and power plant sites than in the rest of the leasehold. Describe the differences in the kind of surveys referred to.
 - d) On a topographic map (or reasonable facsimile) of 1" to 500' scale show the extent of the intensive survey done at well pad site #2 alternate.
 - e) In the nonadjudicatory hearing NCPA testified that small mammal trapping was conducted on the leasehold and proposed development sites during the preparation of the NCPA/RFL Cobb Valley Geothermal Project EIR. Was this suitable for capturing ringtail or other animals classified as fur bearers? If so, explain why.
 - f) If the answer to question "e" is no, what specific measures were taken to determine the presence of ringtail or other legally protected animals in natural habitat that would be affected by the proposed project?
 - g) If the previous surveys identified in this Agreement include the power plant impact zone ($\frac{1}{2}$ mile radius), no further studies are necessary for rare, endangered, or legally protected species. However, if the impact zone was not included, these or similar studies of the impact zone must be undertaken and the results included in the AFC submittal.

Conclusions of Law

1. The Applicant shall provide the data requested in Findings 2, 3, and 6 in accordance with the schedules outlined in the Findings.
2. Subject to the receipt of additional data, the NCPA power plant and related facilities can be constructed and operated in compliance with the applicable standards for the protection and preservation of biological resources.

8. Noise

Noise was cited by Lake County as one of its primary concerns when siting a geothermal power plant. The County applies a standard of 55 dBA Ldn to geothermal plant output to nearby noise receptors. Staff concludes that the project as described in the NOI may not meet the noise standard. However, Staff believes that with the appropriate mitigating design features, the NCPA facility can probably be operated in compliance with the Lake County Noise Element. In an effort to lessen the noise impact of the project, the Committee directed the Applicant to incorporate mitigating design features, such as those in Finding 11, and to consider noise impacts when designing and submitting a vegetation plan for the AFC.

The Applicant testified that the Binkley Ranch is the most sensitive receptor and that Camp Beaverbrook will be able to hear the plant only under unusual circumstances. Staff supported this testimony and stated that the mitigation measures specified should bring the plan into compliance with the County noise ordinance. A noise monitoring program developed in the AFC will ensure compliance after the plant is built.

Until information on specific plant design and plant noise levels is available, a precise determination of conformance with County standards cannot be made. However, no information received by the Committee to date on the issue of noise would preclude the plant from going forward to the AFC stage.

Findings and Conclusions--Noise

Findings of Fact

1. Lake County has adopted a Noise Element to its General Plan, the intent of which is to limit plant operating noise levels at residential receptors to 55 dBA Ldn. Lake County currently establishes noise limits by placing conditions in use permits. NCPA agrees to comply with the Lake County Noise Element
2. Lake County is presently considering a draft noise ordinance imposing a limit of 55 dBA for daytime hours and 45 dBA for nighttime hours.
3. The proposed project site is in close proximity to four residential receptors: the Robinson residence, Binkley ranch, Adams residence, and Huff residence. It is also in close proximity to a structure known as the "Nunnemaker property." An estimate of projected operational noise levels from site No. 3 to these receptors suggest the noise of operation of the plant will be audible at the Robinson residence, Binkley ranch, and "Nunnemaker property."
4. Surveys in the vicinity of the proposed site indicate an ambient noise level range of 40-46 dBA (L_{50}). Ambient noise levels in the project study area range from 33-56 dBA (L_{50}).
5. NCPA agrees to provide accurate information in the AFC on the location of sensitive receptors and on the expected or design noise emission level of the facility. NCPA further agrees to perform a 24 hour survey at the following residential receptors: the Robinson residence, Binkley ranch, "Nunnemaker property" and Camp Beaverbrook.
6. Occupational noise limits are established by CAL/OSHA (8 Cal. Admin. Code Article 105). NCPA agrees to comply with the CAL/OSHA requirements.
7. Results of the surveys will be provided at the time of submittal of an AFC on the project and will show L_x , L_{eq} and Ldn noise levels and relevant weather conditions and instrumentation data (where $x = 10, 50, \text{ and } 90$).
8. The federal occupational noise standards are set by the Occupational Safety and Health Act of 1970 and are basically the same as CAL/OSHA standards.
9. The loudest plant construction noises will be caused by large earth-moving equipment. The noise associated with this equipment will be discernible to the closest receptors. The activity will be temporary in nature and performed during daylight hours whenever possible.
10. NCPA will require its employees to comply with the requirements of CAL/OSHA for hearing conservation through engineering, administrative controls, and/or the use of hearing protectors, wherever necessary.
11. NCPA shall apply to the facility such mitigation as necessary in order to comply with the Lake County Noise Element. NCPA shall consider the following mitigations or their equivalents as a minimum and report on their applicability in the AFC.

- a) Path treatment will be installed on the exterior surfaces of the steam jet ejectors and will consist of materials as effective as mineral wool and an impervious membrane (aluminum and/or lead jacket).
 - b) Thermal (high density) insulation will be installed on the exterior surfaces of the steam turbine and will reduce the noise inside the turbine building.
 - c) The turbine building walls and roof will be constructed to reduce noise propagating to the outside environment.
 - d) An enclosed control room will be built on the turbine-generator floor inside the building.
 - e) NCPA's present purchase specifications for NCPA 2 for mechanical equipment encourage manufacturers to supply equipment that produces a sound level no greater than 80 dBA at three feet from the boundaries of the device.
 - f) Steam drain lines will be routed back into the condenser so that steam will not be discharged into the atmosphere during unit start-ups.
 - g) During unit outage conditions, steam will be routed through a rock muffler system.
 - h) Vegetation will be used to mitigate power plant operating noise.
 - i) Best available sound attenuation techniques in all phases of plant design and plant siting will be employed.
12. The list of noise sources and levels associated with steam supply activities is set forth in the Environmental Impact Report for NCPA/RFL Cobb Valley Geothermal Project (September 1977) and in the NCPA Geothermal Project No. 1 NOI.
13. The projected noise levels for production well testing with portable test mufflers, steam transmission line start-up, unmuffled venting, and well head master valve changes will be significant noise sources and will be discernible to local receptors. However, these four events occur infrequently. The noises associated with the steam field drilling operations would be discernible to Lake County receptors.
14. The noise effects from the steam field development generally exceed plant construction and operation noise levels.

Conclusions of Law

- 1. The Applicant shall provide the information required in Findings 5 and 11 in the AFC.
- 2. It is substantially likely power plant noises from the proposed project will be in compliance with all local, state, and federal noise standards.

9. Cultural Resources

During the nonadjudicatory hearings the Applicant described the survey conducted at the project site to identify cultural resources, acknowledging its preliminary nature. Although a number of Indian middens were located and identified within the 1,425-acre leasehold, the Applicant's witness testified that none is within the power plant site nor within any of the drill sites or alternative drill sites. In view of the fact that cultural resources have not been fully evaluated, the Applicant agreed to conduct a survey which will address and evaluate paleontological, historical and ethnographical resources prior to the filing of the AFC.

The Staff offered the testimony of Gary Heath, who described in some detail the additional information he believes will be necessary to evaluate the cultural resources of the project area for the AFC filing. One reason for the additional information is the evidence that a very high concentration of archaeological sites exists within the leasehold. These sites, or middens, must be identified and, if necessary, protected through fencing or other means. The Committee has requested and received from NCPA an outline of the objectives for the additional study work which will be carried out prior to filing the AFC.

Findings and Conclusions--Cultural Resources

Findings of Fact

1. Cultural resources include paleontological, archeological, historical, ethnographical resources and resources of educational, scientific, religious and other significance.

2. The applicable standards include:

- a) National Historic Preservation Act of 1966, 16 U.S.C. 470 et seq., and implementing regulations, 36 CFR 800 et seq.
 - b) Native American Historical, Cultural and Sacred Sites, Public Resources Code section 5097.9 et seq.
3. The project area cultural resources have not been fully evaluated. A cultural resources survey which will address and evaluate paleontological, historical, ethnographical resources and resources of educational, scientific religious and other significance will be prepared and submitted by NCPA prior to or at the time of the filing of the AFC. The parameters of this cultural resources survey will first be approved by the CEC staff.
4. Preliminary studies indicate numerous archeological sites are found within the NCPA leasehold. None of the identified sites are in close proximity to the preferred plant site, and the proposed project could be constructed and operated without adversely affecting such cultural resources.
5. NCPA agrees to not disturb identified cultural resource areas during steamfield development or during construction of access roads. NCPA also agrees to seek the cooperation of the steamfield developer to avoid disturbing cultural resource areas during steamfield exploration and construction.

Conclusion of Law

1. The proposed project can be constructed and operated without adversely affecting known cultural resources.

D. Other Related Issues

1. Need for the Project

The Applicant is an agency made up of municipalities to which it provides power. The electrical needs of these members have grown rapidly from a demand of 397 megawatts in 1968 to a projected 644 megawatts in 1985. The agency presently has no generating capacity and must buy all of its power from either PG&E or the Western Area Power Administration (WAPA). This power is rapidly becoming both more expensive and less available. Due to these factors, the Applicant believes that even the relatively small capacity of the proposed geothermal project will result in considerable savings to NCPA members.

The Staff testimony at the nonadjudicatory hearing indicates that on the basis of systemwide reserve capacity alone this plant will only be needed during the single year of 1982. That is because only during that year does the statewide power system lack enough reserve power capacity to maintain a standard of one day of expected outage during a ten year period. Nevertheless, other factors must be considered. There is considerable uncertainty regarding the availability of PG&E system resources such as the Diablo Canyon nuclear plant. Forty-two percent of the PG&E system is oil based and therefore subject to restriction from federal laws and the market place. The proposed project would displace approximately 800,000 barrels of oil each year. In addition, geothermal power offers increased flexibility in the statewide power supply system, has a short lead time for projects, and has proven to be 80 percent reliable.

The Staff has requested the Committee to take official notice of the Commission's 1979 Biennial Report. The Committee hereby takes such notice and notes that the Biennial Report deems as needed, and thus in conformance with the Commission's forecast, any geothermal plant proposal whose environmental impacts are reasonably mitigable and which complies with applicable air and water quality standards.

Findings and Conclusions--Need

Findings of Fact

1. In the most recent Biennial Report (adopted December 20, 1979), the Commission concluded that "there are severe limits on the extent to which the State can look to conventional energy sources...for new electricity supplies" and that for environmental, health, and resource considerations, energy sources such as geothermal "should be significantly expanded in the State's mix of electricity supplies."
2. In the Biennial Report, the Commission found that geothermal energy is "one of the cheapest sources of electricity generation" and "should be expanded because of (its) favorable environmental characteristics, efficiency, more stable costs, and the fact (that it is) indigenous to California."
3. In the Biennial Report, the Commission determined that a reasonable balance of State interests, as required by section 25309(b) of the Public Resources code, would be promoted, for the reasons outlined in Finding 2, by giving "first priority to geothermal energy, cogeneration, and other renewable energy sources" and by authorizing the State's utilities to construct and to give preference to such energy sources, including geothermal power plants, not only to meet expected increases in electricity demand but also to meet a Commission policy to reduce oil and natural gas use by 50 percent by 1991.
4. In the Biennial Report, the Commission determined that to meet anticipated growth in demand for electricity, to allow retirement of older facilities, to make up for potential losses resulting from the expiration of contracts for power from the Pacific Northwest, and to meet a 50 percent oil and gas reduction policy, approximately 7,000 megawatts of new generating capacity would be required in Northern California Service areas by 1991.
5. In the Biennial Report, the Commission determined that since the probable maximum amount of new generating capacity achievable from geothermal and other preferred energy sources by 1991 would be less than the total amount of new capacity needed to achieve a reasonable balance of State interests, as required by section 25309(b), each and every geothermal proposal would be deemed needed, provided the proposal generally possessed

the favorable characteristics which made geothermal a preferred source for electricity supply. For that reason, the Commission determined that any geothermal facility which demonstrates reasonably mitigable environmental impacts and complies with air and water quality standards shall be deemed needed and in conformance with the forecast and assessment adopted pursuant to section 25309(b).

6. As the findings and conclusions in the other sections of this Report demonstrate, the environmental impacts associated with the proposed project are reasonably mitigable.
7. As the findings and conclusions for Air Quality and Water Quality demonstrate, the proposed project should comply with all applicable air and water quality laws, standards and ordinances.
8. NCPA 1 will displace the use of approximately 800,000 barrels of oil per year by displacing less efficient oil burning units in PG&E's system.

Conclusions of Law

1. The most recently adopted forecast and assessment adopted pursuant to section 25309(b) of the Public Resources Code shall serve as the basis for certification of facilities proposed by utilities.
2. The forecast and assessment adopted in the most recent Biennial Report deems as needed, and thus in conformance with such forecast and assessment, any geothermal power plant proposal whose environmental impacts are reasonably mitigable and which complies with applicable air and water quality standards.
3. The proposed facility meets the criteria specified in the forecast and assessment adopted in the most recent Biennial Report.

2. Socioeconomics

Socioeconomic issues in this proceeding have been of great concern to the Committee because of the serious potential impacts on Lake County. The County, too, has shown concern by intervening in these proceedings and, at one point, filing a Motion to Consolidate the Notice of Intention proceedings in this case with the Application for Certification proceedings in the DWR Bottle Rock case.

Socioeconomic issues of particular concern to Lake County include the following:

1. Bottle Rock Road--Due to the increased traffic from this project and others, the road will require a major upgrading at an estimated expense in excess of \$700,000. The County is concerned with who will pay for the road.
2. Land Use--The Cobb Valley area is primarily dedicated to residential and resort use, and the location of geothermal power plants may not be compatible with such uses.
3. Taxes--As a result of State Propositions 13 and 4 the County feels that the NCPA 1 Project may not provide the County general fund with sufficient revenues to offset costs.

Lake County has testified that it is negotiating with DWR for an arrangement through which improvements to Bottle Rock Road will be paid for. Unlike DWR, NCPA and its subsidiary, NCMPA, have consented to be taxed as if the proposed facility were built and operated by a private

company. Thus, tax revenues generated by the project will be available for county works such as Bottle Rock Road.

The record indicates that, to date, Lake County has not contacted the Applicant regarding any separate payments for the improvement of Bottle Rock Road.

During the Committee Conference on the summary and Hearing Order, Lake County representative Don Johnson expressed the County's concern regarding the impacts of the proposed project on current and projected land use patterns for the Cobb Valley area. Lake County considers Cobb Valley a transitional area in the process of becoming an area of predominately single family homes. Staff noted that land use impacts may not in themselves be sufficient to prevent approval of the NOI.

Nevertheless, the Committee requested that Lake County submit proposed findings, recommending specific measures which would mitigate the project's land use impacts. The Committee has not received the requested information, and the record does not indicate serious land use conflicts from the project.

During the final nonadjudicatory hearing, Lake County presented the testimony of Don Johnson, consultant; Vernon Strong, County Tax Assessor; and Jack Worthington, County Coordinator. The three witnessess addressed Lake County's concern that in spite of the estimated \$964,000 which NCPA 1 may generate in taxes, the County may be unable to spend the revenues generated. The witnesses acknowledged, however, that at this early date in the project's formation, it is impossible to measure tax impacts on the County. The County is also uncertain whether the project will be assessed by the County

Assessor or whether that role will be preempted by the State Board of Equalization. In the latter case, the resulting revenues to Lake County would be considerably reduced. The testimony received by the Committee on this issue of taxation indicates that there is insufficient evidence to preclude granting the NOI.

Findings and Conclusions--Socioeconomics

Findings of Fact

1. The project will employ approximately 120 workers during the peak construction period; 80 of these workers will be employed for plant construction, and 40 workers will be employed in steamfield development.
2. Following its construction the plant will be operated by an estimated work force of eight persons.
3. NCPA's scheduled labor requirements will occur during 1982, 1983 and 1984, overlapping with the scheduled construction employment needs of DWR Bottle Rock, NCPA 2, PG&E Units 16, 17, and 18, and SMUD Unit 1. The Staff estimates that construction of the above plants will result in approximately 110 new residents moving to Lake County, including approximately 40 children.
4. Lake County has expressed concern that further population increases will adversely affect educational facilities in the area.
5. There are four school districts in Southwestern Lake County, two of which (Ionociti and Lakeport) presently exceed their enrollment capacities. Planned geothermal development will not significantly increase enrollments in these school districts.
6. Motel rooms and "housekeeping" units may provide a short-term housing resource for geothermal workers. Although housing availability has not yet been inventoried, the number of workers involved in geothermal plant construction is not expected to seriously impact housing resources.
7. At the filing of the AFC, NCPA agrees to provide information on the potential cumulative growth and development impacts on southwestern Lake County resulting from geothermal development. This information shall include a discussion of impacts on housing supply and educational facilities, and how such impacts might be mitigated. NCPA agrees to collect this material after consulting with the Energy Commission staff.
8. The Applicant has formed a nonprofit subsidiary corporation known as the North California Municipal Power Corporation (NCMPC). NCPA has signed an agreement that NCMPC will own and operate the NCPA 1 power plant and will pay property taxes "in the same manner and to the same extent...as other privately owned property in the County."

9. The Lake County Tax Assessors Office has estimated the property tax revenues for the completed NCPA 1 power plant and steamfield project at approximately \$964,000, approximately 38 percent of which will go to the general revenue fund. Tax revenues will begin to accrue during the construction period, and will increase annually as the facilities are completed. However, the recent passage of Proposition 4 makes uncertain what portion of this revenue the County can actually spend.
10. The direct and indirect costs to Lake County from regulatory and administrative functions and from the provision of public services will be small in relation to the capital investment of the project. However, as a result of new state tax laws, it is presently unclear whether these costs to Lake County will be offset by property tax revenues generated by the project.
11. With the exception of the Scenic Highway Element of the Lake County General Plan, the proposed project appears to be compatible with the Lake County General Plan, Lake County Zoning Code, and Lake County's Conditions, Procedures, and Performance Standards for Geothermal Regulation.
12. The scenic highway element of the Lake County General Plan designates certain routes as "scenic corridors." Views within such scenic corridors are to be preserved through the application of "development controls." Bottle Rock Road is one such scenic route.
13. Because of its relatively high elevation, the preferred project site may be visible from Bottle Rock Road. The site is also clearly visible to residents living west of the site. At the filing of the AFC, NCPA agrees to provide information on methods for mitigating visual impacts resulting from the project, and on whether such mitigation measures would result in compliance with the Lake County Scenic Element.
14. Bottle Rock Road is the primary access road for the NCPA 1 and DWR Bottle Rock projects. Lake County is presently contemplating a road reconstruction project to make Bottle Rock Road suitable for heavy vehicle use. Although a final plan allocating costs among the users has not been determined, NCPA anticipates that any portion of the resultant expenses allocated to its project would be derived from its tax payments to the county.
15. Recreational activities within the leasehold area include hunting, fishing, and hiking on private lands by owners and guests. Camp Beaverbrook is a privately-owned summer camp for children, located just outside the leasehold boundary. At the filing of the AFC, NCPA agrees to indicate how impacts on nearby recreational uses can be mitigated.

Conclusions of Law

1. The proposed project will not significantly increase the population of Southwestern Lake County.
2. The impacts of the project on schools and housing supply are significant; such impacts appear to be mitigable.
3. At or before the AFC filing, the Applicant will furnish the information referred to in Findings 7, 13, and 15.

4. Tax revenues from the project will more than cover resulting regulatory and administrative costs imposed on the County by the project. However, Proposition 4 and proposed legislative tax measures make uncertain whether or to what extent the County will benefit financially from the proposed project.
5. The socioeconomic impacts of the proposed project are acceptable for the purposes of the NOI.

3. Financial and Economic Impacts

Testimony in support of the economic and financial feasibility of the project was offered by the Applicant through the written testimony of James M. Traudt, NCPA's Manager of Finance and Accounting, and the oral and written testimony of Hari N. Modi, the Applicant's Project Engineer. Additional testimony was offered through Staff witness David Branchcomb and Ezra Amir. The testimony establishes that, insofar as costs can be determined now, under the most unfavorable assumptions as to the cost of field development the project can be financed, and will produce power at a reasonable cost compared to alternative sources. NCPA's proposed method of financing is in conformity with established practices for the public power industry.

Findings and Conclusions--Financial Impacts

Findings of Fact

1. The NCPA power plant will cost approximately \$50 million. NCPA's steam-field developer, RFL Inc., went bankrupt in 1979. If NCPA acquires the geothermal steam leases of RFL, and thereby assumes the cost of field development, as seems likely, the cost of such development will be substituted for the cost of purchased steam.
2. Under unfavorable assumptions as to the number of steam wells which may be required, field development costs may reach \$100 million.
3. NCPA can finance the cost of such development by the issuance of revenue bonds following a pattern set by other successful public agencies.
4. Even under unfavorable assumptions, the cost of the power will be competitive with purchased power; under more favorable assumptions the cost of power from the project will have estimated present value advantages over such purchased power of at least \$77 million.
5. Under agreement entered into between NCPA, Northern California Municipal Power Corporation No. Two and the County of Lake, the project will pay taxes to Lake County in an amount which the County Assessor estimates to be at least \$964,000.

Conclusions of Law

1. NCPA's method of financing steam field development and plant construction has been utilized by other joint action utilities, and appears to be a reasonable approach to financing the project.
2. Although the bankruptcy of NCPA's steamfield developer creates some uncertainty about the costs of such development, NCPA's proposed bond financing program appears sound.

Findings and Conclusions--Economic Impacts

Findings of Fact

1. Geothermal steam electricity generation is the cheapest source of electric energy production under conditions expected to prevail in California over the next 25 to 30 years.
2. Power purchased by NCPA from other sources is projected to be more expensive than power which would be produced by the proposed project.
3. Total busbar costs are sensitive to changes in assumptions relating to the cost of steam supplies. It is unclear how the bankruptcy of RFL, Inc., NCPA's steam supplier, may effect such assumptions on costs.

Conclusions of Law

1. The proposed project is economically superior to alternative generation technologies and to direct purchases of electricity from other sources.
2. It is presently unclear whether the bankruptcy of NCPA's steam supplier will affect the economic superiority of the proposed project. Such determination should be made during the AFC.

4. Public Health

The effects of this project on public health are likely to be very similar to the effects of other geothermal plants. The primary concern with such projects is the amount of H_2S emissions. The ambient air quality standard in California for H_2S is 30 parts per billion. This standard is based on a nuisance odor detection level. Chemicals other than H_2S which are likely to be released in small quantities include arsenic, mercury, and ammonia. These should be in such small amounts as to present no risk to public health.

Camp Beaverbrook raised questions at the nonadjudicatory hearings about the effect of H_2S on active young children. The Staff witness testified that some studies indicate higher susceptibility among the young, the more active and the fragile. However, the witness stressed that this information was developed during much higher exposures than are likely to be experienced at a controlled geothermal power plant.

The Staff also testified that the AFC should include a detailed evaluation of the project's public health impacts to allow an adequate, project specific, health, safety, and compliance analysis.

Findings and Conclusions--Public Health

Findings of Fact

1. The public health issues which arise from geothermal development are generic in nature. The potential public health impacts of NCPA 1 are essentially similar to those of previous geothermal developments.
2. Generic information concerning the regulated and nonregulated pollutants from a geothermal power plant in The Geysers KGRA which are applicable to the NCPA 1 NOI include:

Hydrogen Sulfide

- a. The NCPA power plant will emit hydrogen sulfide (H_2S) in the cooling tower exhaust during normal plant operation and in the steam supply during periods of steam stacking. Emissions may also occur during well bleeding or venting during well development and maintenance activities.
- b. The available existing data on health effects is insufficient to permit experts to reach a uniformly accepted position regarding the human health effects of chronic low level exposure to H_2S .
- c. The state ambient air quality standard for H_2S is 0.030 ppm (1 hour average).
- d. The State ambient air quality standard for H_2S is based on nuisance odor.
- e. Hydrogen sulfide has an odor which can be detected at concentrations of less than 0.030 ppm.
- f. The Illinois Institute for Environmental Quality suggested ambient air quality standard for H_2S , which is intended to protect public health, is 0.01 ppm (8 hour average).
- g. Ambient H_2S concentrations in the project area have exceeded the State standard of 0.03 ppm.

Ammonia

- a. NCPA Geothermal Project No. 1 will emit ammonia in the cooling tower exhaust drift during normal operation in the steam supply during periods of steam stacking.
- b. Inhalation of ammonia in sufficient quantities can cause adverse health effects.
- c. There is no applicable ambient air quality standard for ammonia. The California Occupational Safety and Health Standard is 25 ppm (8 hour average). The Environmental Protection Agency has, however, suggested 0.06 ppm as a maximum safe level for ammonia concentrations in ambient air. (Multimedia Environmental Goals for Environmental Assessment, EPA Document 600/7-77-136 a, November, 1977).
- d. Ammonia concentrations in steam from 61 producing wells at The Geysers has averaged 0.0194 percent by weight.
- e. Atmospheric reactions of ammonia emissions could potentially form toxic ammonium compounds, such as ammonium sulfate.
- f. Sulfates can form through atmospheric oxidation of H_2S .
- g. Sulfates can be toxic to humans when inhaled in sufficient quantities.

- h. The California ambient air quality standard for suspended sulfates is 25 ug/m^3 (24 hour average).
- i. Ambient temperatures and concentrations of precursors at The Geysers probably do not permit the existence of ammonium bisulfide in quantities that could cause health effects.

Arsenic

- a. NCPA Geothermal Project No. 1 will emit some form of arsenic from the cooling tower, and from the steam release valve during steam stacking, into the ambient air. Arsenic detected in geothermal steam may be present as suspended particulates, arsenic trioxide vapor or possibly arsine.
- b. All forms of arsenic are known to be toxic at some concentration, and some forms are potentially carcinogenic.
- c. An EPA sponsored expert panel has proposed a safe ambient air quality level for arsenic of 5 ug/m^3 averaged over a 24 hour period. NIOSH suggests a standard of 2.0 ug/m^3 per 15 minute sampling for arsenic trioxide to protect against carcinogenic effects.
- d. The U.S. Environmental Protection Agency has suggested 0.005 ug/m^3 as a maximum safe level for arsenic concentrations in ambient air. (EPA-600/ 7-77-16 a).

Mercury

- a. Elemental mercury vapor and other mercury forms will be emitted from the cooling tower during normal power plant operation and at the steam release valve during periods of steam stacking.
- b. Mercury is toxic to humans when inhaled or ingested in sufficient quantities.
- c. There is no adopted ambient air quality standard for mercury, although an EPA sponsored expert panel has suggested a standard of 0.8 ug/m^3 for all forms of mercury. In addition, the Environmental Protection Agency has suggested a maximum ambient level of 0.1 ug/m^3 to protect against toxicity and to 0.01 ug/m^3 to protect against potential carcinogenic effects. (EPA-600/7-77-136 a). In addition, an ambient target level of 1.0 ug/m^3 (30 day average) has been suggested pursuant to the Clean Air Act of 1970 as a basis for a National Emissions standard for Hazardous Air Pollutants.
- d. Mercury can enter the food chain from contaminated air, soil, and water.
- e. Mercury in the food chain can adversely impact public health if concentrated in sufficient quantities.

Radionuclides

- a. The noncondensable gas fraction of geothermal steam originating from natural fumarols and developed wells contains the noble radioactive gas, ^{222}Rn radon (Rn^{222}).
- b. ^{226}Ra Radium is a parent radionuclide of Rn^{222} and occurs naturally in the soil in varying concentrations at The Geysers.
- c. Inhalation of short-lived daughter products of Rn^{222} can cause adverse health effects.
- d. The maximum rate of release Rn^{222} in emissions from the 11 operating power plants at The Geysers has been measured at approximately 1.43 Ci/day.
- e. The results of The Geysers Radiological Measurement Program conducted by LEE Environmental Laboratory indicate that the highest recorded Rn^{222} concentrations in the air, with the operation of 11 power plants, were 0.5 pCi/l at Units 1-2 and 1.4 pCi/l at SRI station 7 (Sawmill Flat) in an area of elevated Ra^{226} in the soil.
- f. It is not anticipated that the Rn^{222} content in the steam supply for the NCPA power plant will be substantially different than the average Rn^{222} content in the steam supply for PG&E Units 1-11.
- g. The California standards for Rn^{222} are 100 pCi/l in air for a controlled area and 3 pCi/l in air above natural background, at the point of release to the environment in controlled area.
- h. The radionuclide Pb^{210} (Lead 210) will be contained in the cooling tower sludge from the NCPA power plant.
- i. The resulting Pb^{210} will result from air scrubbing.
- j. Cooling towers at power plant types other than geothermal power plants have shown the same tendency to scrub Pb^{210} from ambient air.

Sulfur Dioxide

- a. Atmospheric oxidation of H_2S may form small amounts of sulfur dioxide (SO_2).
 - b. The California Air Resources Board has established a 24 hour ambient air quality standard 0.05 ppm SO_2 in the presence of oxidant or particulate standard exceedance.
3. There is evidence that children may be more susceptible than adults to the effects of acute hydrogen sulfide pollution.
 4. The health effects of chronic low-level hydrogen sulfide pollutants on children have not been well documented.

Conclusion of Law

1. Emissions during normal plant operation and during periods of steam stacking are not likely to result in adverse public health impacts.

5. Safety and Reliability

Public Resources Code section 25511 requires the Commission to "determine the adequacy of measures proposed by the Applicant to protect public health and safety." Section 25514 requires the Committee to include Findings in the Final Report regarding factors related to the "safety and reliability" of the facilities at the site. The Applicant has stated its intention to comply with all applicable codes and standards which apply to geothermal power plant construction. Included among the measures adopted by NCPA, are sprinkling systems in the cooling tower and fully adequate seismic protection.

NCPA witness Needham testified that the plant will be adequately reliable, due in part to its redundancy features. He stated that the circulating water pumps will each be approximately 50 percent capacity at full operating load for one unit, so that in the event of a shut down of one circulating water pump, a cross over on the water side of the system would reduce the friction loss through the condenser and allow the remaining pump to operate in the neighborhood of a 66 percent flow capacity. In addition, Mr. Needham testified that because the plant will operate with two turbine generating units, it can carry out a 50 percent shutdown without jeopardizing the steam source.

Staff witness Daniel W. Fong told the Committee that:

"...for the purposes of the NOI, adequate safeguards have been provided and discussed so that there is a reasonable likelihood that worker safety and general public safety will be assured. In the area of reliability...there is a reasonable likelihood that their reliability performance goals can be achieved."

Though desirous of obtaining additional information for the AFC, Mr. Fong anticipated that an 80 percent or greater capacity factor is achievable.

Findings and Conclusions--Safety and Reliability

Findings of Fact

1. At the filing of the AFC, NCPA agrees to:
 - a. Explain the selection of materials used for hydrogen peroxide storage tanks.
 - b. Provide design codes and seismic design criteria for all storage tanks for toxic, flammable, or otherwise hazardous materials.
 - c. Provide an evaluation of and need for off-site fire protection assistance.
 - d. Enumerate NFPA codes which apply to the on-site fire protection system.
 - e. Detail the worker safety/accident prevention program proposed for the facility.
2. The applicable standards in this area include:
 - a. Handling and storage of hazardous, toxic, and flammable materials:

Hydrogen - 49 CF, sections 173.302, 178.36, 178.37
Acetylene - 49 CFR, sections 173.303, 178.36, 178.37
Sodium Hydroxide - 49 CFR, sections 173.245(b),
8 CAC Chapter 4.7

Oxygen - 49 CFR, sections 173.302, 178.36, 178.37
Paint Thinner - 49 CFR, sections 173.128

Pressure Vessels - ASME Code section VIII, Division
I; 8 CAC Chapter 4.7.

Storage Tanks - API 650, Manufacturing Chemists
Association Chemical Data Sheets SD-53

H₂O₂ - 8 CAC Chapter 4.7, group 16
 - b. Fire Protection:

Federal Occupational Safety and Health Act of 1970

Public Resources Code section 4291

Title 8, CAC Chapter 4.7, Groups 20, 27

c. Worker Safety Program:

Federal Occupational Safety and Health Act of 1970

Title 8, CAC Chapter 4

3. At this time, it appears that any hazardous or toxic materials which are presently used or proposed for use in geothermal power plants can be transported, stored, and handled in a safe manner and in compliance with the aforementioned standards. If NCPA submits the information required by CEC regulations and stipulated in these facts, staff will be able to verify compliance during the AFC.
4. NCPA agrees to provide the following information at the filing of the AFC:
 - a. Facility performance criteria pertinent to plant outage duration due to seismic events anticipated for the site(s) and a cost/risk/benefit analysis to justify their selections.
 - b. Structural, system, and component seismic design criteria established to meet the desired performance criteria discussed in (a).
 - c. A representative bid document for a reliability critical component that illustrates the Applicant's quality incentive purchase plan.
 - d. A program to incorporate into their design deliberate actions and measures to ensure the operating success of the facility.
 - e. The rationale for not employing redundant main cooling water circulating pumps.
 - f. Plant performance data pertinent to the loss of a cooling tower cell, including a discussion of the need or desirability for a cooling capacity "safety" factor.
5. At the filing of the AFC, NCPA agrees to provide a resource development plan indicating how the leasehold (excluding those portions subject to reserved federal mineral rights) will be developed to sustain a 66 MW power plant. The plan should include empirical data concerning the volume and thermodynamic characteristics of the steam available.

Conclusions of Law

1. The Applicant shall at the filing of the AFC furnish the information referred to in Findings 1, 2, 4 and 5.
2. The project can be constructed and operated safely and reliably in accordance with established standards.

6. Transmission Lines

At the nonadjudicatory hearings NCPA witness Richard Shumward described the tentative nature of the Applicant's transmission plan. He testified that one of the options being considered by NCPA is a transmission line from its proposed site to the DWR Bottle Rock transmission line, and then to PG&E Unit 17 and Unit 11.

Under some scenarios, the existing PG&E mainlines would not be able to accomodate the total new generation. The Applicant acknowledged that the transmission line studies conducted for NCPA by R. W. Beck were preliminary in nature. While NCPA does not yet have a firm wheeling agreement with PG&E, it does have a draft agreement which it is currently reviewing.

Staff witness Joel B. Klein raised issues regarding capacity, cost, and reliability and stated that the six alternatives to the NCPA route which he investigated were all more desirable economically. Nevertheless, Mr. Klein testified that there is a reasonable likelihood the NCPA project can be sited as proposed. The Staff strongly recommended that due to the planned development of new geothermal plants in The Geysers area, comprehensive study should be made of the most efficient, reliable, inexpensive, and least environmentally damaging routes for all future transmission lines serving the various plants. Subsequently, representatives of NCPA, CEC, PG&E and DWR met at a publicly noticed transmission workshop to begin planning for future power transmission from The Geysers KGRA. The Applicant will report in the AFC on the progress made towards reaching a line sharing agreement with PG&E and DWR.

Findings and Conclusions--Transmission Engineering

Findings of Fact

1. One of the options considered by NCPA is to construct a 1.5 mile 230 kV transmission line from the proposed site to the Department of Water Resources (DWR Bottle Rock transmission line). The power would then join the Bottle Rock generation and flow first to PG&E Unit 17, then to Unit 11, and then be carried out of the Geysers area.
2. As an alternative NCPA also considered in the NOI interconnecting directly to Unit 11. In addition, NCPA has subsequently identified (but not evaluated) two additional interconnection points: Units 17 and the existing PG&E 115 kV line from Eagle Rock Substation to Lower Lake.
3. The proposed NCPA 1 power plant is 66 MW and NCPA anticipates that this same geothermal lease may also support an additional 100 MW of power, so that the proposed transmission line could be expected to carry a total of 166 MW by 1987.
4. The proposed DWR Bottle Rock power plant is 55 MW and DWR anticipates a 110 MW DWR No. 3 power plant in this same area; so that DWR generation on the Bottle Rock transmission line could be 165 MW by 1987.
5. PG&E Unit 17 power plant is approximately 110 MW.
6. The approximate capacities of the proposed NCPA 1 transmission line, the proposed Bottle Rock transmission line, and the Unit 17 transmission line are 300 MW each (based on 317 MVA and 0.95 power factor).
7. If NCPA 1 is interconnected with the Bottle Rock transmission lines as proposed and the total generation identified in Findings 3 and 4 is realized, then the Bottle Rock transmission line with its capacity of 300 MW would not be able to accomodate the potential load of 331 MW (166 MW for NCPA and 165 MW for DWR).
8. The transmission line from Unit 17 to Unit 18 has a 300 MW capacity. Proposed NCPA 1 (66 MW), future NCPA (100 MW), DWR 3 (110 MW), DWR Bottle Rock (55 MW), and the existing PG&E Unit 17 (110 MW) will generate a total load of 441 MW. Accordingly, the transmission line from Unit 17 to Unit 11 would be unable to accommodate the potential total load of planned geothermal development.
9. The R.W. Beck report, dated February 1979 and intended to provide studies of additional alternative transmission routes, does not adequately address coordinated regional transmission line planning.
10. NCPA is willing to participate in any future staff or Committee sponsored workshops to consider a joint transmission study by DWR, PG&E and NCPA. Such workshop(s) will consider capacity, cost, transmission losses, reliability, and plans to accommodate future geothermal development.

11. Prior to or at the time of filing of the AFC, NCPA agrees to identify a preferred interconnection point.
12. At the filing of the AFC, NCPA agrees to provide a study justifying conductor size, number of circuits, and the preferred interconnection point. The study shall consider the adequacy of capacity, cost, transmission losses, and reliability. The study shall provide adequate data to allow replication of the values obtained. All estimating values and their sources shall be included.
13. PG&E and the Applicant are presently negotiating a transmission service (wheeling) to the Applicant. The exact terms and conditions of the agreement have not yet been agreed upon. The Applicant shall file a copy of the transmission service agreement with the Committee as soon as it is finished. If the agreement is not finalized and filed prior to the filing of the AFC, the Applicant shall file a status report regarding the transmission service agreement with the Committee at the time of the filing of the AFC. The status report shall specify the area in which agreement has been reached and shall identify those areas in which issues are unresolved.

Conclusions of Law

1. The Applicant shall furnish at or before the filing of the AFC the information described in Findings 11, 12, and 13.
2. The information received by the Committee regarding transmission lines shows a reasonable likelihood that the project may be sited.

7. Civil and Structural Engineering

The Applicant has stated that it intends to establish specific design criteria at the time geotechnical design work is done for the project. The criteria will essentially be the same as that used in designing the proposed NCPA Geothermal Project No. 2.

Findings and Conclusions--Civil and Structural Engineering

Findings of Fact

1. NCPA agrees to comply with Lake County Ordinance 970, which adopts Chapter 70 of the 1976 UBC (Grading and Excavation). NCPA further agrees to address, in detail, compliance with the UBC and all other applicable standards in the AFC.
2. There do not appear to be any conditions at the site which, from an engineering standpoint, cannot be managed with the use of good engineering practice.
3. The Applicant's proposed structural design criteria (other than seismic) are adequate for the purposes of this NOI.
4. No determination can be made as to the adequacy of the Applicant's proposed seismic performance criteria. This determination can be made only when NCPA provides the information required in the section on Reliability.
5. No determination can be made as to whether the proposed seismic design criteria are adequate to ensure that the approved seismic performance criteria will be achieved. However, the seismic design criteria will be the same used in the NCPA 2 AFC and should be adequate if modified for any site specific geologic and soil conditions.
6. No determination can be made as to the compliance of the facility's structural design with applicable laws, ordinances, regulations, and standards. This determination can only be made after review of the final structural plans, specifications, and design calculations.

Conclusions of Law

1. The Committee finds that the civil and structural engineering plans for the project to date indicate a compliance with the standards for the NOI. The Applicant must provide further information in the AFC.

III. PROCEDURAL MATTERS

A. Hearings on the Final Report

1. Committee Conference

The Committee will conduct a public hearing to provide an opportunity for all interested persons to comment on the content of the Final Report. Those wishing to submit oral or written comments on the document are urged to attend this hearing. The Committee-sponsored event will take place as follows:

March 7, 1980

10:00 a.m.

California Energy Commission

1111 Howe Avenue, Room 620

Sacramento, CA 95825

2. Full Commission Hearing

The Commission will receive comments on the Final Report and proposed decision at a public hearing. At the discretion of the Commission, members of the public shall be given five minutes in which to make an oral presentation. The hearing will take place during a regular Commission business meeting as follows:

Wednesday, March 12, 1980

10:00 a.m.

California Energy Commission

1111 Howe Avenue, Room 620

Sacramento, California 95825

Anyone wishing to make a statement at either of these hearings should contact Dan Parker in the Commission's Public Adviser's Office to schedule an appearance. The telephone number is (916) 920-6906 or toll free (800) 852-7516.

B. Decision

The Commission will reach its decision in the NOI on March 12, 1980.

1. Proposed Decision

February 29, 1980, the Committee assigned to this proceeding issued its Final Report pursuant to Public Resources Code section 25514. The Committee then held a public Conference on March 7, 1980, in Sacramento, to receive comments on the Final Report.

A public hearing on the Committee's Final Report and Proposed Decision was held before the full Commission on March 12, 1980, in Sacramento. After considering the comments made at that hearing, the Summary and Hearing Order and Final Report prepared by the Committee, the evidence and comments presented in the course of the hearings and conferences during the Notice proceedings, the Commission hereby APPROVES the Applicant's Notice of Intention, subject to criteria set forth in the Findings and Conclusions contained in the Final Report. In arriving at this decision on the Notice, the Commission adopts the recommendation of the Committee, and the narrative, analysis, and Findings and Conclusions contained in the Final Report.

Findings and Conclusions

The Commission hereby makes the following additional Findings and Conclusions based on the record of the NOI proceedings 79-NOI-1:

1. The proposed project conforms with the Commission's most recent demand forecast adopted pursuant to Public Resources Code section 25309(b).
2. It is reasonably likely that the plant can be constructed and operated in conformance with presently applicable local, regional, state, and federal standards, ordinances, and laws, including long-range land use plans or guidelines.
3. It is reasonably likely that NCPA Geothermal Project No. 1 and related transmission facilities proposed in the NOI could conform to applicable public health and safety laws and standards.
4. The proposed geothermal plant will be constructed and operated in accordance with reasonable reliability criteria.
5. The 66 MW geothermal facility proposed in the Notice of Intention proceedings is acceptable, subject to the conditions stated in the Final Report and incorporated by reference herein.

Commission Order

The Commission ORDERS that at or prior to the time NCPA files an Application for NCPA Geothermal Project No. 1 the Applicant shall:

1. Provide all information and complete all tasks set forth in Appendix B of the Final Report.
2. Comply with all other conditions specified in the Final Report.

SO ORDERED.

APPENDIX A

STATE OF CALIFORNIA

State Energy Resources Conservation and Development Commission

In the Matter of:	)	
	)	
Notice of Intention of	)	DOCKET NO. 79-NOI-1
NORTHERN CALIFORNIA POWER	)	
AGENCY'S Geothermal Project	)	
<u>No. 1</u>	)	

PROOF OF SERVICE

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APPENDIX B

AFC Data Requirements

Air Quality

1. The Energy Commission staff has not yet received information on the power plant steam supply. Prior to or at the AFC filing, NCPA must provide the Staff with a complete analysis of steam in commercial quantities including but not limited to all available information on 1) the actual concentration of H_2S in the steam, and 2) variation in the flow and composition of the steam.
2. NCPA agrees to provide detailed information at the filing of the AFC on the design criteria and the capacity of the Stretford unit to treat H_2S .
3. At the filing of the AFC, NCPA agrees to make specific proposals for condensate treatment systems which will be used, should the operating data concerning surface condensers indicate that the partitioning efficiency of such surface condensers is not sufficient to meet the applicable emissions limitation.

Water Quality

1. During the AFC, NCPA may be requested to participate in developing a regional monitoring program for the Kelsey Creek watershed in which the potential effects of the proposed DWR Bottle Rock and NCPA 1 facilities are evaluated.
2. NCPA has proposed to construct a retention barrier to surround critical plant areas to contain any spills. The barrier will be impermeable and have a volume larger than any anticipated spill and greater than the quantity of condensate in the cooling tower basin above the plant site ground level. A catch basin with pump facilities and alarm devices will be constructed to pump any condensate spills back to the cooling tower basin. The area within the retention barrier shall be lined with an impermeable barrier. Prior to or at the time of the filing of the AFC, NCPA agrees to submit:
 - a) the detailed design criteria for the retention barrier and liner to assure that the lining has a permeability of less than 1×10^{-6} cm/sec;
 - b) the volume of the retention basin surrounding the cooling tower basin and volume of any other spill retention basin(s); and
 - c) the maximum anticipated spill, including criteria for determining this volume and analysis that the retention basin will contain this volume.
3. NCPA has proposed to line and berm the Stretford area with tar or epoxy-coated concrete. NCPA has stated that the bermed area will drain to a sump from which spilled material or rainwater can be pumped to the cooling tower basin or to trucks for off-site disposal. However, these facilities have not been designed. Therefore, prior to or at the filing of the AFC, NCPA agrees to provide details regarding construction of the Stretford area lining and should describe operation of spill containment and disposal system.

Water Quality (continued)

4. Because NCPA has proposed facilities to prevent discharges and has not proposed any permanent on-site waste disposal, the Central Valley Regional Water Quality Control Board (CVRWQCB) will not require the Applicant to file a report of waste discharge. However, the CVRWQ has requested that the Applicant submit a spill contingency and reporting plan. NCPA agrees to provide this plan prior to or at the time of filing the AFC.

Waste Disposal

1. Prior to or at the time of filing the AFC the Applicant agrees to provide the specific details for discharge of solid wastes, including location of discharge facilities proposed for use and an analysis of the facilities' volume capacity.

Geology and Seismicity

1. There is much uncertainty about the Callayomi fault, which runs through the project leasehold. The Applicant agrees that its potential for activity must be considered in any seismic design analysis. Justification for seismic design will be provided in the Reliability section of the AFC.
2. In formulating seismic design criteria, it will be necessary for the Applicant to analyze all "active" and "potentially active" faults which may produce earthquakes of sufficient magnitude to have an effect upon the plant. The Applicant agrees to provide this analysis prior to or at the AFC filing.

Soils

1. NCPA agrees to implement the following mitigation measures to control soil loss and erosion:
 - a) The temporary and permanent measures outlined in the NOI at pages V-II5 through V-II8.
 - b) The requirements contained in the Waste Discharge Requirements for Non-Sewerable Waste Disposal to Land-Disposal Site Design and Operation Information (January 1978) by the California State Water Resources Control Board.
 - c) Quantification of the amount of sediment removed from the proposed sedimentation basin(s) and an annual report of this information to both CEC and the Central Valley Regional Water Quality Control Board (CVRWQCB).
2. The CEC soils staff, in consultation with the Central Valley Regional Water Quality Control Board agree that mitigation measures proposed by NCPA appear to be acceptable. However, no specific schedule or design for implementation has been designated. NCPA agrees to provide prior to or at the time of the AFC the specific designs and schedules for the implementation of the measures outlined in Requirement 1 above. NCPA also agrees to submit at the time of filing the AFC a plan for revegetating the slope created by cutting and filling at the power plant site.

Biological Resources

1. In its AFC filing, NCPA agrees to include a detailed plan, including a wildlife management plan, of those measures necessary to mitigate biological impacts in the project area.
2. Prior to the filing of the AFC, NCPA agrees to identify on a map CNACC natural area no. 171210 and any anticipated project activities which will occur in that area.
3. The Staff of the California Energy Commission and the Northern California Power Agency agreed that the utility's AFC filing will provide specific answers and information on the following biological resource matters:
 - a) How were the locations of potential populations of rare and/or endangered plant species tentatively identified before field surveys of the leasehold were undertaken? Describe the methods used in the follow-up field surveys that resulted.
 - b) List the days plant surveys were conducted and the areas of the leasehold that were covered on those days.
 - c) At the November 20, 1979 Non-Adjudicatory hearing, NCPA testified that the rare plant surveys conducted for the NCPA/RFL Cobb Valley Geothermal Project EIR were more intensive at the proposed well pad and power plant sites than in the rest of the leasehold. Describe the differences in the kind of surveys referred to.

Noise

1. NCPA agrees to provide accurate information in the AFC on the location of sensitive receptors and on the expected or design noise emission level of the facility. NCPA further agrees to perform a 24 hour survey at the following residential receptors: the Robinson residence, Binkley ranch, "Nunnemaker property" and Camp Beaverbrook.
2. With reference to requirement 1, results of the surveys will be provided at the time of submittal of an AFC on the project and will show Lx, Leq and Ldn noise levels and relevant weather conditions and instrumentation data, (where x = 10, 50, and 90).
3. NCPA shall apply to the facility such mitigation as necessary in order to comply with the Lake County Noise Element. NCPA shall consider the following mitigations or their equivalents as a minimum and report on their applicability in the AFC.
 - a) Path treatment will be installed on the exterior surfaces of the steam jet ejectors and will consist of materials as effective as mineral wool and an impervious membrane (aluminum and/or lead jacket).
 - b) Thermal (high density) insulation will be installed on the exterior surfaces of the steam turbine and will reduce the noise inside the turbine building.

Noise (continued)

- c) The turbine building walls and roof will be constructed to reduce noise propagating to the outside environment.
- d) An enclosed control room will be built on the turbine-generator floor inside the building.
- e) NCPA's present purchase specifications for NCPA 2 for mechanical equipment encourage manufacturers to supply equipment that produces a sound level no greater than 80 dBA at three feet from the boundaries of the device.
- f) Steam drain lines will be routed back into the condenser so that steam will not be discharged into the atmosphere during unit start-ups.
- g) During unit outage conditions, steam will be routed through a rock muffler system.
- h) The use of vegetation to mitigate power plant operating noise.
- i) The use of the best available sound attenuation techniques in all phases of plant design and plant siting.

Cultural Resources

1. The project area cultural resources have not been fully evaluated. A cultural resources survey which will address and evaluate paleontological, historical, ethnographical resources and resources of educational, scientific, religious, and other significance will be prepared and submitted by NCPA prior to or at the time of the filing of the AFC. The parameters of this cultural resources survey will first be approved by the CEC staff.

Socioeconomics

1. At the filing of the AFC, NCPA agrees to provide information on the potential cumulative growth and development impacts on southwestern Lake County resulting from geothermal development. This information shall include a discussion of impacts on housing supply and educational facilities, and how such impacts might be mitigated. NCPA agrees to collect this material after consulting with the Energy Commission staff.
2. Because of its relatively high elevation, the preferred project site may be visible from Bottle Rock Road. The site is also clearly visible to residents living west of the site. At the filing of the AFC, NCPA agrees to provide information on methods for mitigating visual impacts resulting from the project, and on whether such mitigation measures would result in compliance with the Lake County Scenic Element.
3. Recreational activities within the leasehold area include hunting, fishing, and hiking on private lands by owners and guests. Camp Beaverbrook is a privately-owned summer camp for children, located just outside the leasehold boundary. At the filing of the AFC, NCPA agrees to indicate how impacts on nearby recreational uses can be mitigated.

Safety and Reliability

1. At the filing of the AFC, NCPA agrees to:
 - a) Explain the selection of materials used for hydrogen peroxide storage tanks.
 - b) Provide design codes and seismic design criteria for all storage tanks for toxic, flammable, or otherwise hazardous materials.
 - c) Provide an evaluation of and need for off-site fire protection assistance.
 - d) Enumerate NFPA codes which apply to the on-site fire protection system.
 - e) Detail the worker safety/accident prevention program proposed for the facility.

Transmission Lines

1. Prior to or at the time of filing of the AFC, NCPA agrees to identify a preferred interconnection point.
2. At the filing of the AFC, NCPA agrees to provide a study justifying conductor size, number of circuits, and the preferred interconnection point. The study shall consider the adequacy of capacity, cost, transmission losses, and reliability. The study shall provide adequate data to allow replication of the values obtained.

APPENDIX C

OPTION 1

From NCPA/1 to CDWR
Bottle Rock Site

LEGEND

—————	230 KV
- - - - -	115 KV
.....	60 KV
—————	230KV CDWR/NCPA LINES

GEYSERS UNITS AND
ASSOCIATED TRANSMISSION LINES

(UPDATE PG & E 230KV SYSTEM IN GEYSER AREA
TO CARRY ADDITIONAL CDWR/NCPA GENERATION)

OPTION 2

From NCPA/1 to PG&E Unit 11

LEGEND

- 230 KV
- - - - 115 KV
- . - . 60 KV
- 230 KV CDWR/NCPA LINES

GEYSERS UNITS AND
ASSOCIATED TRANSMISSION LINES

(UPDATE PG & E 230KV SYSTEM IN GEYSER AREA
TO CARRY ADDITIONAL CDWR/NCPA GENERATION)

OPTION 3

From NCPA/1 to PG&E Unit 17

LEGEND

- 230 KV
- - - - 115 KV
- 60 KV
- 230KV CDWR/NCPA LINES

GEYSERS UNITS AND
ASSOCIATED TRANSMISSION LINES

(UPDATE PG & E 230KV SYSTEM IN GEYSER AREA
TO CARRY ADDITIONAL CDWR/NCPA GENERATION)

OPTION. 4

From NCPA/1 to PG&E's
115KV line to Lower Lake

LEGEND

- 230 KV
- - - - 115 KV
- 60 KV
- 230KV CDWR/NCPA LINES

GEYSERS UNITS AND
ASSOCIATED TRANSMISSION LINES

(UPDATE PG & E 230KV SYSTEM IN GEYSER AREA
TO CARRY ADDITIONAL CDWR/NCPA GENERATION)