CALIFORNIA ENERGY COMMISSION

PRELIMINARY REPORT

ON THE

PACIFIC GAS & ELECTRIC COMPANY'S

NOTICE OF INTENTION

TO SEEK CERTIFICATION FOR

GEYSERS UNIT 16

78-NOI-6

MAY 1979

DISCLAIMER

STATE OF CALIFORNIA—THE RESOURCES AGENCY

EDMUND G. BROWN JR., Governor

CALIFORNIA ENERGY COMMISSION
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The California Energy Resources Conservation and Development Commission, through the Commission Committee assigned to the Pacific Gas and Electric Company's Notice of Intention to file an Application for Certification of the Geysers Unit 16 (78-NOI-6), hereby submits its Preliminary Report pursuant to Public Resources Code sections 25510 and 25512.

C. SUZANNE REED, Commissioner
and Member of the Committee

ALAN PASTERNAK, Commissioner
and Presiding Member of the Committee

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I. SUMMARY

A. Site Related Issues

The Committee finds and concludes that the record demonstrates a substantial likelihood that the proposed site for Geysers Unit 16 will be in conformance with 1) the forecast of statewide and service area electric power demands adopted pursuant to PRC Section 25309 (PRC 25512(a)(1)), and 2) applicable local, regional, state, and federal standards, ordinances, and laws (PRC 25512(a)(2)). The Committee also finds and concludes that the record demonstrates a substantial likelihood that the Geysers Unit 16 power plant can be operated safely and reliably at the proposed site (PRC 25512(c)).

Pursuant to PRC 25540, the Applicant has proposed, and the Committee has considered, only one site for the proposed geothermal power plant.

In order to complete the record for the Final Report and decision on the Notice, the Committee has specified that certain information be provided by the Applicant and Staff subsequent to the issuance of this Report. This information is in the areas of Air Quality, Biological Resources, Cultural Resources, Geotechnical Issues, Public Health and Safety, and Structural Engineering.

In addition, based on the record to date, it is possible to identify specific information which will be required prior to or at the time of filing an Application for Certification (AFC), should the NOI be approved. This information is in the areas of Air Quality, Biological Resources, Civil Engineering, Geotechnical Issues, Noise, Public Health and Safety, Safety and Reliability, and Structural Engineering.

These information requirements are set forth in detail in Section VII of this Report.

(It appears that Hydrology and Water Sources and Socio/Economic issues will require no adjudication during proceedings on an AFC.)

Among the more important site related issues requiring further information at or prior to the filing of an AFC are those related to Air Quality and identification of Best Available Control Technology (BACT), and data determining the efficiency and reliability of the Stretford Unit and the partitioning efficiency of the surface condensate condenser to meet specified hydrogen sulfide (H_2S) emissions limitations. The data are to be obtained from tests on Geysers Unit 15.

B. Transmission Line Issues

The findings and conclusions on transmission line issues in this report are preliminary, and have been reached on the basis of the record to date. The Committee has previously identified those transmission line issues on which it will receive additional testimony following the Preliminary Report. Additional evidence and comments presented prior to the Final Report may result in changes to these conclusions.

The Committee has carefully weighed the considerable amount of evidence in the hearing record which relates to alternative transmission lines. This evidence addresses a number of important factors which bear on the routing, sizing and voltage level of a transmission line including visual and aesthetic effects, geology and seismology, land use, cultural and biological resources, costs, and system planning.

The four corridor alternatives and three substation alternatives which have been considered during the proceedings are shown pictorially in Figure 7 (See Transmission Line Corridor Section) and electrically in Figure 8 (See Transmission System Planning Section).

The evidence provides the basis for the Committee's findings and conclusions required by PRC 25512.

The Committee finds and concludes that a transmission line could be constructed and operated in each of the proposed corridors in conformance with applicable local, regional, state, and federal standards and laws (PRC 25512(a)(2)). However, the viability of the Tulacay East and Vaca-Dixon corridors may depend on avoiding the Cedar Roughs area now under study by the Bureau of Land Management for possible designation as a Wilderness Study Area.

The Committee finds and concludes that with respect to issues in the area of Geotechnical/Structural Engineering a safe and reliable transmission line can be constructed in any of the corridors considered (PRC 25512(c)). (Further testimony will be heard in the area of Transmission Line Health, Safety and Nuisance Effects following the Preliminary Report.)

The record to date provides the basis for the Committee's findings and conclusions assessing the relative merit of each corridor proposal considered (PRC 25512(b)).

Balancing the factors given above, the Committee concludes that the corridor connecting The Geysers to the Lakeville substation is preferable, and also concludes that a 230 kV double circuit tower line (DCTL) with bundled 2300 kcmil conductor is the preferred transmission method. No corridor or substation could be rejected for failing to satisfy any evaluation criteria related to the above factors. That is, all the corridor and substations are acceptable, although they vary in degree of acceptability. The choice of 230 kV over 500 kV and 115 kV voltage levels can be made on the basis of comparative economics.

The primary advantages which the Lakeville routing holds over the other three alternatives accrue because it is the shortest corridor in length (38 miles vs 51 miles for the next shortest--Tulucay West), and it has the least miles of new construction outside of existing right of way (11 miles vs 35 miles for Tulucay West), i.e., it provides for greatest paralleling of existing lines. The shorter length and greater paralleling result in lesser environmental effects, lesser overall visual/aesthetic effects, and lesser impact on land use.

From a cost standpoint, the new 230 kV line is second to Tulucay West, costing about $350,000 per year more, when transmitting about 1000 Mw of Geysers generation (assumes total Geysers generation of about 2000 Mw). If total Geysers generation should ultimately be about 2600 Mw or greater, then Lakeville and Tulucay West are equivalent from the cost standpoint. From an electric systems planning standpoint, Lakeville is rated somewhat higher than the other two substations because it is closer to the Sonoma and Marin County load centers.

In terms of effects on cultural resources, all corridors are acceptable, but it has not been possible to differentiate the degree of acceptability. As regards biological resources, the evidence indicates that the Lakeville corridor is preferable. The present evidence as to how the geologic and seismic problems of the region affect the corridors indicates that, while all are acceptable, the Vaca-Dixon corridor is best, the Lakeville corridor next and the two Tulucay corridors last. Through proper location and design of the towers, the various geologic hazards and expected seismic activity can be mitigated for any of the routes.

Variations within two sections of the Lakeville routing have also been examined at length. In one case, there is the question of whether the proposed 11 mile nonparallel section through the Franz and Alpine valleys is preferable to paralleling an existing line which enters the Fulton Substation from the north and leaves in an easterly direction. A number of different combinations of paralleling, consolidating, nonparalleling, and/or undergrounding the proposed and existing lines have been considered. These variations have become known as the Fulton L alternatives. Based on the evidence received to this point, the Committee concludes for visual, aesthetic, and cost reasons that the nonparallel routing is better than any of the Fulton L alternatives.

The other significant issue concerning the proposed Lakeville route is whether an approximate 1.5 mile section of the new line through the Valley of the Moon and Oakmont community should be undergrounded or consolidated with the existing overhead line. The existing line had been installed prior to the development of Oakmont. The Committee finds that the costs of undergrounding either the new line only, or both lines, far exceed the visual/aesthetic benefits derived from so doing, and concludes that the proposed line should be consolidated with the existing overhead line.

II. INTRODUCTION

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A. The Preliminary Report

On August 30, 1978, the Pacific Gas and Electric Company (PG&E, Applicant) filed with the Energy Resources Conservation and Development Commission (the Commission) a Notice of Intention (Notice; NOI) to file an Application for Certification (Application; AFC) for a 110 Mw geothermal power plant known as Geysers Unit 16 proposed to be constructed in Lake County. In addition, the NOI included a proposal to construct a 230 kilovolt (kV) transmission line along one of four alternative corridors. The proposed power plant site is in the lower southwestern portion of Lake County about 5,000 feet east of the Lake County line. (See Figure 3, on page , reproduced from the NOI). It is approximately 3/4 mile west of the nearest community, Anderson Springs. The Unit 16 site is at an elevation of about 2,400 feet along a spur ridge which trends from the main ridge which forms the boundary between Lake and Sonoma counties.

1. Contents

This Preliminary Report on the PG&E geothermal power plant proposal has been prepared pursuant to California Public Resources Code Section (PRC) 25510, 25512, and 25540. It presents the preliminary Findings of Fact and Conclusions adopted by the Commission Committee, consisting of Commissioner Alan Pasternak, Presiding, and Commissioner C. Suzanne Reed, assigned to conduct proceedings on the Notice. In addition, the Report contains a description of the proposed project (Section II.B.), a summary of the proceedings to date (Section II.C.), and local, state, and federal government agency comments on the proposal (Appendix D). Finally, the Report presents the Committee's view of

those issues that require further consideration in future proceedings on the Notice (Section VII).

Pursuant to PRC Sections 25512 and 25540, the Report presents preliminary findings and conclusions on:

a) 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;

d) the relative merit of the proposed transmission line corridors.

2. Evidentiary Basis

This Report is based on the hearing record of this proceeding as defined in the Committee Order of January 26, 1979, on OPOA's Motion to Define the Administrative Record, and in the Committee Procedural and Scheduling Order of February 16, 1979. Also see PRC 25512. The evidence in the hearing record includes:

a) Written and oral public comment;

b) Written and oral local, regional, state and federal agency comment.

c) Position papers prepared by Commission staff on various issues, supporting affidavits submitted by the Applicant, and a Joint Statement of Findings and Conclusions (Joint Statement) proposed to the Committee by Staff and Applicant. In any case where a party requested to cross-examine the Staff or Applicant witnesses who gave affidavits in support of proposed joint findings and conclusions, the Committee required that those witnesses appear at an evidentiary hearing and be subject to cross-examination. Where no party has requested cross-examination, the Committee has received the staff position papers, Applicant affidavits and Joint Statement into the hearing record without requiring that the witness appear for cross-examination.

d) Testimony by witnesses, including prepared written testimony, direct oral testimony and cross-examination.

e) Exhibits

f) Documents from the administrative record which were received into the hearing record.

g) Other written material received into the hearing record.

h) Matters of which the Committee has taken official notice.

As discussed in our previous Orders, some of these listed items are hearsay, or the equivalent of hearsay, and therefore the Committee has not relied solely on these items to reach findings and conclusions, but rather has considered such evidence as supplementing and explaining other evidence.

3. Opportunity for Comment

Written comments to the Preliminary Report must be filed within 30 days of publication, and the Committee may hold public hearings on the Report commencing no earlier than 14 days after publication. Each party should take advantage of this opportunity to comment on, or express its intent to contest, any finding or conclusion contained in this Report. In addition, any interested person may comment on the Report, at these hearings.

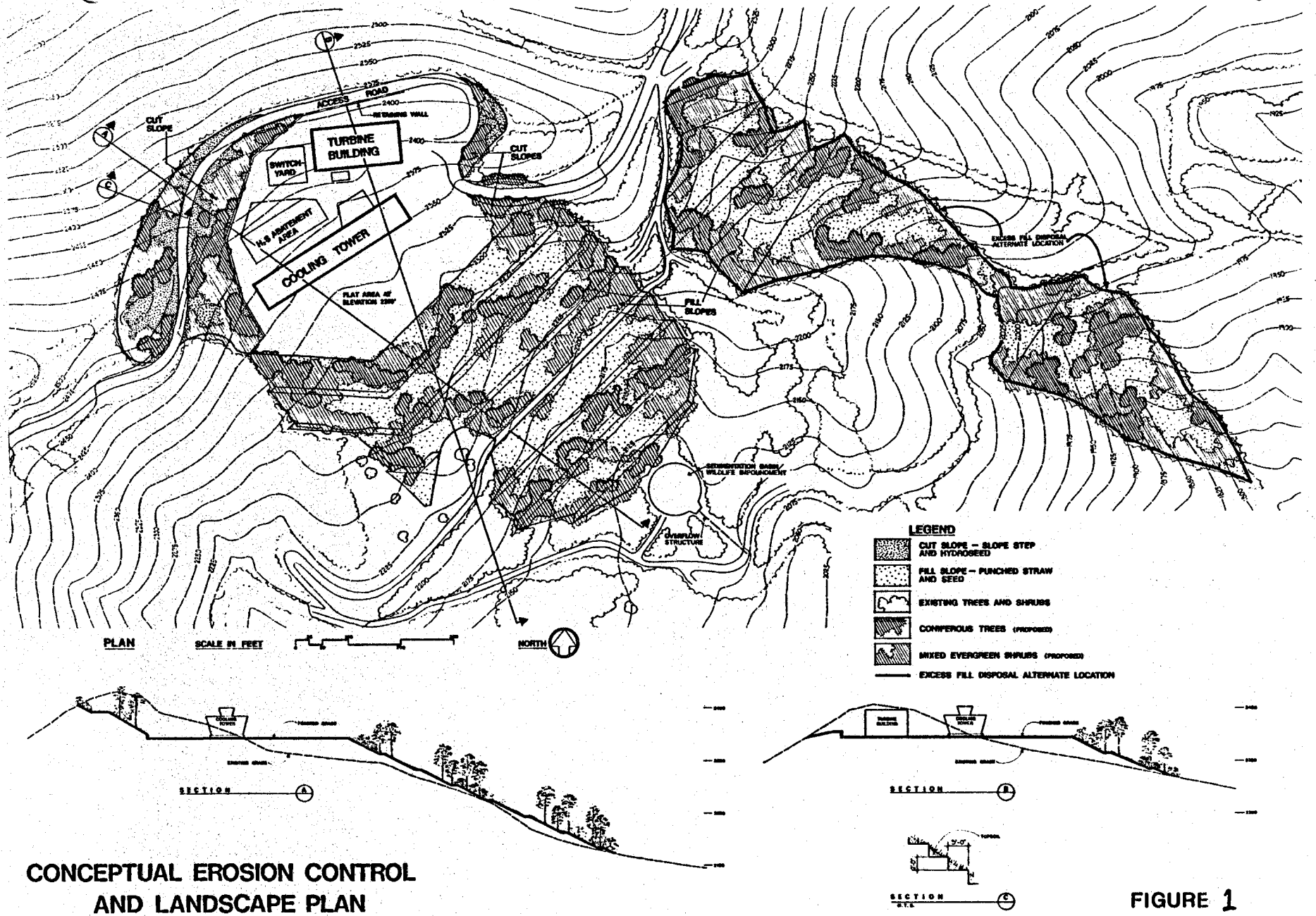
Hearings conducted following the issuance of this Report will lead to the issuance of a Final Report and, within a short period thereafter, to approval or disapproval of the Notice by the Commission. If the Notice is approved, PG&E may then file an Application for Certification of the Geysers Unit 16 project and the associated 230kV transmission line. Following further proceedings on the Application, the Commission will act to grant or deny certification.

B. Description of the Proposed Geysers Unit 16 Project

The project consists of a 110 megawatt (Mw) geothermal power plant, to be located in the Geysers-Calistoga Known Geothermal Resources Area (KGRA), and its associated electrical transmission facilities.

1. The Geysers Unit 16 Power Plant

The construction of Unit 16 will involve earthmoving activities, the building of several structures, and electrical and mechanical equipment installation. The major structures to be built on a level site are the turbine building, cooling tower, electrical switchyard and the hydrogen sulfide abatement



CONCEPTUAL EROSION CONTROL AND LANDSCAPE PLAN

Source: PG&E NOI, Geysers Unit 16
page 95, Figure V-4

FIGURE 1

facility. The main structure, the turbine building, will house the steam turbine generator and other associated equipment required for electrical power production. The turbine generator will have an expected gross rating of 119 Mw at a steam flow of about 2 million pounds per hour.

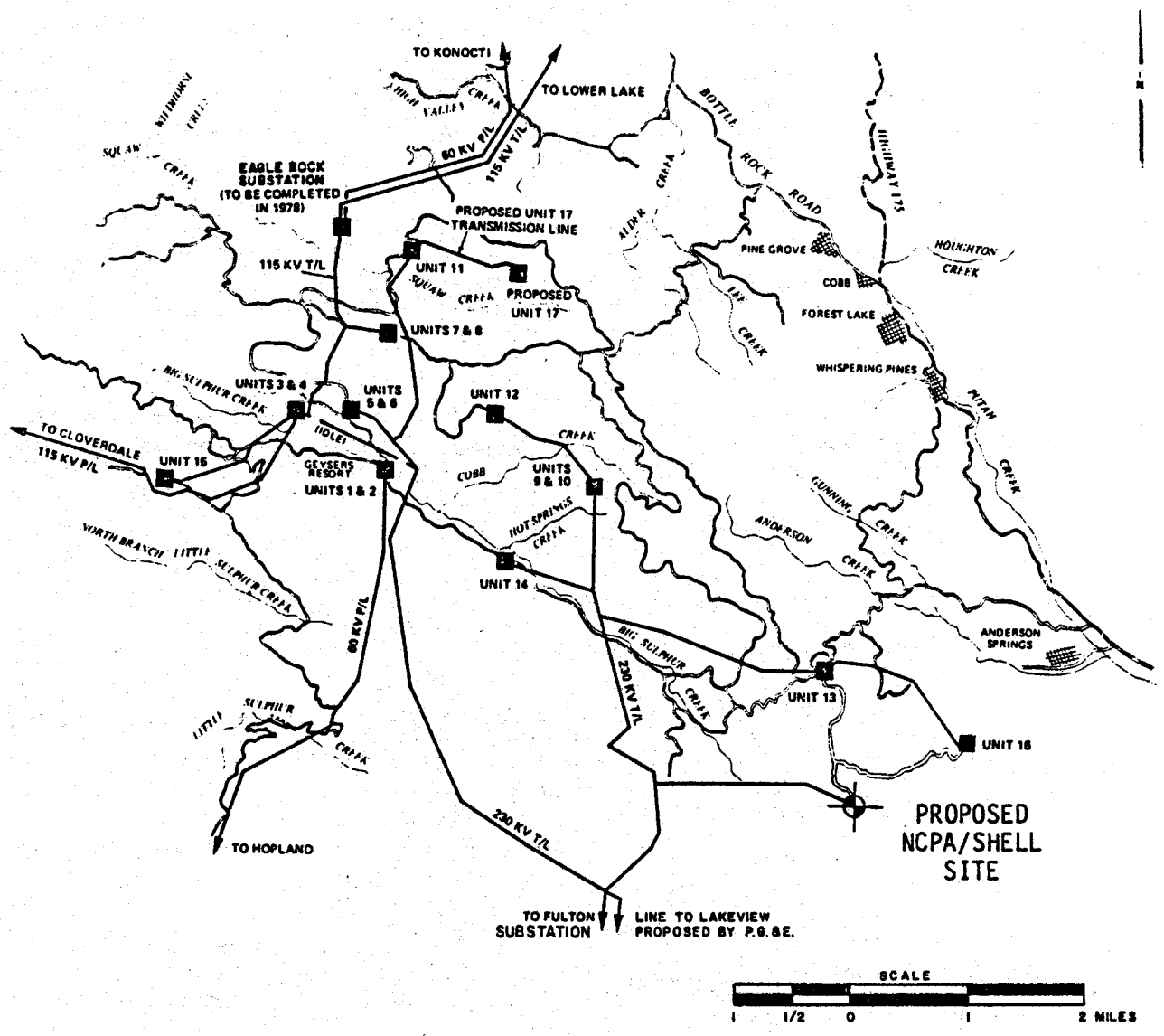
The major components of the condensate and circulating water systems are the cooling tower, surface condenser, noncondensible gas removal equipment, condensate pumps, and circulating water pumps. The mechanical draft cooling tower will dissipate heat rejected from the power cycle.

The hydrogen sulfide abatement system will consist of Stretford process equipment installed downstream of the noncondensible gas removal system. In this process, which is presently being installed on Units 13, 14, and 15, the hydrogen sulfide is scrubbed from the noncondensible gas stream and catalytically oxidized to elemental sulfur. The exhaust gas stream will be ducted to the cooling tower.

The switchyard will step up the voltage of the electrical power from the generator level of 13.8 kV to 230 kV required for economical power transmission.

2. The 230 kV Transmission Line

The proposed electrical transmission facilities will involve the construction of approximately 1.4 miles of new 230 kV single circuit transmission line from Unit 16 to Unit 13, utilizing single circuit lattice transmission towers. At Unit 13, the power would flow into the 230 kV collector line, and be transmitted to Castle Rock Junction, four miles south of the Geysers. The Applicant has proposed four alternative corridors whose starting



■ EXISTING OR PROPOSED PG&E UNITS

SOURCE: PG&E ENVIRONMENTAL DATA STATEMENT
GEYSERS UNIT 17 July, 1977

Source: NCPA NOI, NCPA Geothermal Project No. 2
page V-14, Figure V-6

GEYSERS AREA TRANSMISSION LINES

FIGURE 2

point is Castle Rock Junction and whose termination points would be the point of junction with the interconnected transmission system.

1) Lakeville--38 miles long, through the foothills of Sonoma County, terminating at the Lakeville Substation near Petaluma.

2) Tulucay West--51 miles long, through the hills on the west side of the Napa Valley, terminating at the Tulucay Substation near Napa.

3) Tulucay East--61 miles long, through the foothills to the north and east of Napa Valley, also terminating at the Tulucay Substation.

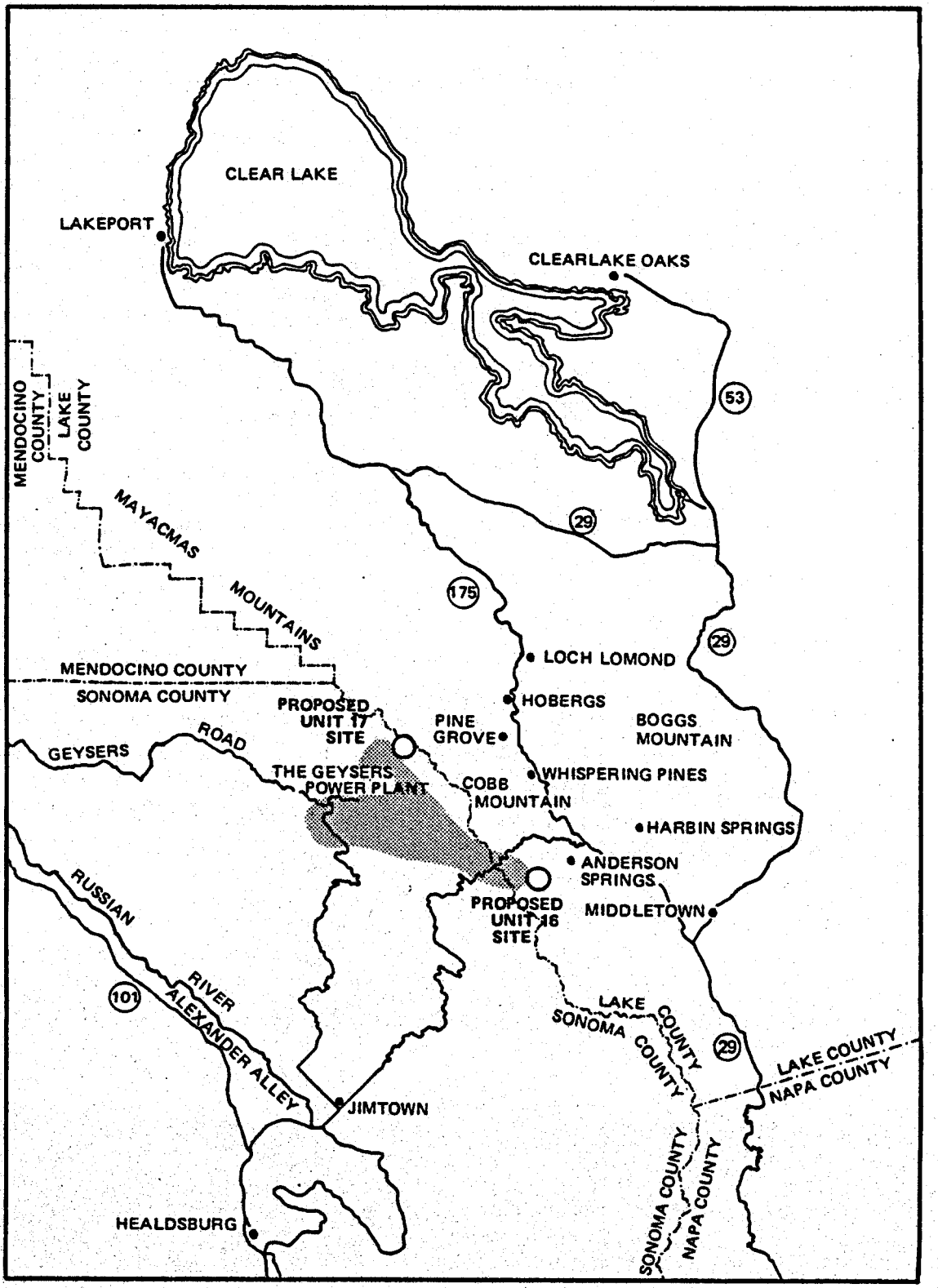
4) Vaca-Dixon--44 miles long, through the foothills to the north and east of Napa Valley, terminating at the Vaca-Dixon Substation near Vacaville.

The route preferred by PG&E is the Lakeville alternative, due to its shorter length and the fact that it parallels an existing transmission line for 27 of its 38 miles.

The proposed line is scheduled for operation in the summer of 1983.

3. The Site

The Geysers region is dominated by a series of northwest trending ridges and steep stream canyons. Many of the spur ridges trending from the main ridge of the Mayacmas Mountains are narrow and steep. The proposed site for Geysers Unit 16 is located along one of these spur ridges, at an elevation of 2,400 feet, in the lower southwestern portion of Lake County about 5,000 feet east of the Lake-Sonoma County line. The nearest community is Anderson Springs, approximately 3/4 mile to the east. Whispering Pines, Cobb, and Pine Cove,



REGIONAL MAP

Source: PG&E NOI, Geysers Unit 16
Page 3, Figure I-1

FIGURE 3

recreational communities northeast of Cobb Mountain, are located at distances of 4, 4.5 and 5 miles, respectively. The general area west of the site is mountainous, rugged and sparsely settled. Principal access is by Highway 175 from the town of Middletown and Socrates Mine Road.

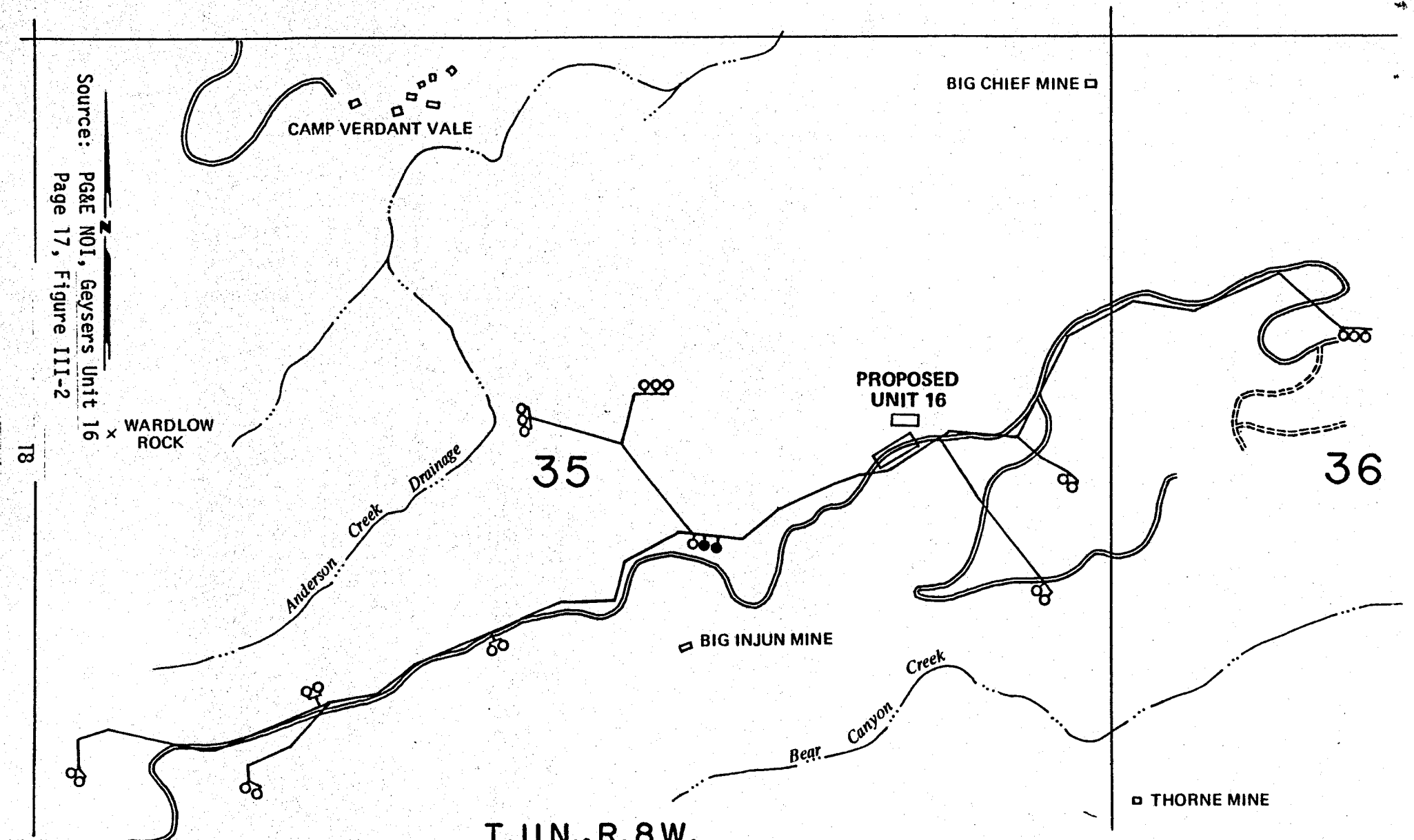
The slopes of the site are covered with chaparral on the south and mixed forest on the north. The site's southern slope is underlain by a large landslide complex which may be unstable. To mitigate this condition, a retaining wall will be built on the south side; it will be about 400 feet long, be keyed into bedrock, and extend to a maximum of 70 feet above rock level, or about 45 feet above finished grade.

The design for the site utilizes 6.6 acres, approximately 1.5 acres of which will be cut slope, with the remainder being roads or flat surface. To prepare the site, it will be necessary to excavate and remove about 360,000 cubic yards of material to be placed at an off-site fill area. The turbine generator building will be located on bedrock. The cooling tower will be placed partially on engineered fill material over a shear zone.

There are no commercially utilized hot springs at the proposed site or at the potential fill area.

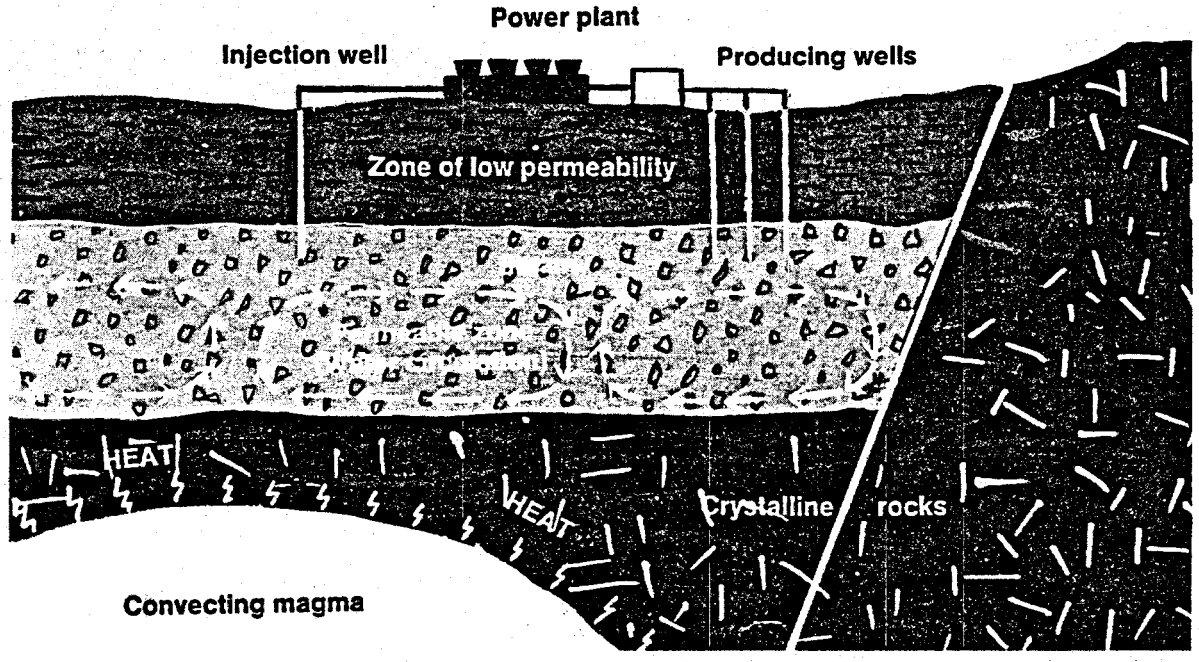
4. The Steam Field

A large reservoir of geothermal steam exists in the Geysers-Calistoga KGRA (see Figures 3 and 6). This natural resource is presently being used by PG&E to generate 502 Mw of baseload electric generation power. Four units representing another 400 Mw of generating capacity are under construction by PG&E. In addition, several other units are being planned by various power suppliers.



EXISTING WELLS AND PROPOSED DEVELOPMENT WELL LOCATIONS FOR UNIT 16

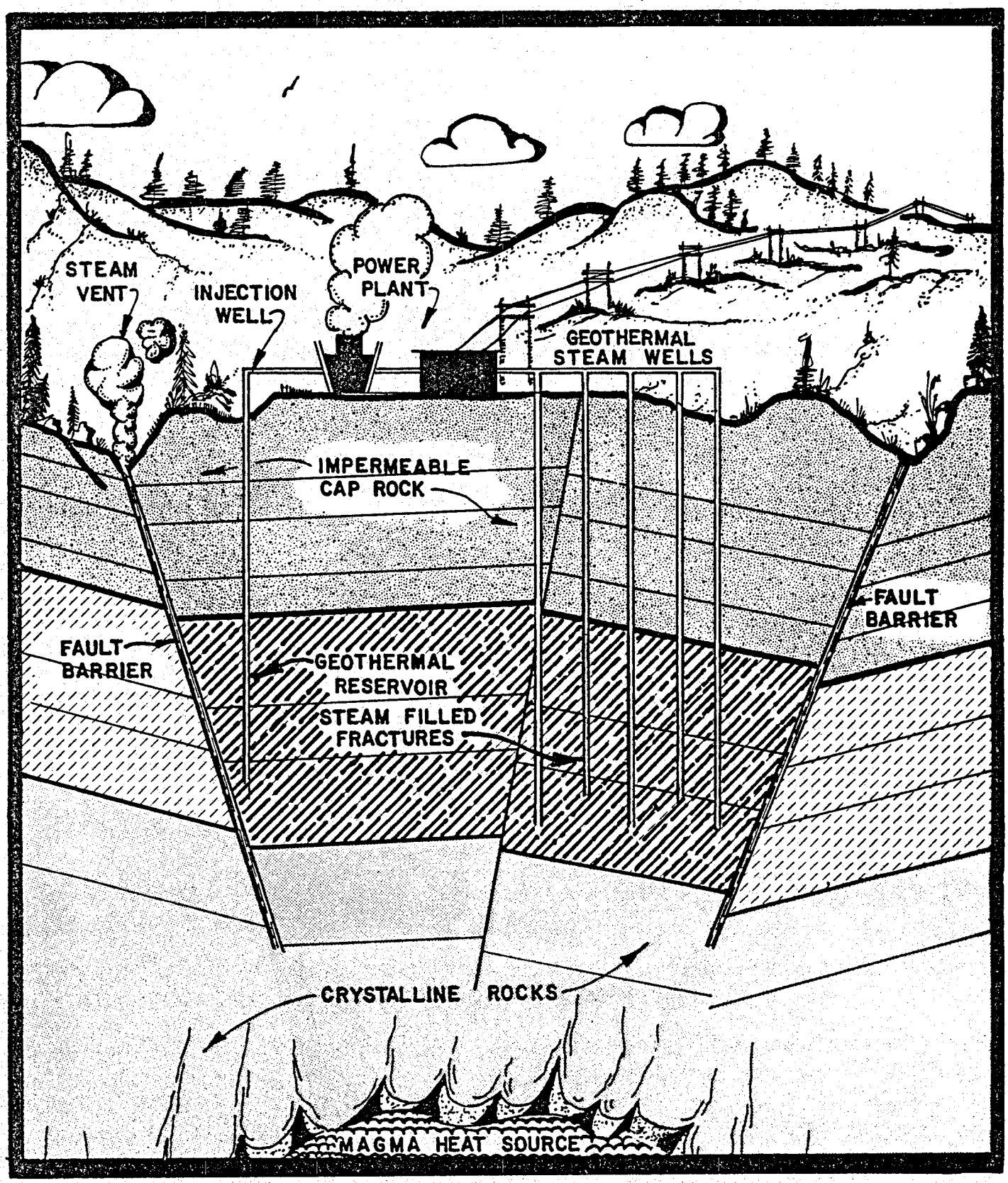
FIGURE 4



GEOTHERMAL FIELD

Source: PG&E NOI, Geysers Unit 16
Page 14, Figure III-1

FIGURE 5



SIMPLIFIED GEOTHERMAL FIELD

Source: NCPA NOI, NCPA Geothermal Project No. 2
Volume I, Page III-2, Figure III-1

FIGURE 6

The steam to operate Unit 16 will be purchased by PG&E from Aminoil USA, Inc. (Aminoil). The steam supplier will drill and operate wells, supply the piping to deliver the steam and build or improve existing access roads to the proposed site. Aminoil will also provide land and land rights for PG&E facilities within the Aminoil leasehold. PG&E will use the steam to generate electricity. Excess condensate will be returned to Aminoil for reinjection into the steam reservoir.

Based on the production history of the existing units, PG&E estimates that approximately 800 acres are required to support a 110 Mw generating unit, even though only 8 to 15 percent of this area will be disturbed. Two wells have been drilled within the Unit 16 steam supply field. Aminoil estimates that about 14 to 16 additional wells initially will be required for Unit 16. Thereafter, approximately 10 additional wells will be needed over the next 30 years to make up for steam-flow decline in the original wells. A cross-over pipeline will be constructed from Unit 16 to Unit 13 so that excess steam can be transported to that unit when Unit 16 is shut down.

C. Summary of the Proceedings to Date

1. Submittal of the Notice

On August 30, 1978, PG&E filed with the Commission a Notice to file an Application for Certification of its Geysers Unit 16 geothermal power plant proposed to be located in Lake County. On September 19, 1978, the Executive Director of the Commission accepted the Notice as containing adequate technical data and information required by Commission regulations to enable the Staff to begin analysis of the proposal. Subsequently, the Chairman of the Commission

appointed a Committee, composed of Commissioner Alan Pasternak, Presiding, and Commissioner C. Suzanne Reed, to conduct proceedings on the Notice. A chronological account of events in these proceedings is contained in Appendix A.

2. Submittal of Supplemental Environmental Information on the Geysers to Lakeville 230 kV Transmission Line and Alternatives (SEI)

Early in the proceedings, the Committee determined that there was insufficient data on the environmental effects of the various transmission corridors proposed in the NOI. Therefore, on September 29, 1978, the Committee issued a Request for Supplemental Environmental Data Regarding Transmission Lines, which ordered the Applicant to supplement the NOI filing. This Request implemented the Committee's intention to determine acceptable transmission corridors and termination points of the Geysers 230 kV line, utilizing data that considers system planning, economic considerations, and environmental effects. Commission staff was directed to assure that these matters were covered in workshops. Although the deadline for providing this information was specified in the Order to be October 26, 1978, the Applicant was unable to complete the filing by that date. The Supplemental Environmental Information* (SEI) in its entirety was submitted November 15, 1978. Subsequently, interrogatories based on the information contained in the SEI were exchanged between the parties until November 29, with responses due by December 8, 1978.

3. Petitions to Intervene

Members of the public, public agencies, or other persons or groups who have intervened in these proceedings (78-NOI-6) involving the Geysers Unit 16 and the 230 kV transmission line proposal are listed in Appendix B.

*Full Title: Supplemental Environmental Information on the Geysers to Lakeville 230 kV Transmission Line and Alternatives

4. Issue Workshops on the NOI Filing

On October 13, 19, and 20, 1978, in Santa Rosa, Sacramento, and Lakeport, respectively, the Commission staff held workshops to discuss issues and concerns related to the project with PG&E and other interested persons. As a result of those workshops, Staff prepared a series of position papers on the various site-related issues and areas of concern including: need for the capacity of the proposed project; biological resources; noise; water quality; soils; hydrology and water resources; cultural resources; socio/economics; public health; and air quality; geotechnical issues; civil engineering; and structural engineering. These subjects were addressed at a Prehearing Conference Statement Workshop on November 7 in Sacramento. The purpose of this workshop was for Commission staff, PG&E, and other parties, to attempt to prepare joint findings of fact and conclusions on those site-related issues that would need no adjudication in evidentiary hearings before the Committee, and to identify those areas of possible dispute where further information or adjudication would be required before an issue could be resolved. The workshop also provided members of the public and interested agencies an opportunity to propose findings and conclusions on site-related issues. Copies of the resulting Joint Prehearing Conference Statement of Findings and Conclusions (Joint Statement) signed by Commission staff and PG&E were made available to the public on November 9, 1978. Staff and Applicant also filed individual Prehearing Conference Statements of Findings and Conclusions on Air Quality, Structural Engineering, and Public Health.

5. Informational Hearings on the NOI Filing

Pursuant to Public Resources Code Section 25509, the Committee conducted public informational hearings on October 26, 1978, in Santa Rosa, October

30 in Lakeport, and November 3 in Napa and Fairfield, for the purpose of enabling Commission staff and PG&E to make presentations to all interested agencies and members of the public concerning the proposed project and potential issues to be addressed during the proceedings. During these hearings, the Committee afforded the public the opportunity to pose questions to the Staff and PG&E and invited general comments and expressions of concern about the proposed project.

6. Prehearing Conference on Site-Related Issues

On November 17, 1978, the Committee held a Prehearing Conference in Sacramento on site-related issues and the resource size of the Geysers-Calistoga KGRA. The primary purpose of the Conference was to consider both the Joint Statement of Staff and PG&E, dated November 9, and any joint statements or individual statements of findings and conclusions on plant site issues filed by any other party, and to identify areas of concern to parties in the proceedings. Prior to the Conference, Staff had filed an individual statement on the issues of air quality, public health, and structural engineering. At the conference itself, PG&E filed its individual statement on the issues of air quality, public health, and structural engineering. During the course of this Conference, they were able to agree on joint findings and conclusions for these areas. Subsequently, on December 29, 1978, PG&E filed with the Commission a typed, formal version of the findings and conclusions that they and Staff had agreed to on November 17. This document is entitled "Supplemental Joint Prehearing Conference Statement re Air Quality, Public Health, and Structural Engineering." No other parties filed either joint or individual findings and conclusions on any plant site issue.

As the issues in the proposed Joint Statement, as well as in the individual findings and conclusions, were discussed, the Committee gave those

parties present an opportunity to state an intention to cross-examine any witness for PG&E or the Staff concerning any matter contained in the proposed findings and conclusions. In addition, the Committee provided an opportunity for parties to state any intention to present a witness on any site-related issue in subsequent evidentiary hearings. No one expressed an intention at this Conference either to present or to cross-examine witnesses during any proceedings on site-related issues, nor did anyone raise any specific or material objection to any of the findings or conclusions on site-related issues proposed by Staff and PG&E for adoption by the Committee.

In addition to reviewing the proposed findings and conclusions, the Committee discussed with those present the interrogatories that were being exchanged among the parties. Letters were received into the record from Alpine Valley Property Owners Association, Oakmont Property Owners Association, and Franz Valley Property Owners Association, that requested an extension of the November 22 deadline for the formulation of interrogatories on the SEI.

On November 22, the Committee issued an Order extending the cut-off date for the filing of any interrogatory to November 29 and the response date to December 8.

7. Evidentiary Hearing on the Geysers Resource Size

In an Order dated November 22, the Committee directed the Applicant, Staff, and NCPA, to furnish testimony on the overall size of the geothermal resource at The Geysers, the restraints that could prevent its full development, and the estimate of the timeline necessary for the construction of power plants to utilize the resource. Intervenors were invited to present evidence and/or

cross-examine witnesses. In addition, all companies who are involved in the development of Geysers steam supplies were invited to participate.

The evidentiary hearing was held on December 8 in Sacramento: three witnesses appeared for the Applicant, one for Staff, and one for the Northern California Power Agency (NCPA). In addition, Mr. Courtney Isselhardt of Republic Geothermal offered comments on the Geysers resource. (For a summary, see Section V).

8. Supplemental Informational Hearings

Subsequent to the public informational hearings in late October and early November, PG&E filed the SEI which contained additional environmental data on the transmission corridor routes. Some of this information had been filed on October 26, and the remainder was filed on November 15. The Committee believed that supplemental informational hearings would provide a forum in the respective affected counties for the parties, general public, and interested agencies, to ask questions and comment on this data. These hearings were held in Lakeport and Santa Rosa on December 14, and Napa and Fairfield on December 15. They were proceeded by a staff workshop on December 12 in Santa Rosa, that also provided an opportunity for questions and clarifications of the SEI filing.

9. Prehearing Conference of January 4, 1979

The Committee held a Prehearing Conference in Santa Rosa on all transmission line issues (system planning, economics, undergrounding, and the environmental impacts of the proposed routes). Staff, Applicant, and the California Public Utilities Commission individually filed proposed findings and conclusions. Napa County filed a statement noting its intention to present

witnesses on the effects of construction of transmission lines in Napa County. These filings by Staff, Applicant, PUC, and Napa County, were used as working documents by the Committee and the parties to ascertain which transmission line issues appeared to require further amplification and clarification in possible future evidentiary hearings. These same documents were subsequently superseded by the proposed joint and individual findings and conclusions filed by the parties on March 1.

In addition, pursuant to the Prehearing Conference Notice of December 21, 1978, the Staff and Applicant were given an opportunity to acknowledge the contents and offer into evidence the following items:

a) Supplemental Joint Prehearing Conference Statement on Plant Site Issues (dated December 29, 1978).

b) Applicant's Verification of the Joint Prehearing Conference Statement on Plant Site Issues (dated December 29, 1978).

c) Staff Position Papers in Support of Joint Prehearing Conference Statement (dated December 4, 1978).

d) Joint Prehearing Conference Statement (dated November 9, 1978).

Any party who wished to object to any proposed finding and conclusion, or any position paper or declaration, was directed to offer, in writing, proposed counter-findings and conclusions, on plant site issues, and position papers, to support said counter-findings and conclusions. No party chose to do this. However, OPOA filed a Declaration in Opposition to Proposed Findings and Conclusions, and objected to the admission of these documents. They were

received into evidence over the objection, and subsequently assigned exhibit numbers 9 through 12, respectively.

10. Procedural Conference

On February 1, in Sacramento, the Committee conducted a procedural conference in order to ascertain the concerns and commitments the parties might have with respect to dates of future filings and hearings. After consideration of comments and suggestions by parties present at the conference, the Committee specified, on February 6, a calendar for future workshops, conferences, and hearings, and the mailing of proposed findings and conclusions and testimony.

11. Supplemental Informational Hearing on the Fulton and Kenwood Alternatives

On February 15, in Santa Rosa, another informational hearing was conducted by the Committee to review the alternative routes, collectively known as the Fulton and Kenwood alternatives, which were being proposed by various parties to the proceedings, for two sections of the preferred Geyser to Lakeville route. This hearing was subsequent to a staff workshop in Santa Rosa on February 8, which also provided the parties, governmental agencies, and the general public, an additional forum in which to review the details of the proposed alternatives.

Again, OPOA was afforded the opportunity to request that Staff and/or Applicant witnesses in support of the proposed findings and conclusions on plant site issues be required to appear for cross-examination in a future evidentiary hearing. The OPOA representative stated that, based on the record, he had no intention of cross-examining these witnesses.

12. Prehearing Conference on Transmission Line Issues

A second Prehearing Conference on transmission line issues was held by the Committee on March 9 and 10 in Santa Rosa to review all the proposed joint and individual findings and conclusions filed by the parties for consideration by the Committee. On February 22 and 23, in Santa Rosa, the Staff had conducted a two-day Prehearing Conference Statement Workshop to allow the parties collectively to review the proposed joint and individual findings and conclusions of Staff and Applicant on transmission line issues that had been distributed on February 15. Subsequently, on March 1, joint and individual statements for Committee consideration were filed by the following parties:

a) PG&E: Individual findings and conclusions in the areas of Transmission System Planning, Transmission Line Corridors, Land Use, Geotechnical and Structural Engineering; and, with the Staff of the Energy Commission, a Joint Prehearing Conference Statement on transmission line corridors, transmission system planning, wheeling, cultural resources, land use, geotechnical, biological resources, and transmission line health, safety and nuisance effects.

b) Staff: In addition to the Joint Statement described above: (1) individual Findings and Conclusions on System Planning, Transmission Line Health, Safety and Nuisance Effects, and Land Use; (2) and, on March 8, individual statements on Transmission line issues related to Geotechnical Structural Engineering; (3) Additional Proposed Findings and Conclusions on Safety and Reliability issues for the proposed plant.

c) Alpine Valley and Franz Valley Property Owners Associations: Joint Proposed Findings of Fact and Conclusions of Law re Transmission Line Issues.

d) County of Sonoma and Oakmont Property Owners Association: Findings of Fact and Conclusions of Law.

e) Fulton:[1] Findings and Conclusions Regarding Transmission Line Issues.

f) Kenwood Community Club and Howard and Jeanne Zwick: Proposed Findings and Conclusions.

g) Napa County: Proposed Findings of Fact.

h) Northern California Power Agency: on March 9, Revised Findings and Conclusions on Transmission Issues.

The other intervenors did not file statements for the Committee's consideration.

These filings, along with witness identification sheets, were used as working papers as the Committee, by subject area, reviewed with the parties present each submitted finding and conclusion to ascertain which transmission line issue required adjudication in future evidentiary hearings. As the subject areas were discussed, the Committee gave those parties present an opportunity to state an intention to cross-examine any witness for any party concerning any matter contained in the various proposed findings and conclusions.

Staff and Applicant also filed verifications of their Joint and Individual Statements on transmission line issues. PG&E filed four verifications on plant site issues that had not previously been submitted due to the

1 Intervenors Lawton Shurtleff, Hansel Hazel, Jonathan Herr, Clarence Wright, Alternative Energy Systems, Inc., S. A. Healy Company, and Marc S. Andersen and the Wikiup Home Owners Association, (all of whom reside in the area known as the Fulton alternative transmission line route), are jointly represented by the firm of Trump, Kouba and Dickson. For convenience, these intervenors collectively are referred to as Fulton.

unavailability of witnesses prior to the January 4 Prehearing Conference. The representative for OPOA and the County of Sonoma expressed a desire to cross-examine at a future evidentiary hearing the Applicant witness for geotechnical plant site issues and the Staff witness for plant site reliability and safety.

13. Prehearing Conference Order and Supplemental Prehearing Conference Order

On March 13 and 19, the Committee issued two Orders outlining the sequence of testimony and witnesses that were to appear in future evidentiary hearings. Since little progress was made toward the resolution of differences on transmission line issues at the Prehearing Conference, the Committee determined that additional time was needed for the taking of evidence, and thus scheduled April 5 and 6 in addition to those dates (April 9 through 20) previously identified in its earlier Calendar Order.

14. Site Visit by the Committee

On Saturday, March 31, the Committee and the parties made a noticed site visit to certain portions of the Applicant's preferred Geyser-to-Lakeville route.

15. Evidentiary Hearings

Evidentiary hearings were held during the period April 5, 1979 to April 21, 1979. Closing arguments were heard on April 24, 1979 and the parties were invited to submit written arguments.

The hearings covered the following two site related issues: Soils and Geology, and Plant Safety and Reliability. The hearings covered the

following Transmission Line Issues: Cultural and Biological Resources, Geotechnical/Structural Engineering, Land Use, Transmission Corridor, and Transmission System Planning. The issues were set forth in the Committee's Prehearing Conference Order dated March 13, 1979 and Supplementary Prehearing Conference Order dated March 19, 1979.

Hearings on Transmission Line Health Safety and Nuisance Issues were deferred until after the Preliminary Report. In addition, the Committee has stated on the record that it will ask for testimony on the relative environmental impacts of power line construction from Lakeville, Tulacay and Vaca-Dixon to the load centers.

D. Rulings on Motions, Complaints and Objections and Declarations

1. Motion for Commission Order Suspending Proceedings and Motion to Suspend Present Timelines (OPOA).

On October 26, 1978, OPOA filed two related motions: Motion for Commission Order Suspending Proceedings and Motion to Suspend Present Timelines. The motion was based on the Applicant's failure to comply with a Committee directive to file on time the SEI on the four proposed alternative 230 kV transmission line routes. On September 29, 1978, the Committee had ordered that PG&E file this information by October 26, 1978. Only a portion of the information was filed on that date. The bulk of the additional data was subsequently filed by the Applicant on November 15, 1978. OPOA argued that this late filing made impossible meaningful participation by the parties, and therefore requested that the Committee either suspend the proceedings or suspend the timelines for conducting hearings in the proceeding.

The Committee, after considering written argument by the parties, ruled on both motions in an Order of November 9, 1978. The Committee ruled as

follows: (1) the motion to suspend the proceedings was denied. The Committee held that the supplemental environmental data did not constitute additional evidence which alters the proposal, as required to invoke the Commission regulation controlling the suspension of proceedings (20 California Administrative Code 1713.5); (2) the motion to suspend the present timelines was granted. The Committee found that the submission of the SEI did constitute good cause to lengthen the time required to complete public hearings under the Commission's regulations (20 California Administrative Code 1203(e) and 1725(a)). Therefore, the Committee extended the date for the completion of evidentiary hearings in this proceeding from December 12, 1978 to February 7, 1979. (This date was subsequently extended again by Commission Order - See D.2, p. 20-2). The Committee also extended the date for the submission of written interrogatories to November 22, 1978 (this was later extended to November 29, 1978).

On November 9, 1978, OPOA filed an appeal of the Committee order to the full Commission. A hearing was held before the full Commission on December 6, 1978. After consideration of written and oral argument, the Commission sustained the order of the Committee.

2. Complaint Against Respondents, PG&E, Barton Shackelford, James A. Walker for Violation of PRC and Commission Regulations (OPOA)

On November 9, 1978, Intervenor OPOA filed a complaint under 20 California Administrative Code Section 1231 which alleged that various statutes and regulations governing Energy Commission power plant siting proceedings had been violated. The Complaint raised the following contentions:

a) PRC 25503 and 20 California Administrative Code Regulations 1703 require the inclusion of at least three alternatives to a proposed transmission line route.

b) The Applicant and the Executive Director of the Energy Commission failed to comply with PRC 25503 and regulations 1703, 1705, and 1708. The basis for this contention was the allegation that the NOI submitted by PG&E on August 30 failed to include, as to the proposed 230 kV transmission line routes, all of the information required by PRC 25503 and regulations 1703 and 1705, and was therefore improperly certified by the Executive Director under regulation 1708.

c) The Commission should suspend all proceedings under regulation 1713.5 until 30 days after the Committee's request for additional environmental data is complied with by the Applicant.

d) The Commission should rule that the statutory time limitations under PRC 25540 (9 months to reach a decision after submittal of an NOI) had not yet begun because of the inadequacy of the NOI.

e) As a matter of law, under PRC 25527, and regulation 1722(f), the Lakeville route through Annadel State Park cannot be approved.

On January 5, 1979, the Commission held a hearing on this complaint at which time the parties offered written and oral argument. On January 22, 1979, the Commission issued an order in which the majority of the Commission ruled as follows:

a) The Complainant's petition for an interpretation of the Warren-Alquist Act that would require the submission of three alterna-

tive transmission line corridors for any proposed transmission line in an NOI filing is denied.

b) The effective filing date of the NOI for the purposes of PRC 25540 is November 15, 1978.

c) The Geysers Unit 16 proceeding is suspended for 30 days.

d) Complaintant's motion to strike from the NOI proceedings the Geysers to Lakeville route based on the record to date is denied.

In addition, the Committee was directed to clarify certain procedural matters, as discussed in the next section.

3. Motion to Define the Administrative Record and to set forth the Procedures to Place Matters in the Record (OPOA)

a) Clarification of Procedural Questions

On December 14, 1978, OPOA filed a Motion to Define the Administrative Record and to set forth the procedures to place matters in the record. In addition, on January 22, 1979, the Energy Commission in an Order on OPOA's Complaint directed this Committee "to draft the appropriate order setting forth the procedure for the admission of all evidence and comment necessary to serve as the basis for the Preliminary and Final Reports required by the statute".

On January 26, 1979, the Committee issued an Order in response to both OPOA's motion and the Commission directive. In this Order, the Committee drew a distinction between the administrative record, which

includes all docketed items and transcripts, and the hearing record upon which the Committee will base its findings and conclusions. The Committee outlined the general procedure that should be followed in placing matters into the hearing record of this proceeding. The Committee also described the types of items found in the administrative and hearing records, and ruled on specific requests to place items into evidence. It should be noted that these procedural questions were also addressed in the Commit tee's Order of December 29, 1978 Regarding the Status of the Draft EIR Prepared by the PUC Staff. In addition, procedural and scheduling questions were considered in detail in the Committee's Procedural and Scheduling Order of February 15, 1979.

b) Motion for Description of Management Process

In addition to the various procedural questions, OPOA's Motion of December 14 also requested an order that would direct the Commission staff to describe the management process used in evaluating PG&E's submittals and an order that would direct PG&E to describe the management process used in its decision that the Lakeville 230 kV transmission line route was preferred over the alternatives.

The Committee denied both motions, based on the evidentiary principal that the probative value, of such evidence, if any, was outweighed by the time that would be needed in pursuing the question.

4. Petition to Review Order to Provide Information

On February 7, 1979, the Committee issued an Order to Intervenor Napa County directing it to provide information on whether the three proposed trans-

mission line routes which traversed Napa County were in compliance with county laws, standards and ordinances. If the proposals were not in compliance, Napa County was to indicate the mitigation measures that would be necessary to bring them into compliance.

On February 9, 1979, Napa County filed a petition with the Commission under 20 California Administrative Code section 1215(b) to review the Committee's Order. On February 28, 1979, a hearing on the petition was held before the full Commission. The Commission upheld the Committee Order and sustained the power of the Commission to require this information. A written Commission Order was filed April 6, 1979.

5. Request for Ruling to be Issued in Form of Written Order. (Napa)

On February 15, 1979, Intervenor Napa County filed a motion entitled "Request for Ruling to be issued in Form of Written Order". The motion argued that PG&E had announced, on February 1, 1979, the results of a so-called "2600 Mw study", and that additional time would be needed for Napa County to analyze the study and prepare for the evidentiary hearings. Therefore, Napa County requested the following relief:

a) Formal discovery be reopened for 30 days.

b) The evidentiary hearings (now scheduled to commence April 5, 1979, previously scheduled to commence April 9, 1979) be continued for 30 days (this was later changed by oral amendment to 60 days.)

c) The Committee ruling be in the form of a written order.

On March 8, 1979, the Committee held a noticed hearing to consider written and oral argument on Napa County's motion. Napa County gave oral argument in support of its position. After hearing oral argument and considering written argument by Napa County and PG&E, the Committee ruled that the motion would be denied and that its order would be set forth in writing.

In its written Order of March 21, 1979, the Committee held in essence that: a) Napa County should have been aware of the "2600 Mw study"; b) the NOI process is a dynamic one where new information is developed continuously and should be considered within the statutory timelines; and c) Napa County has had sufficient time between receiving the "2600 Mw study" on February 15, 1979, and the commencement of the evidentiary hearings on April 5, 1979, to analyze the material, conduct cross-examination and offer rebuttal.

Therefore, the motion to reopen discovery and continue the evidentiary hearings was denied.

By Petition dated March 14, 1979 (Petition to Review Order) Napa County appealed this decision to the full Commission. On March 28, 1979, the Commission upheld the Committee's decision.

6. Declaration for Disqualification of Presiding Member for Bias and Prejudice

On April 5, 1979, Mr. Derek J. Simmons, on behalf of Sonoma County filed with the Committee his declaration captioned Declaration for Disqualification of Presiding Member for Bias and Prejudice.

The Declaration was read into the record by Mr. Simmons. The Declaration requested the Presiding Member to immediately withdraw as Presiding

Member in these proceedings and to take no further actions as Presiding Member except upon failure to withdraw, to immediately suspend this proceeding.

Mr. Simmons' arguments in favor of the Declaration were heard and an opportunity was offered to any other party to be heard on the Declaration. The Applicant took no position on the motion, reserving the right to either support or object to the motion. Staff reserved any comments.

The Presiding Member declined to withdraw and also declined to immediately suspend the proceeding, thus denying the Declaration.

E. Conformity with Applicable Standards, Ordinances, and Laws

The Committee is required by PRC Section 25512(a)(2) to include findings and conclusions in this Report on the degree of conformity of the Applicant's proposed site and related facilities with "applicable local, regional, state, and federal standards, ordinances, and laws." Moreover, PRC 25514(a)(2) requires the Committee to include similar findings and conclusions in the Final Report.

The various Joint Statements submitted by PG&E and the Commission staff enumerated standards, ordinances, and laws applicable to the proposed site and related facilities. In addition, at the Prehearing Conference on March 9, the Committee directed the parties to list any additional standards, ordinances, and laws they felt the Committee should consider in making findings and conclusions. A tentative list of applicable standards, ordinances, and laws to which the proposed project must conform has been compiled and is set forth in Appendix F.

The Final Report will contain findings and conclusions on the degree of conformity of the proposed project with each of the appropriate standards, ordinances, and laws.

III. CONFORMITY TO DEMAND FORECASTS

A. Need for Additional Generating Capacity

1. Introduction

Public Resources Code Section 25512 requires the Committee to determine "[t]he degree to which each alternative site and related facility proposal designated in the notice or presented at a hearing and considered by the Commission is in conformity with...(1) The forecast of statewide and service area electric power demands adopted pursuant to Section 25309..." The forecast of statewide and service area electric power demands was adopted in March 1977. This matter is also known as "determining the need for the project." With respect to the issue of need, the Commission staff and PG&E proposed the findings and conclusions set forth in subsection 3 of this section for adoption by the Committee.

2. Geothermal as a Preferred Technology

On March 22, 1978, the Commission adopted a policy to encourage and expedite the environmentally acceptable utilization of geothermal resource development.

The Commission's Geothermal Policy Report recognizes geothermal energy as a preferred technology for meeting electric power needs because: (1) it is indigenous to California; (2) its development offers a stimulus to the State's economy; (3) for dry steam resources, the environmental impacts and power plant technology are well understood; (4) geothermal power plants are relatively small (50-110 Mw) and thus enable greater system reliability and flexibility; and (5)

geothermal power plants may be planned and constructed in a shorter time frame than power plants using other fuels.

3. Proposed Findings and Conclusions

PG&E and Commission staff proposed Joint Findings and Conclusions on the conformity of the proposed project with the Commission's most recent demand forecast as set forth on the following pages:

4. Committee Findings and Conclusions

In the absence of any refutation of the findings and conclusions proposed by the Applicant and the Staff, the Committee adopts them as its own. They are set forth on the following two pages.

STAFF AND APPLICANT PROPOSED FINDINGS AND CONCLUSIONS NEED FOR CAPACITY

Findings

1. If constructed according to present schedules, Geysers Unit 16 will begin commercial operation in 1982.

2. Geysers Unit 16 will have a net generating capacity of about 110 mw.

3. The "most likely" demand forecast adopted by the Energy Commission, with adjustments, indicates a need in the summer of 1983 for additional generating capacity in excess of 110 mw for the PG&E service area.

4. Geysers Unit 16 is included in PG&E's generation expansion plans for 1982.

5. Conservation is not an alternative to the need for this new geothermal generation in 1982.

6. The policy of the California Energy Commission is to encourage the accelerated development of geothermal resources.

7. Geysers Unit 16 will generate baseload electricity.

8. The bus-bar cost of electricity generated at the Geysers Geothermal power plant is less than the bus-bar cost of electricity generated by other baseload resources. For this reason, it is desirable to bring geothermal generation on line as early as possible.

9. Geothermal power plants have a relatively short construction lead time, relatively high annual capacity factor, and provide for potential fossil fuel savings.

Conclusions

1. The additional system capacity to be added by Geysers Unit 16 is consistent with the forecast of service area electric power demands adopted by the Commission pursuant to Public Resources Code section 25309.

2. From an economic, lead time and fuel type diversity perspective, Geysers Unit 16 is an acceptable means of supplying 110 mw of generation needs for the PG&E serice area in 1982.

3. Staff and Applicant agree that no adjudication of this issue is necessary in the NOI.

IV. SITE-RELATED ISSUES

A. Introduction

In addition to determining the degree of conformity with applicable standards, ordinances, and laws, PRC 25512 requires that a Preliminary Report contain findings and conclusions with regard to the merit of each site and related facility designated in the Notice or considered in the NOI proceedings.

Public Resources Code Section 25540 eliminates the requirement for geothermal power plant Notices to contain alternate sites. Accordingly, the Applicant has proposed only one site for its Geysers Unit 16 power plant. The California Department of Fish and Game, however, proposed an alternative location for the power plant, within the general site area, both at the Prehearing Conference on Site Issues (November 17, 1978 transcript pp. 931-4) and in two letters to the Commission, dated October 25 and 31, 1978. It is the Department's belief that construction at the Applicant's proposed site would have more adverse environmental impacts than the alternate site, some of which would be non-mitigable. Commission staff agree that the loss of 3.3 acres of evergreen forest at the proposed site would be a non-mitigable impact, but that the loss would not be significant. Therefore, it was Staff's conclusion that this impact alone would not be sufficient to render the proposal unacceptable, and consequently they did not feel that an examination of alternative site proposals was warranted. (Id., p. 935). For a more detailed discussion and the Committee's Findings and Conclusions on this issue, see "Biological Resources".

B. Air Quality

1. Introduction

In determining the conformity of the proposed power plant to applicable air quality standards, ordinances, and laws, the Committee must consider: 1) the ambient (background) air quality within the air basin; and 2) the amounts and impacts of the various emissions from the power plant on sensitive receptors at the time of operation.

To examine the ambient air quality, the Committee must review monitored data and projections of air quality at the time the plant commences operation and measure the results against national and state ambient air quality standards. Non-attainment of the air quality standards in the air basin in question, meaning that the air is more polluted than allowed by law, imposes additional requirements for the granting of a permit. Generally, these requirements are: 1) that there be emission reductions (tradeoffs, offsets) elsewhere in the air basin, so that even with the proposed new source, there will be an overall improvement (net benefit) in air quality in the basin, and there will continue to be reasonable progress toward meeting the air quality standards; and 2) that the project employ the best available control technology (BACT).

In addition to the ambient air quality review, which considers the condition of the air within the basin where the power plant is proposed to be built, the Committee must consider a new source review examination of the amounts of emissions from the power plant itself to assure that: 1) they will not violate or prevent attainment of the air quality standards at the time the plant commences operation; and 2) that they are equal to or less than the emissions limitations for a new source.

The regulatory framework for new source review by the Lake County Air Pollution Control District is different from that which applies in Northern Sonoma County, (the proposed location of most of the geothermal projects which have undergone NOI review previously by this Commission).

In Sonoma County, if the Air Pollution Control Officer (APCO) determines that emissions from a new source will cause a violation of ambient air quality standards (A.A.Q.S.) or will interfere with the maintenance of A.A.Q.S. or, will prevent the attainment of A.A.Q.S. he may either grant or deny a permit for the source. However, he may grant the permit only if the new source uses best available control technology (BACT), and, reductions of emissions from existing sources are obtained so that overall air quality in the area will be improved.

In Lake County, the Air Pollution Control Officer does not have discretion but must require BACT for any source which would emit any regulated pollutant in quantities exceeding 20 lbs/hr or 150 lbs/day, as the project is proposed. If, even with the application of BACT, the source would cause a violation of A.A.Q.S. or result in a measurable contribution to the continued violation of A.A.Q.S., then trade-offs will be required. Further, even if the source will emit less than 20 lbs/hr or 150 lbs/day, the APCO may still require BACT and, if necessary, trade-offs, if he determines that the source may nevertheless cause a violation or result in a measurable contribution to the continued violation of A.A.Q.S.

2. Discussion

a. General

On January 23, 1979, the Energy Commission and the California Air Resources Board (ARB) adopted a joint policy statement which "sets forth a procedure for the expeditious approval of needed power plants in a manner that fully preserves the integrity of California's air quality program." The Commission will be explicitly guided by this policy statement in adopting amended NOI/AFC regulations governing the siting of power plants using fuel types other than geothermal, and in other actions affecting compliance with air quality laws. The Commission will be guided generally by the joint agreement in adopting geothermal power plant siting regulations.* The ARB shall be similarly guided in adopting its revised model New Source Review rule to be used by local districts and in any other actions affecting the siting of new power plants. The joint agreement does not affect proceedings on the PG&E Geysers Unit 16 Notice, but should be applicable to the AFC if the Notice is approved.

The applicability of the federal Environmental Protection Agency's (EPA) Prevention of Significant Deterioration (PSD) regulations remains unsettled. The Committee understands that federal, state, and local authorities are engaging in a series of conferences directed toward

*Some aspects of the joint agreement, especially as they relate to alternative sites, are not appropriate to the geothermal power plant siting process. The CEC and the ARB hope to develop a joint agreement specific to geothermal power plant siting in the near future.

clarifying this issue*, among others. The proposed Findings and Conclusions thus take the unsettled nature of the applicability of PSD regulations into consideration, where appropriate.

b. Prehearing Conference - Air Quality Issues

The Staff and the Applicant initially submitted individual statements containing proposed Air Quality Findings and Conclusions. The Lake County Air Pollution Control Officer (LCAPCO) participated substantially regarding formulation of proposed Air Quality Findings and Conclusions at the Prehearing Conference (November 17, 1978, transcript, pp. 765-922). Applicant and Staff resolved their differences and subsequently, on January 4, 1979 at the Prehearing Conference, submitted Joint Proposed Air Quality Findings and Conclusions.

Several key points on air quality discussed at the Prehearing Conference on Site Related Issues are as follows:

o LCAPCD does not regard Carbon Monoxide (CO) as a consequential emission or a serious pollutant at this time. (Transcript p. 801).

o LCAPCO's, Mr. Steve Zalusky, interpretation of a "demonstrable basin-wide air quality benefit" is to mean that a benefit would have to be seen at the impact site as well as elsewhere in the basin. (Transcript pp. 805-6).

*In addition, this Committee will recommend that the full Commission direct Staff to prepare a policy issue paper and that, after consideration of the paper, the Commission adopt a policy concerning the applicability of PSD regulations to H_2S emissions from geothermal power plants.

o Both the NSCAPCO, Mr. Michael Tolmosoff, and the LCAPCO object to a proposed finding stating that the sources for H_2S emissions are "unknown"; they believe that, under certain condition, the sources are known, as identified in SRI International and ERT studies. (Transcript p. 808).

o PG&E filed an Authority to Construction with the LCAPCD in September 1978 for Unit 16.

o Since the operational date for Unit 15 is uncertain, the date for submitting data verifying the effectiveness of the Stretford process is also uncertain. (Transcript pp. 875-7).

In order to fulfill its responsibility to determine the proposed project's conformity with air quality standards, ordinances, and laws, the Committee must first identify those which are applicable. A list of laws tentatively deemed applicable is included in Appendix F of this Report. The Committee will require the Staff and Applicant to assess conformity of the proposed projects with these standards, ordinances, and laws in the course of the NOI proceedings, before issuance of a Final Report.

3. Proposed Findings and Conclusions, Air Quality

Following are the Proposed Findings and Conclusions submitted jointly by the Applicant and Staff following the Prehearing Conference:

APPLICANT AND STAFF
PROPOSED FINDINGS AND CONCLUSIONS

Air Quality

Findings

1. The Applicant has stated that Unit 16 is scheduled to begin operation in the fall of 1982, and that it will have a guaranteed gross generating capacity of 120 MW.

2. Lake County Air Pollution Control District (LCAPCD) Rule 411 limits emissions of particulate matter to whichever is lesser of:

   a. 0.2 grains per standard cubic foot; or

   b. 40 pounds per hour.

3. Particulate emissions from Unit 16 during normal power plant operation will be substantially less than either 0.2 gr/scf or 40 lb/hr. Particulate emissions will not exceed 50 tons/year.

4. Particulate emissions at full steam flow during periods of steam stacking are at present uncertain. The Applicant has agreed to provide this information, when available from the steam supplier, at or prior to the filing of an AFC for Unit 16.

5. LCAPCD Rule 412 limits emissions from any sulfur recovery unit producing elemental sulfur to:

   a. 10 ppm H_2S by volume;

   b. 100 lbs/hour of sulfur compounds calculated as SO_2.

6. The Applicant has proposed to employ a Stretford Unit to remove sulfur from the H_2S in the noncondensible gas stream. The LCAPCD Acting Air Pollution Control Officer has interpreted Rule 412 as applicable to the Stretford Unit. Airborne emission rates and concentrations from the Stretford Unit were supplied in the Supplemental Responses to Staff's Third Set of Data Requests (November 3, 1978).

7. Other than the emissions limitations specified in Findings 2 and 3 above, there are currently no specific emissions limitations applicable to Unit 16 during normal power plant operation. A general emissions limitation is contained in Rule 430, which prohibits the discharge of any contaminant in an amount which causes injury, detriment, nuisance or annoyance to any considerable number of persons or which causes injury or damage to business or property. Further, Rule 430 states that emissions in quantities which cause a state or federal ambient air quality standard to be exceeded is a violation of that rule.

8. An air quality impact analysis pursuant to federal new source review requirements is required for any new major emitting facility. However, the EPA definition of a major emitting facility is unknown at this time.

9. LCAPCD Rules 602 and 605 requires that the APCO perform an air quality analysis for any source which will emit more than 20 lb/hr or 150 lb/day of any pollutant, except CO, for which there is a local, state, or federal ambient air quality standard (AAQS). The APCO must deny an authority to construct for such a source unless he determines that emissions from the source may not be expected to result in the violation or measurable contribution to the continued violation of any AAQS, and provided that the

best available control technology (BACT) will be used on the emitting equipment for the pollutants specified above. Further, Rule 604 allows the permitting authority to conduct an air quality analysis for a source which will emit less than 20 lb/hr or 150 lb/day of any pollutant for which there is an AAQS if the emissions from the source may not be expected to result in the violation or measurable contribution to the continued violation of an AAQS. Any analysis undertaken pursuant to Rule 605 shall consider existing state and local control strategies.*

10. *The NSCAPCD, an adjacent district, adopted Rule 455(b) in June, 1978. Rule 455(b) is an H_2S control strategy requiring specified reductions in H_2S emissions from new and existing sources to achieve a gradual reduction in ambient H_2S concentrations so that the H_2S ambient air quality standard will be attained. The provisions of Rule 455(b), which apply to several sources owned by the Applicant, are hereby incorporated by reference as though fully set forth herein.*

11. *If an analysis performed pursuant to Rule 605 indicates the source will result in the violation or the measurable contribution to the continued violation of an AAQS, that source may still be permitted if emissions offsets, in addition to those reductions required pursuant to existing control strategies, are obtained in such an amount that a "demonstrable basin wide air quality benefit" will result.*

12. *The State AAQS for Hydrogen Sulfide (H_2S) is 0.03 ppm. This standard may not be equalled or exceeded, although measurements in the vicinity of Unit 16 show that the standard has in fact been exceeded several times. Area sources in Lake County and Sonoma County which have contributed to such*

*The Committee suspects that the word "not" has been used here in error. Clarification is requested of the Applicant and Staff.

violations have been identified by environmental consultants, ERT and SRI, for varying meteorological conditions.

l3. The Applicant has performed an air quality analysis to determine whether H_2S emissions from Unit l6 will result in the violation of or measurable contribution to the existing violation of the H_2S standard.

l4. The Applicant's analysis indicates that Unit l6 could emit 5 lb/hr H_2S without causing a violation of the H_2S standard. The analysis further indicates that the expected impact should be less than l0 ppb. The LCAPCD has determined that additive effects from a new source which are less than 5-l0 ppb will not be considered a "measurable contribution" for Unit l6. The Applicant considered impacts from Unit l6 on Anderson Springs, Whispering Pines and Middletown for meteorological conditions of fumigation, limited mixing, drainage flow, and obstacle flow. Either a physical model, tracer study or analytical analyses was performed. The cumulative effects of Units l3, l4, l6 and l8 on Anderson Springs were considered for obstacle flow conditions using a physical model. The cumulative effects of Units l3, l6, and l8 on Whispering Pines were considered during obstacle flow conditions using an analytical analysis.

15. Staff finds that, after a preliminary analysis, Applicant's analysis is reasonable in its consideration of drainage and downwash using a physical model and tracer releases. Applicant's position is that the wind tunnel model is reasonably conservative to predict maximum downwind concentrations. Staff's position is that conclusions must await submittal of verification and description of the plume rise equations used in the analysis.

16. The Applicant's position is that NCPA should conduct their own air quality analyses. After a suitable analysis of the cumulative impacts of the two projects has been provided, at or prior to the filing of an AFC for either project, Applicant will discuss with the Staff and NCPA the methods of combining the two analyses.

17. The Applicant has used a statistical model to evaluate impacts during meteorological conditions described as "subsidence inversion with an inversion base of not less than 3500 feet (MSL)." The model used by Applicant has not been validated for application in the type of terrain and meteorology which characterizes the Geysers and the Unit 16 plant site, and the Staff has reservations as to its viability. However, the Applicant is currently answering Staff interrogatories for Unit 17 which request a comparison of calculated versus observed H2S concentrations for historical days. Staff will, in conjunction with the NSCAPCD and the LCAPCD, review the submitted material and will report its findings and recommendations for future work, if necessary during the comment period on the Preliminary Report for Unit 16.

18. The steam supply for Unit 16 will be approximately 2,000,000 lb/hr., with an H_2S content of 70±20 ppm. This results in a total unabated H2S flow rate of 100-180 lb/hr.

19. BACT may be required for Unit 16. The level of technology or level of abatement which constitutes BACT is uncertain at this time. This will be addressed either at the AFC for Unit 16 or in Generic Technology Assessment hearings, to be conducted by the Energy Commission, the results of which will be provided in the AFC proceeding for Unit 16. In the AFC filing, the

Applicant shall address the technology or level of abatement that would constitute BACT.

20. The Applicant proposes to abate H_2S emission with a surface condenser and Stretford Unit. A Stretford Unit, if correctly sized, should abate 99+ percent of the H_2S which reaches the unit in the gas stream.

21. The Applicant has proposed to use a Stretford Unit with a sulfur handling capacity of at least 300 lb/hr and thus the unit appears to be adequately sized for Unit 16.

22. 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.

23. If the surface condenser partitions less than 95-97 percent of the H_2S into the gas stream, depending on the steam concentration and natural oxidation, the H_2S remaining in the stream condensate will require treatment if the plant is to meet the 5 lb/hr emissions limitation proposed by the Applicant.

24. The partitioning efficiency of the surface condenser proposed is not presently known. The Applicant estimates a partitioning efficiency of 80-98 percent.

25. Unit 15 is the first Geysers power plant utilizing a surface condenser and Stretford system scheduled to begin operation. Unit 15 is scheduled to begin operation in 1979.

26. Because the ability of Unit 16 to operate with 5 lb/hr H_2S emissions is dependent on the partitioning efficiency of the surface condenser and the

actual chemical composition of the steam, the Applicant should, if the NOI is approved, file an AFC which either:

a. *contains sufficient operating data from Unit l5 to determine, with reasonable certainty, that the partitioning efficiency of the surface condenser will be sufficient to limit H_2S emissions to 5 lb/hr; or*

b. *contains specific proposals for condensate treatment systems (or methods of accounting for the natural oxidation) which will be installed prior to commercial operation of Unit l6 in the event that the operating data from Unit l5 indicates that the partitioning efficiency of the surface condenser is not sufficient to limit H_2S emissions to 5 lb/hr at Unit l6.*

27. *The steam supplier asserts that if H_2S emissions from the steam release valve during periods of steam stacking are reduced to 5 lb/hr during adverse meteorological conditions, such emissions will not result in the violation or measurable contribution to the continued violation of the H_2S standard. Although this assertion is probably reasonable, the steam supplier should consider stacking conditions in their analysis with the following qualifications:*

a. *the adverse meteorological conditions under which stacking emissions will be reduced to 5 lb/hr H_2S are defined;*

b. *the response time required to determine the existence of such adverse meteorological conditions is stated;*

c. *the time required to reduce H_2S stacking emissions to 5 lb/hr is stated;*

d. the amount of H_2S emissions reductions which will be obtained during meteorological conditions other than those defined as adverse is clearly stated; and

e. the impact on ambient H_2S concentrations as a result of stacking emissions reductions in the amounts specified pursuant to (d) above is determined.

f. consideration for any other plants in the immediate area which are also stacking.

28. The steam supplier proposes to reduce H_2S emissions during stacking to 5 lb/hr through the use of "automated" flow control valves located in the flow lines of all supply wells and remotely controlled from a central point located at or near the power plant and with the use of a steam crossover pipeline to Unit 13. The ability of the steam supplier to reduce H_2S stacking emissions to 5 lb/hr through the use of automated flow control valves and crossover pipelines has not been demonstrated.

29. The Applicant should, at or prior to the time an AFC is filed, obtain and provide detailed information from the steam supplier demonstrating the engineering feasibility of the automated flow control valve and crossover pipeline to reduce H_2S emissions to 5 lb/hr.

30. Clyde B. Eller, Director of the Enforcement Division, Region IX, of the Environmental Protection Agency, has stated that Federal Prevention of Significant Deterioration Rules (PSD) may apply to geothermal power plants and presumably to the steam release valve. This contention is subject to dispute.

31. Neither the power plant nor the steam release valve have a potential to emit 250 tons/year of any pollutant other than H_2S, except possibly particulates, which would also have allowable emissions less than 50 tons/year. PSD regulations would thus not apply with respect to such other pollutants.

32. The LCAPCD has submitted proposed H_2S emissions limitations for geothermal operations for ARB review. Relevant portions of proposed Rule 421(a) (power plant emissions) and 421(b) (steam transmission line emissions) are as follows:

421A Power Plants

- All geothermal power plants constructed after January 1, 1980 shall emit no more than 100 grams hydrogen sulfide per MWH (electric) up to January 1, 1990.[1]

421B Geothermal Steam Transmission Lines

Scheduled and Unscheduled Outages of Power Plants

- Effective January 1, 1980 hydrogen sulfide emissions shall be reduced to no more than 35 percent of the full unabated steam flow within 1 hour from the time of outage, or not more than is allowed by normal

1. On December 19, 1978, the Lake County Board of Supervisors adopted new language for 421A:

"All geothermal power plants for which an Authority to Construct (sic) was issued after January 1st, 1979 shall emit no more than 100 grams of hydrogen sulfides per megawatt-hour of electricity up to January 1 of 1990."

power plant operation within two hours from the time of outage as specified in Section 421-A.[2]

33. If the power plant emissions are limited to 5 lb/hr H2S, and if stacking emissions are reduced to 5 lb/hr during adverse meteorological conditions, Unit 16 will comply with the provisions of 421A, and the steam release valve will comply with the provisions of 421B during those adverse meteorological conditions. Compliance with 421B during meteorological conditions less than those defined as adverse has not been established. If Rule 421B is adopted in Lake County, the Applicant has agreed to address compliance in the AFC.

Conclusions

1. Unit 16, as proposed in the NOI, will comply with LCAPCD particulate emissions limitations.

2. Emissions from Unit 16 may not require federal New Source Review.

3. If the Stretford Unit performs as expected, the sulfur handling capacity of the Stretford Unit proposed for use on Unit 16 will be adequate to treat the H_2S which may be expected to reach the unit.

4. Both Unit 16 and the steam release valve will comply with federal PSD requirements, assuming such requirements apply.

5. The Applicant shall provide, at or prior to the filing of an AFC for Unit 16, the information specified in Findings 4, 6, 19, 26, 27, 29, and 33.

2. Also on December 19, 1978, the County Board of Supervisors specifically declined to adopt an emissions limitation for the steam release "valve". Therefore, the language of 421(b) which was proposed at the time of the Prehearing Conference Statement was written was not adopted by Lake County. Rather, adoption of emissions limitation for the steam release valve has been expressly deferred indefinitely, pending completion of the technical study.

6. Staff shall report to the Commission as specified in Finding 17.

7. Until the analysis and information specified in this statement is provided, Staff cannot determine whether Unit 16 is siteable. Because the information requested will be provided, the NOI should be approved with respect to air quality.

8. In the absence of further analysis by the Applicant, emissions of hydrogen sulfide will be limited to no more than five pounds per hour.

4. Committee Findings and Conclusions

The Committee adopts the Findings and Conclusions which have been proposed jointly by the Applicant and Staff with the following modifications.

Conclusion number 5 is modified to reflect the requirement of finding 15 that Applicant submit a verification and description of the plume rise equation used in its analysis. This information should be provided at the time of filing the AFC. Conclusion number 7 is renumbered conclusion number 9, a new conclusion number 7 is added and conclusion number 8 is modified so that the last five conclusions (5 through 9) read as follows:

5. The Applicant shall provide, at or prior to the filing of an AFC for Unit 16, the information specified in Findings 4, 6, 15, 19, 26, 27, 29, and 33.

6. Staff shall report to the Commission as specified in Finding 17.

7. NCPA is proposing to construct a geothermal power plant in the vicinity of The Geysers Unit 16 site which may impact the conclusions regarding the air quality impact of Geysers Unit 16.

8. In the absence of further analysis by the Applicant, based on information provided by the Applicant to date, it appears likely that emissions of hydrogen sulfide will be limited to no more than five pounds per hour.

9. Until the analysis and information specified above have been provided, the Committee cannot make a final determination that Unit 16 is siteable. However, the information which has been provided to date is adequate for the purposes of the NOI proceeding and because the Committee expects the information requested will be provided, the NOI should be approved with respect to air quality.

C. Public Health, Safety, and Reliability

1. Introduction

Public Resources Code Sections 25511 and 25512 require the Commission to determine the adequacy of measures proposed by the Applicant to protect public health and safety. Central to this consideration is the determination of the conformity of the proposed power plant with applicable public health and safety laws and standards.

Public Resources Code Section 25216.3 authorizes the Commission to "compile relevant local, regional, state, and federal land use, public safety, environmental, and other standards to be met in designing, siting, and operating facilities in the state", and to "...adopt standards, except for air and water quality, to be met in designing or operating facilities to safeguard public health and safety, which may be different from or more stringent than those adopted by local, regional, or other state agencies...".

The Commission has not adopted standards different from or more stringent than any local, regional, state, or federal standards effective at the present time. Thus, the Commission is currently using existing standards as the benchmark to evaluate the adequacy of public health and safety protection measures.

Many of the site-related issues discussed in previous sections of this Report are relevant to making the public health, safety, and reliability determinations required by PRC 25511. For example, certain of the Findings and Conclusions on Air Quality, Civil Engineering/Solid Waste Management, Hydrology, Noise, and on Water Quality, among others, speak to the adequacy of public

health and safety protection measures. In addition, there are two other issues logically related to making safety and reliability determinations for geothermal power plants. These are the Geotechnical and Civil Engineering issues discussed in Section III.D. Section III.C.3 contains the Staff proposed Findings and Conclusions for Safety and Reliability that were submitted at the Prehearing Conference on March 9, 1979. Finally, Section III.C.4 includes Findings and Conclusions jointly proposed by the Applicant and the Staff specifically dealing with the area of Structural Engineering, as required by PRC 25511 and 25512.

2. Public Health

a. Introduction

Geothermal steam found at the Geysers is composed of various chemical elements and compounds. In a geothermal power plant, this steam source is used to provide heat (and energy) to drive electric power-producing turbines and generators. The steam is not, however, totally "consumed" during the generation process. Rather, a portion is condensed and reinjected into the underlying steam field and a portion is ducted into the cooling tower for release into the atmosphere. This cooling tower exhaust and other ventings into the atmosphere (such as during periods of steam stacking) expose the surrounding area to the chemical components of the geothermal steam.

Hydrogen sulfide (H_2S) is the principal chemical component of the exhaust gas, although constituents such as ammonia, arsenic, mercury, sulfur dioxide, suspended particulates, and radionuclides are also present. It became apparent during previous proceedings on geothermal power plant proposals before the Energy Commission that additional detailed information was needed to

assess meaningfully the public health effects of exposure to the components of geothermal steam. Air quality considerations also interact with this area but, as stated in the Air Quality section (section IV.B), factors such as dilution, dispersion, and ambient concentrations, cannot be evaluated until the completion of the pending air quality analysis. Nevertheless, the information which is available is adequate to reach findings and conclusions regarding H_2S, ammonia, arsenic, mercury, and radionuclides, which are sufficient for the purposes of the NOI. The data appear sufficient, to reach more definitive findings and conclusions regarding the public health effects of exhaust emissions of sulfates, sulfur dioxide (SO_2), and total suspended particulates (TSP).

b. Proposed Findings and Conclusions

The Commission staff and PG&E have jointly proposed the following Findings and Conclusions on Public Health for adoption by the Committee. References to applicable and suggested air quality standards are included where appropriate.

APPLICANT AND STAFF
PROPOSED FINDINGS AND CONCLUSIONS
PUBLIC HEALTH

Findings - Hydrogen Sulfide

1. Unit 16 will emit hydrogen sulfide (H_2S) in the cooling tower exhaust during normal plant operation. H_2S will also be emitted from the steam supply during periods of steam stacking.

2. Chronic long term exposure to H_2S concentrations of 0.08 ppm and above has been reported to cause adverse health effects in the human population.

3. The health effects of exposure to H_2S concentrations less than 0.08 ppm are not well documented.

4. Due to the lack of data, and the uncertainty over the validity of studies of low level exposures, experts disagree on actual effects of such exposures.

5. Hydrogen sulfide has an odor which can be detected at concentrations at levels less than those reported to cause adverse health effects.

6. The state ambient air quality standard for H_2S is 0.03 ppm (1 hour average).

7. The state ambient air quality standard for H_2S is based on a nuisance odor threshold.

8. The proposed Illinois ambient air quality standard for H_2S, which is intended to protect public health, is 0.01 ppm (8 hour average). Applicant questions the basis and applicability of this standard.

9. Ambient H_2S concentrations in Anderson Springs have, on occasion, exceeded the state standard of 0.03 ppm.

10. The impact of H_2S emissions from Unit l6 during normal power plant operation on ambient H_2S concentrations at receptors in the Geysers has not yet been adequately determined for all meteorological conditions identified by Staff.

11. The impact of H_2S emissions from the steam release valve during periods of steam stacking on ambient H_2S concentrations at receptors in the Geysers has not yet been adequately determined.

12. Applicant will monitor H_2S emissions from Unit l6 during the operating life of the power plant.

13. The Applicant has proposed to discuss with Staff, other utilities, steam suppliers, appropriate agencies, and interested parties, the necessity and methodology for monitoring ambient H_2S concentrations in and around The Geysers area.

Conclusions

1. The health effects of continuous exposure to H_2S in concentrations less than 0.08 ppm are not known.

2. Due to insufficient data regarding adverse health effects from chronic exposure to H_2S at levels below 0.08 ppm, it cannot be concluded whether or not there will be adverse impacts to public health as a result of operation of this plant. Staff reserves the right to re-assess the potential public health effects upon completion of the air quality analysis.

3. *Applicant shall submit in an AFC a proposal specifying the manner in which emissions monitoring is to be affected.*

4. *The Applicant shall discuss with Staff, other utilities, steam suppliers, appropriate agencies, and interested parties, the necessity and methodology for monitoring ambient H_2S concentrations in and around The Geysers area.*

Findings - Ammonia

1. *Geysers Unit 16 will emit ammonia in the cooling tower exhaust drift during normal operation and in the steam supply during periods of steam stacking.*

2. *Inhalation of ammonia in sufficient quantities can cause adverse health effects.*

3. *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 safe level for ammonia concentrations in ambient air. (Multimedia Environmental Goals for Environmental Assessment, EPA Document 600/7-77-136 a, November, 1977). Applicant questions the basis and validity of this study.*

4. *Ammonia concentrations in steam from 61 producing wells at the Geysers has averaged 194 parts per million (ppm).*

5. *The ammonia concentrations is steam from four test wells for Unit 16 ranged from 8.8 to 41.1 ppm; the average was 30.6 ppm.*

6. The Unit 16 cooling tower as proposed in the NOI will emit approximately 61 pounds per hour ammonia, based on ammonia concentrations in the steam from four test wells for Unit 16.

7. Dilution of ammonia emissions will occur during transport, and the resultant ambient concentrations at points of sensitive receptors can be determined by the air quality analysis. Staff will assess ambient ammonia concentrations after it has completed its assessment of the Applicant's air quality analysis.

8. Atmospheric reactions of ammonia emissions could potentially form toxic ammonium compounds, such as ammonium sulfate.

9. Sulfates can form through atmospheric oxidation of H_2S.

10. Sulfates can be toxic to humans when inhaled in sufficient quantities.

11. The California ambient air quality standard for suspended sulfates is $25ug/m^3$ (24 hour average).

12. The ambient air quality standard for sulfates is not expected to be exceeded as a result of normal power plant operation or the stacking of the steam supply for Unit 16.

13. Ambient temperatures and concentrations of precursors at the Geysers do not permit the formation of ammonium bisulfide in quantities that could cause health effects.

Conclusions

1. *It will be possible to assess the impact of Unit 16 ammonia emissions on ambient ammonia concentrations after the staff has completed its assessment of the Applicant's air quality analysis.*

2. *Ammonium bisulfide formed by atmospheric reaction of ammonia emissions will not be present in sufficient quantities to cause adverse health effects.*

3. *Since the state ambient air quality standard for sulfates is not expected to be exceeded, adverse health impacts should not occur from sulfate formations resulting from operation of Unit 16.*

Findings - Arsenic

1. *Unit 16 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 possible arsine.*

2. *All forms of arsenic are known to be toxic at some concentrations, and some forms are potentially carcinogenic.*

3. *The World Health Organization has proposed a safe ambient air quality level for arsenic of 5.9 ug/m^3 averaged over a 24 hour period. The National Institute for Occupational Safety and Health suggests a standard of 2.0 ug/m^3 per 15 minute sampling for arsenic trioxide to protect against carcinogenic effects.*

4. The U. S. Environmental Protection Agency has suggested 0.005 ug/m^3 as a safe level for arsenic concentrations in ambient air. (EPA-600/7-77-l36 a). Applicant questions the basis and validity of this report.

5. Arsenic concentrations in steam from four wells for Unit l6 were less than 0.004 ppm (approximately l6 ug/m^3).

6. The expected arsenic emission rate from the cooling tower will be less than 0.008 pounds per hour, based on results of steam analysis. This emission rate represents the maximum amount of arsenic in the incoming steam, and thus the emission rate during stacking would not exceed this rate. A lower emission rate would be expected during normal operations.

7. Arsenic released to the atmosphere during normal power plant operation and during periods of steam stacking will be substantially diluted before reaching the nearest receptor.

8. Dilution of arsenic emissions will occur during transport in the form of vapor and particulates in the drift. Staff will assess ambient arsenic concentrations after it has completed its assessment of Applicant's air quality analysis.

Conclusions

l. It will be possible to assess the impact of Unit l6 arsenic emissions on ambient arsenic concentrations after the Staff has completed its assessment of Applicant's air quality analysis.

Findings Mercury

1. *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.*

2. *Mercury is toxic to humans when inhaled or ingested in sufficient quantities.*

3. *There is no adopted ambient air quality standard for mercury, although the World Health Organization 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-600/777136 a). Applicant questions the basis and validity of this report.*

4. *The mercury concentration in steam from 61 producing wells at the Geysers averaged 0.005 ppm (approximately 21 ug/m^3).*

5. *The mercury concentration in steam from four wells for Unit 16 ranged from 0.0003 to 0.054 ppm (approximately 223 ug/m^3) the average was 0.0143 ppm (approximately 59 ug/m^3).*

6. *Maximum emission rate of mercury at the cooling tower would be approximately 0.108 pounds per hour. This emission rate represents the maximum amount of mercury in the incoming steam, and thus emissions during stacking would not exceed this rate.*

7. Mercury is diluted in the atmosphere during transport to nearby populated areas.

8. Ambient mercury concentrations in the Geysers monitored by Battelle Northwest Laboratories ranged from less than 0.001 to 0.018 ug/m^3. The ambient concentrations were monitored while 11 geothermal power plants were operating. At least one additional power plant will be operating in the vicinity of the proposed site at the time Unit 16 is scheduled to commence operation.

9. Dilution of vaporized mercury emissions will occur during transport. Some mercury components will be in the drift. Staff will assess ambient mercury concentrations after completing its assessment of Applicant's air quality analysis.

10. Mercury can enter the food chain from contaminated air, soil, and water.

11. Mercury in the food chain can adversely impact public health if present in sufficient quantities.

12. The addition of mercury from Unit 16 emissions to the food chain as a result of normal power plant operation and steam release valve during periods of steam stacking are not expected to be significant.

Conclusions

1. It will be possible to estimate the impact of Unit 16 mercury emissions on ambient mercury concentrations and ultimately on public health upon the completion of Staff's assessment of Applicant's air quality analysis.

2. The additions of mercury to the food chain from the operation of Unit 16 will not adversely affect public health.

Findings - Radionuclides

1. The noncondensable gas fraction of geothermal steam originating from natural fumaroles and developed wells contains the noble radioactive gas, radon-222(^{222}Rn).

2. Radium-226 is a parent radionuclide of ^{222}Rn and occurs naturally in the soil in varying concentrations at The Geysers.

3. Inhalation of shortlived daughter products of ^{222}Rn can cause adverse health effects.

4. The maximum rate of release of ^{222}Rn in emissions from the 11 operating power plants at The Geysers is approximately 1.43 Ci/day.

5. The results of the Geysers Radiological Measurement Program conducted by Lawrence Livermore Laboratory indicate that the highest recorded ^{222}Rn concentrations in the air, with the operation of 11 power plants, were 0.5 pCi/l at Units 12 and 1.4 pCi/l at SRI station 7 (Sawmill Flat) in an area of elevated ^{226}Ra in the soil.

6. It is not anticipated that the ^{222}Rn content in the steam supply for Unit 16 will be substantially different than the average ^{222}Rn content in the steam supply for PGandE Units 1-11.

7. The California standards for ^{222}Rn are 100 pCi/l in air for a controlled area and 3 pCi/l in air, above natural background, in uncontrolled area.

8. PGandE should initiate a monitoring program to verify that concentrations of radon 222 from plant operation remain below applicable standards.

9. Radioactivity, including fallout and naturally occurring radionuclides, will be contained in the cooling tower sludge from Unit 16. PGandE contends that the concentration of radioactivity in the sludge will be in the approximate range of concentrations found in soil of the general area.

10. The resulting radioactivity will result from the scrubbing of radioactive particulates from ambient air.

11. Wet cooling towers have shown a generic tendency to scrub particulates, including radioactive particulates from ambient air.

12. Disposal of the cooling tower sludge at an appropriate disposal site will not adversely affect the public.

Conclusions

1. If ^{222}Rn content in the steam supply for Unit 16 is similar to that for PGandE Units 1-11, the resultant ambient concentrations from Unit 16 will not exceed ^{222}Rn Standards for both controlled and uncontrolled areas and should not cause an adverse public health impact.

2. The Applicant shall provide detailed information on its proposed ^{222}Rn monitoring program at or prior to the filing of an AFC.

3. The Applicant shall dispose of the cooling tower sludge at an appropriate disposal site.

Findings - Sulfur Dioxide

1. *Atmospheric oxidation of H_2S may form small amounts of sulfur dioxide (SO_2).*

2. *The California Air Resources Board has established a 1 hour ambient air quality standard of 0.5 ppm SO_2; a 24 hour standard of 0.05 ppm SO_2 in the presence of oxidant or particulate standard exceedance.*

3. *The California ambient air quality standard for SO_2 will not be exceeded as a result of operation of Unit 16 during normal power plant operation or during periods of steam stacking.*

Conclusion

1. *Ambient air concentrations of SO_2 resulting from operation of Unit 16 will not adversely affect public health.*

Findings - TSP

1. *Total suspended particulates can, depending on their particle size and chemical composition, produce adverse health effects.*

2. *The California Air Resources Board has adopted an annual standard for TSP of 60 ug/m^3 and a 24 hour standard of 100 ug/m^3.*

3. *Emissions from Unit 16 will not prevent the attainment, interfere with the maintenance, or cause a violation of the ambient air quality standard for total suspended particulates (TSP) during normal operation.*

4. *Emissions from the steam release valve will not prevent the attainment, interfere with the maintenance, or cause a violation of the ambient air quality standard for TSP during periods of steam stacking.*

5. *The ambient air quality standard for TSP is intended to protect the public from adverse health impacts.*

Conclusion

1. *Emissions of TSP during normal power plant operation and during periods of steam stacking will not result in adverse public health impacts.*

c. Committee Findings and Conclusions on Public Health

The Committee adopts the findings and conclusions on public health as jointly proposed by the Staff and Applicant with the following comments:

Conclusion number 3 for Radionuclides directs the Applicant to dispose of the cooling tower sludge at an appropriate disposal site.

In addition, the findings and conclusions make repeated reference to Staff assessment of the Applicant's air quality analysis.

During the comment period on the Preliminary Report, Staff and Applicant will advise the Committee as to who (what agency or agencies) is responsible for making the determination of an "appropriate disposal site", the appropriate time frame for the determination, and the criteria for and likelihood of a finding of compliance. Staff and Applicant, during the comment period, will also specify for the Committee the particular air quality analysis referred to, the time frame for completion of the analysis, the time frame for completion of Staff review and assessment.

3. Safety and Reliability

a. Introduction

On March 1, 1979, Staff mailed to all parties for Committee consideration its Findings and Conclusions on Safety and Reliability for the proposed plant. On March 9, at the Prehearing Conference, the Committee asked if any party desired to have witnesses come forward to support these proposed findings and conclusions and to be available for cross-examination. Mr. Derek Simmons, on behalf of OPOA and the County of Sonoma, indicated that he wished to cross-examine these Staff witnesses. Consequently, in the Prehearing Conference Order of March 13, the Committee requested that both the Applicant and Staff have witnesses present for such cross-examination at the April 5 evidentiary hearing.

On March 26, Staff filed written testimony that supported its proposed findings and conclusions which had been submitted on March 1. The testimony of Mr. Bruce Stiver addressed the capacity and availability factors of the proposed facility and reviewed the proposed methods of handling and transporting toxic, hazardous, or flammable substances. Similarly, Staff testimony by Mr. Richard Kishi was submitted on the system engineering aspects of plant reliability. The witnesses stated collectively that, for the purposes of the NOI, the plant is acceptable from the standpoints of safety, reliability, and control systems.

b. Summary of Testimony

Mr. Charles Franks, operating Specialist in the Steam Generation Department of PG&E, testified on April 5 on behalf of the Applicant. He discussed supervisory control systems for Geysers units, operator procedures, and unit shutdown. The units are designed for unattended operation, and a computer-based supervisory control system gives the facility operator an overview of each unit's operation, and signals any malfunctions. Conditions which could lead to equipment damage will result in automatic unit shutdown or reduced load operation.

The control room operator would respond to alarm conditions (for example, abnormal temperature rise in a cooling system or a high pressure reading) by making appropriate adjustments to the unit's operation from the remote control room, or he could send a roving operator to the unit where the required adjustments would be made.

Safe unit shutdown, when needed to prevent damage to equipment, requires the use of relays and protective devices not normally associated with an attended unit. Shutdown can be accomplished manually from the remote control room or at the unit. Automatic shutdown of the unit is accomplished through standard protective relays and devices on the turbine, generator and auxiliary equipment. Geysers units are also provided with a number of additional protective features.

Mr. Franks' testimony incorporated page 10-2 of Appendix I of the NOI describing the reliability of The Geysers Power Plant. Mr. Franks expects the reliability of Geysers Unit 16 to be "essentially the same or higher than existing units at The Geysers Power Plant as measured by capacity and availability factors during the years 1975 through 1977." Page 10-2 reports capacity and availability factors of about 80 percent and 90 percent respectively for those years.

Mr. Bruce Stiver, an Energy Facility Siting Planner for the Energy Commission, testifying on behalf of the Staff, stated that the proposed project is acceptable from the standpoint of safety and reliability for purposes of the NOI.

Mr. Richard Kishi, an Associate Mechanical Engineer for the Energy Commission, testifying on behalf of the Staff, stated the Applicant's plant control systems as described in the NOI are adequate. However, more information on plant control systems will be needed during during the AFC phase.

c. Proposed Findings and Conclusions

Following are the staff proposed findings and conclusions on Safety and Reliability:

STAFF PROPOSED FINDINGS AND CONCLUSIONS
SAFETY AND RELIABILITY

Findings

1. In the NOI at page 10-2 of Appendix I, the Applicant indicated that the capacity and availability factors for the proposed power plant will be essentially the same as for existing units operated by the Applicant at the Geysers geothermal field, i.e., a capacity factor of more than 80% (at maturity) and an availability factor higher than 90%. During the consideration of the NOI, nothing has been identified that would preclude attainment of these capacity or availability factors.

2. In the Applicant's response to the Staff's Second Set of Data Requests dated October 17, 1978, the Applicant identified the hazardous, toxic or flammable substances or chemicals which will be used or stored at the proposed site, and the methods for handling and transporting these substances with respect to the safety of plant personnel and the general public.

3. The laws, ordinances, and standards applicable to this project are:

   a. Occupational Health and Safety Act and implementing regulations;

   b. Federal Occupational Health and Safety Act and implementing regulations.

4. In the Applicant's response to the Staff's Second Set of Data Requests dated October 17, 1978, the Applicant specified the methods to be utilized in the case of an accidental spill of any of the chemicals or effluents stored, handled or produced at the site.

5. Prior to or at the filing of the AFC the Applicant shall provide the following information:

a. A description of the procedures to be followed by the control operator at the power plant or at the remote central control facility to determine the appropriate response to emergency or upset condition at the power plant.

b. A discussion of the basis for a decision to shut a plant down by a control operator, including the decision by the operator to override the automatic system, and a discussion of the basis for selecting the parameters along with their values utilized to automatically shut a plant down by the automated monitoring system.

c. A description of the remote central control facility alarm and/or warning indicator system and its relationship to the alarm and/or warning indicators at the proposed power plant.

Conclusions

1. For the purposes of this NOI, the proposed project is acceptable from the standpoint of plant reliability.

2. Subject to the receipt of the information specified in Finding 7 of the Civil Engineering Findings and Conclusions, and based on quantities of and methods for handling the hazardous, toxic or flammable materials to be stored on the site, the proposed project is acceptable from the standpoint of plant safety for the purposes of an NOI.

3. Subject to the receipt of the information found in Finding 5 above and in Finding 7 of the Civil Engineering Findings and Conclusions, there is a substantial likelihood that the proposed plant will comply with the applicable laws, ordinances and standards.

4. Subject to the receipt of the information specified in Finding 5 above and Finding 7 of Civil Engineering Findings and Conclusions, no adjudication of this issue is necessary during the NOI.

d. Committee Findings and Conclusions on Safety and Reliability

The Committee adopts the Staff's Proposed findings and conclusions on Safety and Reliability.

4. Structural Engineering

a. Proposed Findings and Conclusions

Following are the Applicant and Staff Proposed Findings and Conclusions on Structural Engineering:

APPLICANT AND STAFF
PROPOSED FINDINGS AND CONCLUSIONS
STRUCTURAL ENGINEERING

Findings

1. Applicant has proposed to design the Unit 16 power plant and related facilities to perform as follows:

a. "Damage from a Functional Basis Earthquake (as defined below) to critical structures will be repaired within one week and critical equipment repaired or replaced within one week. This is expected performance. A possible exception is large rotating equipment such as the turbine-generator, although probably it, too, will be returned to service within one week. In any event, plant structures, components, and equipment will be repaired as expeditiously as possible, using special measures such as augmented crews and extra shifts when necessary.

b. In the event of a Safety or an Extreme Basis Earthquake as defined below), there will be no collapse of major structures. Critical structures will be repaired or replaced within 12 months. A possible exception is large rotating equipment such as the turbine-generator, although probably it, too, would be returned to service within twelve months. In any event, plant structures, components, and equipment will be repaired as expeditiously as possible, using special measures such as augmented crews and extra shifts when necessary.

c. For this matter, the following definitions apply:

Functional Basis Earthquake - occurence at the site of peak accelerations in rock or firm soil with 50 percent probability of being exceeded in 40 years (i.e., return period of 60 years).

Safety or Extreme Basis Earthquake - occurrence at the site of peak accelerations in rock or firm soil with 10 percent probability of being exceeded in 40 years (i.e., return period of 380 years).

d. Critical - major components (major equipment) or structures which are of such importance that damage would require plant shutdown, and of such expense or complexity that risk of seismic damage must be minimal.

2. Applicant proposes to justify the criteria for the Functional Basis and Safety or Extreme Basis Earthquakes, based on existing literature and historical data. Staff cannot accept this basis without assessing the data. Applicant and staff agree to participate in a workshop to discuss the justification of the seismic design criteria and desired performance criteria for the Functional Basis and Safety or Extreme Basis earthquakes prior to the AFC. Applicant agrees to provide a justification at or prior to the AFC.

3. The performance criteria for Unit 16 are less stringent than are proposed for the Geysers 17 unit. Nevertheless Applicant's seismic performance criteria appear adequate provided that the Functional and Extreme Earthquake can be justified pursuant to Finding Number 2.

4. Applicant has proposed to design and construct all critical structures using seismic design criteria specified in the Uniform Building Code (UBC l976), with the base shear being the higher of:

1. 0.2w
2. Formula l4-l, UBC 76, with I=l.0 and T_e = 0.5 sec. T to be determined from a "Lumped mass" model.
3. Formula 4-l, ATC 3-06, with effective ground acceleration, A_a=0.4g.

5. The Applicant has also proposed to design and construct all non-critical structures and anchors for non-critical equipment using seismic design criteria specified in the Uniform Building Code (UBC l976), with a shear of not less than 0.2w.

6. The turbine-generator will be designed for an equivalent seismic lateral force of 0.2w.

7. The Appicant's proposed seismic design criteria are acceptable subject to Finding 8.

8. Applicant has agreed to furnish information listed in Finding 2 prior to or at the time of the filing of the AFC, demonstrating that the proposed seismic design criteria will achieve the desired performance criteria.

9. The applicant proposes to use the Uniform Building Code (UBC l976), in conjunction with the codes and specifications listed below, for the nonseismic structural design.

a. Manual of Steel Construction by American Institute of Steel Construction; 7th edition.

b. American Concrete Institute Standard on Building Code Requirements for Reinforced Concretes; ACI 3l8-77.

c. American Iron and Steel Institute Specification for the Design of Light Gauge Cold-Formed Steel Structural Members. (Current edition in effect at time of AFC filing.)

d. American Welding Society Structural Welding Code Dl.l-75 (revision in effect at AFC filing).

e. American Institute of Timber Construction Manual, Sixth edition l972.

f. American Association of State Highway Transportation Officials Standard Specifications for Highway Bridges - llth edition l973, (edition in effect in time of AFC filing).

l0. The proposed codes for non-seismic structural design criteria are adequate for the NOI proceeding.

ll. Applicant has agreed to supplement the design criteria prior to or at the time of the AFC filing with structural design criteria for live loads, operating loads, thermal loads, and load combinations with accompanying allowable stress increase or load factors.

12. Applicant has agreed to designate which power plant and related facility components are critical and to justify such designations prior to or at the time of the AFC filing.

13. Seismic design criteria for critical electrical and mechanical components have not been furnished. The Applicant has agreed to furnish these criteria by the end of December, l978.

14. The Applicant proposes to use the static equivalent lateral force method of analysis for seismic structural response. Additionally, the design of critical structures will be checked by dynamic analysis methods.

15. Unit 16 will be designed and constructed to meet the following standards with respect to structural design of structures and electrical and mechanical components:

a. Standards contained in the Uniform Building Code (1976), and adopted by Lake County; and

b. Regulations contained in Title 8, of the California Administrative Code.

Conclusions

1. Applicant shall design and construct Unit 16 and its related facilities to perform as specified in Finding Number 1.

2. Applicant shall design and construct facility structures as specified in Findings Numbers 4, 6, 9, and 15.

3. Applicant shall design critical facility components to conform to the seismic performance criteria specified in Finding Number 1.

4. If the power plant and related facilities are designed in accordance with Conclusions 1 through 3, the power plant and related facilities are acceptable for purposes of the NOI from a structural engineering standpoint.

5. Applicant shall provide information as specified in Finding Numbers 2, 8, 11, 12, and 13 prior to or at the filing of the AFC for Unit 16.

6. Staff and Applicant agree that no adjudication of this issue during the NOI proceeding is necessary.

b. Committee Findings and Conclusion on Structural Engineering

The Committee adopts the Applicant's and Staff's jointly Proposed Findings and Conclusions on Structural Engineering.

D. Other Site-Related Issues

1. Introduction

In addition to air quality considerations, the acceptability of a proposed site depends upon the possible impacts that constructing and operating the proposed facility may have on human and ecological values in the area. Thus, the Committee must consider factors such as impacts on soils and hydrology, socio/economic concerns, viability of mitigation measures, and the nature and scope of the overall effects of the proposed project area. The following Findings and Conclusions treat these factors on a subject by subject basis.

2. Proposed Findings and Conclusions

Following are the Joint Findings and Conclusions on Biological Resources, Noise, Water Quality, Soils, Hydrology and Water Resources, Cultural Resources, and Socio/Economics, Geotechnical issues, and Civil Engineering proposed by the Commission staff and PG&E for adoption by the Committee.

3. Committee Findings and Conclusions

Following each of the Joint Findings and Conclusions on Biological Resources, Noise, Water Quality, Soils, Hydrology and Water Resources, Cultural Resources, and Socio/Economics, Geotechnical issues, and Civil Engineering are the Committee's Findings and Conclusions.

APPLICANT AND STAFF PROPOSED JOINT FINDINGS AND CONCLUSIONS GEOTECHNICAL ISSUES

Findings

1. The proposed cooling tower location is on a fault or shear zone at the east end of the site. The cooling tower foundation and structures could be damaged by differential movement in this zone due to differential settlement, subsidence or fault rupture induced by geothermal development or by natural tectonic faulting.

2. However, none of these hazards are considered to have a high probability of occurrence during plant life. Furthermore, the lightweight, segmented cooling tower may be relatively easily returned to operating condition if damaged.

3. The nature of the bedrock at the proposed cooling tower location and its suitability as foundation material will be carefully inspected and reported by an engineering geologist as recommended in the September 1978 geotechnical report by Harlan and Associates.

4. A large, unstable, active to dormant landslide exists on the southside of the power plant site. The Applicant proposes to remove the material at the top of the landslide down to competent bedrock, then construct a 70 foot high retaining wall with an exposed height of about 45 feet and backfill behind it up to plant grade to obtain the necessary space for plant facilities. Part of the cooling tower structure will rest on this backfill.

5. Based on present information, Applicant's proposal as contained in the Harlan Report for mitigating this landslide hazard is feasible and acceptable.

6. The nature of the bedrock below the landslide material and its suitability as foundation material for the wall shall be carefully investigated and reported by an engineering geologist during excavation as required by Chapter 70, UBC and recommended in the Harlan Report.

7. Zones of weaker fractured rock occur in the proposed 150 foot high cut slope on the west end of the power plant site. Failure of any rock material in the cut slope could result in encroachment of landslide debris onto the site and facilities.

8. Applicant has agreed that the character of the rock exposed in the cut slope and at its base shall be carefully investigated and reported by an engineering geologist during excavation as required by Chapter 70, UBC, and recommended in the Harlan Report.

9. The Applicant has presented a detailed geotechnical report by R. C. Harlan and Associates. This report indicates the geologic conditions at the Unit 16 power plant site and fill disposal site are complex, not completely known, and potentially more adverse or favorable than represented in the report.

10. A final determination of site geologic conditions and the necessary protection measures cannot be made until after site excavation begins.

11. If geologic conditions are substantially as represented by the Harlan report, adverse conditions can be acceptably mitigated by following the recommendations in the Harlan report and the Applicant will implement those recommendations.

l2. Any geologic conditions which deviate from those predicted in the Harlan report enough to warrant changes in design of site earthwork, power plant facilities, or site viability will be immediately reported to CEC.

l3. Records of site inspections (especially detailed logs of excavated surfaces) will be prepared during site preparation and submitted to CEC upon request.

l4. More detailed requirements for inspection, monitoring, and reporting to be performed during site preparation will be considered during the AFC proceedings. Prior to or at the time of the AFC filing, Applicant will submit a proposed inspection, reporting, and monitoring plan to ensure careful evaluation of geologic conditions during site preparation.

l5. Staff and Applicant are currently analyzing estimates of potential ground shaking at the Unit l6 site from the Maacama and Collayomi faults.

l6. The Applicant will provide by mid-December, l978 updated estimates of ground shaking at the site after reviewing a regional seismicity report by Dr. Bruce Bolt.

l7. The California Division of Mines and Geology will complete a regional geology and seismicity report for CEC Staff in November l978. CEC Staff and CDMG will then estimate the seismic shaking which may occur at the site.

l8. A workshop will be held with the Applicant prior to submittal of the AFC to discuss any significant differences in the estimated magnitudes of earthquakes which regional faults may produce.

19. Topography can greatly amplify seismic shaking, particularly at ridgetop localities. The Applicant will evaluate the applicability to this site of present techniques for analyzing such topographic effects and submit results of this evaluation by December 8, 1978.

20. Applicant has agreed to provide a geologic map showing existing and proposed well pad sites by December 1, 1978.

21. Other detailed maps of existing and proposed wells will be available in December, 1978 as part of the addendum to the Castle Rock Springs EIR.

Conclusions

1. The Applicant shall undertake the measures specified in Findings Numbers 3, 6, 8, 11, 12, and 13.

2. With the implementation of the measures specified in Findings Number (sic) 3, 6, 8, 11, 12 and 13, if geologic conditions are substantially as represented by existing reports, the potential geologic hazards to the power plant and off site disposal sites are acceptable.

3. The Applicant shall supply the information specified in Findings Numbers 14, 16, 20, and 21.

4. Final determination of geologic conditions at the well pad sites cannot be made until the information specified in Findings Numbers 20 and 21 is evaluated.

5. Staff and Applicant agree that no adjudication of this issue in the NOI proceedings is necessary. However, during AFC proceedings, appropriate engineering and geologic monitoring and inspection activities to be carried out during site preparation will be evaluated.

a. Committee Findings and Conclusions on Geotechnical Issues

The Committee adopts the joint findings and conclusions on Geotechnical Issues proposed by the Applicant and Staff with the following comments:

During the comment period on the Preliminary Report, the Applicant and Staff will advise the Committee of the status of all items identified for submittal in Findings 15, 16, 17, 19, 20 and 21 and the conclusions of any evaluations and analyses performed.

APPLICANT AND STAFF PROPOSED JOINT
FINDINGS AND CONCLUSIONS
CULTURAL RESOURCES

Findings

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

2. The applicable standards are:

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 plant site and steam field were evaluated for prehistoric archeological sites and artifacts and none were present in either area.

4. The remaining plant site and steam field cultural resource considerations have not been fully evaluated. Applicant will perform a full cultural resources survey and provide such report to the Commission promptly upon its completion. Such survey shall be filed by December 1, 1978.

5. Upon receipt of the report, Staff may make recommendations for additional mitigation measures if any are necessary.

Conclusions

1. The proposed plant and related steam field will not impact upon prehistoric archeological resources as none are present in the site area.

2. The existence and significance of paleontological, historical, and ethnographic resources, as well as resources of educational, scientific, or religious significance at the plant site and steam field cannot be determined until the Applicant has completed the cultural resources survey as specified in Finding 4. Such survey shall be filed by December 1, 1978.

3. Subject to compliance with the requirements of Finding 4, Applicant and Staff agree that no adjudication of these issues are required during the NOI process.

b. Committee Findings and Conclusions on Cultural Resources

The Committee conditionally adopts the joint findings and conclusions on Cultural Resources proposed by Applicant and Staff.

During the comment period on the Preliminary Report, the Staff will advise the committee if the full cultural resources survey has been provided by the Applicant, as called for in Finding #4 and Conclusions #2, and whether or not the information in the report affects the proposed conclusions.

APPLICANT AND STAFF PROPOSED JOINT FINDINGS AND CONCLUSIONS BIOLOGICAL RESOURCES

Findings

1. The following laws and standards govern the preservation and protection of biological resources:

- *Federal Endangered Species Act of 1973 and implementing regulations.*
- *Ecological Reserve Act of 1963 and implementing regulations, Fish and Game Code sections 1580-1584.*
- *California Species Preservation Act of 1970, Fish and Game Code sections 900-903.*
- *California Endangered Species Act of 1970, Fish and Game Code section 2050-2055.*
- *Fully Protected Species Act, Fish and Game Code section 3511, 4700, 5000, and 5515.*
- *Federal Regulations implementing the Geothermal Steam Act of 1970 (30 USC 1001-1025 and CFR 270.34(k)).*

2. The American Peregrine Falcon is an endangered species by designation of California and Federal law.

3. The American Peregrine Falcon has been observed in the Geysers Calistoga Known Geothermal Resource Area.

4. No active breeding sites for the American Peregrine Falcon are known to exist at the Unit 16 site.

5. The Unit 16 site is not included within the federally proposed "Critical Habitat Zone" for the American Peregrine Falcon.

6. No other rare, threatened, or endangered wildlife species known to exist at the Unit 16 site.

7. The Golden Eagle and the Ringtail cat are fully protected species by designation of California law.

8. The Golden Eagle and the Ringtail cat have been observed in the Geysers-Calistoga Known Geothermal Resources Area and one sighting of the Golden Eagle within the Geysers 16 leasehold has been reported.

9. The Unit 16 is not known to be a significant breeding or feed area for either the Golden Eagle or the Ringtail cat.

10. No rare or endangered plant species are known to exist at the Unit 16 site.

11. The Applicant has proposed to undertake mitigation measures for the protection and preservation of biological resources. These mitigation measures are specified in the NOI on pages 116, 117, 156-161, Appendix D, and October 17, 1978, Response to Staff's Second Set of Data Requests, pages 4, and 5.

12. Areas of critical concern which may contain unique habitats and which therefore may need special protection are known to exist at or near the Unit 16 site.

13. Mitigation measures proposed by the Applicant are adequate to protect known areas of critical concern at or near the Unit 16 site. However, there are seeps and springs for the proposed disposal site which may be areas of critical concern. The Applicant shall evaluate the nature and significance of the springs and seeps for value to wildlife or in maintaining the trout fishery of Bear Canyon Creek and identify any mitigation measures it proposes to utilize, in a report regarding the environmental impacts of the disposal site to be submitted by January 1, 1979.

14. Construction of Unit 16 will result in direct loss of mixed evergreen forest habitat and such loss will not be fully compensated for by the Applicant's mitigation measures. However, the loss of evergreen forest from this unit alone is not significant.

15. There may be some loss of rainbow trout spawning habitat in Bear Canyon Creek from the project and such loss may not be fully compensated for by Applicant's mitigation measures. However, the extent of such losses cannot be resolved until further geotechnical and engineering design data is analyzed as part of the AFC proceeding.

16. Species of recreational value, in addition to rainbow trout, are known to exist in or near the Unit 16 site.

17. Except for the potential impacts on the rainbow trout as discussed in Finding 15 mitigation measures proposed by the Applicant are adequate to protect species of recreational value in or near the Unit 16 site.

18. Vegetation stress has occurred from cooling tower drift at the Geysers. As stated in the Geysers 17 NOI, the Applicant is studying the effects

of cooling tower drift on vegetation and reports on these studies will be submitted at or prior to the filing of the Geysers 17 AFC and an interim report on this study will be completed in the near future. The Staff shall report to the Committee after it has reviewed the Applicant's report and shall make such recommendations as may be necessary.

19. Both the U.S. Fish and Wildlife Service and the California Department of Fish and Game have stated concern over the acceptability of cumulative impacts from this and other geothermal projects. Staff will meet with these agencies and interested parties to identify the impacts and mitigation or compensation program that would be needed to reduce cumulative impacts to an acceptable level. Subsequent to the meeting, Staff will report to the Committee or Commission any findings or recommendations.

Conclusions

1. The Applicant shall undertake the mitigation measures specified in Finding Number 11.

2. With the implementation of the measures specified in Finding Number 11, the Unit 16 power plant and related facilities can be constructed and operated in compliance with applicable standards for the protection and preservation of biological resources.

3. The Applicant shall provide the data requested in Findings 13 and 18 at or prior to filing of the AFC.

4. Staff and Applicant agree that no adjudication of these issues are necessary in the NOI.

c. Committee Findings and Conclusions on Biological Resources

The committee adopts the joint findings and conclusions on Biological Resources proposed by Applicant and Staff.

During the comment period on the Preliminary Report, the Staff and Applicant will advise the Committee of the status of the reports specified in Findings 13 and 19 and the interim report specified in Finding 18.

APPLICANT AND STAFF PROPOSED JOINT FINDINGS AND CONCLUSIONS WATER QUALITY

Findings

1. The Stretford effluent and steam condensate contain substances which are classified as toxic and hazardous.

2. The Stretford effluent will be elemental sulphur and Stretford purge stream. The latter will be pumped into the base of the cooling tower for reinjection. The former will be temporarily stored at the site in an enclosed container, and either sold for use or disposed of at an approved site.

3. The steam condensate will be utilized for cooling water and the excess will be reinjected. In the event of a spill, the retention basin construction around the entire plant site would be adequate to prohibit escape of any reasonably expectable spill.

4. The cooling tower will emit droplets which contain certain toxic chemicals. These droplets would not be deposited or otherwise reach surface waters in such quantities as to be measurable.

5. The water quality standards potentially applicable to the project include:

a. U.S. Environmental Protection Agency Water Quality Criteria (1976).

b. Central Valley Basin Plan (contained in California Water Quality Control Plan, Sacramento River Basin).

c. Porter-Cologne Water Quality Control Act.

d. 23 California Administrative Code, Title 23, Chapter 3.

6. The Applicant has proposed to implement the following mitigation measures to control and preserve water quality.

a. A retention barrier will surround the entire plant to contain any spills. The barrier will be impermeable and have a volume of 170,000 gallons. The lowest point in the barrier will contain a catch basin with pump facilities and alarm devices. (NOI, pg. 4-1).

b. A monitoring program has been instituted in order to evaluate long term impacts of the construction and operation of Unit 16. (NOI, pg. 161, App. C-5 pg. 4-2).

c. The reinjection pond will hold 200,000 gallons, and be equipped with high and low level alarms. (NOI, pg. 4-1).

d. Those measures outlined in Finding Number 3 of the Soils Findings.

Conclusions

1. There will be no intentional discharge of any toxic or hazardous material into surface waters in quantities sufficient to affect water quality.

2. Plume drift deposition will not measurably affect water quality.

3. For the protection of water quality, Applicant shall implement the mitigation measures specified in Finding Number 6.

4. If the Applicant follows the proposals outlined in Finding Number 6, the project will not exceed water quality standards listed in Finding Number 5.

5. Staff and Applicant agree that no adjudication of these issues is required in the NOI.

d. Committee Findings and Conclusions on Water Quality

The Committee adopts the joint findings and conclusions on Water Quality proposed by the Staff and Applicant.

APPLICANT AND STAFF PROPOSED JOINT FINDINGS AND CONCLUSIONS SOCIO/ECONOMIC

Findings

1. The proposed power plant project will employ approximately 85 workers during the power plant's peak construction time, and have an average employment level of 40-50 workers during its 28 month construction period.

2. The previous operations in the Geysers area have established a resident labor force in the Sonoma-Lake County Area.

3. Both Lake and Sonoma Counties will have economic benefits from the construction and operation of the Geysers Unit 16 power plant, irrespective of the origin of the workers. These benefits reflect the additional economic activity generated in the two Counties as a result of the payrolls of the personnel involved in the Unit 16 project. Sonoma County will most likely receive the greater amount of these payroll effects.

4. Lake County will derive tax revenues from the proposed power plant and development of the Geysers Unit 16 steam field.

5. The passage of Proposition 13 and the legislation enacted for its implementation will effect the property tax revenues to be derived from construction and operation of Unit 16 and associated steamfield.

6. Direct and indirect costs to be borne by Sonoma and Lake County, as well as by the communities near the project as a result of Geysers 16 power plant construction and operation will be minimal.

7. The proposed power plant is located in an area whose principal land use is the exploration, development, and utilization of geothermal energy and which has numerous geothermal power plants in operation.

8. The Commission Committee has requested Lake County to provide comments and recommendations regarding the compatibility of the proposed project with local land use plans, goals and policies. No response has been received to date.

Conclusions

1. Due to the present resident labor force in the Sonoma-Lake County area, the proposed project will not cause a significant increase in the number of construction workers who may migrate to these areas in order to work at the Unit 16 power plant.

2. Payroll and income benefits generated by the construction of the proposed power plant will occur in Sonoma and Lake Counties. Sonoma County, because of the large proportion of geothermal related workers residing there, will likely receive the larger share of these income benefits.

3. Direct and indirect costs for Sonoma and Lake Counties as well as the local communities near to the project, as a result of PG&E's construction and operation of the power plant appear at this time to be less than the anticipated tax revenues associated with the project. Project tax revenues, derived from the construction and operation of the plant, as well as effects from construction payrolls appear to be of a sufficient magnitude to cause the economic benefits to exceed costs.

4. The proposed location of the facility is in an area that has numerous geothermal electrical generation facilities in operation. The proposal appears, therefore, to be compatible with the land use plans of Lake County.

5. Staff and Applicant agree that no adjudication of this issue will be necessary in either the NOI or AFC.

e. Committee Findings and Conclusions on Socio/Economic Issues

The Committee adopts the joint findings and conclusions on Socio/Economic Issues proposed by the Staff and Applicant

APPLICANT AND STAFF PROPOSED JOINT FINDINGS AND CONCLUSIONS HYDROLOGY AND WATER RESOURCES

Findings

1. The Applicant proposes to utilize condensed geothermal steam for the plant cooling water supply.

2. The total plant operating needs for fresh inland waters will be minimal and should total approximately one acre-foot of water per year.

3. The source for the necessary fresh water will be from either trucking water from existing water sources, utilization of the turbine building roof for collection of rain water or drilling of a water well nearby. In any event, the impacts on water resources would be minimal.

4. The plant site is located on a ridge line. As such, there is little surrounding water shed upon which to generate overland flows and there would be no possibility of flood from the nearest surface water (Bear Canyon Creek).

Conclusions

1. The construction and operation of the proposed plant would not adequately affect fresh water resources.*

2. The chances of the plant site being flooded by overland flow or from the nearest surface water (Bear Canyon Creek) is virtually non-existent.

3. Staff and Applicant agree that no adjudication of this issue in the NOI or AFC is necessary.

* The Committee suspects that the word "adequately" has been used here in error and the word "adversely" is intended. Clarification is requested of the Applicant and Staff.

f. Committee Findings and Conclusions on Hydrology and Water Resources

The Committee adopts the joint findings and conclusions on Hydrology and Water Resources proposed by the Staff and Applicant. Clarification is requested on Conclusion #1.

Soils

Summary of Testimony

At the Prehearing Conference on March 9, it was requested that Mr. Larry Patzkowski be made available on April 5 for cross-examination on the plant site issues of Soils and Geology.

Mr. Larry Patzkowski, an engineering geologist, testifying on the behalf of the Applicant, stated that the Findings and Conclusions of the Joint Prehearing Conference Statements in the area of soils are true and correct. He also stated that there is a moderate to high erosion potential. A number of mitigation measures which can adequately control erosion will be used. The Unit 16 site is an average site in terms of erosion hazards, and since mitigation measures have been adequate at the other Geysers sites, they can be expected to be successful at the Unit 16 site, too.

APPLICANT AND STAFF PROPOSED JOINT FINDINGS AND CONCLUSIONS SOILS

Findings

1. The soils in the vicinity of the site exhibit a moderate to high erosion potential and those at the proposed site are highly erosive.

2. The standards applicable to the steam field regarding soils which will be met are:

a. 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.

b. Lake County Planning Commission Resolution 76-30 "(Special Use Permit) Burmah Oil and Gas Company Castle Rock Springs", March 18, 1978.

3. The mitigation measures to be utilized for the power plant to control soil loss and erosion are as follows:

a. The temporary and permanent measures for the site and transmission lines outlined in the NOI at pages 156-160.

b. The measures for the offsite waste disposal site C included in the September, 1978 report, "Detailed Geotechnical Investigation, Geysers Power Plant Unit 16" by Harlan and Associates at page 54.

4. Lake County has issued a use permit (November 8, 1978) which requires Aminoil to implement the proposals by the engineering consultants in "Specifications for the Preparation for Drill Sites and Access Roads" in the Castle Rocks Spring EIR.

5. The Central Valley Regional Water Quality Control Board has issued a waste discharge permit requiring Aminoil to comply with the requirements contained in the Waste Discharge Requirements for Non-Sewerable Waste Disposal to Land-Disposal Site Design and Operation Information (January 1978).

Conclusions

1. The Applicant shall implement the mitigation measures outlined in Finding Number 3.

2. Pursuant to the Lake County and Central Valley Regional Water Quality Control Board permits, Aminoil will implement the measures specified in Findings Numbers 4 and 5.

3. If the mitigation measures in Findings Numbers 3, 4, and 5 are implemented, it appears that this project will comply with the applicable standards.

4. The Staff and Applicant agree that no adjudication of this issue is required in the NOI.

g. Committee Findings and Conclusions on Soils

The Committee adopts the joint findings and conclusions on Soils proposed by the Staff and Applicant.

APPLICANT AND STAFF PROPOSED JOINT FINDINGS AND CONCLUSIONS CIVIL ENGINEERING

Findings

1. The proposed power plant site is on a generally east-west trending ridge that slopes down easterly. A large active landslide is present on the south side of the ridge.

2. The construction of the power plant pad, encompassing about 3.5 acres, will require a 150 feet high cut slope at the west end of the site and a 40 feet high cut slope at the east end.

3. A large earth retaining structure is planned at the south edge of the site at the head of the landslide. The planned retaining wall will be about 400 feet long with a maximum height of 70 feet above bedrock and exposed height of about 45 feet. A retaining wall about 150 feet long and with a maximum height of 25 feet above bedrock is planned on the northeast part of the site.

4. Recommendations for cut and fill slopes are given in the September 1978 report by Harlan and Associates "Detailed Geotechnical Investigation Geysers Power Plant Unit 16." The measures are feasible and acceptable if conditions are substantially similar to those reported in the Harlan Report. Applicant has agreed to follow the recommendations in the Harlan Report for cut and fill slopes if conditions are substantially similar to those reported in the Harlan Report.

5. The type of retaining structures that will be used on the south and northeast sides of the site have not yet been selected. Current preferences by Applicant are a reinforced earth wall for the large structure on the south and a crib wall on the northeast.

6. Partial design criteria for the reinforced wall have been given.

7. Prior to or at the time of filing of the AFC Applicant will provide additional design criteria for the earth retaining structures at the site with special regard to seismic loads and a detailed description of the design methods and references to published documents containing applicable design methods for those structures.

8. About 450,000 cubic yards of excess materials will be generated by the site development.

9. The Big Injun Mine Site, located about 1,200 feet west of the plant site, has been proposed as the disposal site for the excess material. Applicant has agreed to follow the engineering recommendations for development of the disposal site set forth in the Harlan Report if conditions are substantially similar to those reported in the Harlan Report.

10. If the conditions at the fill site are substantially similar to those reported in the Harlan Report and if the recommendations for the fill site in the Harlan Report are implemented, the site is satisfactory for disposal of up to 500,000 cubic yards of spoil.

Conclusions

1. Applicant shall undertake the measures referred to in Findings Numbers 4 and 9 and provide the information specified in Finding Number 7.

2. With the implementation of the measures referred to in Findings Number 4 and 9 and subject to AFC evaluation, the unit is acceptable from a civil engineering standpoint.

3. No adjudication of this issue is necessary during the NOI.

h. Committee Findings and Conclusions on Civil Engineering

The Committee adopts the joint findings and conclusions on Civil Engineering proposed by the Staff and Applicant.

APPLICANT AND STAFF PROPOSED JOINT FINDINGS AND CONCLUSIONS NOISE

Findings

1. Lake County has adopted a noise element to its general plans. The intent of the Lake County noise element is to limit noise to 55 dBA L_{dn}. Certain construction activities, such as the movement of heavy equipment during daylight hours, are exempt from the noise standards. Lake County has issued a proposed draft noise ordinance. The date of adoption, content and form of the ordinance, are presently uncertain.

2. The state noise limits are established by CAL-OSHA 8 Cal. Admin. Code section 5095-5099 and Cal. Vehicle Code section 23130.

3. The federal standards are set by the Occupational Health and Safety Act of 1970 and are basically the same as CAL-OSHA standards.,(sic)

4. The ambient noise levels of the site and sensitive receptors are contained in the NOI at page 81 and Appendix I page 7-3.

5. The closest identified sensitive residential receptor to Unit 16 is Camp Verdant Vales, located 2700 feet northwest of the site. Based upon the estimated projected project operational noise level to this receptor, the sounds of operation should barely be audible to audible at this receptor from time to time. The projected operating noise levels would be less to the other identified sensitive receptors which are farther distant.

6. The frequency spectrun data are contained in Exhibit I page 7-1 of the NOI. Certain tonalities are expected to be discernable at the receptors when ambient noise levels are low, but are not considered to be a significant noise impact.

7. The following mitigations are to be implemented by the Applicant.

a. Path treatment will be installed on the exterior surfaces of the steam jet ejectors and will consist of 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 reduce noise propagating to the outside environment.

d. A sound-proof office space will be built on the turbine-generator floor inside the building.

e. PG&E's present purchase specifications for mechanical equipment encourages 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 installed and operated by the steam supplier.

8. The highest plant construction noises will be caused by large earth moving equipment. The noise associated with this equipment will be discernable to some of the closest receptors. However, it is proposed that the activity will be temporary in nature and performed during daylight hours.

9. PG&E will require its employees to comply with the requirements of CAL-OSHA for hearing conservation through administrative controls and/or the use of hearing protectors, wherever necessary.

10. The permissible noise levels and mitigation measures associated with the steam field are set forth in the Aminoil USA, Castle Rock Springs, Dillingham and Vought Leasehold use permit, issued October 13, 1978.

11. The Applicant has agreed to at or prior to the filing of the AFC, to submit copies of the studies referred by the Applicant which demonstrate that the power plant will emit 60 dBA at 500' and an analysis which shows the basis of the estimated barrier effects of the turbine-generator building.

12. The effects from the steam field development generally exceed plant construction and operation noise levels. The cumulative impacts of these two noise sources will not increase the impact on the receptors over the noise levels associated with the well development operation noise levels.

13. No further analysis of noise impacts from construction and operation of the power plant is anticipated.

Conclusions

1. Applicant shall undertake the noise impacts mitigation measures specified in Finding Number 7.

2. With the implementation of the noise impacts mitigation measures specified in Finding Number 7, the power plant noises during normal operations could be barely audible to audible to the closest receptor to the power plant site.

3. With the implementation of the noise impacts mitigation measures specified in Finding Number 7, power plant noises during normal operations will be in compliance with the Lake County noise standards and with the requirements of CAL-OSHA and with federal standards.

4. The permissible noise levels and mitigation measures for the steam field development are contained in the documents referred to in Finding Number 10.

5. Noises caused by construction of the power plant and related facilities will be discernable to some of the receptors closest to the power plant site but will be in compliance with Lake County noise standards and CAL-OSHA requirements and federal standards.

6. The Applicant shall limit the use of heavy earth moving equipment to daylight hours whenever possible. If the Applicant limits the use of earth moving equipment to daylight hours, the noises caused by plant construction will be tolerable to local receptors.

7. No adjudication of issues related to the impacts of noises caused by power plant construction and operation is anticipated during the NOI for Unit 16.

i. Committee Findings and Conclusions on Noise

The Committee adopts the findings and conclusions on Noise proposed by the Staff and Applicant.

The Staff is requested to clarify the relationship between the use permit issued on October 13, 1978 as described in Finding #10 and the use permit issued by Lake County on November 8, 1978 as described in Finding #4 on soils and the relationship of both permits to the Castle Rock Springs EIR.

V. SIZE OF THE GEYSERS GEOTHERMAL RESOURCE

A. Summary of the Testimony and Public Comments

In response to a Committee Order dated November 22, the Applicant, Staff, and NCPA presented witnesses on December 8, 1978, who testified to: (1) the size of the Geysers resource, (2) the restraints that might prevent its full development, and (3) the time requirements for the construction of generating plants to utilize the resource.

The first PG&E witness, Dr. Henry J. Ramey, Professor of Petroleum Engineering at Stanford University, has been retained since 1966 as a consultant to PG&E to assess the steam reserves for new units as they have been proposed for the Geysers area. His expertise as a petroleum reservoir engineer is within the realm of drilling and completing and producing steam wells. He has no connection with exploration efforts in the Geysers (transcript pp. 1088-90, 1100-03). In 1969, he was able to give PG&E a "rough" estimate that 2000 Mw of electric power capacity could be generated from an area of 23 square miles. This area was established by the drilling of steam productive wells and by information from shallow geothermal gradient wells drilled throughout this area (transcript pp. 1042-3). Although the perimeter of this 23 square mile area has changed somewhat, Dr. Ramey believes that his estimate of 2000 Mw is still reasonable for purposes of planning for future development. When more information became available as Geysers units were developed, Dr. Ramey redefined and enlarged the area he refers to as the "producing" area. However, since the steam-recovery factor, on the average, has declined since 1969, it is his testimony that the generating capacity has consequently remained at approximately 2000 Mw (transcript pp. 1079-80). The boundaries, which are necessarily

only approximations, are suggested by the drilling of dry wells; however, there are not enough dry holes to delineate a line all the way around the system, although there are sufficient dry wells to delineate a possible barrier on the western edge of the producing field (transcript pp. 1083-4, 1114-5). His current estimate is based in part on historical data accumulated on a pressure decline that resulted from production of steam from the Sulfur Bank and Happy Jack area of the field. It is possible to relate the pressure decline to a unit of steam produced, which, in turn, can indicate the quantity of steam that can be produced per acre of surface area. Assuming that steam production is on the same order of magnitude from other areas known to be productive (i.e., a producing life of 30 to 35 years), Dr. Ramey computes an eventual development of approximately 2000 Mw. He noted, however, that all available data deal only with the western portion of the producing field, and that the field as he defines it encompasses only a small portion of the Geysers-Calistoga KGRA. His assessment covers only the dry steam reserves. He has never attempted to assess the other geothermal resources at The Geysers field.

Dr. Ramey also testified that it is his belief that the steam is being supplied from a trapped liquid phase that is not being replenished to an appreciable degree, especially when compared to the mass of fluid being withdrawn from the system (transcript pp. 1082-3, 1120-1). It is his opinion that there may be several zones of steam that may or may not be interconnected (transcript pp. 1094-5). He expressed a strong belief that it would be astounding if the Geysers field is the only occurrence of dry steam resource in Northern California (transcript pp. 1134-7).

The Applicant's second witness, Mr. Carl Weinberg, Supervising Civil Engineer in PG&E's Siting Department presented testimony on several constraints

that might hinder the development of the resource potential in the Geysers-Calistoga KGRA. Although he listed several potential constraints, he believes only those pertaining to air quality, land use, and perhaps noise may prove to be restrictive. In his written testimony, Mr. Weinberg stated that air quality regulations would prohibit the construction of additional generating units beyond the level of approximately 2000 Mw production. On cross-examination, it was established that the emissions output per plant was not necessarily directly related to the 2000 Mw production. That is, with certain control technologies, emissions per unit could be reduced, and thus, in effect, the total megawatt production of the resource could be increased and still meet air quality regulations. Consequently, it may be possible to have a megawatt output of 2500 Mw, or maybe 3000 Mw, in the KGRA, before any air quality regulations would prohibit additional generating units.

The final PG&E witness, Mr. Bruce Williams, a Senior Civil Engineer in PG&E's Engineering Planning Department presented testimony that provided a unit-by-unit breakdown of the 2000 Mw estimate. All the units described were within Dr. Ramey's producing area, including units being proposed by the California Department of Water Resources and NCPA.

Staff's sole witness, Mr. David Hill, a Senior Engineering Geologist with the Energy Commission presented testimony that was, in essence, a literature survey. He cited several studies that provided different estimates, ranging from 2000 Mw to 5600 Mw, for the dry steam resource. He believed that a comparison of the individual studies would not be particularly meaningful as they are based on different planning periods, have different geographical boundaries, and may or may not incorporate restraints such as air quality. Mr.

Hill also mentioned that his attempts to contact individual developers did not produce much information, because the developers feel that such data is proprietary. In conclusion, Mr. Hill stated that it was his personal opinion that the Geysers-Calistoga KGRA contains more than 2000 Mw of electric generating capability, although he did not specify nor estimate how much total resource was in this region.

Mr. Charles Schnautz, Project Coordinator for two Northern California Power Agency (NCPA) geothermal proposals, appeared at the invitation of the Committee as an unsworn witness for NCPA. Through questioning by counsels for PG&E and Staff, it was established that NCPA is proposing to construct approximately 270 Mw of geothermal capacity.

Mr. Courtney Isselhardt, a Senior Exploration Geologist for Republic Geothermal, gave independent public comment on the field operations aspects of predicting resource size. Assuming the same type of reservoir and geologic conditions as The Geysers will be present on at least 5-6,000 acres of the 11,000 acre leasehold that his company is exploring near The Geysers in the area between Mount Konocti and Boggs Lake, Republic Geothermal hopes to produce 500-600 Mw from that acreage alone. Based on proprietary data and previous experience, Mr. Isselhardt feels this to be a conservative estimate (transcript pp. 1142-57).

In summation, the major points established at the hearing:

1. PG&E's 2000 Mw estimate rests solely on the dry steam resource of an area designated as a production area; this area, approximately three miles by ten miles, is only a small portion of what is known as the Geysers-Calistoga KGRA.

2. PG&E's figure of 2000 Mw is for a planning period of 20 years.

3. The 2000 Mw estimate does not attempt to evaluate any hot water or dry rock resources within the production area, nor does it attempt to estimate the dry steam resource and hot water resource outside the producing area but only within the Geysers-Calistoga KGRA.

4. While air quality and land use constraints may be a problem, it seems from a control technology viewpoint, that these problems can be ameliorated.

B. Committee Findings and Conclusions

The Committee concludes that for the purpose of transmission system planning, a range of 2000 to 3000 Mw should be assumed for total electric generating capacity at The Geysers using presently commercialized technology, i.e., exploitation of the dry steam resource. Given the conflicting testimony, the fact that much of the exploration data are propriety and the possibility of eventually exploiting other resources (e.g., hot water), it is not possible to state, at this time, the ultimate generating capacity which will be placed on line at The Geysers. Therefore, a flexible approach is required which will accommodate a range of possibilities.

VI. TRANSMISSION LINE ISSUES

A. Land Use

1. Annadel State Park

a. Introduction (Public Resources Code 25527)

The Applicant's "preferred" Geysers to Lakeville route includes a 1.4 mile portion which traverses Annadel State Park. The existing two circuit 230 kV Geysers to Lakeville transmission line crosses Annadel on a single line of lattice towers. PG&E proposes to consolidate the two new 230 kV circuits with the existing circuits on four circuit towers (of either lattice or tubular construction) using the existing right-of-way.

Section 25527 of the Public Resources Code provides (in part) that:

> The following areas of the state shall not be approved as a site for a facility unless the commission finds that such use is not inconsistent with the primary uses of such lands and that there will be no substantial adverse environmental effects and the approval of any public agency having ownership or control of such lands is obtained:
>
> (a) State, regional county and city parks; wilderness, scenic or natural reserves; areas for wildlife protection, recreation, historic preservation; or natural preservation areas in existence on the effective date of this division.

Public Resources Code Section 25119 defines "Site":

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

Public Resources Code Section 25110 defines "Facility":

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

With respect to the issue of conformance of the Applicant's proposal with the provisions of Public Resources Code 25527, it is the Committee's view that:

(1) Approval of the Director and/or the State Department of Parks and Recreation would have to be obtained; and,

(2) The Commission would have to make findings that the proposed use is not inconsistent with the primary uses of Annadel State Park and that there will be no substantial adverse environmental effects.

b. Evidentiary Requests

The Committee, in its Prehearing Conference Order dated March 13, 1979, made the following evidentiary requests:

o Mr. Russell Cahill, Director of the California State Department of Parks and Recreation was asked to present testimony on the following subjects:

(1) Does the Department of Parks and Recreation own or control Annadel State Park?

(2) If so, the date and circumstances under which such ownership or control was acquired.

(3) The existence of any PG&E transmission line and/or right-of-way at the time such ownership or control was acquired.

(4) Is Mr. Cahill empowered to give the approval specified under PRC 25527?

(5) If so, will Mr. Cahill and/or the Department of Parks and Recreation give approval under PRC 25527 for Annadel Park to be a site for a consolidated transmission line facility as contained in PG&E's proposed Lakeville transmission line. Would any specific mitigation measures be required in order to obtain such approval?

(6) Does Mr. Cahill believe that PG&E's proposed consolidated transmission line is not inconsistent with the primary uses of Annadel State Park?

o In addition, the Committee directed PG&E and the Commission Staff to present testimony on compliance with PRC 25527 and with the General Plans of Sonoma County and the City of Santa Rosa.

Testimony from Mr. Cahill, and from witnesses for the Applicant and Staff was heard on April 5, 1979.

The Prehearing Conference Order also invited testimony from other parties concerning conformity of the Applicant's proposal with PRC 25527 and the General Plans of Sonoma County and the City of Santa Rosa. Although Sonoma County/OPOA, the City of Santa Rosa, and Kenwood had indicated an intention to present such testimony, none was offered.

c. Summary of Testimony

(Annadel State Park witnesses testified on April 5, 1979.)

Mr. Russell Cahill is Director of the Department of Parks and Recreation for the State of California. The Department has control of the State Park System which includes Annadel State Park.

As to Public Resources Code Section 25527, Mr. Cahill testified that:

1) He is prepared to furnish the approval necessary to cross Annadel State Park with the planned transmission line.

2) The present line through Annadel State Park has a substantial adverse environmental effect on the park. The reconstruction and expansion of the present line will have an additional adverse environmental effect, however, that effect will not be substantial. In addition, he believes that of all the adverse environmental effects resulting from the location of a new transmission line, the proposed route through Annadel State Park will have less environmental impacts than the other alternatives (including Tulucay West, Tulucay East, Vaca-Dixon, and the Kenwood bypass).

3) The purpose of a state park generally includes the preservation of outstanding natural, scenic and cultural values and indigenous aquatic and terrestrial flora and fauna. The uses of Annadel State Park include picnicking, sightseeing, hiking, and horseback riding. In his opinion the proposed consolidated line through Annadel State Park is inconsistent with the purposes of the park but is not inconsistent with the primary uses of the park.

Mr. Charles E. Morrison is the Supervisory Title Representative for PG&E. He reviewed documents in PG&E's files and official Sonoma County records related to the acquisition of the present transmission line easement through Annadel State Park. He testified that PG&E acquired an easement in 1959 to install, maintain, and use a single line of towers across what is now Annadel

State Park. Mr. Morrison attached a copy of the easement to his testimony and testified that "the relevant portion of this document grants to PG&E":

> "... the right to erect, construct, reconstruct, replace, remove, maintain and use a single line of towers with such wires and cables as second party shall from time to time suspend therefrom ..."

The State of California acquired its ownership of the lands comprising Annadel State Park from 1971 to 1974 subject to PG&E's prior transmission line easement.

Ms. Peggy J. Gibbons is a Planning Analyst in the Land Department of PG&E.

She testified that the General Plans of Sonoma County and the City of Santa Rosa contain no policies related to Annadel State Park and in any case these General Plans do not apply to the Park.

As to PRC 25527, it was her opinion that the language "not inconsistent" with the primary uses (of Annadel State Park) implies an intent not to require absolute and total consistency. She gave this opinion as a planner, not as an attorney and was not familiar with the legislative history of this section. She also did not consider what the primary uses of the park were in reaching this opinion.

Mr. Neil Schmidt is employed by PG&E as an electrical engineer. He is responsible for the design of all the proposed overhead transmission lines.

He testified that there are presently eight double-circuit 230 kV transmission line towers located in Annadel State Park. PG&E originally proposed to consolidate the original and the new two-circuit 230 kV line on a four circuit

tubular tower structure. However, at the request of the California Department of Parks and Recreation, the Applicant has agreed to use a four circuit lattice tower structure for the proposed Annadel crossing. These towers will be placed in the same location as the present towers. The lattice towers would have two legs and eight feet with an average height of 120 to 125 feet. The lattice tower structure would have less visual impact and could be built without the large cranes required for tubular towers. The Applicant expressed a willingness to continue to cooperate with the State Parks Department in establishing additional measures to mitigate the adverse environmental effects of construction.

Mr. Schmidt further testified that the consolidated four-circuit tower (whether lattice or tubular) was preferable to a parallel line through Annadel State Park. This was true not only because a parallel line could not be constructed in the present 100 foot easement, but also because a parallel line would require removal of dense vegetation which would have a substantial adverse environmental effect.

Mr. Kreig S. Larson is an Associate Planner in the Environmental and Health Office of the California Energy Commission.

He testified that in his opinion the project would comply with PRC Section 25527.

He based his testimony in part on a docketed letter of February 14, 1979 from the Department of Parks and Recreation. He interpreted that letter to state that with proper mitigation the proposal will not cause substantial adverse environmental effects and therefore, approval could be given by the

Department. In addition, he was of the opinion that the transmission line would not be inconsistent with the primary uses of the park, such as biking, picnicking, fishing, and horseback riding. Mr. Larsen admitted that he was not a recreational use planner and his opinion was given as a lay person.

Mr. Larson was also of the opinion that neither the Sonoma County General Plan or the City of Santa Rosa General Plan was applicable to Annadel State Park because the park was beyond the jurisdiction of those local governments. However, he admitted under California law a General Plan is required to address planning issues beyond its current borders so long as those issues are within its sphere of influence.

2. Other Land Use Issues

a. Introduction

The Preliminary Report must contain findings and conclusions on the proposal's degree of conformity with applicable local, regional, state and federal standards, ordinances and laws. PRC 25512. The committee has stated that a General Plan is a local standard which must be considered under this section. Various parties have taken the position that one or more of the transmission corridor proposals before the committee (including some of the "Fulton alternatives") are not in conformity with the following: Sonoma County General Plan, Sonoma County zoning ordinances, Franz Valley Specific Plan, Santa Rosa General Plan, Santa Rosa zoning ordinances, Napa County General Plan, Napa County zoning ordinances, Napa County local ordinances. The Applicant asserts that all of its proposals are in conformity with all local ordinances and applicable General Plans.

b. Evidentiary Requests

The Committee requested the Applicant to present evidence on the degree of conformity of their transmission line proposals with applicable local ordinances and General Plans including a summary of mitigation measures necessary to bring their proposals into compliance. The following parties expressed an intention to present evidence on the lack of compliance of the proposals to local ordinances and/or General Plans: Sonoma County, Alpine/Franz Valley, Napa County.

c. Summary of Testimony

Mr. John A. McCullough is the Lands Department Project Coordinator for PG&E. He testified for PG&E on April 12, 1979 as follows:

o He has reviewed the four alternative transmission line proposals in the context of PG&E's route selection methodology. Based on this review, in his opinion, there are no identified issues which would preclude locating a 230 kV transmission in any of those proposed routes or corridors (including the Fulton alternatives).

o PG&E's four proposed alternative transmission line corridors are Geysers (Castle Rock Junction) to Lakeville, Tulucay West, Tulucay East and Vaca-Dixon. Each of these alternatives would interconnect at one of three alternative substations: Lakeville near Petaluma; Tulucay, near Napa; or Vaca-Dixon near Vacaville.

o PG&E's current route selection methodology is found on pages 4-1 to 4-29 of the SEI.

o Mr. McCullough cited three guidelines which encourage the paralleling of existing lines:

a) When selecting a transmission line route or corridor, paralleling existing lines should be considered. (Departments of Interior and Agriculture (DOI/DOA) "Environmental Criteria for Electrical Systems."

b) "Encourage consolidation of utilities into common utility corridors wherever practical." Sonoma County General Plan, Goals and Policies on Land Use, Gl.h.

c) "These existing lines might present opportunities for multiple line corridors." (PG&E Route Selection Methodology, page 4-4 of the SEI.

Mr. McCullough testified that these criteria should be used only as guides when applied to a specific circumstance.

He further testified as follows:

o Application of the suggested guidelines to multiple lines was done with the Lakeville proposal. Twenty-seven miles of the preferred route's total length of 38 miles are located in a common utility corridor.

o A common Fulton utility corridor is not practicable as compared to the eleven mile nonparallel section through the Franz and Alpine Valleys. The proposed Fulton alternatives are longer, more expensive and have a visual impact on more people than the preferred route.

o In 1972 the Fulton-Ignacio transmission line was constructed across the Valley of the Moon. Subsequently the residential area of Oakmont was developed adjacent to the preexisting right of way.

o Seven homes and the golf clubhouse are directly adjacent to the utility right of way; thirty-seven homes are adjacent to the golf course fairway occupying the right-of-way.

o Crossing Oakmont with a consolidated four circuit transmission line is more acceptable than: (1) undergrounding; and (2) a new nonparallel crossing of the Valley of the Moon.

o A parallel crossing of Annadel State Park is not acceptable because additional clearing of vegetation necessary for an added right of way would significantly adversely affect the park.

o The proposed consolidated four-circuit transmission line through Annadel is more acceptable than; (1) undergrounding; and (2) a new nonparallel crossing of the Valley of the moon.

o The consolidation of four-circuits through Annadel State Park is not inconsistent with the primary use of the area for park and recreation purposes.

o Approximately 45 homes are located within a 2,000 foot wide study corridor along the eleven-mile nonparallel Franz/Alpine Valley route. Approximately 350 homes are located within a 2,000 foot wide study corridor along the suggested Fulton parallel alternative.

o None of the Sonoma County General Plan Maps - "Unique Biotic Areas" map (Figure 9), "Critical Open Space" (Plate 2) or "Resources and undeveloped areas" (Plate 3) - identify any natural or unique biotic areas along the nonparallel Franz/Alpine Valley route.

o With appropriate construction techniques and environmental mitigation, there are no significant environmental impacts which will preclude the Franz/Alpine Valley areas as a capable corridor.

o The Cedars Rough area is being considered by the Bureau of Land Management (BLM) for a wilderness study area and as such would pose a constraint for specific transmission line route selection. However, the study corridor can be adjusted to allow an alignment that avoids the area.

o The Alpine/Franz Valley area already has a substantial number of access roads. PG&E's proposal would add a number of short segments that would total 5 1/2 miles of roads.

o In the northern sections of the Fulton Alternative the land is very similar to the Franz Valley; i.e., grazing, agricultural, watershed-type usage. Any adverse effects from a transmission line would be similar in those two areas.

o The visual effects of the transmission line in the Fulton area could be mitigated by consolidation.

o The nonparallel route has more opportunity for visual mitigation than the Fulton parallel alternative. Because of the terrain and existing vegetation the towers could be placed to minimize the visual impact. In the Fulton area, because of the density of population around Larkfield and Wikiup, the openness of the area, and the existance of additional lines, it would be more difficult to mitigate the visual effects.

o Benefits of paralleling a line only occur if use can be made of the existing impacts to the environment without substantially increasing those impacts.

o The Lakeville corridor will probably affect the greatest number of people of the four proposed corridors.

o Sugar Loaf Ridge State Park is within the Tulucay West corridor. However, a route would be placed that avoids the park. Sugar Loaf is treated differently from Annadel because there is no existing transmission line there.

o The adoption of the Franz Valley Specific Study by the Sonoma County Board of Supervisors does not preclude the placing of a transmission line in the Franz/Alpine Valley.

Mr. Richard B. Maxwell has been the attorney for Oakmont Builders, Inc, the developers of Oakmont, since 1962. Prior to that he was City Attorney for the City of Santa Rosa. Mr. Maxwell was a committee witness and testified on April 12, 1979 as follows:

- o The Oakmont property was acquired by Mr. and Mrs. H.N. Berger in 1962. In 1963, it was annexed to the City of Santa Rosa, and the planned community zoning for Oakmont was established.

- o The existing 100 foot wide utility easement was in existence when the property was acquired. The present owners had not anticipated that the existing transmission line would be expanded. However, Mr. Maxwell could not express a legal opinion that the order of condemnation establishing the utility easement placed any restriction on expansion of the line.

- o The Oakmont development consists of approximatly 1,275 acres. 1,715 residential units with approximately 2,800 residents have been constructed. Over the next six to ten years, an additional 1,000 residential units will be built.

- o A number of the existing residential units have been built adjacent to the present utility easement. A number of the proposed residential units will be constructed adjacent to the present utility easement.

Ms. Peggy Gibbons is a Planning Analyst in the Land Department of PG&E. She testified for PG&E on April 13, 1979 as follows:

o She has reviewed the general plans and zoning ordinances of Lake, Solano, Napa, and Sonoma Counties and the City of Santa Rosa. The preferred route and alternative corridors are all consistent with the various General Plans and are compatible with the zoning ordinances.

o General Plans constitute guidelines by which site specific decisions may be made.

o The Tulucay East and Vaca-Dixon proposal will comply with the General Plan and Zoning ordinances of Lake County. This has not been disputed by Lake County or any party.

o The Tulucay East and Vaca-Dixon proposals will comply with the General Plan and Zoning ordinances of Solano County. This has not been disputed by Solano County or any party. However, the Solano County Planning Department has expressed a preference for the Lakeville route.

o Napa County contends that the Tulucay West, Tulucay East and Vaca-Dixon proposals are in conflict with the seismic safety element of their General Plan. Napa County has expressed a preference for the Lakeville Route.* This witness is of the opinion that the General Plan does not preclude construction of the proposed transmission line, but does require a geologic/seismic report showing the line is consistent with public safety. The witness testified that for reasons of reliability as well as safety, towers will be located so as to avoid, where possible, areas of known or potential geologic hazard, and that where such areas cannot be avoided, construction methods and/or materials have been prescribed to

*Letter, November 8, 1978 from J. Hickey, Director, Conservation Development and Planning Department to Commissioner Pasternak.

maintain the safety and reliability of the line. Ms. Gibbons cited the testimony of PG&E witnesses H. Goldman and B. Bolt (geotechnical), G. Lenfesty (structural engineering), and J. Walsh (construction practices) to support her conclusion that the combination of mitigation and avoidance will allow towers to be placed in Napa County. Where required, site-specific mitigation measures will be prescribed and implemented to ensure utility placement consistent with public safety.

o Sonoma County, through various resolutions passed by its Board of Supervisors, contends that the proposed Lakeville and Tulucay-West routes are inconsistent with the County General Plan.

o Sonoma County has found a Planning Commission Staff Proposal to be consistent with the General Plan. This proposal would add 44 million dollars to the cost of the preferred route, and includes routing the line through the Fulton substation with undergrounding and consolidation in the vicinity of the Fulton substation and undergrounding through the Valley of the Moon and the Oakmont Community.

o The Sonoma County General Plan under its general goal on Land Use contains several policies relating to utilities. None of these policies precludes the siting of the Lakeville or Tulucay West routes.

o One of the policies of the Sonoma County General Plan is to encourage consolidation of utilities into common utility corridors wherever practicable. The witness cited testimony of other PG&E witnesses to support her conclusion that the Fulton alternative is not practicable because:

1. Direction: Fulton Substation is out of the way and is not a point of electrical interconnection.

2. Line length: Paralleling through the Fulton area would increase the line length by approximately 5.6 miles compared to the preferred route.

3. Line losses: Greater than the Applicant's preferred route.

4. Cost: More expensive than the Applicant's preferred route.

5. Human effects: More persons will be affected by rerouting through the Fulton area than along the Applicant's preferred route through Franz Valley.

6. Construction Activities: The Fulton area, with greater population, will be more affected than would the Franz Valley area.

o The City Counsel of the City of Santa Rosa contends that the Lakeville proposal is inconsistent with its General Plan.

o The witness has reviewed those portions of the Santa Rosa General Plan which are relevant to the Lakeville proposal. In her opinion, the Lakeville proposal is consistent with those relevant elements and policies of the Santa Rosa General Plan.

o Napa County zoning ordinances allow the construction of electrical transmission lines upon the granting of a use permit. Napa County contends that this use permit requirement has not been preempted by the Warren-Alquist Act. Ms. Gibbons assumed that this use permit requirement has been preempted in reaching her conclusion that the proposed Tulucay and Vaca-Dixon lines are compatible with Napa County zoning ordinances. However, she also was of the opinion that since transmission lines are an allowable

use they are compatible with the Napa County zone ordinances even if a use permit were required.

o Sonoma County Zoning Ordinances permit electric transmission lines in all districts without requiring a use permit.

o Zoning ordinances of Santa Rosa require a use permit for electric transmission lines. There is nothing in these ordinances to prohibit the development of the Lakeville line as proposed.

o There are three categories of uses under local zoning ordinances. (1) Allowed by right (2) Allowed with a use permit (3) Not allowed (prohibited).

o The fundamental principle concerning a use permit is that the use may be appropriate depending on the kinds of conditions agreed to between the jurisdiction and the Applicant or imposed by the jurisdiction.

o Most general plans contain conflicting goals and policies. A local jurisdiction, in the furtherance of its general plan, must decide how to resolve these conflicts on a case-by-case basis.

o In Ms. Gibbons' opinion, the use of land for a transmission line is compatible with the use of adjacent land for residential land use.

o The best example of a land use that is inconsistent with a transmission line is a use that creates an actual or potential hazard.

o Under the Franz Valley Specific Plan, Scenic Qualities, it states "Except within geothermal permit area, any new transmission facilities should parallel existing lines where possible."* In Ms. Gibbons' opinion, practicable could be substituted for possible in that sentence.

Mr. James H. Hickey is Director of the Napa County Planning Department. He testified for Napa County on April 13, 1979.

o The proposed Tulucay West, Tulucay East and Vaca-Dixon transmission lines are inconsistent with relevant portions of the Napa County General Plan elements, Napa Valley area plans and relevant county ordinances.

o Mr. Hickey listed the following specific sections of the Napa County General Plan, Napa Valley Area Plan, and local ordinances with which PG&E's proposed alternative transmission corridors are inconsistent:

1. Napa County General Plan: Seismic Safety Element Policies: Requirement for a Geologic/Seismic Report: Inasmuch as many miles of the Tulucay and Vaca-Dixon routes are landslide areas, and many more miles are composed of soils which are prone to slumping and landsliding, a geologic/seismic report should be prepared before a corridor is selected. Failure to prepare such a report is inconsistent with the Napa County General Plan.

2. Napa County General Plan: Land Use Element Policies: Ecologically Sensitive Areas, and Limited Development Areas: Since most of the land traversed by the Tulucay and Vaca-Dixon are "Ecologically

*Note: This language was revised in the final Franz Valley Specific Plan.

Sensitive" areas designed for "Limited Development," it is contrary to the Napa County General Plan to approve corridors in these locations.

3. Napa County General Plan: Land Use Element: Water Supply Protection: Since access roads would affect the ratio of rainfall runoff/percolation and increase the amount of siltation in streams, approval of a new corridor which would require extensive road building and vegetation removal would depart from the Napa County General Plan. Tulucay-West would have the greatest impact in this regard.

4. Napa County General Plan: Land Use Element: Scenic Transportation Routes: Construction of either the Vaca-Dixon or Tulucay routes would degrade the visual scenic quality of Napa County. The destruction of the visual beauty of Napa Valley with a major electrical transmission line would be inconsistent with the Napa County General Plan.

5. Napa County General Plan: Conservation and Open Space Element Policies: Fisheries Habitat Conservation: Construction of access/maintenance roads and vegetation removal in hilly areas would increase the rate of rainfall runoff, and consequently increase erosion and sedimentation in the Napa River and Lake Berryessa watersheds, thus harming fisheries habitat and contradicting the Napa County General Plan.

6. Napa County General Plan: Conservation and Open Space Element Policies: Open Space Lands for Public Health and Safety Conservation: The potential for massive erosion which would be presented by construction/maintenance roads and vegetation removal for the Vaca-Dixon and Tulucay corridors is contrary to the Napa County General Plan.

The construction of Tulucay West also could increase the potential for flooding in the City of Napa to the extent that sedimentation occurs in Redwood Creek and the rate of rainfall runoff is increased.

7. Napa County General Plan: Conservation and Open Space Element Policies: Scenic Areas of Outstanding Value Conservation: Creation of any of the Tulucay or Vaca-Dixon routes would tend to destroy visual quality of the landscape and would thus be inconsistent with the General Plan.

8. Napa Valley Area Plan: General Guidelines: Requires retention of trees and other vegetation. Construction of construction/maintenance roads and vegetation clearing for the proposed lines would be contradictory to this policy.

9. Napa Valley Area Plan: Geological Policy Guidelines: Trees should not be removed from slopes exceeding 15 percent since this action could render these areas unstable. Vegetation clearing for any of the proposed corridors would require removal of hundreds of acres of trees on slopes greater than 15 percent in total contradiction of this policy.

10. Napa Valley Area Plan: Areas Presenting High Fire Risk: Inasmuch as construction/maintenance roads would make vast areas of the County more accessible, particularly to ORV (Off Road Vehicle) drivers, the creation of a new transmission line in any of the alternative corridors will increase the probability of wild fires in the County.

11. Napa County Zoning Ordinances: Use Permit: Whether or not the Commission has exclusive siting authority, it is impossible to put a

transmission line in Napa County in compliance with existing standards unless the use permit requirements of Napa County zoning ordinances are recognized.

12. Watercourse Obstruction/Riparian Cover Ordinance: Creeks are protected by Ordinance #477. Each of the alternatives crosses creeks protected by this ordinance.

o Visual impacts on the Napa Valley of the Tulucay East and Vaca-Dixon routes would be minor.

o There would be a visual impact on the Lake Berryessa recreational area and the Cedars Rough area by the Tulucay East or Vaca-Dixon line.

o Even if PG&E was able to mitigate all of the impacts of the proposed line the county might deny a use permit. The Board of Supervisors has discretion to deny a use permit.

o There is no specific mention of transmission lines in the Land Use Element of the Napa County General Plan.

o In the absence of a specific alignment, he could not say if a proposal would be consistent with the goals and policies identified in his testimony. However, any of the proposed corridors would have some impact on agricultural lands; the specific mitigation would depend on the alignment.

Mr. William Larramendy is Area Manager for the Clear Lake Resource Area, Bureau of Land Management (BLM), which includes the Cedar Roughs Area. On April 16, 1979, Mr. Larramendy appeared on behalf of Mr. Edwin G. Katlas, Acting District Manager for BLM and presented a letter to the Presiding Member from

Mr. Katlas dated April 6, 1979. Mr. Larramendy adopted the letter from Katlas as his own testimony.

o The Federal Land Policy and Management Act of 1976 requires the BLM to inventory all roadless area of 5,000 acres or more for their wilderness characteristics.

o The Cedar Roughs area has 5,800 acres. It is currently being inventoried under this Act.

o An interim management policy based on the Act, and on draft regulations precludes the construction of permanent facilities including transmission lines in a potential Wilderness Study Area (WSA), such as Cedar Roughs.

o A decision will be made by the BLM by December 1979 as to whether Cedar Roughs should be designated as a Wilderness Study Area. If it is not so designated, it will be released from interim wilderness management restrictions. If it is so designated, the restrictions will remain until Congress acts on the recommendations of the BLM and the President.

o The area that has been designated by PG&E as the Cedar Roughs Natural Area (Figure 6-3, SEI, #32-H) is generally the same as the Cedar Roughs area that is being considered as a wilderness study area.

o If PG&E's proposed Vaca-Dixon or Tulucay East route bypassed Cedar Roughs but was close enough to affect the area, then the BLM might oppose such an alignment. This could be true whether or not the bypass traversed other BLM lands.

o The Lakeville route is the only one that does not cross BLM lands.

o The BLM has received 22 million dollars from geothermal leases in the KGRA.

Mr. Kreig Larson is an Associate Planner in the Environmental and Health Office of the California Energy Commission. He testified on behalf of the Energy Commission Staff on April 18 and 20, 1979.

o It was his opinion that except for the proposed Franz Valley Specific Plan, the proposed transmission corridors are all consistent with the adopted land use and related elements of the General Plans of Napa, Lake, Sonoma, and Solano Counties and the City of Santa Rosa.

o Mr. Larson testified that the 11-mile nonparallel crossing of the Franz/Alpine Valley was inconsistent with the proposed Franz Valley Specific Plan.

o On April 17, 1979, the Sonoma County Board of Supervisors adopted the Franz Valley Specific Plan. However, the sentence stating "Oppose any new transmission routes through the study area" was changed to "Except within the geothermal permit area, any new transmission facilities should parallel existing routes and should be designed to minimize visual and community impacts."

Based on this change in language, Mr. Larson was no longer prepared to say that the 11-mile nonparallel crossing of the Franz/Alpine Valley is inconsistent with the Specific Plan. His preliminary opinion was that it was consistent with that plan. This opinion was based on the change from

"oppose" which he viewed as mandatory to "should" which he viewed as permissive.

o A routing through the Fulton area which utilized existing corridors would be consistent with the General Plan.

o He felt that the Sonoma County Board of Supervisors had determined that the Sonoma County Planning Commission Staff Fulton Proposal (which required a combination of consolidation and undergrounding) was the only proposal that would be consistent with the Sonoma County General Plan. He disagreed that undergrounding is required in urban areas to make the proposal consistent with the Sonoma County General Plan.

o He disagreed with the City of Santa Rosa contention that the Applicant's proposal to build a consolidated transmission line through the planned community of Oakmont was inconsistent with the Santa Rosa/2000 General Plan. Nothing in that Plan explicitly required undergrounding through Oakmont.

o The Sonoma County Zoning Ordinances allow transmission lines in any district.

o Napa County contends that the Tulucay West, Tulucay East and Vaca-Dixon proposals are all inconsistent with the Seismic, Land Use and Open Space/Conservation elements of its General Plan. Mr. Larson has reviewed the Land Use and Open Space/Conservation elements of the Napa County General Plan and has found no specific prohibition of the proposed transmission lines.

o Napa County Zoning Ordinances list transmission lines as allowable uses in any district with the granting of a Conditional Use Permit. PRC 25500 provides that such permits are not required therefore the proposals are consistent with Napa County Zoning Ordinances.

o Solano County has indicated an objection to the Vaca-Dixon and Tulucay East corridors. However, the County has not contended that the proposals are inconsistent with its General Plan or zoning ordinances.

o Relative Ranking of Alternatives:

1. Lakeville (assuming the Franz Valley is avoided)
2. Tulucay West (assuming the Franz Valley is avoided)
3. Vaca-Dixon
4. Tulucay East

However, with the adoption of the modified Franz Valley Specific Plan, Mr. Larson was tentatively prepared to strike the parenthetical phrases listed above.

o It is not necessary to have an explicit prohibition in order for a proposal to be inconsistent with a general plan.

o Transmission lines are consistent with urban land use (in harmony, in agreement with).

o There could be land use difficulties in paralleling the existing Fulton route; i.e., the existing route is very close to some schools in the Lakeville/Wikiup area.

Mr. Toby Arthur Ross is the Senior Planner in charge of Comprehensive Planning for the Sonoma County Community and Environmental Services Department. His testimony on behalf of Sonoma County was presented on April 18 and 20, 1979.

o Two Sonoma Board of Supervisors Resolutions were attached as part of Mr. Ross's testimony.

1. Resolution No. 63494 (April 3, 1979)

o Reaffirms Resolution No. 63138 of February 20, 1979 finding that the Sonoma County Planning Commission staff's alternative transmission line proposal of December 12, 1978 is consistent with the Sonoma County General Plan.

o The Planning Commission's staff proposal would parallel existing 230 kV facilities and would underground lines (both proposed and existing) through the Larkfield-Wikiup area, across the Valley of the Moon and through Oakmont, as well as consolidate lines in several sensitive areas.

o Finds that the Planning Commission staff proposal is the only suggested Lakeville alternative which is consistent with the Sonoma County General Plan.

o Finds the Vaca-Dixon Corridor to be the most reasonable in light of the long-range potential development at the Geysers.

2. Resolution No. 63496 (April 4, 1979)

o Finds the nonparallel sections of PG&E's proposed transmission line through the Franz Valley Study Area and overhead line across the Valley of the Moon inconsistent with the Sonoma County General Plan.

o As to Annadel State Park, Mr. Ross testified as follows:

*In his opinion the proposed consolidated line through Annadel is inconsistent with the Sonoma County General Plan and with the purpose and primary uses of Annadel State Park.

*However, the Sonoma County Board of Supervisors Resolutions do not find that the proposal through Annadel is inconsistent with the General Plan. In Resolution No. 63494 the Board of Supervisors has recommended undergrounding the proposed and existing lines through Oakmont. Mr. Ross admitted that a necessary result of that undergrounding is that the transmission lines traverse Annadel by means of an overhead line.

Mr. Ross further testified that a proposal which furthers the policies of the General Plan is consistent, one which does not is inconsistent. However, the Plan contains many policies. If one policy is given priority over another, it could result in a different decision than if the priorities are reversed.

o One of the policies of the General Plan is to:

*"Oppose the routing of major transmission lines through public recreation and scenic areas if not consistent with the plan for

utility services adopted by the Board of Supervisors." The Sonoma County Board of Supervisors has not adopted a plan for utility services. This means that new transmission lines should not be built through public recreation and scenic areas until such a plan is adopted.

o One of the Policies of the Sonoma County General Plan is to:

*"Encourage consolidation of utilities into common utility corridors wherever practicable."

The Board of Supervisors is attempting to implement this policy by encouraging a use of a common utility corridor for the Lakeville proposal.

o The existing line to Fulton was constructed prior to the adoption of the Sonoma County General Plan. It contains examples of poor land use planning. Mitigation measures could be developed to upgrade the existing line.

o The Franz Valley Specific Study concludes that new transmission routes are not consistent with the long-term preservation of open space in the Franz Valley Study area. The rationale is that the unique characteristics of this area should be permanently designated and protected as open space. Transmission lines would be inconsistent with this designation.

o The alternative that the Sonoma County Board of Supervisors has found to be consistent with the Sonoma County Plan in the Fulton Area has been designated as plan 3C. The incremental cost of this

Fulton mitigation is $33 million. All of the other Fulton alternatives in Exhibit E of Neil Schmidt's testimony have been found to be inconsistent with the Sonoma County General Plan.

o In the Franz Valley Specific Plan, adopted April 17, 1979, the language on page 11, "Oppose any new transmission routes through the study area." was changed to "Except within the geothermal permit area, any new transmission facilities should parallel existing routes and should be designed to minimize visual and community impacts."

o There were two reasons for that change:

1. The continued development of geothermal resources in the Geysers area would be impossible if new routes were completely precluded.

2. To clarify the reasons for opposing new routes; visual and community impacts.

o The use of "should parallel" above means that the policy is not mandatory. It is consistent with encouraging paralleling lines where practicable, and must be applied on a case-by-case basis. In the case of the Lakeville proposal, the Sonoma County Board of Supervisors has determined that the route must use the existing Fulton utility corridor rather than traverse the Franz/Alpine Valley in a nonparallel crossing to be consistent with the Sonoma County General Plan. A portion of the existing line is also in the Franz Valley Study Area.

o There are no specific policies in the Sonoma County General Plan that require undergrounding of transmission lines. It was the judgment of the Board of Supervisors that undergrounding was the best mitigation measure in the Larkfield-Wikiup area because of its designation in the General Plan for eventual urban status.

o If a proposal is not in conformity with the General Plan, it can be disallowed even if it conforms to zoning regulations.

o Mr. Ross testified that one of the policies of the General Plan is to:

> "Encourage multiple use of utility-owned rights of way for riding and hiking trails, pedestrian ways, landscaped greenways, park areas and wildlife preserves."

This section recognizes the fact that utility corridors can in some situations exist with dissimilar uses.

o There is nothing in the Sonoma County ordinance that specifically prohibits transmission lines.

o In Resolution 62191 (Oct. 24, 1978) the Sonoma County Board of Supervisors declared the Lakeville proposal to be in confict with the Sonoma County General Plan.

o In Sonoma County, a Specific Plan, such as the Franz Valley Specific Plan is used to implement the General Plan and make more detailed those components of the General Plan that are relevant to an area.

o The determination of practibility of using existing corridors would involve consideration of the line length, cost, population density, environmental suitability, compatibility with open space concerns, and other factors.

o The Energy Commission cannot overrule a finding by the County that a proposal is inconsistent with its General Plan, although it may in certain cases override a County's decision.

o Fulton Proposal 2f was developed by the Commission Staff at the request of the Committee. It involves consolidation in the Fulton area but no undergrounding. While it is similar to proposals that have been found to be inconsistent with the General Plan, the witness does not have an opinion at this time as to whether 2f is consistent or inconsistent with the Sonoma County General Plan.

o The northern section of the existing Fulton L crosses scenic areas as designated in the General Plan (see Plate 2 "Critical Open Space" of Sonoma County General Plan). The proposed non-parallel line through Franz Valley does not cross any scenic areas designated in the General Plan. The nonparallel line does cross through critical open space areas as designated in the Franz Valley Specific Study.

o When the term paralleling is used, there is no determination as to whether the specific tower sites will actually be in tandem or be staggered. In fact, it was his understanding that in some areas on the Fulton line, the towers would be different heights and not adjacent to one another.

Mr. Robert Panzer is an attorney and President of OPOA. He testified for OPOA on April 21, 1979.

o The provisions of PG&E's utility easement granted by order of condemnation allows reconstruction of the present lines through Oakmont but not a replacement.

o There is nothing in the order of condemnation which specifically disallows a replacement of the present tower in Oakmont with larger towers.

o If the owners of the Oakmont property were to bring an action against PG&E for an excessive burden caused by the proposed consolidated lines, the court could award money damages or require PG&E to condemn additional right-of-way. If PG&E had additional right-of-way condemned, they would be required to pay a sum of money to the owners of the property.

3. Committee Findings and Conclusions

Annadel State Park and Other Land Use Issues

The Committee's Findings and Conclusions on Annadel State Park and Other Land Use Issues are found on the following pages:

FINDINGS AND CONCLUSIONS
LAND USE

a. Annadel State Park

Findings

1. Annadel State Park is presently traversed by a two-circuit 230 kV transmission line.

2. The existing transmission line in Annadel State Park was constructed prior to the time that the State Department of Parks and Recreation acquired that land for the State Park system.

3. At present the Annadel State Park is part of the State Park system and is managed by the State Department of Parks and Recreation.

4. Under PG&E's preferred Lakeville proposal the present two-circuit 230 kV line through Annadel State Park would be consolidated with the new 230 kV line into one four-circuit transmission line.

5. The proposed consolidated line through Annadel would use eight two-legged, eight-footed lattice towers which would be in the same locations as the present towers.

6. Russel Cahill is the Director of the State Department of Parks and Recreation.

7. Mr Cahill has the authority to give approval, under PRC 25527, for the consolidated transmission line to traverse Annadel State Park.

8. Mr Cahill has given his approval, under PRC 25527, for the consolidated transmission line to traverse Annadel State Park.

9. The primary uses of Annadel State Park are horseback riding, sightseeing hiking and picnicking. The present 230 kV transmission line in the Park is not preventing these uses from occurring.

10. The proposed consolidated four-circuit 230 kV transmission line will not be inconsistent with the primary uses of the Park.

11. The Sonoma County Board of Supervisors has not opposed the consolidated route through Annadel. The resolution calling for undergrounding through Oakmont would necessarily result in traversing Annadel by overhead lines.

12. The Sonoma County Board of Supervisors has found the Kenwood alternative to be inconsistent with the Sonoma County Plan.

13. The Kenwood alternative would have a greater adverse environmental impact then the proposed consolidated crossing of Annadel.

14. The consolidated crossing of Annadel would have less adverse environmental impact then all of the alternatives that have been considered.

15. With proper mitigation measures there will be no substantial adverse environmental effects caused by consolidating the present two-circuit 230 kV transmission line in Annadel State Park with the proposed two-circuit 230 kV transmission line.

16. No substantial evidence was presented to support the contention that the proposed consolidated line through Annadel would be inconsistent with the General Plans of the County of Sonoma or the City of Santa Rosa.

Conclusions

1. At this time it appears that the proposed four-circuit consolidated 230 kV transmission line through Annadel State Park will be in compliance with PRC 25527 in that:

a. The proposal is not inconsistent with the primary uses of the Park lands.

b. With proper construction techniques and mitigation measures the consolidation will not cause substantial adverse environmental effects.

c. The proposal has the approval of the public agency (State Department of Parks and Recreation) that owns and controls the Park.

2. At the time of the filing of the AFC the Applicant will file a detailed plan for the construction and operation of the consolidated line through Annadel State Park. The plan shall include all mitigation measures necessary to insure that the construction and operation of the consolidated line shall cause no substantial adverse environmental effects. The Applicant shall cooperate with the State Department of Parks and Recreation in developing this plan.

3. The Committee is not convinced that the Sonoma County General Plan and City of Santa Rosa General Plan are applicable to Annadel State Park. If they are the proposed consolidated transmission line is consistent with those Plans.

4. Kenwood is not a viable or reasonable alternative to the proposed consolidated transmission line in Annadel State Park. The Kenwood alternative should be given no further consideration.

b. Land Use

Findings

1. The Applicant has proposed a preferred transmission line route and three alternative transmission line corridors to transmit additional power from The Geysers. They are:

a. Route A - Lakeville: This route is 38 miles long, of which 11 miles do not parallel existing right-of-way. It terminates near Petaluma in Sonoma County. It traverses only Sonoma County.

b. Route B - Tulucay-West: This route is 51 miles in length, 35 miles are non-parallel. It terminates near the City of Napa, in Napa County. It traverses Sonoma and Napa County.

c. Corridor C - Tulucay-East: This corridor is 61 miles in length all of it non-parallel. It also terminates near the City of Napa, in Napa County. It traverses Sonoma, Lake and Napa County.

d. Corridor D - Vaca-Dixon: This corridor is 54 miles in length, 50 of which are non-parallel. It terminates in Solano County near Vacaville. It traverses Sonoma, Lake, Napa and Solano Counties.

2. The Committee has also considered a series of variations of the Lakeville/Tulucay-West route known as the Fulton alternative. These variations are described in detail in Exhibit E, of PG&E witness Neil Schmidt's testimony. All of these variations would eliminate the 11 mile nonparallel section through the Alpine/Franz Valleys. Variations 4a and 4b would require new nonparallel sections. The other variations (2a, 2b, 2c, 2d, 2e, 3a, 3b, 3c, 5a, 5b) would all parallel the existing Fulton transmission line and do not require any new utility corridors. The committee has also considered variation 2f described in the testimony of Mr. Allen Jones. All of these variations, with the exceptions of 4b, would require various combinations of consolidation with existing line(s) and/or undergrounding of the proposed (and in some cases existing) line(s).

3. The incremental costs of these Fulton variations (above the cost of the 11 mile nonparallel line) delineated in Exhibit E of Neil Schmidt's testimony range from $3 to $33 million. These cost estimates are found to be reasonable for planning purposes. However, the undergrounding cost estimates might be conservatively low according to the testimony of PUC witness Julian Ajello.

4. The Sonoma County Board of Supervisors has taken the following positions:

a. Sonoma County opposes the construction of the Lakeville transmission line. It maintains that the Vaca-Dixon line is preferable.

b. If the Lakeville transmission line is constructed it opposes the 11 mile nonparallel route through the Franz/Alpine Valleys.

c. If the Lakeville transmission line is constructed it argues the line should parallel the existing Fulton line.

d. The only Fulton variation in Exhibit E of Neil Schmidt's testimony that is in conformity with the Sonoma County General Plan is 3c. 3c would parallel existing 230 kV facilities and would underground lines (both proposed and existing) through the Larkfield-Wikiup area. Across the Valley of the Moon and through Oakmont, as well as consolidating lines in several sensitive areas. All the other variations are not in conformity with the Sonoma County General Plan. There may be other variations which would be in conformity with the Sonoma County General Plan.

e. Sonoma County has not yet taken a position on Fulton variation 2f.

5. The Sonoma County General Plan contains the following language:

> "Encourage consolidation of utilities into common utility corridors whenever practicable."

The Franz Valley Specific Plan contains the following language:

> "Except within the geothermal permit area, any new transmission facilities should parallel existing routes and should be designed to minimize visual and community impacts"

The Committee finds this language is not mandatory, but discretionary.

6. The incremental cost of Fulton variation 3c is $33 million.

7. The present Fulton line was constructed prior to the adoption of the Sonoma County General Plan.

8. The present Fulton line contains many examples of poor planning, poor construction techniques and insensitivity to the environment.

9. Because of the present placement of towers on the Fulton line in many cases it will not be possible to place the towers on a new line at the same height or abreast of the present towers. Therefore, the height and spacing of the new towers may be staggered.

10. Construction of the 11 mile nonparallel section will require the construction of approximately five and one-half miles of new access roads. The construction of a Fulton variation will also require construction of new access roads, but the total length is uncertain. The number of transmission lines in the Larkfield-Wikiup area is approaching the level of visual saturation.

11. The present Fulton line and any new Fulton variation will pass through critical open space scenic areas as defined by the Sonoma County General Plan. (Critical Open Space Map - Plate 2)

12. The proposed 11 mile nonparallel route does not pass through critical open space areas as defined by the Sonoma County General Plan. (Critical Open Space Map - Plate 2)

13. The Sonoma County Board of Supervisors has taken the position that no transmission line should be constructed through a critical open space scenic area until a plan for utility services has been adopted by the Board.

14. The County of Sonoma and the City of Santa Rosa assert that the Applicant's proposal to consolidate the new transmission line with the existing 230 kV transmission line to traverse the community of Oakmont with a four

circuit line, is not consistent with their respective General Plans. They argue that undergrounding of the proposed and/or existing line is necessary to make the Lakeville proposal conform with their General Plans.

15. Neither the Sonoma County General Plan nor the City of Santa Rosa General Plan contain any policies that specifically require undergrounding in the Fulton or Oakmont areas.

16. The cost of undergrounding in the Oakmont area as set out in detail in Exhibit F, to PG&E witness Neil Schmidt's testimony is from 2 to 23 million dollars. These figures are found to be reasonable for planning purposes.

17. The PUC, has considered the plan to underground both the proposed and existing line for the 1.2 miles through Oakmont. These costs are estimated to be $9 million. The PUC considers this to be an unreasonable amount to spend on undergrounding in the Oakmont area.

18. The present utility easement through Oakmont was acquired, and the existing 230 kV transmission line was built, prior to the development of the Oakmont residential community.

19. No substantial evidence was presented to show that PG&E could not acquire, through negotiation or condemnation proceeding, whatever utility right-of-way was necessary to construct any part of the Lakeville or Tulucay-West proposal.

20. No substantial evidence was presented to show that there was any provisions in the City of Santa Rosa or Sonoma County Zoning Ordinances that the Lakeville proposal would not be in conformity with.

21. The County of Napa requires a use permit in its zoning ordinance for the construction of a transmission line. The County asserts that this use permit process is not preempted by PRC 25500. The Committee disagrees.

22. No substantial evidence was presented to indicate that the Tulucay West, Tulucay East and Vaca-Dixon lines would not be in conformity with the Napa County Zoning Ordinances, and other applicable local ordinances.

23. The County of Napa asserts that the Tulucay West, Tulucay East and Vaca-Dixon lines would not be in conformity with the Seismic Safety Element, Land Use Element and Conservation and Open Space Element of the Napa County General Plan, and the Napa Valley Area Plan.

24. The Tulucay East, Vaca-Dixon and Tulucay West proposals, in Napa County are corridors, not routes or alignments. The possible adverse environmental effects that Napa County has identified from these proposals may or may not occur depending on the specific routes and alignments chosen and the mitigation measures required.

25. The Tulucay East and Vaca-Dixon corridors pass through the Cedar Roughs area.

26. The Cedar Roughs area is federal land that is managed by the Bureau of Land Management (BLM) of the United States Department of the Interior.

27. The Cedar Roughs area is 5800 acres.

28. In 1976 the Congress passed the Federal Land Policy and Management Act (FLPMA). Under this Act all areas of over 5000 acres are to be inventoried for possible designation as a Wilderness Study Area (WSA). Cedar Roughs is currently being inventoried by the BLM.

29. An interim management policy based on FLPMA, and on draft regulations precludes the construction of permanent facilities, including transmission lines in a potential wilderness study area, such as Cedar Roughs.

30. A decision will be made by December 1979 as to whether Cedar Roughs should be designated as a wilderness study area. If it is not so designated it will be released from interim wilderness management restrictions. If it is so designated the restrictions will remain until Congress acts on the BLM's and the President's recommendation.

31. The area that has been designated by PG&E as the Cedar Roughs Natural Area (Figure 6-3, SEI, #32-H) is generally the same as the Cedar Roughs area that is being considered as a wilderness study area.

32. PG&E maintains that it can adjust the present Tulucay-East, Vaca-Dixon corridor in a Westerly direction to avoid the Cedar Roughs area. However, it has not yet presented convincing evidence that it would in fact be possible to do so. If Cedar Roughs is designated a WSA the Easterly branch of the corridor would be blocked.

33. No evidence has been presented to demonstrate that any of the proposals would not be in conformity; with the General Plans, zoning or other local ordinances of Lake or Solano County.

Conclusions

1. Under PRC 25512 the Preliminary Report must contain findings and conclusions on the proposals degree of conformity with local ordinances and standards including General Plans. In assessing this degree of conformity the Committee has considered the local governments interpretations of their own

ordinances or General Plans but has made an independent determination on this question.

2. As to the 11 mile nonparallel route through the Franz/Alpine Valley: The Committee interprets the Sonoma County Plan as encouraging paralleling of existing utility corridors, when such paralleling is a reasonable or practicable alternative. The question then is whether any of the Fulton variations is a reasonable alternative to the 11 mile nonparallel route.

As to Fulton variations 4a and 4b: Both of these variations are longer and more expensive than the 11 mile nonparallel route and would have an equivalent degree of adverse environmental effects. Neither of them parallel the existing lines. The Committee sees no reason to give these variations further consideration.

Variations 3a, 3b, 3c, all require varying degrees of undergrounding. The Committee agrees with the PUC, the Applicant, the Commission staff, and other parties that have argued undergrounding is not a reasonable mitigation measure in the Larkfield/Wikiup area because of the high costs, and the great number of already existing lines. Therefore, the Committee feels that these variations should receive no further consideration.

In regard to the remaining Fulton variations, additional problems are encountered. All of the Fulton variations would be longer and costlier than the 11 mile nonparallel route, and require that the line go in a direction that is unnecessary from a systems planning perspective. Also, to the extent that these variations require consolidation they are somewhat less reliable. All of these variations would also require an additional crossing of a designated scenic area and an additional line and/or larger towers in the visually saturated Larkfield/

Wikiup area. The present tower placement on the Fulton line will make it difficult or impossible to coordinate the tower locations and heights in many parts of the line. In these areas the result will be a visually distressing staggered effect. The visual benefits which are often obtained by paralleling will be significantly diminished in this case due to the placement of the existing towers.

Furthermore, the Committee is aware that by eliminating 3c from consideration the Committee is eliminating the only Fulton variation that the Sonoma County Board of Supervisors has found to be consistent with the County General Plan. The Committee is in agreement with the general principal of paralleling existing lines when reasonable. However, when the shortcomings of the Fulton variations are considered, along with the fact that the Sonoma County Board of Supervisors has found these variations to be inconsistent with the General Plan, the Committee must conclude at this time that none of the Fulton variations are a reasonable or practicable alternative to the 11 mile nonparallel line. Therefore, in our view, since there is presently no reasonable parallel route, the 11 mile nonparallel route would be in conformity with the Sonoma County General Plan.

The Committee notes that the Sonoma County Board of Supervisors has not yet taken a position on whether variation 2f, a Fulton variation developed by the Commission staff at the suggestion of the Committee, is in conformity with the Sonoma County Plan. If Sonoma County presents evidence that 2f, or any other Fulton variation that does not require undergrounding, is in conformity with its General Plan, does not require unreasonable incremental costs, and is environmentally preferable, such evidence would be considered in the preparation of the Final Report.

3. Under PRC 25525, at the Application for Certification stage of these proceedings, the Commission, if it is to certify a facility that is not in conformity with a local ordinance or General Plan, must find that the facility is required for the public convenience and necessity and that there are not more prudent and feasible means of achieving such public convenience and necessity. We have expressed our view that, the 11 mile nonparallel route appears on the state of the record at this time to be in conformity with the Sonoma County General Plan. It is also our view that, again on the state of the record at this date, even if the Commission were to find that the 11 mile nonparallel route was not in conformity with the Sonoma County General Plan it could still certify that route. The alternatives to this route (Fulton variations, Tulucay East, Vaca-Dixon) are all longer, costlier and involve an equivalent or greater adverse environmental impact. Therefore, it appears, that the Commission could find that there is not a more prudent and feasible means than the Lakeville route of transmitting this necessary power from The Geysers.

4. The Committee agrees with the PUC, Applicant and Commission staff that the undergrounding alternatives in the Oakmont area are not practical mitigation measures. (See Transmission Corridor Findings and Conclusions).

5. The Committee disagrees with the assertion that undergrounding through Oakmont is necessary to bring the Lakeville proposal into compliance with the General Plans of Sonoma County and the City of Santa Rosa.

6. The Cedar Roughs area appears at the present time to pose a potential restraint on the proposed Tulucay East and Vaca-Dixon lines. The Applicant may be able to adjust the present corridor to demonstrate a viable alignment around

the area, but thus far has not done so. If an AFC is filed on either of these routes the Applicant would be required to demonstrate such an alignment.

7. Napa County has identified a number of potential adverse environmental impacts upon the County by the construction of either the Tulucay West, Tulucay East or Vaca-Dixon line. These potential impacts, which were identified in Mr. Hickey's testimony, could make these proposals inconsistent with the Napa County General Plan and local ordinances. However, the proposals, as they relate to Napa County are broad corridors at this point. If an AFC was filed on any of these alternatives the Applicant would be required to demonstrate that construction and maintenance of the specific alignment would not result in substantial adverse environmental effects, and that the transmission line could be constructed in conformity with the Napa County Plan and local ordinances. If the Applicant cannot demonstrate that the line can be constructed in conformity with the Napa County General Plan and local ordinances, and the Lakeville alternative continues to be more prudent and feasible, then it is doubtful that the Commission could make the necessary findings under PRC 25525 to grant certification.

8. None of the proposed lines (Lakeville, Tulucay West, Tulucay East, Vaca-Dixon) are prohibited by the local zoning ordinances of Sonoma, Napa, Lake or Solano County. All of the lines, on the present state of the record, could be constructed in conformity with those zoning ordinances. In an AFC proceeding the Applicant would be required to demonstrate to the Commission in greater detail that the applicable zoning ordinances could be complied with.

9. The Tulucay East and Vaca-Dixon lines would be in conformity with the General Plans of Solano and Lake Counties.

10. The Tulucay East and Vaca-Dixon lines would be in conformity with the Sonoma County General Plan.

B. Cultural Resources

1. Introduction

The concern in this area is that fossils, site locations, structures, artifacts and other tangable items of scientific, historic and cultural significance be located and preserved along the proposed transmission line routes or corridors. This will require adequate surveys of the potentially effected areas and appropriate mitigation measures.

2. Evidentiary Requests

The Committee requested that Dr. David Frederickson for the applicant and Mr. Gary Heath for the Commission staff testify in support of the joint Staff/Applicant proposed findings and conclusions. Their testimony was to include evidence on potential adverse effects on cultural resources in the Fulton and Kenwood areas as well as mitigation measures in those areas. In addition, Dr. Fredrickson was to testify on compliance with the applicable laws in this area as well as necessary mitigation measures to bring the proposals into compliance.

3. Summary of Testimony

Dr. David Fredricksen is a Professor of anthropology, whose speciality is archaeology. He is consultant for PG&E who was hired to assess the cultural resources along the proposed routes. He testified on April 9, 1979.

o While archaeological sensitivity varied from low to high within each of the four alterntive corridors, no one corridor appeared to

have archaeological resources present of such significance that selection of that corridor should be ruled out.

o An intensive archaeological survey, including intensive field reconnaissance, of all but five miles of the Lakeville transmission line route was conducted.

o A literature search was done and archaeological sensitivity maps were prepared for the Fulton alterntive, Tulucay West, Tulucay East, and Vaca-Dixon corridors. No field surveys were done in these areas (except for the portions of the Tulucay West route identical to Lakeville).

o His examination of potential cultural resources and necessary mitigtion measures was compatible with the requirements of the Historic Preservation Act of 1966, as well as 36 CFR 800.

o No contact was made with Native Americans regarding the possible occurrence of Native American historical, cultural and sacred sites. Therefore the requirements of PL 95-341 (Joint Resolutions, "American Indian Religious Freedom") and PRC 5097.9 et seq., have not yet been satisfied. He believes the requirements could be satisfied at the AFC stage.

o Undergrounding could constitute a greater negative effect on cultural resources than overhead lines.

o He has not ranked the corridors or routes in order of preference.

o Contact with Native Americans could identify significant sites that might influence the final route selection.

o The effects of a transmission line, including access roads can usually be mitigated by simply avoiding the site.

o Some sites in Northern California extend for miles and could not be avoided. He feels that it is unlikely that such an areas would be found in the present corridors.

o The Kenwood area is highly sensitive in terms of cultural resources.

Mr. Gary Heath is the Staff Anthropologist, Archaeologist for the California Energy Commission. He testified on April 9, 1979.

o Cultural Resources do in fact exists and/or are likely to exist in all the proposed transmission line corridors.

o With appropriate mitigation the impacts on cultural resources can be minimized.

o Dr. Fredricksen adequately assessed the cultural resources in the Lakeville area.

o Mitigation measures may include fencing-off of sites, avoidance of sites and the collection or excavation of sites as well as a site-specific mitigation plan for the AFC.

o If an AFC is filed for the Lakeville route, four additional studies should be filed with the AFC.

1. Survey of remaining five miles;
2. Survey of access roads;
3. Contacts with Native American; and
4. Development of a specific mitigaton plan for any cultural resources impacted from the project.

o If an AFC is filed for the Tulucay West, Tulucay East or Vaca-Dixon alternatives, the Applicant will undertake an intensive cultural resource survey equivalent to the level of detail of the Lakeville survey.

o If a Kenwood or Fulton undergrounding alternative is chosen, the Applicant should have to submit in the AFC finding of an intensive archaeological survey, along with a site specific mitigation plan.

o The flexibility of four mitigation options is somewhat decreased when you are paralleling an existing line. However, it still should be possible to use voidance mitigtion.

o He has not ranked the different alternatives. It is not reasonable to do so when they have had different levels of surveys.

4. Committee Findings and Conclusions

The Committee's findings and conclusions on cultural resources follow on the next three pages.

FINDINGS AND CONCLUSIONS
CULTURAL RESOURCES

Findings

1. The following laws, ordinances and standards are applicable to the preservation and protection of cultural resources.

Federal

- o National Historic Preservation Act of 1966, 16 U.S.C. 470 et seq., 36 CFR 800.
- o The Mineral Leasing Act of 1920 (P.L. 66-146 Stat. 437).
- o Joint Resolution "American Indian Religious Freedom" (P.L. 95-341, a2 Stat. 469).

State

- o Native American Historical, Cultural and Sacred Sites, Public Resources Code Section 5097.9 et seq.

2. Dr. Fredricksen has conducted an intensive archaeological survey, including intensive field reconnaissance, of all but five miles of the proposed Lakeville route. A literature search was done and archaeological sensitivity maps were prepared for the Fulton alternative, Tulucay West, Tulucay East and Vaca-Dixon transmission corridors. No field surveys were done in these areas (except for those portions of the Tulucay West route identical to Lakeville).

3. No contact was made with Native Americans regarding the possible occurrence of Native American historical, cultural and sacred sites.

4. The effects of a transmission line, including access roads, can usually be mitigated by simply avoiding the site.

5. Mitigation measures may also include fencing off of sites and the collection or excavation of sites as well as a site specific mitigaton plan for the AFC.

6. There are significant cultural resources within the geographical area of the Kenwood Alternative.

Conclusions

1. No one corridor appears to have archaeological resources present of such significance that selection of that corridor should be ruled out.

2. It appears that the requirements of the National Historic Preservation Act of 1966, 16 U.S.C. 470 et seq. and 36 CFR 800 can be met.

3. The requirements of Joint Resolution, "American Indian Religious Freedom" (P.C. 95-341 a2 Stat. 469) and the Native American Historical, Cultural and Sacred Sites, PRC 5097.9 et seq. have not been met because no contact with Native Americans has been initiated. The Applicant and Staff should contact the Native American Heritage Commission concerning the four proposed routes and report their findings to the Committee during the Prehearing Conference on the Preliminary Report.

4. No evidence was presented on compliance with the Mineral Leasing Act of 1920 (P.C. 66-146 Stat. 437). The Applicant will be required to show compliance with this statute at the AFC stage.

5. If an AFC is filed for the Tulucay West, Tulucay East or Vaca-Dixon alternatives, the Applicant shall undertake an intensive cultural resource

survey equivalent to the level of detail of the Lakeville survey. These studies will follow the Cultural Resources Mitigation Program (SEI 6-17, 6-18).

6. It would be difficult to preserve the cultural resources, and difficult to mitigate against adverse consequences should the Kenwood Alternative be chosen.

7. At or prior to the time of the filing of the AFC, the Applicant shall submit a detailed mitigation plan for the route selected.

8. If an AFC is filed for the Lakeville route, the Applicant will submit a cultural resources report on the five miles of the route not yet completed and on the access roads to the line.

C. Biological Resources

1. Introduction

The concern in this area is to insure that the transmission line construction and operation will not have a significant adverse effect on plant and animal life. This in turn requires that potentially affected plant and animal life, particularly rare, threatened, endangered, and fully protected species be identified. It also requires that critical habitat zones and ecologically sensitive areas along the proposed routes and corridors be identified and that appropriate mitigation measures be developed.

2. Evidentiary Requests

The Committee requested that the Applicant's witness testimony include the following:

a. Evidence as to whether the proposal will be in conformity with applicable laws, standards and ordinances.

b. A summary of necessary measures to mitigate the adverse effects on biological resources.

c. A summary as to what construction techniques would be required to mitigate the adverse effects on biological resources. (This construction technique information was covered by PG&E witness James Walsh, under the structural engineering topic.)

d. Evidence as to whether the project would have a significant adverse effect on biological resources along the Fulton and Kenwood alternatives, and necessary mitigation measures.

In addition, a witness for Napa County and for the Fulton Intervenors was scheduled. The Franz and Alpine Valley Intervenors originally identified eleven potential witnesses in this area. They later submitted written testimony for seven witnesses. All of those witnesses were allowed to testify. It should be noted however, that the testimony of Mr. Allen Buckman from the State Department of Fish and Game was struck for lack of a sufficient foundation, and therefore is not included in the following summary.

3. Summary of Testimony

(All testimony was heard April 9, 1979)

Ms. JoAnne Mensh is a biologist who works for Jones and Stokes Associates. She, and her firm, are consultants to PG&E.

o She, and her associates, have prepared a series of reports, tables and exhibits on the biological resources along each of the proposed routes and corridors. These reports include the types of impacts that could occur with transmission line construction on biological resources and a list of mitigation measures that could be taken to protect the resources.

o All of the proposed transmission line routes or corridors are in conformity with the following applicable laws, standards and ordinances:

a. Federal

1) Endangered Species Act of 1973 and implementing regulations. 16 USCA 1531 et seq., 50 CFR part 17.

2) Rivers and Harbor Act of 1899. (33 USCA 403)

b. State

1) Ecological Reserve Act of 1968 and implementing regulations, Fish and Game Code Sections 1580-1584, 14 Cal. Admin. Code Section 670.5.

2) California Species Preservation Act of 1970, Fish and Game Code Sections 900-903, 14 Cal. Admin. Code Section 670.5.

3) Endangered Species Act of 1970, Fish and Game Code Section 2050-2055.

4) Fully Protected Species, Fish and Game Code Sections 3511, 4700, 5000, 5050, 5055.15.

5) Fish and Wildlife Protection and Conservation, Fish and Game Code Sections 1600, et. seq.

o Potential impacts of transmission lines on biological resources may include:

1) Temporary and/or permanent loss of vegetation.

2) Loss of natural area attributes.

3) Diminishing water quality.

4) Alteration of wildlife habitats, which may effect species numbers and composition.

5) Collisions between birds and transmission lines.

o Mitigation measures which may reduce the impacts on biological resources include:

1) Avoidance of sensitive habitats of rare and endangered species, species of special concern or anadromous fish;

2) Limiting of construction area to the smallest possible area (consistent with safety);

3) Use of existing roads and rights-of-way;

4) Application of effective erosion control techniques (hillside and stream crossing);

5) Revegetation;

6) Limiting clearing of vegetation to individuals obstructing the line;

7) Restricting construction activities at specific locations during breeding or spawning periods if the potential exists for significant impact; and

8) Designing specific alignment segments to reduce the probability of conductor or tower strikes by birds.

o In general, from an environmental standpoint she would favor paralleling existing corridors. However, as between the Fulton alternative and the Franz Valley 11-mile nonparallel they are about equal. This is because they are similar biologically, and both routes would require construction or upgrading of access roads.

o There are no rare or endangered plants or sedantary animal species found along the Fulton route.

o There are rare or endangered plant species found within a study corridor (two miles wide) of the proposed 11-mile nonparallel route.

o Ranking from a biological resources viewpoint (in order of preference):

1) Lakeville.

2) Tulucay West;

3) Tulucay East, Vaca-Dixon.

o With proper construction techniques and mitigation measures, construction of any of the proposed transmission lines should not significantly affect biological resources.

o Mitigation measures in riparian zones would include spanning the zones and proper construction techniques to avoid erosion and siltation.

Dr. Richard E. Warner is a biologist who specializes in riparian zones.

He testified for Franz/Alpine Valley Intervenors.

o Definition of Riparian Zones: Bands of mesic (water loving) vegetation and their associated animal populations found immediately adjacent to hydrologic system.

o The aggregate human impact upon riparian zones has been one of progressional and accelerating destruction and degradation.

o Mitigation in the sense of replacing riparian zones is impossible. They are produced by a combination of many unique hydrologic, geologic, and biological circumstances. However, spanning of riparian corridors, if done with extreme care to avoid siltation and increased turbidity, could be an acceptable mitigation measure.

o Applicable Federal Law, Executive Order (EO) 11990, Protection of Wetlands (42 FR 26951; May 25, 1977). He did not testify that the Lakeville proposal would not be in conformity with this order.

o Riparian zones are found along both the Fulton route and the 11-mile nonparallel route.

o The Jones and Stokes biological reports are very competent general studies.

o From an ecological point of view there would be less environmental impacts by following the existing Fulton corridor than by a new 11-mile nonparallel route. Ecologically they are quite similar, the difference is in previous vegetation clearing and access roads along the Fulton route.

Mr. Lawton Shurtleff owns approximately 1200 acres along the existing Fulton route. He testified for the Fulton Intervenors.

o The area along the northern part of the Fulton alternative consists of a number of large parcels with one homesite per holding, and the

land basically is in its natural state. The major man made intrusion is the existing transmission line.

o The property contains a wide and varied mixture of plant and animal habitation.

o The major impact of the present line is visual.

Dr. Philip Leitner is a professor of biology at St. Mary's College. He testified as a consultant for Napa County.

o He analyzed the potential adverse impacts on biological resources for the four alternative corridors. Based on this analysis he concluded that the Lakeville route was preferable to the other alternatives. (He only considered Lakeville and Tulucay West from the point of their divergance).

o As compared to the other alternatives the Lakeville route:

1) Traverses fewer miles of wildlife habitat.

2) Traverses fewer miles of undisturbed natural habitat.

3) Traverses fewer streams that provide spawning and nursery habitat for steelhead trout.

4) Traverses fewer riparian corridors.

5) Traverses fewer areas on the Inventory of the California Natural Areas Coordinating Counsel.

6) Has less erosion hazard.

7) Has more access roads.

8) Because of the parallel line, the impacts would be easier to mitigate.

o The following laws and policies are applicable to the consideration of impact of biological resources by this project:

Laws

1) Endangered Species Act of 1973 (Federal).

2) Ecological Reserve Act of 1968 (State).

3) California Species Preservation Act of 1970 (State).

4) Endangered Species Act of 1970 (State).

5) Fully Protected Species, Fish and Game Code Sections 3511, 4700, 5000, 5050, and 5515 (State).

Policies

1) Conservation of Wildlife Resources Policy of 1974 (State).

2) Native Species Conservation and Enhancement Act (State).

o It is preferable from a biological resource perspective to parallel existing transmission corridors. This is particularly true when a new corridor would require the construction of new access roads in steep countryside with a high erosion potential.

Dr. Monte N. Kirven is a Professor of Environmental Studies and Planning at Sonoma State University. He is an authority on the Peregrine Falcon. He testified for the Franz/Alpine Valley Intervenors.

o The Peregrine Falcon is an endangered species.

o There are documented cases of Peregrine Falcons being killed or injured due to collisons with transmission lines.

o The Mt. St. Helena area is a critical habitat area for the Peregrine Falcon. A pair of birds are known to nest in that area.

o The Northern section of all of the proposed lines, as well as the Fulton alternative and the 11-mile nonparallel route are all within the Falcons estimated 25-mile foraging range.

o There is no legal protection for foraging areas; just for critical habitat areas.

o Two main flight corridors have been observed. One in the direction of the Franz Valley and one into Napa County.

o The Peregrine Falcon has been observed in the Franz Valley.

o Details of the foraging range, location and priority of the Mt. St. Helena Peregrine Falcons are unknown. A study to establish these details is underway. Results are expected in approximately three months.

o Traversing Franz Valley with a transmission line could constitute a threat to the Peregrine Falcon.

Mr. Charles W. Brown is an instructor of Life Sciences at Santa Rosa Jr. College. He is an expert on the Pacific Giant Salamander. He testified for the Franz/Alpine Valley Intervenors.

- o The Pacific Giant Salamander and three species of newts (Rough Skinned Newt, California Newt and the Red-Bellied Newt) are all found in the riparian Corridors of Alpine Valley. All of these reptiles would be affected by construction of a transmission line in the 11-mile nonparallel route if that resulted in soil disruption and increased stream turbidity.

- o It is unique to find the Pacific Giant Salamander and these three newts in one area in Alpine Valley.

- o The Pacific Giant Salamander and the three newts are not rare, threatened, endangered or fully protected species.

- o The primary threat would be to the reptile larvae from increased turbidity. However, these larvae are in the water when the seasonal turbidity is at its lowest.

- o Many of the Pacific Giant Salamanders in Alpine Valley are located east, or upstream (on Mark West Creek) from the proposed transmission line and therefore will not be affected by its construction.

Ms. Betty L. Lovell is a member of the California Native Plant Society, State Rare Plant Committee. She testified for the Franz/Alpine Valley Intervenors.

- o She was concerned with three possible adverse impacts on vegetation if the 11-mile nonparallel line was constructed:

1) Displacement of vegetation in highly erodible areas of that route.

2) Impact on the Mark West, Van Buren Creek Watershed riparian area and adjacent redwood area.

3) Possibility of rare and endangered plant species in the portions of this route which have not yet had a vegetation survey.

o No rare plants have been found within 200 yards of the proposed 11-mile nonparallel route.

o Avoidance of a rare plant, or sensitive biological site is a suitable mitigation measure. However, she does not believe that an acceptable mitigation plan could be developed and executed for the 11-mile nonparallel route at this time. That is because an onsite vegetation survey for potential rare and endangered plants in that area has not yet been completed.

o In her opinion, in terms of adverse impact on plant vegetation, it is preferable to parallel an existing line.

Ms. Martha C. Bentley is Conservation Co-Chairman for the Madrone Audubon Society. The Audubon society is concerned primarily with the preservation and conservation of wildlife. She testified for the Franz/Alpine Valley Intervenors.

o The proposed transmission line through the Franz Valley traverses one of the most varied and; therefore, richest relatively compact

wildlife habitat area left in the county. To preserve this area's relatively pristane quality the transmission line should follow the existing corridor. However, in forming this conclusion the witness conceded that she was not familiar with the northern area of the Fulton alternative.

Dr. Robert J. Sherman is a professor of biology at Sonoma State University. He is a plant ecologist with particular expertise in forest fires.

o The construction of the 11-mile nonparallel transmission line in the Franz Valley will increase the chance and danger of fire in that area for the following reasons:

1) Greater human access because of the construction of additional roads will increase the chance of uncontrolled fire from accident and arson;

2) Presence of transmission lines may inhibit the use of fire for controlled burning, and firefighting.

o Once a fire has started the increased access is a positive factor, allowing firefighting equipment into the area.

o The Franz Valley area is historically a high fire risk area.

o The area along the Fulton alternative is somewhat more open than the Franz Valley so the fire danger is not quite as great.

4. Committee Findings and Conclusions

The Committee's Findings and Conclusions on Biological Resources Follows:

FINDINGS AND CONCLUSIONS

BIOLOGICAL RESOURCES

Findings

1. The following federal and state laws are applicable to the preservation and protection of biological resources

a. Federal

1) Executive Order 11990, Protection of Wetlands (42 FR 26951; May 25, 1977)

2) Endangered Species Act of 1973 and implementing regulations. 16 USCA 1531 et seq., 50 CFR part 17.

3) Rivers and Harbor Act of 1899. (33 USCA 403)

b. State

1) Ecological Reserve Act of 1968 and implementing regulations, Fish and Game Code Sections 1580-1584, 14 Cal. Admin. Code Section 670.5.

2) California Species Preservation Act of 1970, Fish and Game Code Sections 900-903, 14 Cal. Admin. Code Section 670.5.

3) Endangered Species Act of 1970, Fish and Game Code Section 2050-2055.

4) Fully Protected Species, Fish and Game Code Sections 3511, 4700, 5000, 5050, 5055.15.

5) Fish and Wildlife Protection and Conservation, Fish and Game Code Sections 1600 et seq.

2. The Peregrine Falcon is an endangered species. There are no critical habitat zones for Peregrine Falcons within any of the proposed routes or corridors are within the foraging range of the Mt. St. Helena Peregrine Falcons. Federal and State law protects the falcon's critical habitat zone but not its foraging area. Studies are now underway to determine the precise foraging range and critical foraging areas of the Mt. St. Helena Peregirne Falcons. Peregrine Falcons have been killed or injured due to collisons with transmission lines. However, on the state of the record at this time, any possible danger to the Peregrine Falcon posed by the construction of any of the proposed transmission lines is minimal and speculative.

3. Riparian zones have great ecological importance for a variety of mesic vegetation and associated animal life. Proper construction techniques, tower placement, and mitigation measures can be used to prevent the disruption of riparian zones by transmission line construction and operation.

4. As compared to the other transmission line corridors the Lakeville route:

a. Traverses fewer miles of wildlife habitat.

b. Traverses fewer miles of undisturbed natural habitat.

c. Traverses fewer streams that provide spawning and nursery habitat for steelhead trout.

d. Traverses fewer riparian corridors.

e. Traverses fewer areas on the Inventory of the California Natural Areas Coordinating Counsel.

f. Has more access roads.

g. Because of the parallel line, the impacts would be easier to mitigate.

5. Construction of new roads by making an area more accessible may somewhat increase the danger of forest fire, and the resultant adverse effect on biological resources. However, additional roads also make the area more accessible to fire fighting equipment. Therefore construction of additional access roads does not automatically increase fire danger in the construction area.

6. The biological resources along the 11-mile nonparallel route are similar to the biological resources found along the northern area of the parallel Fulton alternative.

Conclusions

1. With proper construction techniques and adequate mitigation measures the construction of any of the proposed transmission lines can be done in compliance with applicable state and federal laws.

2. Any of the proposed transmission lines can be constructed without causing a substantial threat to the endangered Peregrine Falcon. However, at the AFC the Appliant's mitigation plan shall include the designing of specific alignment segments to reduce the probability of conductor or tower strikes by birds. (See testimony of PG&E witness Jo Anne Mensch (TR. 3398)).

3. At the AFC the Applicant's mitigation plan will include a detailed plan to prevent the disruption of riparian zones. This plan will include the spanning of riparian zones wherever possible and the use of proper construction techniques to prevent erosion and increased siltation in the riparian zones. With proper mitigation measures a substantial adverse impact on plant and animal life, including Salamandors and Newts in the riparian zones in the proposed routes or corridors can be avoided.

4. Construction of the Lakeville route will have less of an adverse effect on biological resources than construction of the alternative proposals. (Tulucay West, Tulucay East, Vaca-Dixon.)

5. With proper construction techniques and mitigation measures construction of the transmission line along any of the proposed routes or corridors should not significantly adversely affect biological resources.

6. Construction of the Lakeville transmission line including the additional five and one-half miles of access roads in the Franz Alpine Valley will not significantly increase the danger of fire damage in that area.

7. The Committee finds that as a general rule paralleling of existing lines will result in less of an adverse impact on biological resources than construction of a nonparallel line. However, with respect to the 11-mile nonparallel route as opposed to the Fulton alternative this general rule is not necessarily applicable:

a. The Fulton parallel alternative is longer than the nonparallel alternative.

b. The Fulton parallel alternative has similar biological resources to the nonparallel alternative.

c. Because of previous tower placement and the nature of the topography along portions of the Fulton parallel alternative the usual advantages of using a common utility corridor may not be realized.

d. Portions of the Fulton parallel alternative cross designated scenic areas, and areas of low density and sensistive biological resources. Paralleling existing lines in those areas may lessen the flexibility of potential mitigation measures.

Taking these factors into consideration, and considering the entire record, the committee finds that there will not be a significant difference in the adverse effect on biological resources between construction of the 11-mile nonparallel route and construction of the Fulton alternative. With proper construction techniques and mitigation measures, construction of the proposed transmission line along either of these routes will not significantly affect biological resources.

8. The Applicant shall include in the AFC filing a detailed mitigation plan for the biological resources impacted by the proposed project. This plan shall specifically address the following areas (if appropriate) as requiring special mitigation consideration:

a. Rare, threatened, endangered and fully protected plant and animal species; commercial and recreational biological resources; species of special concern; and areas of critical concern.

b. The 11-mile nonparallel crossing of Franz and Alpine Valley. This shall include an onsite survey for rare and endangered plants in this area. Also particular attention should be directed to the Mark West Creek area. In developing a detailed mitigation plan for this area, the Applicant will cooperate with interested local, state and federal governmental agencies as well as private groups and individuals that have participated in this NOI process.

D. Transmission Line Corridors

1. Introduction

In order to provide a basis for the findings and conclusions required to be included in the Preliminary Report by PRC 25512, the Applicant and Commission Staff were directed to present testimony on various issues related to four alternative transmission line corridors by the Committee's March 19, 1979, Supplemental Prehearing Conference Order.

2. Background Information

The Applicant submitted an NOI for the Geysers Unit 16 Power Plant which contained four alternative transmission line corridors for the construction of a proposed 230 kV double circuit tower line (DCTL) from Castle Rock Junction. These alternatives are identified as The Geysers (Castle Rock Junction) to Lakeville, near Petaluma; Tulucay, near Napa; or Vaca-Dixon, near Vacaville. These corridors are shown pictorially and electrically on several maps and documents submitted in the NOI, Supplemental Environmental Information, and responses to various data requests. Figure 7, taken from the NOI, shows the four corridor alternatives (Lakeville - A; Tulucay West - B; Tulucay East - C; Vaca-Dixon - D). The Applicant has identified the Lakeville corridor in its NOI and subsequent testimony as the preferred route for the proposed 230 kV transmission line.

The relative merits of the corridor alternatives have been evaluated by a number of witnesses during the evidentiary hearings. Factors considered by them include comparative environmental effects, social effects, land use constraints, costs, construction methods, and geotechnical matters. In addition, significant data exist in the record on these factors; e.g., the Applicant's NOI and Supplemental Environmental Information (November 1978).

The Applicant's preferred Castle Rock Junction to Lakeville corridor crosses several sensitive areas, and there has been considerable testimony given on various subalternatives which are intended to mitigate various problems which parties have asserted exist in these areas. The significant issues are the following:

- o Should an eleven-mile nonparallel section of the proposed line crossing the Franz and Alpine Valleys (part of the preferred route) be replaced by a "Fulton Alternative" (includes various combinations of consolidation, paralleling, and undergrounding the proposed line with existing lines passing through the Fulton substation)?

- o Should an approximate 1.2 mile section of the proposed line crossing the Valley of the Moon and the Oakmont community be consolidated with, or undergrounded with, the existing line crossing these areas?

- o Should the proposed line be consolidated with an existing line through Annadel State Park or should it be routed around the park?

3. Summary of Testimony

Mssrs. John Smithwick, a Field Engineer in the Land Department of PG&E, and Neil Schmidt, an Electrical Engineer with PG&E, appeared on behalf of the Applicant, presented testimony on transmission corridor issues.

Mr. Smithwick appeared on April 17, 1979 and stated that PG&E's preference for the Lakeville corridor was based on balancing the economic,

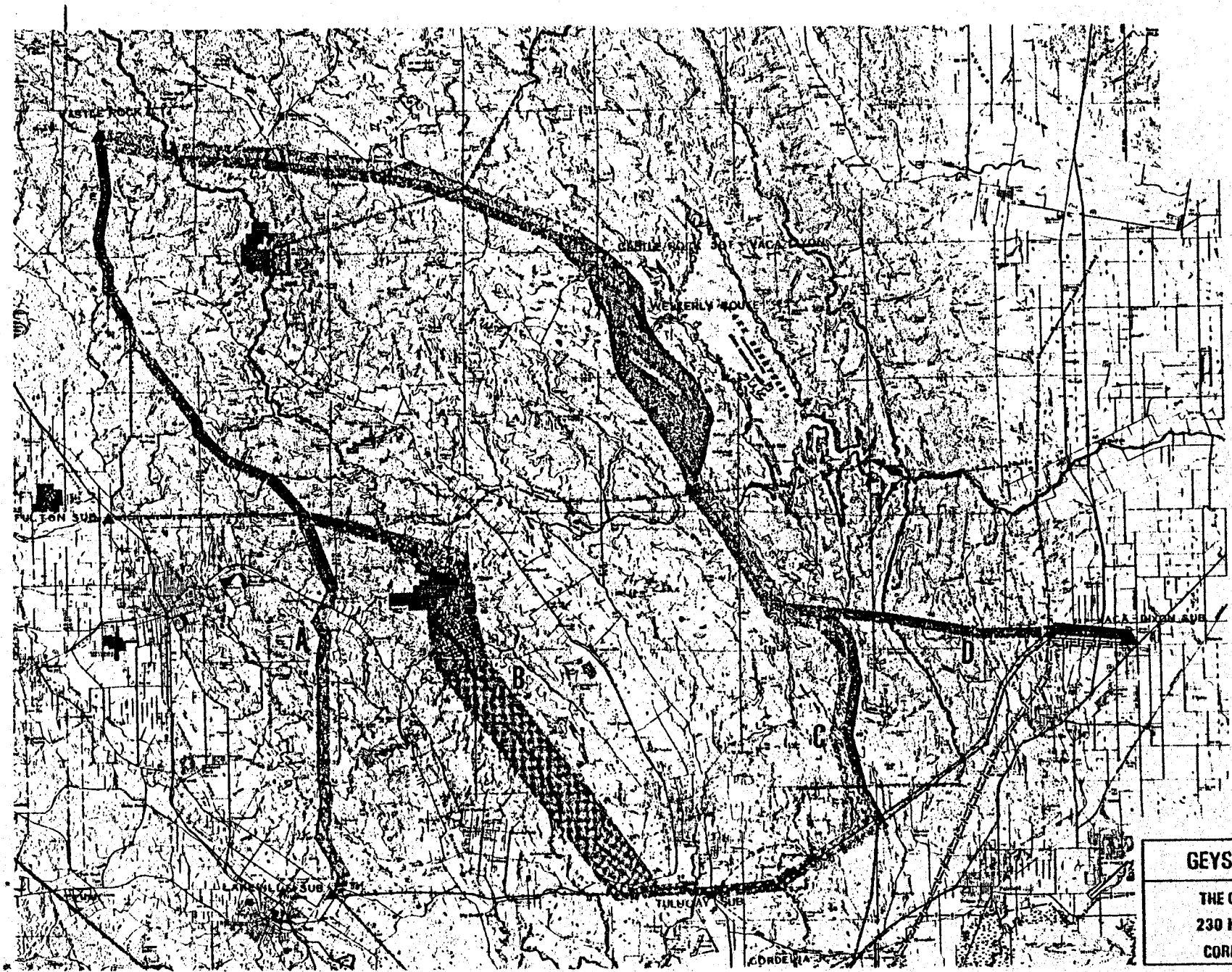


Figure 7

GEYSERS UNIT 16 NOI

THE GEYSERS TO LAKEVILLE 230 KV TRANSMISSION LINE CORRIDOR ALTERNATIVES

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engineering, and environmental considerations of the four corridor alternatives. He gave several advantages of the Lakeville route over the alternatives:

- o Lakeville affords the greatest opportunity to parallel portions of existing lines.

- o Lakeville has the least potential environmental impact because it will require the smallest amount of new access roads and create the least amount of new construction effects.

- o Lakeville will have the least visual impact in that where the proposed lines are parallel the views will be consistent with the existing facility and where they are nonparallel the terrain will afford direct and background screening of the lines.

- o With the exception of Tulucay West, Lakeville has an economic advantage over the alternatives (under the assumption that development at the Geysers does not exceed 2000 Mw).

Smithwick said that all the corridors were acceptable from the following standpoints:

- o Within any corridor individual tower sites can be located to avoid specific geologic hazards, even though each corridor traverses geologically unstable areas.

- o Land use considerations do not impose any unacceptable constraints.

Smithwick further testified on a number of points as follows:

o As public concern for the environmental effects of new facilities has increased in recent years, PG&E has increased its efforts to use mitigation measures to minimize adverse impacts. Such measures include using topography, screening, and painting to reduce the visual impact of transmission towers and lines.

o The construction and routing of transmission lines depends equally upon environmental considerations, economics, and engineering considerations.

o Assuming that development at the Geysers does not exceed 2000 Mw, the Tulucay West routing is less costly than the Lakeville routing; however, Lakeville is better from the environmental and engineering standpoints. Thus, Lakeville is preferred.

o Lakeville is better than Tulucay West from the environmental standpoint because Tulucay West is longer, and will therefore have more towers, more access roads, more clearing, and more visability. Also, some ridge crossings may be necessary and there will be vineyard crossings.

o Lakeville is preferable to the other three corridors from the environmental standpoint because of the advantages which accrue from paralleling existing facilities: less access roads required, less visual impact, less clearing needed, and reduced tree removal.

o If the Bureau of Land Management (BLM) were to designate the Cedar Roughs area as a Wilderness Study Area (WSA), this would not pose an

unacceptable constraint to the Vaca-Dixon and Tulucay East corridors because there is room within the western part of the corridor to avoid crossing Cedar Roughs.

o The cost estimates for the alternative corridors are believed to include costs for environmental mitigation.

o The Lakeville costs are more precise than the costs for the other corridors because the Lakeville corridor has been studied in greater detail.

o The nonparallel section of the Lakeville and Tulucay West corridors through the Franz and Alpine Valleys is preferred over the Fulton L alternatives because the environmental impact will be less.

o This nonparallel section is about equal to the Fulton L alternatives in terms of topography and geology factors, but has a lesser aesthetic impact.

o The old Mendocino 500 kV route is within the Vaca-Dixon and Tulucay East Corridor.

o PG&E had studied the possibility of paralleling or consolidating the proposed 230 kV line with an existing 115 kV line whih runs east from Fulton Substation to tie in with a transmission line near the Vaca-Dixon Substation. This alternative was rejected because of problems in crossing the southern portion of Lake Berryessa, Putah Creek Canyon, and the Napa Valley.

Mr. Neil Schmidt appeared on April 16, 1979. His testimony coincided with Mr. Smithwick's at many points, but it also provided supplemental information. Schmidt said there is a need for a double circuit 230 kV tower line with bundled 2300 kc mil aluminum conductor. Double circuit galvanized steel lattice towers are proposed for the three alternative and the Lakeville route, except for a 3.8 mile section across the Valley of the Moon, Oakmont, Wild Oak, and Annadel State Park. In this 3.8 mile section, the existing 230 kV line would be consolidated with the proposed 230 kV line on four-circuit lattice towers and/or four circuit tubular steel towers. The choice of tower type depends on the desires of the OPOA and State Department of Parks.*

Schmidt presented cost estimates for the four alternative routes, the Fulton L alternatives, the Valley of the Moon/Oakmont alternatives, and Oakmont/Annadel Crossing and By-Pass Alternatives. The Fulton L alternatives consist of various combinations of paralleling, consolidating, or undergrounding the proposed and existing lines in the vicinity of the Fulton Substation. The Valley of the Moon/Oakmont alternatives consist of undergrounding only. The Oakmont/Annadel By-Pass Alternatives consist of re-routing and undergrounding around the state park ("Kenwood Alternatives"). The incremental (1983 dollars) costs for the Fulton L alternatives portion range from about $2 million to $33 million. The incremental costs for the Valley of the Moon/Oakmont alternatives in comparison to the Applicant's preferred method range from $4.4 million to $10.5 million. The incremental costs for the "Kenwood Alternative" range from $11.5 million to $23.3 million.

*Note: The Wild Oak Homeowners Association, through a letter to Commissioner Pasternak dated April 6, 1979 opposes lattice towers within the Wild Oak Development, and expresses a preference for the same type towers that are being recommended for Oakmont.

Mr. Schmidt further testified on a number of points as follows:

o The design of a transmission line depends on criteria related to minimizing environmental effects, assuring safety and reliability, and minimizing costs. These criteria are interrelated and must be weighed together.

o The four circuit tower with overhead lines through Oakmont would have a greater environmental impact as compared to undergrounding the lines, but the costs of undergrounding would be greater.

o A consolidated four-circuit 230 kV tower line is not quite as reliable as two parallel 230 kV double circuit tower lines, but it has a lesser environmental impact.

o If the proposed 230 kV DCTL were fully paralleled along the 16 mile Fulton L, about 75 to 80 towers would be needed. About 45 towers would be needed for the Applicant's preferred 11 mile nonparallel route.

o The levelized annual revenue requirements (LARR), which include line losses, for the Tulucay West route are somewhat less than for the Lakeville route for the 2000 Mw transmission case.

o The methodology used to estimate costs for subsequent system development was similar for all four corridor alternatives.

o The environmental impacts of paralleling the entire Fulton L are greater than those associated with the Applicant's preferred diagonal (nonparallel) route because of the additional towers needed, the added length, and intrusion into residential areas.

o Four circuit tubular towers through Oakmont provide a lesser visual impact than two parallel double-circuit lines. Using four circuit towers is the only way to consolidate the proposed and existing transmission lines and stay within the existing Oakmont right of way.

o PG&E is indifferent to the choice of lattice or tubular towers through the Oakmont area.

o None of the Fulton L alternatives given in Schmidt's written testimony require the removal of any buildings.

o The Applicant's preferred Lakeville line with the addition of two 230 kV circuits would be more reliable than a 500 kV line to Vaca-Dixon with the addition of only one circuit.

Mr. James Walsh is a Line Construction Superintendent in the Line Construction Department of PG&E. He testified on behalf of the Applicant on April 10, 1979 on transmission line construction practices. His testimony covered the following points:

o After route selection, the construction methods to be used for the transmission line depend on case-by-case evaluations. No single method can be called a standard. The construction methods used for a specific project depend on a number of factors, some of which are environmental considerations, visual impact, erosion and siltation, vegetation, mitigation considerations, and economic considerations.

o Three or four construction yards, at 12- to 20-mile intervals, will be located along the line. These yards, two to five acres in size, provide space for field offices and material/equipment storage.

o Access roads are needed to build and maintain transmission lines. Existing roads will be used wherever possible, and new roads will be built such that visual impacts are minimized and erosion/landslides are mitigated.

o Clearing is avoided, or minimized, as it is costly and unsightly. Where clearing is necessary, consideration will be given to revegetation, erosion control, and restoration.

o Construction of the tower structures includes foundation installation, delivery of tower steel, and the erection of the structure. The erection is usually accomplished with the use of a mobile crane.

o In the past, transmission lines were constructed primarily considering reliability and economy. Now, changing values require that environmental concerns be given equal consideration.

Mr. Henry Kunitake is an Electrical Engineer in the Electrical Engineering Department of PG&E. He appeared on April 21, 1979 on behalf of the Applicant, to testify on methods and costs for undergrounding transmission lines. He said that High Pressure Oil Filled (HPOF) pipe-type systems would be used if any undergrounding were required. In such a system, the three cables, which comprise a single circuit, are pulled simultaneously into a steel pipe having lengths of 1500 to 2000 feet. The steel pipe is installed in a two-foot

wide trench with depth averaging about five feet. A four-foot wide trench would be necessary if two cable pipes (two circuits) were installed in a common trench.

Kunitake prepared 18 cost estimates for undergrounding various sections of the proposed Castle Rock-Lakeville 230 kV transmission line and the existing transmission lines in the Oakmont and Fulton areas. These cost estimates were used by Mr. Schmidt in his testimony to make overall project cost comparisons.

Kunitake testified on a number of points as follows:

o The undergrounding design for the existing and proposed lines in the Oakmont area will allow a maximum transmission of 2000 Mw. By adding forced cooling, perhaps an additional 20 percent (400 Mw) could be transmitted. To achieve a capacity of 2800 Mw, additional circuits would have to be added.

o The underground cost estimates do not include contingencies, so that the estimates would error on the low side.

o Undergrounding can be accomplished to transmit 2800 Mw in the Fulton L, also.

o For 2000 Mw transmission capacity, underground line loss costs for a 26 year period are $167,000 per mile per year and overhead line loss costs are $85,000 per mile per year.

o Transition stations are needed at points where overhead lines go to underground and where underground lines go to overhead. For four

circuits in the Valley of the Moon/Oakmont area, the two transition stations would each require about one acre.

o If an underground cable were to fail, a significant operation would be required to repair it. The trench would have to be dug into at three separate locations, and repair work would require three to four weeks.

Mr. Julian Ajello is a Senior Utilities Engineer, Electric Branch, Utilities Division of the Public Utilities Commission. His testimony on April 20, 1979 covered methods of construction and costs for undergrounding transmission lines. The CPUC staff concluded that PG&E's cost estimates for underground transmission are reasonable, except that using a ten percent escalation rate instead of six percent (PG&E) would be more approrpriate. The CPUC staff also concluded that the underground transmission design proposed by PG&E complies with its General Order No. 128.

Mr. Ajello stated that the effect of changing from a six percent escalation rate to a ten percent rate is to increase the absolute costs of all the undergrounding alternatives and to increase the differentials between undergrounding costs and corresponding overhead costs.

Mr. Allan Jones is a Consulting Electrical Engineer who testified on behalf of the Staff, on April 20 1979. His testimony covered system costs for the alternative corridors, including the costs associated with the various Fulton L and Oakmont alternatives on the Lakeville route. He stated that his estimates generally verified the Applicant's cost figures given in Mr. Neil Schmidt's testimony. He also said that extensive consolidation and/or undergrounding adds very significant costs to the Lakeville and Tulucay West routes.

Jones also testified as follows on several points:

o His estimates were good to plus or minus ten percent, and that errors would be in the same direction for all alternatives.

o The cost of right of way were based on data provided by a realtor friend, but since right of way is a small cost element, errors in estimating this element will not change the overall results.

o The line cost estimates were based primarily on work completed on transmission line costs for the Sundesert nuclear plant. This includes both overhead and underground estimates.

o As a mitigation measure, undergrounding is usually reserved for extremely dense urban areas where other solutions are not reasonably possible. For the Lakeville route, where other alternatives are reasonable, there are no economic foundations for using undergrounding.

o Assuming a Geysers development of 2000 Mw, the preferred order on a least cost basis is Tulucay West, Lakeville, Tulucay East, and Vaca-Dixon. Assuming a 2600 Mw development (1 DCTL), the preferred order is Lakeville,* Tulucay West,* Tulucay East, and Vaca-Dixon. Assuming a 3000 Mw development (2 DCTL), the prefered order is the same as for 2600 Mw.

o From a comparative economics and system benefit perspective, the Lakeville and Tulucay West routes are equal. However, if the costs of

*These two alternatives are essentially equal.

undergrounding for the various Oakmont alternatives are included, the Tulucay West route becomes economically preferable.

June Fallon, President of the Wikiup Homeowners Association, testified on April 12, 1979 on behalf of the Fulton intervenors. She opposed construction of the Fulton L alternatives, stating that 341 presently existing buildings and two elementary schools would be affected. She expressed concern with the visual impact on the community, but even more concern with the health and safety effects of the proposed transmission line. She said the Fulton alternatives are less desirable than the preferred route through the Franz and Alpine Valleys because many more people will be adversely affected.

Joan Vilms, a land use consultant and Executive Director of both the Sonoma Land Trust and the Napa County Land Trust, testifying on behalf of the Alpine and Franz Valleys intervenors, said that until a transmission line master plan is prepared and adopted, the best route for the line is along the existing corridor. She opposes the 11-mile non-parallel corridor through the Franz and Alpine Valleys as inconsistent with the Franz Valley Study. She said the transmission master plan should be prepared by government agencies with input from PG&E. She was not aware that PG&E had submitted transmission planning data for the case of 3000 Mw generating capacity at The Geysers.

Mr. Marc S. Anderson, a realtor testifying on behalf of the Fulton intervenors, stated that a policy of the Sonoma County General Plan is to encourage consolidation of utilities into common utility corridors whenever practicable. However, he said that the Fulton alternatives are not practicable because:

- The present power line from Geysers to Fulton contains many mistakes leaving adverse environmental effects, and the new line would only compound these mistakes if consolidated with the existing line.

- The Fulton alternatives adversely affect many more people and structures than the preferred Franz Valley route.

- The Fulton alternatives are much more costly than the preferred route.

- The Fulton alternatives will require more towers and lines than the preferred route.

Mr. Hobart McDaniel, Vice-President of the Oakmont Property Owners Association (OPOA) presented testimony on behalf of (OPOA) on April 16, 1979 and stated that if the Applicant's preferred route is approved, the portion of the line passing through the Valley of the Moon, Oakmont, and Annadel State Park should be undergrounded. He said there is no way that towers which are 15 percent taller than the existing towers, and are carrying 18 cables, can be made less visually objectionable to Oakmont residents than the existing double-circuit towers (carrying six cables).

McDaniel also testified as follows on several points:

- OPOA's position is that the proposed line should be undergrounded, but that they would like to also have the existing line undergrounded.

- If overhead lines were ultimately approved, Oakmont presently has no position on whether four-circuit tubular type or lattice type towers would be preferred.

o Probably 40-50 percent of the approximately 1,700 homes in Oakmont are located such that the existing 230 kV transmission line is visible.

Mr. Jonathan Herr, a Landscape Architect testifying on behalf of the Fulton intervenors on April 16, 1979 stated that the existing Geysers to Fulton transmission line was not designed according to proper design concepts to minimize negative visual impact. He said the existing lines are in areas which grading operations have scarred for the long term, which are not compatible with the major visual patterns of their setting, and which occupy a major portion of the viewed landscape. Therefore, he believes that the mistakes of the existing line should not be repeated by paralleling and/or consolidating this line with the proposed 230 kV line.

Mr. Herr also testified as follows on several points:

o New lines on the Fulton L cannot be mitigated as effectively as new lines on the Applicant's preferred Franz and Alpine Valleys route. The option of avoidance is available within the Franz Valley corridor, but it is not available for the Fulton L. Mitigation costs are also much greater for the Fulton L as compared to the Franz Valley route.

o The proposed tower locations in the Franz Valley corridor are very good, but an improvement might be to use additional towers at the four road crossings.

o The Fulton L, as compared with the Franz Valley route, has the longest length of exposure to residential development.

4. Findings and Conclusions

Findings and conclusions on transmission line corridors are consolidated with system planning findings and conclusions (See Section E.4.)

E. Transmission System Planning

1. Introduction

The Committee views evidence in the area of transmission system planning as pertaining to its obligations under PRC 25512(b) to make findings and conclusions with regard to the relative merits of the proposals. The Applicant and Commission staff were directed to present such evidence by the Committee's March 19, 1979, Supplemental Prehearing Conference Order.

2. Background Information

In essence, transmission system planning can be thought of as the science of adding new transmission lines to the existing system of lines in order to optimize the transfer of electric energy from new generators (and existing generators sometimes) to distant load centers where the energy is to be used. An "optimum" new transmission line is the result of balancing a number of competing interests: voltage levels and conductor sizes of the lines, economics, environmental effects, social effects, land use, termination points, and others. Some of these factors are the same as those discussed in the preceding section on "Transmission Corridors." The alternatives and subalternatives for carrying new Geysers power in an "optimal" way have been the subject of testimony in this proceeding.

The purpose of this section is to summarize the testimony presented on transmission planning issues. There necessarily is some overlap with the section on transmission corridor issues. Based on the testimony in both the transmission planning and corridor issue areas, findings and conclusions for both areas are given at the end of this section.

Figure 8 is a schematic diagram which shows the alternative lines, alternative substations, and other substations south of these alternatives. The testimony can often be better understood by referring to Figure 8, as well as Figure 7 in the preceding section.

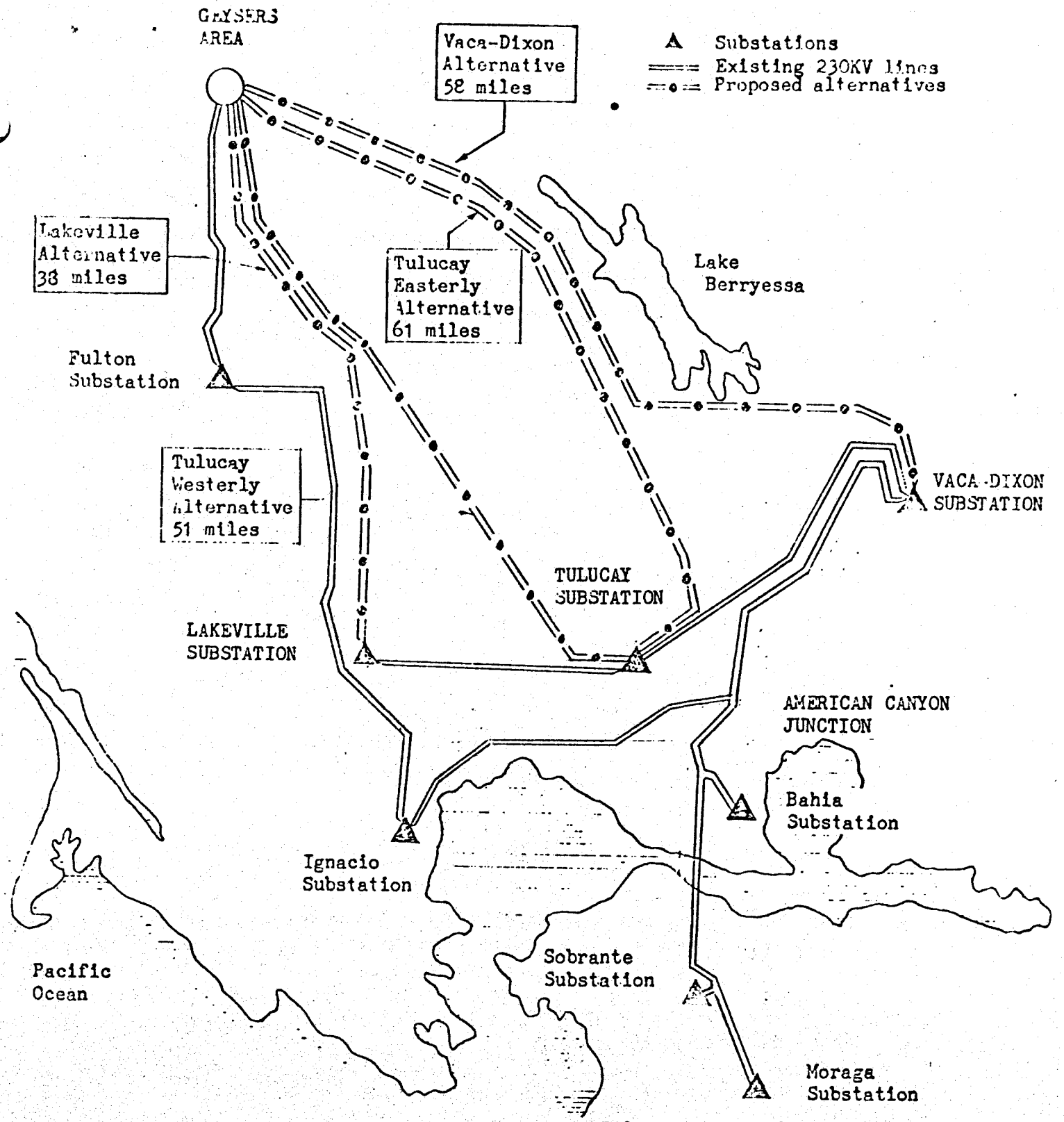
3. Summary of Testimony

Mr. Momcilo Tasich, a Senior System Planning Engineer for PG&E testifying on behalf of the Applicant on April 18, 1979, first discussed the existing transmission outlets which are capable of handling about 1000 Mw of existing and future Geysers generation:

- o A 60 kV wood pole which tied Units 1 and 2 (24 Mw) to the nearby 60 kV system.
- o A 230 kV DCTL which now serves as an outlet for Units 5, 6, 9, 10, 11, and 12 (424 Mw), and will serve future Units 13, 14, and 17 (355 Mw) in 1982.
- o A 115 kV DCTL and a 60 kV wood pole line serve as outlets for Units 3, 4, 7, 8, and future Unit 15 (215 Mw).

He stated that 1000 Mw of additional transmission capability is needed in 1983 for new units which will increase The Geysers area generating capacity to about 2000 Mw.

Several alternatives based on different voltage levels (500 kV, 230 kV, 115 kV) and conductor sizes (1113 kcmil and 2300 kcmil) were examined. A 230 kV DCTL with 2-2300 kcmil conductors was chosen as the preferred alternative



	Lakeville Alternative	Tulucay Westerly Alternative	Tulucay Easterly Alternative	Vaca-Dixon Alternative
Total miles of new line construction	38	51	61	58
Total miles outside existing corridor	11	35	53	54

Source: PG&E Supplemental Environmental Information

FIG. 8

on the basis of comparative economics. Next, the alternative substations which could serve as the point of delivery were identified: Cortina, Fulton, Lakeville, Tulucay, and Vaca-Dixon. Cortina and Fulton were rejected because they will already be absorbing 1000 Mw of Geysers generation by 1982, and it would not be practical to use them for the additional 1000 Mw of Geysers generation. The remaining three are all considered viable from the system transmission point of view, but the Tulucay West and Lakeville alternatives are more economic than Tulucay East and Vaca-Dixon.

For assumed Geysers development of 2600 Mw and 3000 Mw, the economic advantage of the Tulucay West and Lakeville alternative increases over the other two.

Mr. Tasich also testified as follows on a number of points:

o The schedule of Geysers generation additions beyond Unit 17 is as follows:

Unit	Size	Planned Operation
- PG&E Unit 16	110 Mw	12/82
- PG&E Unit 18	110	10/82
- NCPA Shell 1 & 2	106	6/82, 12/82
- DWR Bottle Rock	55	4/83
- DWR South Geysers	55	10/83

If these units come on-line as scheduled, the new 230 kV line is needed in the summer of 1982, assuming PG&E's reliability criteria are adhered to. However, if the single line outage criterion is waived on a short term basis, it would be possible to squeeze an additional 110 Mw unit in the summer

of 1982 and an additional 55 Mw unit in October 1982. This would mean that NCPA Shell 1 and Unit 18 would be squeezed into the existing transmission line, but the new line would still be needed by December 1982 in order to accommodate NCPA Shell 2 and Unit 16.

o System planning involves consideration of economics, reliability, performance, voltage levels, conductor sizes, and distances from the system.

o System loss values were obtained for the 2000 Mw, 2600 Mw, and 3000 Mw assumed Geysers developments by running a large number of cases on PG&E's power flow computer program.

o PG&E developed a new more accurate method in August 1978 for deriving system power values, and application of this method led to changing the conductor size from 1113 kcmil to 2300 kcmil. Power values depend both on the cost of capacity and energy, and are particularly sensitive to the increasing cost of energy.

o At the same time the preferred line from Geysers to Lakeville is built, it would be economically justifiable to complete the subsequent system development (Lakeville to Sobrante substation). The further system development south of Lakeville is needed as soon as possible because this part of the system is already often fully loaded.

o The Lakeville line may be somewhat less reliable than the Tulucay West line because of consolidating four circuits on one tower line along an approximate three mile section through Oakmont, whereas

Tulucay West consists of one power line with two circuits for its entire length. However, the lesser reliability of Lakeville is minor and acceptable.

o In planning its transmission system, PG&E does not assume the loss of a tower line as one of its risk criteria. The loss of a single circuit is one of the criteria.

o Lakeville is preferred over Tulucay as a termination point because it is closer to the Sonoma County and Marin County load centers.

o If Geysers generation ultimately reached 3000 Mw, less overall transmission would have to be built by first going with a 230 kV line to Lakeville, followed by a second 230 kV to Vaca-Dixon, as compared to first going to Vaca-Dixon and then Lakeville. This solution is preferable for both economic and reliability reasons. It reduces the possibility that an additional line from Vaca-Dixon to Lakeville will be needed.

o A 500 kV line from Castle Rock to Vaca-Dixon would be far more costly and less reliable than the preferred 230 kV DCTL to Lakeville. The levelized annual revenue requirements (1983 dollars) for the former is about $16 million per year and about $8.3 million per year for the latter. These costs include right of way, transmission lines and towers, termination facilities, and line losses.

o The three alternative substations (Lakeville, Tulucay, and Vaca-Dixon) are all viable as outlets for Geysers generation from a system planning viewpoint regardless of other PG&E system uncertainties; e.g., whether or not Fossil 1 and 2, Pittsburg 8 and 9, Diablo Canyon 1 and 2, or other planned generation actually come on-line.

Mr. Allan Jones, testifying on behalf of the Staff, on April 20, 1979 stated that he had reviewed the transmission system planning data contained in the NOI and additional material submitted subsequently to the record. Based on a single contingency criterion, units beyond Geysers Unit 17 - Unit 16 (110 Mw), Unit 18 (110 Mw), NCPA Shell (106 Mw), Bottle Rock (55 Mw), DWR South Geysers (55Mw) - require additional transmission line capability.

Mr. Jones also testified on a number of other points as follows:

o The Applicant's risk criteria for transmission line planning are reasonable industry standards. These criteria sometimes cannot be satisfied completely because transmission lines may be delayed in coming on-line. The criteria provide a safety margin for outages of transformers, transmission lines, and generators. Risk criteria for transmission lines should assume that the generators supplying power to the lines are at 100 percent capacity factor.

o There is no economic justification, either in hindsight or at present, for having 500 kV transmission capability at The Geysers.

o There is a necessity for PG&E to carry out subsequent system development for whichever of the three alternative termination substations is selected. There probably would be an economic justification (line loss savings) for doing so a year or two in advance of actual need for such development.

o The Lakeville transmission line has an advantage over the Tulucay West line because the former is closer to the Sonoma and Marin County load centers. Future growth in these areas can be better served from the Lakeville substation.

o System loss values used by PG&E were not independently checked.

o Independent load flow analyses were not carried out to check PG&E's load flow results.

o The ranking of the alternative transmission lines was done on a comparative cost basis first, then other factors (system performance, reliability, parallel mileage, line construction) were qualitatively analyzed as to their possible effects on the ranking.

Mr. Jones' ranking follows:

"Alternative Ranking:

"Based on transmission system planning criteria, which consists of system performance, economics, reliability, parallel mileage, and initial and final new 230 kV transmission line construction, it is my opinion that the following represents the preferred order of alternatives:[1]

"A. Lakeville/Tulucay (West) route

(1) As proposed

(2) By-Pass 4(b)

(3) By-Pass 4(a)

(4) Consolidation 2(a)

(5) Consolidation 2(c)

(6) Consolidation 2(f)

"B. Tulucay (East) route

1. Reference to alternative 4(b), 4(a) etc. are so described in Appendix C of my testimony of April 10, 1979.

"C. Lakeville/Tulucay (West) route

(1) Consolidation 2(b)

"D. Vaca-Dixon route

"Alternatives 3(a), 3(b), and 3(c) are economically unacceptable. (This ranking assumes that there are no other significant mitigation problems associated with the alternative transmission line routes.)"

Mr. George Ferrell, a Consulting Energy Engineer working for Public Interest Economics appeared on behalf of Napa County on April 17, 1979.

A summary of his testimony follows:

o The purpose of his testimony was to evaluate the characteristics of the transmission lines and identify some situations that would favor the Lakeville route over the Tulucay West route.

o He was not aware that the NOI proposed conductor size of 1113 kcmil had been subsequently changed by the Applicant to the preferred size of 2300 kcmil, although he testified that he had reviewed PG&E's "Evaluation of Transmission Losses and Siting the Conductor of the Proposed Line."

o With the exception of comparing PG&E's cost estimates for 230 kV transmission lines and line loss estimates with several generic studies, his testimony was essentially a restatement of PG&E's analyses on several issues (system power values, load flow studies, and

cost estimates for alternative routes) without any independent check, e.g., the Lakeville route is increasingly more economic for larger Geyser capacities.

4. Committee Findings and Conclusions, Transmission System Planning and Transmission Corridors

Findings

1. There is a need for at least 1000 Mw of new transmission capability, in addition to the 1000 Mw of existing transmission, to serve as an outlet for planned generation in the Geysers area.

2. There is a potential that total generation at the Geysers will ultimately exceed 2000 Mw, in which case the ultimate need for new transmission would exceed 1000 Mw.

3. A new line is needed for the following projects with proven steam supplies:

PG&E Unit 16	110 Mw
PG&E Unit 18	110 Mw
NCPA Shell	106 Mw
DWR Bottlerock	55 Mw
DWR South Geysers	55 Mw
	436 Mw

This represents a total of 1454 Mw of generating capacity with proven steam.

4. A transmission method based on using a double circuit 230 kV tower line with bundled 2300 kcmil conductors is better from economic and reliability standpoints than a single circuit 500 kV tower line.

5. The major substations nearest to The Geysers area which might serve as the point of delivery for Geysers generation are Cortina, Fulton, Lakeville, Tulucay, and Vaca-Dixon.

6. From a systems planning standpoint, the Lakeville, Tulucay, and Vaca-Dixon substations are acceptable points of delivery.

7. Lakeville, Tulucay and Vaca-Dixon terminations are electrically equivalent because they are interconnected by the existing Vaca-Dixon - Lakeville 230 kV DCTL.

8. Local loads at Lakeville and Tulucay are presently supplied from the Vaca-Dixon Substation.

9. Local loads at Lakeville and Tulucay will be supplied directly from The Geysers if the proposed DCTL is terminated at either Lakeville or Tulucay.

10. Independent of which substation is ultimately chosen, it is economically preferable to complete the subsequent system development south of the substation.

11. All three substations are also viable outlets for Geysers generation regardless of whether other planned PG&E projects (e.g., Fossil 1 and 2, Pittsburg 8 and 9, etc.) are actually constructed or not.

12. Lakeville substation is better from a system planning standpoint than Tulucay and Vaca-Dixon because it is closer to the Sonoma and Marin counties load centers.

13. From the environmental standpoint, the four alternative corridors from Castle Rock to the three substations are acceptable.

14. In many situations, utilization of existing transmission line corridors has fewer land use, biological and visual impacts than using separate corridors.

15. The proposed route from Castle Rock Junction to Lakeville is 38 miles long of which 11 miles are nonparallel.

16. The Lakeville corridor has a lesser environmental impact than the other three corridors because it is parallel to existing transmission lines for most of its length, whereas the three alternatives are not, and because it is shorter than the other three. These two advantages mean that Lakeville has a lesser visual impact, requires less access roads, requires less clearing, and reduces tree removal.

17. The capitalized costs (including subsequent system development) and levelized annual costs (including losses relative to Lakeville) of these four alternative transmission line corridors based on a Geysers development of 2000 Mw are:

	Thousands (1983 $)			
	Lakeville Alternative	Tulucay West Alternative	Tulucay East Alternative	Vaca-Dixon Alternative
Capital Cost For Facilities	53,520	59,780	63,390	65,160
Levelized Annual Cost	8,970	8,600	10,430	11,090

These costs are considered to be reasonable planning estimates and are acceptable for comparative purposes.

18. From a comparative economic standpoint, Tulucay West is somewhat less expensive (about $350,000/year less - 1983 dollars) than Lakeville under the assumption that Geysers generation is 2000 Mw. For Geysers generation in excess of 2600 Mw, Tulucay West and Lakeville are about equal from a comparative economics standpoint.

19. There is no electrical reason for the line to be routed to the Fulton Substation.

20. The various Fulton L alternatives cost from $2 million to $33 million (1983 dollars) more than the non-parallel Franz and Alpine Valley routing (which is within the Lakeville corridor).

21. The concept of paralleling existing lines in the Fulton area instead of constructing the nonparallel section has the disasdvantages that it would result in substantially increased line length, human impacts, construction costs and line losses compared to the nonparallel proposal.

22. The Fulton L alternatives have a greater environmental impact than the nonparallel routing.

23. The Fulton L, compared to the non-parallel route, has the greatest exposure to residential development.

24. With appropriate constructon techniques and environmental mitigation, there are no significant environmental impacts which will preclude the Franz and Alpine Valley areas as an acceptable corridor.

25. The residential area of Oakmont was developed adjacent to the pre-existing Fulton Ignacio transmission line right-of-way. A golf course occupies

part of the right-of-way. Other residential areas are under construction near Oakmont and the existing transmisson line.

26. The Applicant has provided estimates for undergrounding alternatives in and around the Oakmont/Annadel State Park areas. These estimates are considered reasonable for planning purposes.

27. The various Valley of the Moon/Oakmont undergrounding alternatives cost from $4.4 to $10.5 million (1983 dollars) more than the overhead line proposal.

28. Undergrounding the proposed line only, or both the proposed and existing line, through Valley of the Moon/Oakmont provides mitigation of visual and aesthetic effects in these areas. This mitigation amounts to reducing or eliminating the visual effects of the overhead transmission lines to approximately 700-800 Oakmont homes and the vehicular traffic on Highway 12.

Conclusions

1. A new 230 kV DCTL is needed in order to provide an outlet for new generation which is being planned in the Geysers geothermal area.

2. One 230 kV DCTL with 2-2300 kcmil aluminum conductors per phase provides adequate transmission outlet capacity for a Geysers development of 2,600 Mw.

3. All four transmission line corridors are viable from a system transmission point of view.

4. The Castle Rock to Lakeville transmission corridor represents the best corridor/substation combination of the alternatives which have been evaluated on

the basis of comparative environmental effects, aesthetics, costs, and system planning factors.

5. Regardless of whether Geysers generating capacity may ultimately turn out to be 2,000 Mw or more, the existence of the Vaca-Dixon - Lakeville 230 kV DCTL makes it economically preferable to terminate the first 230 kV DCTL (as proposed) at Lakeville rather than at Vaca-Dixon.

6. For the Lakeville corridor, the Franz and Alpine Valley nonparallel routing is preferable to any of the Fulton L alternatives on the basis of comparative environmental effects, aesthetics, and costs.

7. Overhead consolidation of the proposed and existing transmission lines through Valley of the Moon/Oakmont is preferable to undergrounding either the proposed line only, or both the proposed and existing lines, on the basis that the mitigation benefits provided by undergrounding are simply not commensurate with the costs of so doing.

F. Geotechnical/Structural Engineering

1. Introduction

The Committee views evidence in the areas of potential geological and seismic hazards along the transmission line corridor alternatives, and mitigation of such hazards by the Applicant through tower design and placement, as pertaining to its obligations under PRC 25512(b) and (c) to make findings and conclusions with regard to the acceptability, relative merit and the safety and reliability of the alternatives. The Applicant, Commission Staff, and certain intervenors were directed to present such evidence by the Committee's March 19, 1979, Supplemental Prehearing Conference Order.

2. Background Information

The alternative corridors are located in areas containing various types of geological hazards as well as seismic activity. It is necessary to determine which, if any, of the corridors are unacceptable in view of these hazards or seismic activity. The main hazards in question involve potential fault rupture areas, which may be in proximity to active faults; ground failure due to liquefaction, which could be induced by earthquakes; landslides; and soil erosion.

3. Summary of Testimony

Dr. Bruce Bolt, a Professor of Seismology and a Registered Geologist and Geophysicist in the State of California, testified on behalf of the Appli-

cant on April 10, 1979 and stated that in a 50-year interval there is a probability of 0.9 that the peak ground acceleration will not exceed levels ranging from 0.3g to 0.7g over the regions traversed by the four alternative corridors. His understanding is that the transmission lines will be designed at levels higher than 0.7g; therefore, the design represents a conservative position.

Mr. Harold Goldman, a Consulting Geologist registered by the State of California, testified on behalf of the Applicant on April 10, 1979 and stated that the potential geologic hazards along the Lakeville and Tulucay West corridors are landslides and fault displacements, while the potential hazards along the Tulucay East and Vaca-Dixon corridors are landslides. He said that the transmission towers can be sited to avoid unstable slopes (hence landslides) and to span the active fault traces; none of the geologic hazards prevent locating a transmission line within the corridors.

Mr. Goldman also testified as follows on several points:

o Liquefaction does not present a problem for any of the corridors.

o He was not asked by PG&E to rank the four corridors from a geologic point of view. Transmission lines can be built in any of the corridors.

Mr. George Lenfestey, a Supervising Civil Engineer with PG&E, testified on behalf of the Applicant on April 10, 1979 and stated that the Geysers to Lakeville towers can be expected to withstand a peak ground acceleration of 0.9g. This conclusion is based on a recent dynamic analysis test of a 230 kV double-circuit tower. He also testified on several points as follows:

o One-legged tubular, two-legged tubular, two-legged lattice, and four-legged lattice towers would all be capable of withstanding the expected ground acceleration in the areas of the four corridors.

o Towers designed to withstand extreme wind loading and broken conductor loading in accordance with CPUC criteria in General Order 95 will be good for about 0.9--1.0g.

o There is no record of seismically induced transmission tower failure within the PG&E system. There have been tower failures due to landslides, but these failures can be prevented by avoiding landslide areas or using special footings.

Mr. Bennie Troxel, a Registered Geologist and Engineering Geologist, testified on behalf of Napa County on April 10, 1979 and stated that the Tulucay West and Tulucay East corridors in Napa County would be fraught with extreme difficulty in choosing adequate tower sites and development and maintenance of harmonious access routes. Both corridors have problems related to the stability of the bedrock, landslides, and the possibility of seismic events or ground rupture.

He also testified as follows on several points:

o His review was limited to only those portions of Tulucay West and Tulucay East located in Napa County, and he did not examine the Lakeville or Vaca-Dixon corridors.

o He said it would be important to know if any existing transmission lines in the area crossed faults in reviewing the siting of a potential line; however, he could not recall whether any did or not.

o He said he has had no previous experience in the siting of transmission lines, and that his testimony goes to the existence of faults and other geological features and not to the relative ease or difficulty of siting transmission lines in view of such features.

Mr. Gaylon Lee, a Geologist with the Engineering and Safety Office of the Commission, testified on behalf of the Commission Staff on April 10, 1979 and stated that none of the potential geologic/seismic problems appear to be significant enough to preclude use of any corridor provided that appropriate mitigation measures are used. From a geologic hazard standpoint, the order of preference is Vaca-Dixon, Lakeville (distant second), Tulucay East, and Tulucay West.

The Lakeville and Tulucay West corridors have greater susceptibility to fault rupture than do Tulucay East or Vaca-Dixon because of their location relative to major active faults. However, the probability of fault rupture appears minimal for all corridors if traces of active faults are avoided in tower siting.

Landsliding is the geologic phenomena most likely to produce tower damage. However, even in regions of general slope instability, mitigation is possible by siting towers on local stable areas or traversing the unstable area with the transmission lines.

During an average 100 year period, peak rock accelerations of 0.3 to about 0.7g may occur within the region of the corridors. Such shaking is considered most probable in the more seismically active western portion of this region near the major active faults.

Mr. Robert Chittenden, a Structural Engineer for the Engineering and Safety Office of the Commission, testified on behalf of the Staff on April 10, 1979 and discussed structural engineering considerations associated with tubular and lattice towers from a seismic effects standpoint.

Lattice towers have historically performed well under moderately severe seismic ground shaking events and their structural design is somewhat standardized. Because the conductor and wind design loads are generally higher than seismic design loads, the tower design is governed by the conductor and wind loads.

The structural design of tubular towers is less standardized, because tubular towers have been used extensively only in the last 15 years. To his knowledge, there is no data to substantiate that tubular towers of the type proposed are capable of withstanding seismic ground accelerations of 0.3 and 0.7g.

Based on the past performance of lattice and tubular tower which have been subjected to wind and conductor loads, his opinion is that the wind and conductor design criteria are adequate.

Mr. Chittenden also testified on several other points as follows:

o He did not have specific knowledge as to the peak ground accelerations and their effects on transmission lines which resulted from the 1971 San Fernando Valley earthquake.

o There is no reason why tubular towers could not be designed to be safe and reliable during seismic events. On the basis of appropriate analysis, tubular towers can be designed to withstand a seismic loading of 0.9g.

Mr. Clark McHuron, testifying on behalf of Sonoma County, stated that the Lakeville corridor is the worst of the alternatives from the standpoint of geologic hazards. This corridor has the most miles of unstable slopes, the most earthquake epicenters, and is the only corridor containing two faults. However, these hazards do not preclude the use of the Lakeville corridor. His opinion is that the Vaca-Dixon corridor poses the fewest geologic hazards.

Mr. McHuron also testified as follows on several other points:

o The Lakeville corridor actually has the second fewest miles of unstable slope (24 miles) and the second fewest miles of landslides (5.5 miles). Only the Vaca-Dixon corridor has less. The conclusion that Lakeville is the worst corridor is based on the percentages of the unstable slope miles and landslides miles relative to the total length of the route.

o Earthquakes of approximately 7.0 to 7.5 (Richter scale magnitude) originating at epicenters in the region traversed by the corridors could cause ground accelerations of 0.9g. However, he is not aware of any historical earthquake in the region which exceeded a 5.4 magnitude.

o He has not attempted to count the number of epicenters which are located within a mile or two on either side of any corridor.

o Liquefaction potential is a problem for the Lakeville corridor.

o Further evaluation of geologic hazards is needed before any of the four corridors are selected.

4. Committee Findings and Conclusions

Geotechnical/Structural Engineering

Findings

1. All four corridors to varying degrees are affected by potential seismic activity and geological hazards (slope instability, landsliding, soil erosion, liquefaction, and potentially active faults).

2. Potential undergrounding routes in the Oakmont and Fulton areas do not cross potentially active faults or active landslide areas. No known geologic hazards exist along these possible routes which would require exceptional design measures.

3. In the region traversed by the corridors there is a probability of 0.9 in a 50-year interval that the peak ground acceleration will not exceed levels ranging from 0.3g to 0.7g.

4. 230 kV transmission towers are commonly built to withstand a peak ground acceleration of 0.9 to 1.0g as a consequence of satisfying wind loading and broken conductor loading (CPUC criteria).

5. Through proper location of towers and design of footings, the various geologic hazards along any of the proposed corridors can be mitigated.

6. The Applicant agrees not to place tower footings across or within traces or any known or suspected active faults identified prior to or during construction (as defined by California Division of Mines and Geology special report #42).

7. Lengthy portions of the Lakeville and Tulucay West alternative corridors and the Fulton alternative are in close proximity to major active faults (Maacama and Rodgers Creek-Healdsburg) and are more susceptible to severe earthquake shaking and seismically-induced ground failures. Consequently, the potential seismic hazards along these corridors are somewhat greater than along the Vaca-Dixon or Tulucay East corridors. However these potential hazards do not appear to be of a nature or magnitude which would preclude utilization of any of the alternative corridors.

8. The geologic hazards of slope instability and landsliding affect all corridors, although mitigation measures can be used to make all acceptable. The preferred routes are Vaca-Dixon and then Lakeville, because the two Tulucay routes have greater potential hazard.

9. There is no instance of a transmission tower failure in the PG&E system due to a seismic event.

10. Lattice and tubular towers can be designed to be safe and reliable during seismic events.

11. Foundation conditions, slope stability, fault rupture, and earthquake shaking do not appear to seriously constrain utilization of the Fulton, Tulucay, Vaca-Dixon, and Lakeville substations.

Conclusions

1. None of the alternative corridors preclude the routing of a transmission line based on the present evidence related to geologic hazards and seismic activity.

2. From geologic and seismic standpoints, the Vaca-Dixon corridor is preferable, Lakeville second, and the two corridors to Tulucay last.

3. As part of the AFC, the Applicant will submit a report which:

   a. Proposes specific measures to mitigate geologic hazards along the specific alignment to be used within the approved corridor.

   b. Demonstrates that the lattice towers and tubular towers, if any, proposed for the transmission line will not fail as a consequence of a seismic event.

VII. ISSUES REQUIRING FURTHER REVIEW

A. Site Related Topics

1. Introduction

The first basis for identifying site-related issues that may require further consideration in proceedings on PG&E's proposal to construct and operate its Geysers Unit 16 geothermal project lies in the Findings and Conclusions presented in the foregoing sections. Several of these Findings and Cocnlusions reference information, studies, or reports that PG&E has agreed to provide prior to or at the time of filing an Application for Certification, should the Commission approve the Notice of Intention. In addition, the Committee will consider the comments on the Preliminary Report as a source for identifying issues that may require futher review.

The preceeding Findings and Conclusions for site-related issues indicate that the areas of "Hydrology and Water Sources" and "Socio/economic" will require no adjudication at an AFC stage. Additional information is to be submitted on the subjects of "Air Quality", "Biological Resources", "Civil Engineering", "Cultural Resources", "Geotechnical", "Noise", and "Public Health". Subsection two summarizes the information yet to be submitted for each site-related area. Subsection three specifies the time frame when the information is to be provided.

Under these circumstances, unless new information is presented in comments or at hearings on the Preliminary Report, the Committee will issue its Final Report to the Commission based largely upon information available to date and information to be received at hearings on issues already identified as requiring testimony after the Preliminary Report. PG&E, Staff, interested

public agencies, and the public are, therefore, invited to state their views during hearings on the Preliminary Report.

2. Information Yet to be Submitted and Additional Tasks to be Performed for Site-related Issues

The following section contains a listing and a brief summary, on a subject-by-subject basis, of the information yet to be submitted and/or tasks yet to be performed for site-related issues.

Area	Information and Tasks
Air quality	Specification of control system or systems, or other pertinent information, verifying that the steam supplier will be able to comply with LCAPCD Rule 411; air quality impact analysis; Staff final conclusions on the reasonableness of PG&E model for drain and downwash conditions; analysis of the cumulative impacts of the NCPA/Shell project and the Geysers Unit 16 project; a review and report by Staff, NSCAPCD, and LCAPCD of PG&E data on a comparison of calculated versus observed H_2S concentrations for historical days; assessment of what constitutes BACT; Staff submission regarding status of applicable NSR rules; sufficient operating data from PG&E Unit 15 to determine, with reasonable certainty, that the

Stretford unit's performance efficiency and the partitioning efficiency of the surface condenser will be sufficient to meet specified H_2S emissions limitations, or specific proposals for condensate treatment systems which will be installed prior to commercial operation of the proposed project; detailed information on the method of control during steam stacking; detailed information demonstrating the engineering feasibility of the automated valve shut-in and crossover pipeline to reduce H_2S emissions to 5 lbs./hr.; demonstration of compliance with Rule 421B (findings 4, 9, 15, 16, 17, 19, 26, 27, 29, 33; conclusions 2-8).

Biological resources

The Applicant shall evaluate the nature and significance of the springs and seeps near the Unit 16 site for value to wildlife or in maintaining the trout fishery of Bear Canyon Creek and identify any mitigation measures it proposes to utilize, in a report regarding the environmental impacts of the disposal site, to be submitted by January 1, 1979 (finding 13; conclusion 3)

The Applicant is studying the effects of cooling tower drift on vegetation and

reports on these studies were to be submitted at or prior to the filing of the Geysers 17 AFC. The Staff shall report to the Committee after it has reviewed the Applicant's report and shall make such recommendations as may be necessary (finding 18; conclusion 3).

Staff will meet with both U.S. Fish and Wildlife Service and the California Department of Fish and Game to identify the impacts and mitigation or compensation programs that would be needed to reduce cumulative impacts. Staff will report to the Committee or Commission any findings or recommendations (finding 19).

Civil engineering

The Applicant will provide additional design criteria for the earth retaining structures at the site with special regard to seismic loads and a detailed description of the design methods and references to published documents containing applicable design methods for those structures (finding 7; conclusion 1).

Cultural resources

Applicant will perform a full cultural resources survey and, upon its completion, provide such report to the Commission. Upon

	receipt, Staff may make recommendations for additional mitigation measures (findings 4 and 5; conclusions 2 and 3).
Geotechnical	Applicant will submit a proposed inspection, reporting, and monitoring plan for evaluation of geologic conditions during site preparation (finding 14; conclusion 3);
	Estimates of ground shaking at the site (findings 15, 16 and 17; conclusion 3);
	Workshop on significant differences in the estimated magnitudes of earthquakes which regional faults may produce (finding 18; conclusions 3 and 4);
	Evaluation of present techniques for analyzing how topography affects seismic shaking (finding 19; conclusion 4);
	Maps showing existing and proposed well pad sites (finding 20 and 21; conclusion 4).
Noise	Studies that demonstrate that the power plant will emit 60 dBA at 500 feet and an analysis which shows the basis of the estimated barrier effects of the turbine-generator building (finding 11).
Public health	Proposal for emissions monitoring (conclusion 3 for H_2S);

Discussions between staff, utilities, steam suppliers, public agencies and interested persons on the necessity and methodology for monitoring ambient H_2S concentration (conclusion 4 for H_2S);

Ascertainment of the impact of Unit 16's emissions of ammonia, arsenic, and mercury, on their respective ambient concentrations (conclusions 1 for ammonia, arsenic, and mercury);

Proposed ^{222}Rn monitoring program (conclusion 2 for radionuclides).

Safety and reliability

Information on the procedures for the control operator to follow to determine the appropriate response to emergency or upset conditions at the power plant; discussion on the criteria to be used for (1) the control operator over-riding the automatic system for plant shutdown, (2) for establishing the parameters of the automatic monitoring system; description of the remote control facility alarm system. (finding 5; conclusions 2, 3 and 4). Criteria for the earth retaining structures with special regard to seismic loads and a

	detailed description of the design methods (finding 7-Civil Engineering).
Structural engineering	Criteria for Functional Basis and Safety or Extreme Basis Earthquakes (findings 2,8,11, 12,13; conclusions 4 and 5).

3. Summary of Information to be Submitted, Site Related Issues.

Information specified in the following findings and conclusions on various issues is to be submitted as indicated:

DURING THE COMMENT PERIOD
ON THE PRELIMINARY REPORT

Air Quality
Finding 17.

Applicant and Staff will advise the Committee on the schedule for operational tests of the surface condenser and Stetford unit on Geysers Unit 15 (see Findings 20-25, and Conclusion 3).

Biological Resources
Finding 13, 18 (interim report), 19.

Cultural Resources
Findings 4 and 5.
Conclusions 2 and 3.

Geotechnical Issues
Findings 15, 16, 17, 19, 20, 21

Public Health and Safety
Staff and Applicant will advise the Committee on the process for determining an appropriate sludge disposal area and on the status of the air quality analysis.

Structural Engineering
Finding 13 (Applicant to report on criteria specified)

AT OR PRIOR TO THE FILING
OF AN AFC

Air Quality
Findings 4, 6, 9, 15, 16[1], 19[2], 26, 27, 29, 33

Biological Resources
Finding 18

Civil Engineering
Finding 7

Geotechnical Issues
Findings 14, 18

1 Based on discussions with Staff prior to an AFC filing.

2 Clarification is requested from Staff and Applicant as to what information is to be submitted at the time an AFC is filed and what information may be filed during proceedings on an AFC.

Noise
Finding 11

Public Health and Safety

Hydrogen Sulfide:	Conclusions 3 and 4
Ammonia:	Conclusion 1
Arsenic:	Conclusion 1
Mercury:	Conclusion 1
Radon-222:	Conclusion 2

Safety and Reliability
Finding 7 (Civil Engineering)
Finding 5
Conclusions 2, 3, 4

Structural Engineering
Findings 2, 8, 11, 12, 13
Conclusions 4 and 5

B. Transmission Line Topics

1. Introduction

As in the case of site-related topics (See Section V), information has been identified during the NOI proceedings which will be needed during evaluation of the AFC. The following section lists the information and tasks for several technical areas which the Applicant is to submit as part of the AFC review.

2. Information to be Submitted and Additional Tasks to be Performed for Transmission Line Issues

Land Use

o Prior to or at the time of filing the AFC, the Applicant shall submit to the Commission in conjunction with the Department of Parks and Recreation a mitigation plan for minimizing environmental effects of the 1.4 mile crossing of Annadel State Park by the new lines. The Department has consented to the proposed crossing so long as adequate mitigation measures are undertaken by the Applicant.

o If the Applicant files an AFC for either the Vaca-Dixon or the Tulucay East corridor, Applicant will be required to demonstrate in the AFC an alignment around the Cedar Roughs area, which is now being inventoried by BLM for possible designation as a Wilderness Study Area (WSA).

o If the Applicant files an AFC for either the Vaca-Dixon, Tulucay East, or Tulucay West corridor, Applicant is required

to include in the AFC a geologic/seismic report in accordance with the Napa County General Plan showing that the transmission line is consistent with public safety.

Geotechnical

o Prior to or at the filing of the AFC, the Applicant will provide detailed geologic map(s) of the proposed alignment showing the proposed transmission line route within the corridor and all potential geologic hazards and impacts (slope instability, erosion sensitivity, mapped fault traces, and any other potentially adverse geologic conditions which were determined by detailed field investigation) which the applicant will avoid or for which mitigation measures will be required. The scale of the map or maps will be at least 1:24,000.

o Prior to or at the filing of the AFC the Applicant will provide an evaluation of the levels of potential hazard or impact (slope instability, erosion sensitivity, mapped fault traces, and any other potentially adverse geologic conditions which were determined by detailed field investigation) along the specified route and will propose specific measures to mitigate the hazards and impacts evaluated.

o Prior to or at the filing of the AFC, the Applicant will provide a detailed report of dynamic analysis of the specific types of tubular towers proposed. This report shall specifically address:

-- Estimates of the maximum vibratory ground motion which towers of the type to be utilized have historically withstood without structural failure due to shaking, and

-- theoretical estimates of the maximum vibratory ground motion these types of towers could be expected to withstand without structural failure due to shaking.

The report will present in detail the assumptions, methodology and base data utilized, as well as results and conclusions of the analysis.

Cultural Resources

o If an AFC is filed for the Tulucay West, Tulucay East or Vaca-Dixon alternatives, the Applicant shall undertake an intensive cultural resource survey equivalent to the level of detail of the Lakeville survey. These studies will follow the Cultural Resources Mitigation Program (SEI 6-17, 6-18).

o If an AFC is filed for the Lakeville route, the Applicant will submit a cultural resources report on the five miles of the route not yet completed and on the access roads to the line.

o The Applicant will be required to show compliance with the Mines Leasing Act of 190 (P.L. 66-146, Statute 437) for the selected route.

o At or prior to the time of the filing of the AFC, the Applicant shall submit a detailed mitigation plan for the route selected.

o The applicant shall contact the appropriate Native American organizations regarding the possible occurrence of Native American historical, cultural, and sacred sites within the selected corridor. The purpose is to fulfill requirements of PL 95-341 and PRC 5097.9 et seq.

Biological Resources

o The Applicant shall include in the AFC filing a detailed mitigation plan for the biological resources impacted by the proposed project. This plan shall specifically address the following areas (if appropriate) as requiring special mitigation consideration:

a. Rare, threatened, endangered and fully protected plant and animal species; commercial and recreational biological resources; species of special concern; and areas of critical concern.

b. The 11-mile nonparallel crossing of Franz and Alpine Valley. This shall include an onsite survey for rare and endangered plants in this area. Also particular attention should be directed to the Mark West Creek area. In developing a detailed mitigation plan for this area, the Applicant will cooperate with interested local, state and federal governmental agencies as well as private groups and individuals that have participated in this NOI process.

c. Mitigation plan for preventing disruption of riparian zones.

APPENDIX A

Timeline of Events

APPENDIX A

Timeline of Events

Event	1978/79
NOI filed	August 30
Staff workshops	
on transmission system planning	October 13
on site related issues	October 19 and 20
Informational hearings:	
Santa Rosa	October 26
Lakeport	October 30
Napa and Fairfield	November 3
Supplemental Environmental Information (SEI) submitted	October 26 (partial) November 15 (complete)
Prehearing conference statement workshops on site related issues	November 7
Prehearing conference on site related issues	November 17
Commission hearing on complaint filed by Oakmont Property Owners Assoc.	December 6
Evidentiary hearing on the resource size of the Geysers	December 8
Staff workshop on transmission line issues	December 12
Second set of informational hearings:	
Lakeport and Santa Rosa	December 14
Napa and Fairfield	December 15
Prehearing conference statement workshop on transmission line issues	December 20
Prehearing conference on transmission line issues	January 4
Hearing and decision on Complaint by OPOA	January 5
Procedural conference	February 1
Staff workshop on Fulton and Kenwood Alternatives	February 9

Procedural conference	February 1
Staff workshop on Fulton and Kenwood Alternatives	February 9
Informational hearing on Fulton and Kenwood Alternatives	February 15
Prehearing conference statement workshops on transmission line issues	February 22, 23
Commission hearing on Napa Petition to Review Committee Order to Provide Information	February 28
Committee hearing on Napa Request for Ruling	March 8
Prehearing conference on transmission line issues	March 9, 10
Commission hearing on Napa Appeal from Committee Ruling	March 28
Site visit by the Committee	March 31
Evidentiary hearings	April 5-April 21

APPENDIX B

List of Intervenors

APPENDIX B

List of Intervenors

Intervenor	Petition Granted
Oakmont Property Owners Association	October 12, 1978
County of Sonoma	October 12, 1978
California Public Utilities Commission	October 23, 1978
Northern California Power Agency	October 23, 1978
Alpine Valley Property Owners Association	October 26, 1978
Franz Valley Property Owners Association	November 22, 1978
Wild Oak Home Owners Association	November 22, 1978
County of Napa	December 7, 1978
California Air Resources Board	December 7, 1978
Howard and Jeanne Zwick	January 8, 1979
Kenwood Community Club, Inc.	January 8, 1979
California Department of Parks and Recreation	January 8, 1979
Upper Napa Valley Associates	January 17, 1979
Lawton Shurtleff, et al.	January 17, 1979
City of Santa Rosa	January 17, 1979
County of Solano	January 22, 1979
Alternate Energy Systems, Inc. and S.A. Healy Company	March 1, 1979
Carl and Margaret Livingston	March 15, 1979
Richard J. and Kaye B. Heafey	March 15, 1979
Marc S. Anderson	March 15, 1979
Wikiup Home Owners' Association	March 15, 1979
Phillips A. Johannes	March 15, 1979

APPENDIX C

Proof of Service List

TP-1A:27

STATE OF CALIFORNIA

State Energy Resources
Conservation and Development Commission

In the Matter of:	)	
	)	
The Notice of Intention	)	Docket No. 78-NOI-6
of PACIFIC GAS AND ELECTRIC COMPANY	)	
to File an Application for	)	
Certification RE: Geysers 16	)	

PROOF OF SERVICE

I, _____, declare that on _____, 1979, I deposited copies of the attached _____ in the United States mail in Sacramento, California, with first class postage thereon fully prepaid, and addressed to the following, with the exception of those at the Commission's headquarters which were hand delivered:

Applicant

Mr. Ivor Samson
Attorney at Law
Pacific Gas & Electric Company
77 Beale Street
San Francisco, CA 94102

Reporter

Peters Shorthand Reporting
Certified Shorthand Reporter
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Sacramento, CA 95826

Intervenors

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Vice-President
Oakmont Property Owners Assoc.
23 Valley Green Drive
Santa Rosa, CA 95405

County of Sonoma
Office of County Counsel
Lynda Millspaugh
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Santa Rosa, CA 95401

James T. Quinn
California Public Utilities Commission
5066 State Building
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ALTERNATE ENERGY SYSTEMS, INC.
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L. Shurtleff, H. Hagel,
J. Herr, and C. Wright
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Solano County Planning Dept.
Courthouse
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Santa Rosa, CA 95401

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Richard & Kaye Heafey
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Energy Commission

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Pam Patterson
Secretary of the Commission
State of California Energy
Resources Conservation and
Development Commission
1111 Howe Avenue
Sacramento, CA 95825

Docket Section (12)
California Energy Commission
1111 Howe Avenue, M.S. 24
Sacramento, CA 95825

I am and was at the time of the service of the attached paper over the age of 18 years and not a party to the proceeding involved.

I declare under penalty of perjury that the foregoing is true and correct.

_____

Attachment

APPENDIX D

Public Agency Comments

Following are written comments submitted by public agencies from the filing date of the Notice of Intention through the preparation of the Preliminary Report.

APPENDIX D

List of Public Agency Comments

Date of Correspondence	Agency and Signature
September 15, 1978	California Department of Transportation Office of Planning and Design W.R. Green, Chief
September 28, 1978	California Department of Transportation Division of Aeronautics G.A. Miller, Deputy Chief
September 29, 1978	California State Lands Division William F. Northrop, Executive Officer
October 5, 1978	California Division of Mines and Geology Roger W. Sherburne, Seismology Manager
October 11, 1978	City of Santa Rosa Office of the City Attorney Bruce Leavitt, City Attorney
October 12, 1978	California Division of Oil and Gas A.D. Stockton, Geothermal Officer
October 12, 1978	California Public Utilities Commission James T. Quinn, Senior Counsel
October 12, 1978	County of Sonoma Planning Division Raymond E. Krauss, Asst. Environmental Admin.
October 13, 1978	County of Sonoma Office of the County Counsel Elizabeth A. Strauss, Deputy Counsel
October 13, 1978	County of Solano Planning Department Clayne E. Munk, Planning Director
October 17, 1978	U.S. Fish and Wildlife Service Division of Ecological Services James J. McKevitt, Field Supervisor
October 18, 1978	California Department of Health Services Hazardous Materials Management Section Harvey F. Collins, Acting Chief
October 19, 1978	State Water Resources Control Board Larry F. Walker, Ex. Dir, Water Quality

Date of Correspondence	Agency and Signature
October 23, 1978	California Department of Conservation Lalliana Mualchin, Seismologist
October 24, 1978	County of Sonoma Board of Supervisors
October 25, 1978	California Department of Fish and Game
October 31, 1978	California Department of Fish and Game E.C. Fullerton, Director
November 8, 1978	California Division of Mines and Geology Roger W. Sherburne, Seismology Manager
November 6, 1978	California Department of Conservation Richard T. Kilbourne, Geologist
November 8, 1978	County of Napa Conservation, Development and Planning Department James H. Hickey, Director
November 29, 1978	California State Lands Comission William F. Northrop, Executive Officer
December 4, 1978	County of Napa Conservation, Development and Planning Department Anthony R. McClimans, Senior Planner
December 7, 1978	California Department of Health Services Hazardous Materials Management Section Harvey F. Collins, Acting Chief
December 12, 1978	County of Sonoma Planning Division Raymond E. Krauss, Asst. Environmental Administrator
December 18, 1978	Northern Sonoma County Air Pollution Control District Michael W. Tolmasoff, Air Pollution Control Officer
December 20, 1978	U.S. Federal Aviation Administration Western Region W. Bruce Chambers, Regional Planning Officer
December 21, 1978	County of Solano Resolution Planning Commission

Date of Correspondence	Agency and Signature
January 8, 1979	U.S. Federal Communications Commission Safety and Special Radio Services Bureau Carlos V. Roberts, Chief
February 14, 1979	California Department of Parks and Recreation Russell W. Cahill, Director
February 20, 1979	County of Sonoma Board of Supervisors
March 1, 1979	County of Sonoma Resolution No. 8558 Planning Commission
March 6, 1979	California Department of Health Services Hazardous Materials Management Section Harvey F. Collins, Acting Chief
March 9, 1979	U.S. Bureau of Land Management Dean E. Stepanek, District Manager
March 13, 1979	California Department of Fish and Game E.C. Fullerton, Director
March 29, 1979	California Department of Fish and Game E.C. Fullerton, Director
April 2, 1979	U.S. Fish and Wildlife Service James S. Leiby, for Director
April 3, 1979	Resolution No. 79-64, Board of Supervisors of the County of Napa
April 13, 1979	Resolution No. 79, Wikiup County Water District
April 16, 1979	Resolution from the Members of the Larkfield-Wikiup Land Use Study
April 19, 1979	Mark West Union School District Brad Vaughan, District Superintendent

A. Pasternak

State of California — Business and Transportation Agency

Memorandum

78-NOI-6

To : Office of the Secretariat
California Energy Commission
1111 Howe Avenue
Sacramento, CA 95825

ENERGY RESOURCES
SEP 20 1978

Date: September 15, 1978

File : 78-NOI-6

Telephone: ATSS ( )
(445-) 4400

From : DEPARTMENT OF TRANSPORTATION
Division of Project Development - Office of Planning and Design

Subject: PG&E's Geysers Unit 16

We have reviewed the above report for the construction of a geothermal electric power plant to be located approximately five miles west of Middletown near Anderson Springs.

The project is in such a remote area that it will not have any direct affect on State highways in the area.

W. R. GREEN
Chief, Office of Planning and Design

State of California — Business and Transportation Agency

78-NOI-6

Memorandum

To : Office of the Secretariat
California Energy Commission
1111 Howe Avenue
Sacramento, CA 95825

Date : September 28, 1978

File No.: Environmental General

OCT 2 1978

From : DEPARTMENT OF TRANSPORTATION
Director's Office

Subject: Notice of Intention Filed by Pacific Gas and Electric Company - PG&E Geysers Unit 16 (78-NOI-6)

D-5

Our review of the Notice of Intention indicates three areas of concern to the Division of Aeronautics which we feel should be addressed in the Environmental Impact Report.

I. Transmission Lines and Towers

Hazards to aircraft in flight caused by extending the height of existing transmission towers and/or construction of transmission lines over new routes--Sections 21656-21660, Public Utilities Code (Appendix A, attached).

II. Aircraft and/or Airport/Heliport Operations

Use of aircraft during the construction phase of this project would subject the proponent to the provisions of the State Aeronautics Act and/or Department of Transportation Regulations.

The Division of Aeronautics is the approving authority for the issuance of airport/heliport permits within the State. The Division is governed in the issuance of permits by Subchapter 2 and 2.1, Chapter 9, Title 4, State Administrative Code; and Article 3, Chapter 4, State Aeronautics Act.

III. Helipad as Part of Project

If the construction of a permanent helipad is contemplated (i.e., for transmission line inspection, transportation of employees or materials, etc.), it would be better to evaluate it as a part of this project rather than as part of a separate project to be submitted at a later time.

The Department's standard for heliport design is the Federal Aviation Administration Advisory Circular 150/5390-1B, "Heliport Design Guide," dated August 22, 1977.

Thank you for the opportunity to comment.

G. A. MILLER, Deputy Chief
Division of Aeronautics

Attachment

State of California — State Lands Commission

Memorandum

To : Mr. Frank Hahn
Deputy Executive Director
California Energy Commission
1111 Howe Avenue
Sacramento, CA 95825

Date : September 29, 1978

File No.: W 9800

OCT 4 1978

From : STATE LANDS DIVISION
100 Oceangate, Suite 300 — Long Beach, CA 90802

Subject: PACIFIC GAS & ELECTRIC COMPANY'S GEYSER UNIT 16 NOTICE OF INTENTION (DOCKET NO. 78-NOI-6)

Our staff has reviewed subject NOI and we are concerned that steam for Powerplant 16 will be supplied solely by Aminoil, USA, Inc., despite the fact that there are at least three other developers who are close enough to provide steam to this plant. Making Aminoil the exclusive supplier raises several issues which should be addressed by the Commission.

D-6

Of greatest concern to the State Lands Commission is the potential effect this exclusive supply commitment could have on the nearby State mineral lease known as the "Davies Estate" Lease (PRC 5206). This 130-acre parcel was leased by competitive bidding to Natomas and is located approximately one-quarter mile from the proposed Powerplant 16 site. Because of its close proximity, it is logical that a steam supply developed from this State lease go to Plant 16. The determination that Aminoil be the sole supplier could have a detrimental effect on development of the resource from State-owned lands since the developer would have no immediate market and be looking at a long lead-time for additional plants in the area. Development of the resource in this manner could have an adverse effect on the steam reservoir.

Although not a direct concern of the Commission, the same situation, with all of its inhibiting effects is true for other nearby developers in that immediate area, namely, Natomas, Occidental and Shell. One wonders about the anti-competitive aspects of such an exclusive steam provision to the exclusion of all others. The California Supreme Court has recognized the importance of considering anti-competitive aspects when approving the siting of geothermal powerplants (Sec. N.C.P.A. v. P.U.C., 5 Cal. 3rd, 370, 1971).

It would be useful for the Commission in its deliberations on this plant to consider some mechanism to insure full steamfield participation in this plant. Failure to consider this problem could have an inhibiting impact on development of the resource from nearby leases.

WILLIAM F. NORTHROP
Executive Officer

State of California — The Resources Agency

78-NOI-6

Memorandum

To : Mr. Mike Bathem
Project Manager, ERCDC

Date: October 5, 1978

Re: 31-03-01

OCT 11 1978

From : Department of Conservation
Division of Mines and Geology
2816 O Street
Sacramento 95816

Subject: Geysers Unit 16

This letter is to inform you of the results of the NOI review for UNIT 16 at the Geysers. CDMG staff scientists, Drs. R. Kilbourne (geologist) and L. Mualchin (seismologist) have reviewed the text and found the data content adequate and interpretations compatible with available information; however, alternate interpretations are possible and suggest that a significant potential exists for unsatisfactory foundation conditions at this site. The applicant, PG&E, has attempted to answer this question. The ultimate answer will become available only as site excavation progresses; it would be appropriate, considering the number of facilities to be constructed in the Geysers area, to request that the applicant provide geologic logs of excavated surfaces exposed both during and following the excavation. These data would be valuable to both the applicant and the State for current decision making and also as a case history for reference whether or not the site is ultimately developed.

Another potential problem is the area selected for the spoils; it is known to be a landslide area and whether or not it will be appropriate for the proposed use will also be dependent upon geologic conditions exposed as development proceeds.

No potential problems, which could be quantified, were identified relative to seismology.

In summary the NOI was satisfactory, but geologic conditions may be discovered in the plant site foundation or spoils area which may make this site less than desirable. It is recommended that site excavation be reviewed during and after preparation to adequately evaluate the geologic environment. The individual CDMG staff reviews will be forwarded to your office at a later date. If additional questions arise, please contact either myself or the appropriate scientist.

Roger W. Sherburne, Ph.D.
Seismology Manager

Approved:

James F. Davis, Ph.D.
State Geologist

RWS:yo

cc: John Alfors, P. Amimoto
L. Mualchin, R. Kilbourne
Gaylon Lee

APPENDIX A

The following sections from the State Aeronautics Act may relate to this project:

Section 21656

No person shall erect or add to the height of any structure within the boundaries of this state which will result in a structure that extends more than 500 feet above the ground on which such structure rests until a permit therefor has been issued for such purpose by the department. This section is not applicable to the construction of any structure if the Federal Communications Commission is required to approve the height of the structure or if the height of the structure is required to be approved under the Federal Aviation Act of 1958 (Public Law 85-726: 72 Stat. 731).

Section 21657

The department may refuse issuance of a permit under Section 21656 if it determines after notice and hearing held pursuant to this part, that the erection of or addition to a structure would obstruct the airspace overlying the state so as to create an unsafe condition for the flight of aircraft.

Any person aggrieved by the action of the department pursuant to this section may have such action reviewed by the courts in a manner provided by law.

Section 21658

After the effective date of this section, no public utility shall construct any pole, pole line, distribution or transmission tower or tower line, or substation structure in the vicinity of the exterior boundary of an aircraft landing area of any airport open to public use, in such a location with respect to such airport and at such a height as to constitute an obstruction to air navigation as an obstruction is defined in accordance with Part 77 of the Federal Department of Transportation, or any corresponding rules or regulations of the Federal Aviation Agency, unless the Federal Aviation Agency has determined that such pole, line, tower, or structure does not constitute a hazard to air navigation. This section shall not apply to existing poles, lines, towers, or structures or to the repair, replacement, or reconstruction thereof if the original height is not materially exceeded and this section shall not apply unless just compensation shall have first been paid to the public utility by the owner of any such airport for any property or property rights which would be taken or damaged hereby.

Section 21659

After the effective date of this section, no person shall construct any structure or permit any natural growth to grow within one statute mile of the exterior boundary of any airport open to public use at such height as to constitute a hazard to air navigation as a hazard to air navigation is defined in accordance with Part 77 of the Federal Aviation Regulations of the Federal Aviation Administration, Department of Transportation, unless a permit allowing such construction or growth is issued by the department, provided, however, that such permit shall not be required if the Federal Aviation Administration has determined that such construction or growth does not constitute a hazard to air navigation; and provided further, however, that this section shall not apply to a pole, pole line, distribution or transmission tower or tower line, or substation of a public utility. The foregoing exceptions to this section shall continue, however, to be subject to the provisions of Section 21658.

Section 21660

The department may refuse issuance of a permit under Section 21659 if it determines, after notice and hearing held pursuant to this part, that the construction of the structure or growth of the natural growth would constitute a hazard to air navigation or create an unsafe condition for air navigation.

Any person aggrieved by the action of the department pursuant to this section may have such action reviewed by the courts in the manner provided by law.

78-NOI-6

OFFICE OF THE CITY ATTORNEY
CITY HALL, P.O. BOX 1678, SANTA ROSA, CALIF. 95403
(707) 528-5261 100 SANTA ROSA AVE.

BRUCE LEAVITT
CITY ATTORNEY

October 11, 1978

OCT 16 1978

Mr. Frank Hahn, Deputy Executive Director
California Energy Commission
1111 Howe Avenue
Sacramento, California 95825

Re: Your Letter of September 8, 1978: Docket No. 78-NOI-6

Dear Mr. Hahn:

While, according to your staff's position, this City does not have permit authority over 100 KV (and above) transmission lines, you are hereby advised that the proposed overhead 230 KV transmission lines through the planned residential community of Oakmont are inconsistent with this City's adopted General Plan and its applicable zoning ordinances.

The City's position relative to the proposal in the NOI is expressly and clearly set forth in City Council Resolution No. 13482, a certified copy of which I enclose for your information and review.

Thank you for this opportunity to put the City's opposition to the proposed overhead lines and its over-all position relative to the development of the Geysers clearly on the record. Should you have any questions with respect thereto, I would be glad to hear from you.

Very truly yours,

BRUCE LEAVITT
City Attorney

BL:dm
Enclosure

cc: Derek J Simmons, Attorney at Law
726 Mendocino Avenue
Santa Rosa, California 95401

D-8

78-NOI-6

City of Santa Rosa

By [signature]

OCT [illegible] 1978

RESOLUTION NO. 13482

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SANTA ROSA OPPOSING CONSTRUCTION OR USE OF ANY OVERHEAD TRANSMISSION FACILITY THROUGH OAKMONT-VALLEY OF THE MOON

WHEREAS, the City of Santa Rosa supports reasonable use of the Geysers as an alternative source of power to meet the legitimate energy needs of Californians; and

WHEREAS, the Pacific Gas and Electric Company (P. G. & E.) has proposed the construction of a 230 KV transmission line (Geysers to Lakeville Substation) to take power out of the Geysers generating area; and

WHEREAS, this transmission route is proposed to be constructed through the middle of the planned residential community of Oakmont in the City of Santa Rosa; and

WHEREAS, this proposed overhead transmission route would despoil the unique beauty of the Valley of the Moon, transverse State Highway 12 - a designated scenic highway, straddle the homesites of more than 2,000 Santa Rosans, cutting through the heart of the scenic and recreational areas of the Oakmont Golf Course and Annadel State Park; and

WHEREAS, the City of Santa Rosa has gone on record from the outset of proceedings before the California Energy Resources Conservation and Development Commission (C.E.C.) in support of the C.E.C. taking jurisdiction of this proposed 230 KV transmission line so that decision making concerning the line and the Geysers units would not be piecemealed in violation of the Warren-Alquist Act and the California Environmental Quality Act; and

WHEREAS, the construction of such a transmission line is inconsistent with the sound land use policies adopted in the Santa Rosa General Plan and threatens the health, safety and welfare of the citizens of Santa Rosa in the vicinity of this line.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Santa Rosa opposes the construction or use of any overhead transmission facilities through Oakmont-Valley of the Moon and supports approval of routing energy from the Geysers eastward or, if south, undergrounding all such facilities through Oakmont and the Valley of the Moon.

IN COUNCIL DULY PASSED this 10th day of October, 1978.

AYES: (4) Mayor Born, Councilmen Guggiana, Healy and Wilhelm

NOES: (0)

ABSENT: (0)

APPROVED: [signature]
Mayor

ATTEST: [signature]
Assistant City Clerk

APPROVED AS TO FORM:

[signature]
City Attorney

STATE OF CALIFORNIA—RESOURCES AGENCY EDMUND G. BROWN JR., Governor

DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS
[illegible]-9th STREET, ROOM 1316
SACRAMENTO, CALIFORNIA 95814
[illegible]

78-NOI-6

October 12, 1978

OCT 13 [illegible]

Office of the Secretariat
California Energy Commission
1111 Howe Avenue
Sacramento, California 95825

Dear Sirs:

Our response to your request for information from public agencies regarding the Notice of Intention for Geysers Unit 16 power plant is as follows:

1. The Division of Oil and Gas (CDOG) has an interest in the stability of the proposed site as it might affect wells, roads, and pipelines. We have no authority over the power plant site itself, but we will make recommendations of mitigating measures if the site appears to threaten the stability of well pads, roads, or pipelines.

2. The enclosed copies of our law and regulations fulfill request No. 2.

3. The nature and scope of the information we require to satisfy AB 844, is contained in the enclosure titled "Lists and Criteria for Completed Application for Development Projects".

4. At this time, we have no comments on the design, operation, or location of proposed power plant Unit 16.

5. Modifications of the proposed project are not needed to comply with our regulations.

Sincerely,

A. D. Stockton
A. D. Stockton
Geothermal Officer

ADS:rrn
enclosures

D-10

*= Enclosed documents are filed in Docket Unit-MS-24 for Review.

LISTS AND CRITERIA FOR COMPLETED APPLICATION FOR DEVELOPMENT PROJECTS

78-NOI-6

Pursuant to State Administrative Manual, Guidelines for Processing Permits for Development Projects, Sections 1079, 1080, 1080.1, 1080.2, 1080.3, and 1080.4 (all new 1/31/78) the Department of Conservation adopts the following lists which specify the information which will be required from any applicant for a development project and the criteria to determine the completeness of an application for a development project.

A. Development Projects

Development projects under the jurisdiction of the Department of Conservation include:

1. Geothermal well drilling
2. Oil and gas well drilling
3. Enhanced recovery, disposal, and related projects.
4. Gas storage projects

B. Information Required for Application

1. The appropriate application form. Application forms for all development projects are included in Appendix A for convenience.
2. The name and address of an agent who must be a resident of the State.
3. A valid drilling bond.
4. A drilling fee in the proper amount required for [illegible] wells only.
5. Environmental documents required by California Environmental Quality Act of 1970.

Written approval of the State Oil and Gas Supervisor is required before any operations can be commenced, and approvals are conditioned upon compliance with regulations contained in the California Administrative Code, Title 14, Chapter 4.

C. Environmental Documentation

Appropriate environmental documents required by CEQA must be completed before any application can be approved by any public agency. Divisions of the Department of Conservation rarely act as lead agencies, but do act as responsible permitting agencies or as commenting agencies with special expertise. Environmental documents are planning documents and logically precede the application for a project and guide the decisions involved in the approval of them. The Department is available for consultation during environmental studies and will review and comment on completed documents received thru the normal process for preparation and review of CEQA documents.

The scope and content of information which would be germane to the Department's statutory responsibilities to protect mineral resources and to protect life and property from geologic and seismic hazards is contained in CDMG Note 46. This list is included in Appendix B.

The scope and content of information which would be germane to the Department's statutory responsibilities to protect natural resources and life, health, and property from damage resulting

from drilling and operation of oil, gas, and geothermal wells is in the applications forms, Appendix A, Appendix B, and the regulations contained in California Administrative Code, Title 14, Chapter 4.

The responses to Notices of Preparation of an EIR shall be appropriate to the project described in the notice and may contain any or all of the appendix forms and copies of appropriate sections of the Administrative Code.

D. Criteria for Completeness of Applications

Applications are considered complete when the form appropriate to the proposed project and the information required (section B) have been submitted and the fee has been paid and accepted.

ADDRESS ALL COMMUNICATIONS
TO THE COMMISSION
CALIFORNIA STATE BUILDING
SAN FRANCISCO, CALIFORNIA 94102
TELEPHONE (415) 557-1763

Public Utilities Commission

STATE OF CALIFORNIA

78-NGL-6 mgm 004-3

October 12, 1978

OCT 13 1978

Office of the Secretariat
California Energy Commission
1111 Howe Avenue
Sacramento, CA 95825

Dear Sir:

We are in receipt of your "Notice to Public Agencies and Request for Information" regarding Pacific Gas and Electric Company's Notice of Intention re Geysers Unit 16.

Please be advised that as stated in the table attached to your notice, Section 1001 of the Public Utilites Code and Public Utilities Commission General Orders 95 and 131-A are applicable to the Geysers Unit 16 project. Therefore, PG&E is required to file an application for a certificate of public convenience and necessity with the PUC.

Participation of the Public Utilites Commission will be in accordance with Sections 25506.5 and 25514.3 of the Public Resources Code.

Very truly yours,

James T. Quinn

James T. Quinn
Senior Counsel

JTQ/bf

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SONOMA COUNTY 78-NOI-6

COMMUNITY AND ENVIRONMENTAL SERVICES

Duane Butler, Director

PLANNING DIVISION
Pranab Chakrawarti, Deputy

Mr. Frank Hahn
Deputy Executive Director
California Energy Commission
1111 Howe Avenue
Sacramento, California 95825

October 12, 1978

OCT 13 1978

COMMENTS TO ENERGY COMMISSION RE: NOI P G & E GEYSERS UNIT 16 AND 230 KV TRANSMISSION LINE (DOCKET NO. 78-NOI-6)

We thank you for the opportunity to comment on this NOI as the project will significantly impact Sonoma County and is of great concern to many County residents.

We hope that the Energy Commission will proceed in a manner that assures that the Environmental Impact Report will represent the independent objective judgment of the State Energy Commission and that all data and conclusions provided by the project proponent will have been independently verified and confirmed by technically qualified persons responsible to the Commission.

Much of the development of The Geysers KGRA has proceeded piecemeal with no consideration of future increments of development. The County does not believe that such practice should continue as it results in needless waste of resources and unnecessary land use conflict.

Largely overlooked in past consideration has been the long range view. What is the true potential of The Geysers' KGRA both in total output and in field life? The measure of the "acceptable" level of impacts must be determined in relationship to the true benefits. The California Environmental Quality Act (CEQA) requires consideration of the "Relationship Between Local Short-term Uses of Man's Environment and the Enhancement of Long-term Productivity" which is extremely important to the decision making process. Past P.U.C. EIR's have not, in our opinion, adequately considered this issue.

The "Long Range" view is also essential for the reasonable evaluation of transmission line alternatives. In all of the previous discussions of the proposed Geysers to Lakeville transmission line, long range future transmission requirements have not been clearly presented and considered. This is true regarding both ends of the proposed facility: the ultimate output of The Geysers has not been established and the future demand at the Lakeville location in the power distribution network is not clear. Nor has it been made clear what reasonable alternatives exist.

We hope that the Energy Commission Certified Final EIR for the project will adequately consider these matters.

2555 Mendocino Ave, Room 105A ■ Santa Rosa, California 95401 ■ (707) 527-2412

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In addition to the above general comments, we offer the following specific observations:

1. Geology and Soils. Experience with Geysers Power Plants Unit 11 and 14 has indicated a number of problems as to the identification of potentially unstable areas and the achievement of mitigation of soils and geology impacts revealed during construction. Both Units 11 and 14 encountered slope stability problems, the potential for which was or certainly could have been known prior to undertaking construction. Both Units required substantial mitigation, including additional grading and relocation and compaction of unstable soils and the construction of extensive slope retaining structures. Particularly in the case of Unit 14, which involved the excavation of the toe of a known slide and the construction of a massive cable-anchored retaining wall, the problem could have been avoided and extra costs saved if the environmental review had been adequately reflected in the approved project.

Additionally, once problems on Unit 14 became evident, no agency, including the County, had, or chose to exercise, the necessary authority to review the technical adequacy of the mitigation measures. The State Division of Mines and Geology, Division of Oil and Gas, and Public Utilities Commission could all provide information to the Energy Commission regarding these past problems.

We believe that all engineering geology relating to the project should be reviewed by technically qualified persons responsible to the Energy Commission. We would also urge the Commission to establish procedures for enforcement of conditions, and the monitoring of compliance with conditions of approval, in the field.

2. Water. Water quality impacts, including both direct spills to area waterways and cumulative erosion and consequent siltation of spawning beds, continues despite improved environmental review and grading and construction standards. We believe two problems exist. First, little if any baseline data exists, or is being accumulated, so that cumulative effects cannot be measured nor adequacy of mitigations established. Second, enforcement of, and monitoring for, compliance with required mitigations does not occur. Of all the public agency personnel responsible for some aspect of The Geysers geothermal development, only one, Jack Miller of the Division of Oil and Gas, is assigned full time in the field and is in a position to be knowledgeable about day-to-day construction activities. DOG's jurisdiction has not extended to plant sites, area roads, pipelines, transmission lines, etc. Some better means should be established to assure compliance with permit conditions.

3. Air. Air quality impacts continue to be a source of controversy among the various jurisdictions. It would be useful if the Energy Commission in consultation with the Air Resources Board, the Northern Sonoma County Air Pollution Control Board, and the Lake County Air Pollution Control Board could assess long-term air quality impacts and establish standards for all existing and future generating plants.

4. Vegetation and Wildlife. The same problems occur regarding fish and wildlife and vegetative impacts as with water quality impacts. First, no good base line has been established, so no quantitative measure of cumulative impacts is possible. And, second, clearly adequate mitigation measures have not been established and agreed upon by all responsible agencies. Experience to date indicates that vegetation can be reestablished on disturbed soils in the area only with great difficulty. Clear revegetation standards need to be established, research to establish techniques for successful revegetation undertaken, and procedures for monitoring success and enforcing conditions established.

State Fish and Game have repeatedly recommended, because onsite impacts on vegetation and wildlife have not and perhaps cannot be successfully mitigated, that compensating areas be acquired and set aside exclusively for wildlife purposes. This concept has merit and the County would encourage its serious consideration by the Energy Commission.

5. Noise. Noise standards for use in The Geysers area have been hotly debated in Sonoma County for years. No standard has to date satisfied the nearby residents. Recent use by Unibn Oil Company of rock mufflers has been generally successful and is recommended for general application.

6. Archaeology. Investigation of archaeological resources in The Geysers has generally been excellent and preceded most development activities. More care needs to be exercised in order to assure that required mitigations are actually implemented in the field.

7. Resources. Development of The Geysers field to date has largely precluded the conservation, enhancement and timely production of other area resources. The County would encourage a careful long-term look at all of the resource values of the affected area and consider requiring actions now that will enhance future resource value of the area. Such actions might include riparian and other wildlife habitat enhancement, development of recreational opportunities, or restablishment of the sugar pine timber potential. Some thought should be paid now to future land use of the field if and when the steam resource is depleted.

8. Aesthetics. Development of the geothermal steam wells, steam lines, transmission lines, roads, offices, shops and other facilities necessary to serve a power plant results in the disturbance of 20-50% of the land surface within a production field. Because of the difficulty in reestablishing vegetation on disturbed areas, this disruption to the aesthetic quality of an otherwise remote landscape is significant and long term. Coupled with the noise and odor of steam discharges and the on-going construction and traffic impacts, the aesthetic quality of The Geysers is totally changed. The maximum feasible mitigation of all adverse environmental impacts will minimize although not eliminate aesthetic change.

Past County Use Permits for geothermal plants have attempted to achieve such mitigation. Several such Permits are attached for your information.

The County has particular concerns regarding the proposed Geysers to Lakeville Transmission Facility. The residents of Sonoma County have consistently supported geothermal development and willingly borne the majority of the environmental costs of The Geysers development even though the benefits extend to many outside of the County. Additional data submitted by P G & E to justify their proposed Lakeville connection fails to consider Geysers development beyond the next ten years. Current evidence suggests that the projected 2008 MV "Total Geysers Development Capacity" is unrealistic. Some experts extimate field capacity at more than ten times the P G & E estimate and a field life exceeding 300 years. Use of a ten-year time frame and an underestimated total field capacity are likely to result in unacceptable and unanticipated further environmental costs to the people of Sonoma County in the future.

It is our expectation that a long-range, independent, and objective evaluation of future transmission requirements will result in recognition of substantially different costs and benefits than reflected in Appendix J of the NOI.

The adopted Sonoma County General Plan includes the following Goals and Policies regarding public utilities pertinent to this project:

G. Utilities:

1. It shall be the goal of Sonoma County to promote facilities that meet the utility needs of the public and are of high ecological and aesthetic quality.

Policies:

b. Review the location of proposed public utilities for consistency with adopted Goals and Policies of Sonoma County.

c. Oppose the routing of major transmission lines through public recreation and scenic areas . . . . .

d. Encourage continued studies to devise economic methods of installing underground electric-transmission lines.

h. Encourage consolidation of utilities into common utility corridors wherever practicable.

The proposed transmission lines are not consistent with these Goals and Policies.

The County staff has completed preparation of a Specific Plan (Franz Valley Study) which includes much of the area impacted by the proposed Geysers to Lakeville transmission line. This Plan reveals an exceptional level of biological diversity and high productivity as being characteristic of the area. The overriding policy of this Plan is the conservation, enhancement, and timely production of the resources of the area. Many of these resources,

including aesthetics, vegetation, wildlife and water quality, will be adversely impacted by the proposed line. In particular, the area covered by the eleven miles of new right-of-way required for this proposal is especially sensitive. Most of this additional right-of-way lies in areas which will be zoned as "Resource Conservation District" upon adoption of the Specific Plan.

Adopted plans for the Sonoma Valley call for the protection and maintenance of the aesthetic quality and rural character of the Valley of the Moon. The section of the proposed transmission line crossing the Oakmont Community and Annadel State Park, particularly, violates the Goals and Policies of both the County General and Specific Plans for the area.

Consequently, it is our feeling that the proposed transmission facility is inconsistent with all applicable County Plans.

The NOI fails to provide complete information and data necessary to evaluate the relative environmental sensitivities and costs of the various alternative routes. General data available to this office indicates that environmental sensitivity as measured by biological diversity increases with proximity to the coast. By this measure, the Lakeville alternative would be most costly to the environment. More data should be developed in order that a reasonable comparison of the environmental costs might be made.

In summary, the County is of the opinion that the information presented regarding the Geysers to Lakeville Transmission Facility is primarily a justification for predrawn conclusions. We hope that the Energy Commission will recognize and remove these deficiencies. In the absence of compelling, objective justification for the use of the Geysers to Lakeville transmission route, the County remains opposed to this alternative.

We thank you for the opportunity to comment on this NOI and look forward to your responses to these comments.

PRANAB CHAKRAWARTI
Planning Director

RAYMOND E. KRAUSS
Ass't. Environmental Administrator

REK:vr

* Attachments

D-15

78-NOI-6

JAMES P. BOTZ
COUNTY COUNSEL

OFFICE OF THE
COUNTY COUNSEL
COUNTY OF SONOMA
COUNTY ADMINISTRATION CENTER
2555 MENDOCINO AVENUE
SANTA ROSA, CALIFORNIA 95401
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DEPUTIES
RICHARD W. ERGO
PRENTICE A. FISH
LYNDA MILLSPAUGH
CAROLINE A. KERL
MARK J. FREED

October 13, 1978

Office of the Secretariat
California Energy Commission
1111 Howe Avenue
Sacramento, CA 95825

OCT 16 1978

Re: Notice of Intention of Pacific Gas and Electric Company to File for an Application for Certification re Geysers Unit 16: Response of Sonoma County

Dear Commissioners:

This letter is being written in response to the Commission's request for information relative to the conformity of the P.G.&E. facility with a local agency's standards, ordinances and planning documents. Our response is necessarily limited by the priorities established by the Sonoma County Board of Supervisors in response to the adoption of Proposition 13. We have attempted to respond to your request as fully as possible given the limited resources we are able to direct towards this project at this time.

You will note from the accompanying correspondence that the proposed P.G.&E. facility is inconsistent with the County's General Plan, zoning ordinances and land use scheme. The General Plan specifically addresses the type of project proposed and specifically disallows such a project at the proposed site.

We recognize that the Energy Resources Conservation and Development Commission asserts that a local agency does not have regulatory authority over a regional project of this kind. However, we have specifically addressed such a project in extensively-researched planning tools and concluded that the proposed project is diametrically inconsistent with the policies enumerated therein. This inconsistency legally compels the County to deny approval to any applications for permits for the proposed project. In our judgment the Commission may not lawfully make the findings of consistency required by Public Resources Code section

D-16

25512. We respectfully ask the Commission to take into account the interests and written policies of Sonoma County when determining the location of the project.

The County is continuing to research the effects of the project on Sonoma County and will appreciate the opportunity to comment further on these subjects.

Thank you for your consideration.

Very truly yours,

Elizabeth A. Strauss

ELIZABETH A. STRAUSS
Deputy County Counsel

EAS:jw
Enc.
cc: Derek Simmons, Esq.

PLANNING DEPARTMENT

CLAYNE E. MUNK
Planning Director
CHARLES W. MOORE
Asst. Planning Director
Courthouse
Fairfield, California 94533
Phone (707) 429-6581

78-NOT-6

OCT 18 1978

October 13, 1978

Mr. Frank Hahn
Deputy Executive Director
California Energy Commission
1111 Howe Avenue
Sacramento, CA 95825

Dear Mr. Hahn:

Solano County Planning Department wishes to comment upon the alternative transmission lines proposed in Geysers Unit 16 Notice of Intention.

Two transmission lines through Solano County have been proposed. Alternative C would run south between the Twin Sisters and Suisun Creek and meet the existing Tulucay—Vaca-Dixon transmission corridor. The line would then parallel the existing lines to the Tulucay substation in Napa. County Alternative D would run almost due east through the Vaca Mountains to meet the existing Vaca-Dixon transmission corridor near the intersection of Gibson Canyon Road and Cantelow Road. The line would then parallel the existing lines to the Vaca-Dixon substation in Solano County.

D-17

We would favor the selection of routes other than Alternative C and Alternative D on the grounds that they would be less expensive to construct and would be more efficient due to lower line loss. (Refer to Figure 18 in Appendix J)

Within Solano County, Alternative C crosses a mountainous, sparsely populated area designated in the West Central Solano County General Plan either as park or extensive agriculture. The Solano County Planning Department would oppose locating transmission corridors in potential park areas as these corridors conflict with park esthetics.

A portion of Alternative D would require construction of a new corridor. The alternative also crosses two areas that could develop into residential areas within the next 15 to 20 years. The first developable area is the area between Vaca Valley and Pleasants Valley. The western edge of Vaca Valley immediately south of Mix Canyon Road has been recently rezoned rural residential. The proposed corridor is less than one mile north of this rezoning. The

other developable area is between English Hills Road and the existing transmission corridor. Furthermore, the existing transmission corridor runs between Aldridge Lane and Cantelow Road, and we feel this area will be subject to increasing development pressure which will not be compatible with a wider corridor.

In summary, we feel neither transmission corridor, C or D, is appropriate for various reasons. We strongly feel it is inappropriate to construct a line with lower efficiency and for that reason the Lakeville line is the best choice. We oppose location of lines in Solano due to a conflict with esthetics or conflicts with potential residential development.

Sincerely,

Clayne E. Munk
Planning Director

CEM/DH/jf

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Division of Ecological Services
2800 Cottage Way, Rm. E-2727
Sacramento, California 95825

78-NOI-6

October 17, 1978

ENERGY COMMISSION RECEIVED

OCT 19 1978

Mr. Frank Hahn, Deputy Executive Director
Energy Resources Conservation and
Development Commission
1111 Howe Street
Sacramento, California 95825

Dear Mr. Hahn:

Your September 8 letter requested our comments and recommendations concerning Pacific Gas and Electric Company's Notice of Intent (NOI) application for its proposed Geysers Unit 16 Project (a 110 megawatt geothermal power plant), Lake County, California. We have reviewed the application and offer the following comments:

D-18

General Comments

With the exceptions listed under Specific Comments, the NOI adequately describes the existing fish and wildlife resources and a number of impacts which would result from project construction and operation. However, the NOI fails to adequately address two major issues associated with geothermal activities. They are:

1. A discussion of the cumulative effects of this project in relation to existing, nearby geothermal projects is needed. Pacific Gas and Electric Company currently operates 13 power plants and has plans for another 12 or more power plants in The Geysers. The continuing encroachment by geothermal projects will have long-term, adverse impacts on fish and wildlife resources and their habitat. While the loss of fish and wildlife habitat attributable to the Geysers Unit 16 Project may appear minor, collectively a number of geothermal projects in the area would have significant impacts. For instance, the construction of Cobb Valley Project in Lake County with full-field development would result in the loss of 1,400 acres of resource habitat; however, the cumulative effects of geothermal projects adjacent to the Cobb Valley Project would remove 10,056 acres of resource habitat (1).

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

2. While the proposed mitigation measures, if implemented, may minimize several potential adverse impacts on fish and wildlife resources and their habitat, we are not convinced that the proposed wildlife habitat plan (page 160) would adequately compensate for the loss of resource habitat caused by project construction and operation. We believe that undue emphasis has been placed to minimize the loss of wildlife habitat. For example, page 115 refers to "the overall effect upon vegetation and wildlife habitat (would result) in the combined loss of 9.3 acres of mixed chaparral and 3.3 acres of mixed evergreen habitat " for a total of 12.6 acres. The NOI ignores a series of events which preceded the proposed action, i.e., to construct and operate The Geysers Unit 16 power plant. These events represent a commitment to develop the Bear Canyon leasehold (acreage not listed in the NOI), i.e., full-field development, which would convert a forested watershed into an industrial complex. The extensive land disturbances associated with the construction of geothermal facilities such as roads, pipelines, sumps, power plant, cooling towers, and transmission line would result in the permanent loss of wildlife habitat.

Operation of geothermal facilities are subject to accidental discharges of toxic materials which would cause the loss of fish and wildlife resources and habitat. Finally, increased human activities in the leasehold could be harmful to wildlife species, particularly during critical breeding or nesting and rearing periods. Observations by California Department of Fish and Game personnel in Yosemite and Sequoia National Parks revealed that increased human activity was detrimental to deer populations; deer avoided certain areas formerly used for reproduction and rearing purposes (2). Similar behavior was noted in the North Kings River deer herd on the Sierra National Forest. Although deer have adjusted to man's activities in the past, these observations suggest there are limits whereby deer and man may coexist. We believe that the end product (power plant, et al) was responsible for the initiation of a series of events which degraded and destroyed habitat. The modification and elimination of habitat would reduce the carrying capacity of land to support wildlife populations. The survival, growth, and maintenance of wildlife is influenced by food, cover, water, and space. The distribution or abundance of wildlife species is affected by one of these factors. The expansion of geothermal activities in the leasehold has short-term and long-term impacts on the carrying capacity of land to support wildlife populations. We maintain that loss of resources and habitat extends throughout the entire leasehold and is not restricted to the 12.6 acres of the Unit 16 plant site.

Specific Comments

1. Page 66. Rare and Endangered Plant Species. No details are provided in the NOI concerning how the on-site (leasehold) plant survey was conducted. The survey conducted in April could have overlooked plants that emerge later in the summer or fall. Also, there is no information to indicate that the survey took into account the threatened and endangered plants listed in the Federal Register of July 1, 1975 and of June 16, 1976. Therefore, no valid conclusions can be made concerning the presence or absence of threatened (rare) and endangered plants in the leasehold.

2. Page 179, paragraph 3. We disagree with the statement "After decommissioning of the installation, the site could be returned to its former state...". Recently a proposal to dismantle nuclear power plants at some future date was discussed. The concerns of knowledgeable individuals concluded that excessive cost would preclude attempts to dismantle these plants. We believe that this proposal would be applicable to geothermal projects, and doubt that restoration of the leasehold to preproject conditions would be feasible for economic reasons. We are unaware of any project either in California or elsewhere whereby an industrial complex has been dismantled and the disturbed areas restored to their natural state or preproject condition.

3. Page 180, Irreversible Environmental Changes Involved in Proposed Action. The development of a full-field geothermal project would cause impacts on resources habitat which may not be reversible. Because fish and wildlife resources cannot be stockpiled in the same manner as lumber, the annual production of fish and wildlife foregone during the life of the project must be considered irretrievable.

4. Page D-11. The proposed Critical Habitat Zone in the Cobb Mountain area appeared in the Federal Register on August 30, 1976.

5. Page D-21. There is no indication that the list of 10 species of rare plants occurring in Sonoma and Lake Counties (table 3) were compared with other plants being considered by the Fish and Wildlife Service for possible classification as either endangered (E) or threatened (T) species (Federal Register of July 1, 1975 and of June 16, 1976). With reference to table 3 (page D-24), the Fish and Wildlife Service has proposed to classify the following plants as endangered species: Lake County dwarf flax, H. didymocarpum; Lake County stonecrop, Parrisedum leicarpum; white sedge, Carex albida;

Hot Springs panic grass, Panicum thermale. The following plants are listed as threatened species: Contact Mine streptanthus, Streptanthus brachiatus; glandular dwarf flax, Hesperolinon adenophyllum; two carpel flax, H. bicarpellatum; Cobb Mountain lupine, Lupinus sericatus. On future NOI applications by Pacific Gas and Electric Company (or other applicants) we recommend that the Federal Register of July 1, 1975 and and June 16, 1976 be consulted to insure that endangered or threatened (rare) plants are not overlooked in project planning.

Thank you for the opportunity to review and comment on this NOI.

Sincerely,

James D. Carson

for James J. McKevitt
Field Supervisor

Attachment: references cited

cc: Dir., CDF&G, Sacramento
Reg. Mgr., CDF&G, Reg. III, Yountville
Ca. Native Plant Soc., Davis
(attn: W. Robert Powell)

References Cited

1. Sociotechnical Systems, Inc. 1977. Draft Environmental Impact Report for Cobb Mountain Geothermal Project. September 1977.

2. Ashcraft, G.C. 1977. Big Game Investigations. Sacramento, Ca. Department of Fish and Game, PR Project W-51-R-22, Job 1.

State of California — Department of Health Services

Memorandum

78-NOI-6

To : Office of the Secretariat
California Energy Commission
1111 Howe Avenue

ENERGY COMMISSION RECEIVED
NOV 6 1978

Date : October 18, 1978

Subject: Comments on NOI for Geysers Unit 16

Telephone: ATSS ( ) ( ) 2-2337

From : Hazardous Materials Management Section
1420 - 5th Street, Room 140

We have been asked to comment on the Notice of Intention (NOI) for PG&E's proposed Geysers Unit 16 power plant. Following are our comments:

1. It is unclear from the information given in V.C.2. (Page 111) and VII.B.2 (Page 127) how the applicant will handle disposal of the hydrogen sulfide (H_2S) abatement sludge. This sludge is generated by other geothermal steam operations in the Geysers KGRA and it is reasonable to expect it to be generated at Unit 16. The applicant should address the issue of disposal of this hazardous waste

2. The law and regulations that the Hazardous Materials Management Section is charged with enforcing are Section 25100 et. seq., Health and Safety Code and Section 60001 et. seq., Title 22, California Administrative Code (CAC). If the waste generated by the power plant is determined to be hazardous, then the applicants proposed project will be subject to the above law and regulations. The law and regulations should be shown in Appendix I, Table 13.0-1 of the NOI. Lloyd Batham is our contact person on this matter.

3. PG&E must either: (a) apply for classification of their wastes as nonhazardous (Section 60169, 22 CAC), (b) apply for a variance from the requirements of the hazardous waste regulations (Section 60171, 22, CAC) or apply for a hazardous waste facility permit (Section 60191,22, CAC) from this Department. The informational requirements are specified in the aforementioned sections of the regulations. If a hazardous waste facility permit is necessary, PG&E shall submit an application and an operation plan (Section 60130 and 60193, Title 22, CAC) in conformance with the regulations. An "Operating Permit for Facilities Receiving Hazardous Waste" will be issued within 60 days.

4. PG&E should list the process chemicals and the concentrations of those chemicals, as well as others that are formed in the H_2S abatement system. Our experience is that elemental sulfur is not the only by-product of the H_2S abatement system proposed by PG&E.

5. The disposal of the H_2S abatement sludge to a permitted hazardous waste disposal site is a suggested mitigation measure.

Richard L. Krauch, for

Harvey F. Collins, Ph.D.
Acting Chief

State of California — The Resources Agency

Memorandum

78-NOI-6

Mr. James A. Walker
Executive Director
California Energy Commission
1111 Howe Avenue
Sacramento, California 95825

Date: OCT 19 1978

ENERGY COMMISSION RECEIVED
OCT 24 1978

From : STATE WATER RESOURCES CONTROL BOARD

Subject: P. G. & E. GEYSERS UNIT 16 NOI COMMENTS AND APPLICABLE LAWS

This is in response to your request for the Board's comments regarding the P. G. & E. Geysers Unit 16 NOI and the request for information regarding applicable laws and standards affecting the project.

Comments on this NOI are as follows:

Page 91, Storm Drainage System; Page 126, Condensate; Page 161, Water Quality -

D-21

The physical and hydraulic characteristics of the "impermeable retention barrier" should be specified. As indicated in previous correspondence to P. G. & E. concerning the spill-containment facilities for Unit 17, the installation of a two-inch thick asphalt liner would be similarly suitable at Unit 16. This asphalt liner should be properly installed and maintained to retain a permeability of 1 x 10-6 cm/sec or less.

The Regional Water Quality Control Board, North Coast Region has provided detailed information relating to the laws, regulations, etc., applicable to the geothermal project in their response to a similar request for information regarding P. G. & E. Geyser Unit 17 (See Memorandum to Frank J. Hahn, Deputy Executive Director for David H. Snetsinger, Regional Water Quality Control Board, North Coast Region, dated June 13, 1978). This information should be sufficient for your analysis of the P. G. & E. Geysers Unit 16 Project.

We are unable at this time to provide comments and recommendations concerning the conformity of the proposed project to the applicable laws, or concerning its design, operation and location,

beyond the comments on the NOI. We rely on the Energy Commissions hearing process to develop sufficient information to enable us to make meaningful comments and recommendations.

Larry F. Walker
Executive Director
Water Quality

cc: Larry Pearson
California Regional Water
Quality Control Board
Central Valley Region
3201 S Street
Sacramento, CA 95816

Thomas Bailey
Division of Planning & Research
2125-19th Street
Sacramento, CA 95818

State of California — The Resources Agency

Memorandum

To : Roger W. Sherburne

Date: October 23, 1978

From : Department of Conservation
Division of Mines and Geology
2815 O Street, Sacramento 95816

Subject: Review of NOI, Geysers Unit 16.

The report in regard to seismology is adequate. However, it is suggested that the applicant use more recent seismicity data in future reports such as compiled by CDMG. It is also desireable that the report shows the Collayomi fault (as mentioned in p. 30), in Figure IV-2 for examination. This is important because the report suggested that this fault may be connected with Soda Creek thrust fault extension (NW extension of Collayomi fault), and earthquakes from the fault can generate a large bedrock acceleration at the site.

The estimated fault lengths in Table A for the Maacama, Collayomi (NW extension), Concord, and Green Valley faults are not in agreement with other investigations.

In the case of the Concord and Green Valley faults, Kilbourne suggested from published information that the two faults are probably part of the same system and the combined fault length may extend to about 110 km. However, this increase in fault length does not cause concern to bedrock acceleration at the site (which is insignificant) because the distance to the fault is great (about 50 miles).

Regarding the Maacama fault, Corps of Engineers study suggested a fault length of 150 km versus 35 km in the report. The estimated magnitude of maximum credible earthquake is M 6.6 by this report and M 7.5 according to Corps of Engineers and the corresponding bedrock accelerations are 0.37 and 0.47 g, respectively.

The fault length of the northwest extension of the Collayomi fault is 36 km from published data according to Kilbourne (1978) and 18 km in the report. He also suggested that the fault is not "northwest extension". However, magnitudes of maximum credible earthquakes from these two viewpoints are the same (M 6.6), probably due to the use of different fault length-magnitude relationships. The bedrock acceleration is about 0.58g from the report and 0.52 g using Schnabel-Seed attenuation curves, which are practically almost the same.

D-22

The following comments and questions are of minor importance:

1. The source of information that the Maacama fault exhibiting creep should be given (p. B-20).

2. It is not clear about the number of sources of faults: five or six? (p. B-21)

3. Papers by Wesson, R, C. and others (1975) and Schnabel and Seed (1973) are not mentioned in the references (p. B-21).

4. What are "two small scale compilations of expected bedrock accelerations"? (p. B-21)

5. What fault is referred to in the footnote of Table B? (p. B-23). Probably northwest extension of the Collayomi fault?

Lalliana Munichin
Seismologist

LM:vlf

78-NOI-6

THE WITHIN INSTRUMENT IS A CORRECT COPY OF THE ORIGINAL ON FILE IN THIS OFFICE.

ATTEST: OCT 25 1978

EUGENE D. WILLIAMS, County Clerk & ex-officio Clerk of the Board of Supervisors of the State of California in & for the County of Sonoma.

RESOLUTION NO. 62191

Administration Building
Santa Rosa, California

Date October 24, 1978

ENERGY COMMISSION RECEIVED
OCT 27 1978

RESOLUTION OF THE BOARD OF SUPERVISORS, COUNTY OF SONOMA, STATE OF CALIFORNIA, OPPOSING PROPOSED GEYSERS-LAKEVILLE TRANSMISSION LINE

WHEREAS, the Sonoma County Board of Supervisors has consistently supported responsible development of its geothermal resources as an alternative energy source, and

WHEREAS, the location of geothermal power transmission lines will have a profound and long-term impact on the quality of life enjoyed by the residents of Sonoma County, and

WHEREAS, the Board of Supervisors has previously commented via resolution to the Public Utilities Commission that the public interest requires long-term planning of utility corridors, and that PG&E's proposed 230 KV transmission line represented a piecemeal approach based on insufficient data and inadequate evaluation of alternative corridors, and

WHEREAS, unless undergrounded, the proposed line would scar the unique scenic beauty of the Oakmont community, Annadel State Park and the Valley of the Moon, and

WHEREAS, the Board of Supervisors has adopted the Sonoma County General Plan, with which the proposed line is in conflict,

NOW, THEREFORE BE IT RESOLVED, that the Sonoma County Board of Supervisors supports the Energy Resource Commission's Committee request for supplemental data, which recognizes the insufficiency of the data previously submitted by PG&E and commends the Commission's concern for intelligent, careful, long-term utility corridor planning, and

BE IT FURTHER RESOLVED, that for the above-stated reasons the Board of Supervisors opposes the Geysers-Lakeville Transmission Line as currently proposed by PG&E.

Supervisors

DeLong Abstain Rudee Aye Johnson Absent Koenigshofer Aye Kahn Aye

Ayes 3 Noes 0 Abstain 1 Absent 1

SO ORDERED

D-23

State of California

Memorandum

78-NOI-6

The Resources Agency

To : Mr. Frank Hahn, Deputy Executive Director
Energy Resources Conservation and Development Commission
1111 Howe Avenue
Sacramento, California 95825

Date: October 25, 1978

ENERGY COMMISSION RECEIVED
OCT 27 1978

From : Department of Fish and Game

Subject: The Pacific Gas and Electric Company's Unit 16 Notice of Intention (Docket No. 78-NOI-6).

Your memorandum of September 8, 1978 requested the Department's comments on the subject report. We have reviewed the report and inspected the project site. We recommend that an alternate site for the plant be given further consideration. A more suitable area for the plant is found on the main ridgeline, to the west of the proposed installation, in the vicinity of alternative site "P". Apparently this site was not given further consideration because it is on federal land and there are "uncertainties that existed under the federal geothermal leasing regulations" (page 12-1, Appendix I). In view of the potential adverse environmental impacts of the proposed site, including extensive cut and fill areas on steep slopes, loss of wildlife habitat, erosion and stream sedimentation, and a large landslide adjacent to the site, we believe that the "uncertainties" of the federal regulations should be investigated, and clarified. Since NCPA is currently proposing a similar installation on federal lands, the "uncertainties" should not be insurmountable.

We have the following specific comments on the report:

1. Introduction, page 4. A discussion is provided of present development and plans to install future units. The cumulative impacts of this development, including the steam supply areas, should also be addressed, particularly with respect to the potential effects on fish and wildlife resources and use opportunities.

2. Biological environment, page 67-68. Protection of the area streams is of extreme importance to fishery resources, particularly rainbow trout. The upper Putah Creek drainage within the area of project impacts is of substantial value as a spawning and nursery area for rainbow trout from Lake Berryessa. Of the 149 miles of tributaries to Lake Berryessa, only 65 miles are suitable for spawning rainbow trout. More than half of this amount is within the project area.

3. Environmental Effects of Unit 16, page 114-117. It is stated that project procedures will "keep soil erosion and sedimentation within acceptable limits". The report should define what "acceptable limits" are and what measures will be taken if these are exceeded. In our view, any increase above natural existing conditions is unacceptable.

The statement regarding loss of 0.69 and 0.25 percent of mixed chaparral and mixed evergreen forest habitats with project construction is inappropriate. The habitat loss should be considered relative to the area of the steam supply field, and should include the additional losses resulting from construction of the necessary supply facilities.

Construction of the sedimentation basin should be accompanied by an annual sediment removal plan. Water appropriations for construction purposes need to be further clarified. The report indicates potential "adverse impacts" to Bear Canyon Creek but makes no mention of impacts which could also result in Anderson, Gunning, and Dry Creeks. All of the streams listed have important trout populations and equally low summer flows. Reductions in ponding could result from water draw. Water requirements and sources should be specifically addressed. Compliance with State appropriative water rights procedures and the Fish and Game Code should be discussed.

4. Socio-Economic Sphere of Influence: Sonoma County and Lake County, page 73. This section should discuss the fish and wildlife resources and related recreational values that will be affected by the project.

5. Vegetation, Wildlife and Fisheries, page 137-138. This section discusses the effects of cooling tower drift on vegetation near the power plants, and states, "Mortality, however, is not expected". This conclusion should be substantiated. Existing units have been in operation only a short time, and long-term effects may be more severe than presently evident. Although most of the vegetation adjacent to the units is still alive, in some areas growth is so retarded that the plants may as well be dead. Other potential adverse effects, including reduced cover, forage, and seed production, and the effects on wildlife, should be considered. The potential success of the revegetation program in the vicinity of the plant should also be discussed.

6. Environmental Effects of the Unit 16 Transmission Line, page 150. The report proposes the construction of spur roads to place transmission towers. Because of the nature of the terrain and its important values to fish and wildlife, soil disturbance should be held to an absolute minimum. Helicopter placement is recommended in lieu of additional road construction. Native plant species should be utilized for mitigation plantings.

7. Wildlife Habitat Plan, page 160. The schedule for implementation of this plan should be stated. Co-ordinated plans of the steam supplier for wildlife habitat development as mitigation for habitat losses should also be discussed.

8. Appendix E, Fishery Resources and Stream Sedimentation. This section proposes studies of fish populations and streambed sediments. Studies should also be made of other components of the aquatic ecosystem, including amphibians and insects. Aquatic insects are an important source of fish forage, and may be affected by changes in streambed sediments. Analysing this segment of the aquatic ecosystem could be related to changes in the

fish populations. Page D-32, paragraph 2 indicates that amphibians have exhibited lower population levels in areas of geothermal development. Therefore, this animal group should receive a portion of the study effort.

Other recommendations on the project are contained in a separate memorandum responding to the "Notice to Public Agencies and Request for Information" from the Office of the Secretariat, dated September 28, 1978.

Department of Fish and Game personnel are available to discuss our concerns and recommendations. To arrange a meeting, please contact Mr. E. V. Toffoli, Regional Manager, Region 3, Department of Fish and Game, Post Office Box 47, Yountville, California 94599, telephone (707) 944-2443.

For: Director

State of California — The Resources Agency

Memorandum

To : Office of the Secretariat
California Energy Commission
1111 Howe Avenue
Sacramento, California 95825

78-NOI-6 Date: October 31, 1978

[illegible] 7 1978

From : Department of Fish and Game

Subject: Pacific Gas and Electric Company's Geothermal Project Geysers Unit 16, Notice of Intention (Docket No. 78-NOI-6) Notice to Public Agencies and Request for Information

The Commission's Notice of September 28, 1978 requested written responses to statements concerning our agency's participation in the proceedings pursuant to PRC 25506. This memorandum is to comply with these requests, as follows.

I. Identify each aspect of the proposed site and related facility for which the agency has an interest or permit authority.

The Department of Fish and Game is concerned with project impacts on fish and wildlife resources. Fish resources may be affected by erosion and stream sedimentation resulting from the clearing, grading, and filling required for the power plant site, steam transmission lines, electrical power transmission facilities, well drilling sites, associated roadways, and other facilities. In addition, large volumes of geothermal steam condensate will be generated. This condensate contains toxic components, and if allowed to discharge into area streams, may have adverse effects on aquatic life. Wildlife resources will be affected by the loss of habitat resulting from clearing, grading, and filling. This habitat loss will be especially severe if critical habitats, such as breeding areas, water sources, foraging areas, or other sites of high value are eliminated. Other losses may occur through reduced wildlife uses of lands adjacent to the facilities because of continuous disturbances associated with development. Finally, public use and enjoyment of wildlife on these public lands may be impaired by development, or use restrictions may be required for protection of the facilities.

II. List and summarize the laws, regulations, ordinances, or standards which the agency administers, enforces, or otherwise has an interest which are applicable to the proposed site and related facility.

The Department has broad statutory authority to promote and protect fish and wildlife resources of California. Part of that authority is found in Section 21001 Public Resources Code subdivision (c) in which it is declared to be the policy of the State to "Prevent the elimination of fish and wildlife species due to man's activities, insure that fish and wildlife populations do not drop below self-perpetuating levels, . . .".

D-25

In addition, the following sections of the Fish and Game Code are applicable.

Section 900-903; Declares it is the intent of the Legislature to preserve, protect, and enhance the birds, mammals, fish, amphibia, and reptiles of this state, and determination of criteria for rare and endangered species, inventory, and reporting by the Department.

Section 1301; Declares that the preservation, protection and restoration of wildlife within the State is an inseparable part of providing adequate recreation for our people in the interest of the public welfare.

Section 1600; Provides that the protection and conservation of the fish and wildlife resources of the State are of the utmost public interest. Fish and wildlife are the property of the people and provide a major contribution to the economy of the State as well as providing a significant part of the people's food supply and therefore their conservation is a proper responsibility of the State.

Section 1700; Declares that it is the policy of the state to encourage the conservation, maintenance, and utilization of the living resources of the ocean and other waters under the jurisdiction of the state for the benefit of all citizens.

Section 1750-1756; Native Species Conservation and Enhancement Act; states that it is the policy of this state;

(1) "To maintain sufficient populations of all species of wildlife and native plants and the habitat necessary to insure their continued existance. . .

(2) To provide for the beneficial use and enjoyment of wildlife and native plants. . .

(3) To perpetuate native plants and all species of wildlife for their intrinsic and ecological values, as well as for their direct benefits to man.

(4) To provide for aesthetic, educational, and nonappropriative uses of the various wildlife and native plant species."

Section 1756 also states that "the policy set forth in this chapter is in the public interest regardless of the economic value or lack of such value of wildlife or native plants."

Section 1801; Declares that it is the policy of the State to encourage the conservation and maintenance of wildlife resources under the jurisdiction and influence of the state. This policy includes the following objectives:

(a) To maintain sufficient populations of all species of wildlife and the habitat necessary to achieve the objectives stated in subdivisions (b), (c), and (d).

(b) To provide for the beneficial use and enjoyment of wildlife by all citizens of the state.

(c) To perpetuate all species of wildlife for their intrinsic and ecological values, as well as for their direct benefits to man.

(d) To provide for aesthetic, educational, and nonappropriative uses of the various wildlife species.

(e) To maintain diversified recreational uses of wildlife, including the sport of hunting, as proper uses of certain designated species of wildlife, subject to regulations consistent with the maintenance of healthy, viable wildlife resources, the public safety, and a quality outdoor experience.

(f) To provide for economic contributions to the citizens of the state, through the recognition that wildlife is a renewable resource of the land by which economic return can accrue to the citizens of the state, individually and collectively, through regulated management. Such management shall be consistent with the maintenance of healthy and thriving wildlife resources and the public ownership status of the wildlife resources.

Section 1900-1913; Native Plant Protection; declares that the intent of the Legislature and the purpose of this chapter is to preserve, protect, and enhance endangered or rare native plants of this state.

Section 2014; Declares that it is the policy of this State to conserve its natural resources and to prevent the willful or negligent destruction of birds, mammals, fish or amphibian, and further provides that the State may recover damages in a civil action against any person who unlawfully or negligently takes or destroys such resources.

Section 2050-2055; Expresses legislative concern over California's threatened wildlife; defines rare and endangered wildlife and gives authority to the Fish and Game Commission to deem what species in California are rare and endangered.

Section 5650; Prohibits discharge into State waters of any substance or material deleterious to fish, plant life, or bird life.

Sections 3511, 3505, 4700, 5000, 5050, and 5515; Regarding fully protected fish and wildlife species.

III. Describe the nature and scope of the informational requirements which the Applicant must eventually meet in order to satisfy the concerns or permit requirements of the agency; summarize the agency's procedures for resolution of such concerns or requirements and indicate the amount of time necessary to do so; describe any other studies, analyses, or other data collection which the Applicant, agency, or commission would have to perform in order to resolve all concerns or permit requirements of the agency.

If the unit is to be supplied with steam from Aminoil's adjoining federal lease, studies should be initiated on fish and wildlife resources of the area encompassed by the steam supply field for the proposed power plant. The following information is needed to identify additional impacts caused by project development and to further improve the effectiveness of mitigation measures through adjustments, and refinements. These studies should respond to our concerns, and meet the requirements of 30 CFR 270.34(k), which specifies that the studies should cover a period of at least one year prior to production. To thoroughly document the existing resources, the required studies of the ecological system should cover a minimum period of five years. This period of time is necessary to determine the affects of variations in climate, seasons, growth cycles of other species or groups, forage and cover, and other environmental factors. It is not necessary to complete these studies prior to the initiation of the exploratory phase of project development but they should be completed prior to proceeding into the developmental phase of the project.

The following specific information of the ecological system and its components should be developed for the area:

1. Vegetation types should be mapped on a scale of 1:6000. Critical wildlife habitats should be indicated, including deer fawning meadows or glades, den and nest trees, snags, oak stands, riparian growth, waterholes, springs, seeps, and unique associations of mixed plant species.

2. Rare and endangered plant and wildlife species: Inventory of location and assessment of habitat requirements. Present and potential habitats should be indicated on a map scaled 1:6000. Habitat requirements should be defined so these species may be protected, maintained, and enhanced.

3. Vegetation growth and seed production of major species within the steam supply field.

4. Permanent and seasonal populations should be defined and indices of abundance should be developed for major fish and wildlife ecosystems.

5. Maps of Bear Canyon and Anderson Creeks should be prepared, showing configuration, pool areas, fish spawning areas, riffles, runs, bottom types, gradient, and normal stream widths.

6. Continuation of P G & E's water quality sampling and streambed sediment composition studies in the Putah Creek drainage.

7. Assessments should be made of the public recreational use, if any, of this area, including hunting, fishing, and camping, and recreation-days, and success rates determined.

8. Revegetation studies should be conducted when necessary to aid in the success of reestablishing endemic and/or native plant species.

The results of these studies should be used to insure that project induced losses to fish and wildlife have been fully compensated for and there are no cumulative detrimental impacts to fish and wildlife resources.

IV. Conduct a preliminary analysis, based upon the information available, for the purpose of providing comments and recommendations to the Commission regarding the design, operation, and location of the facilities designated inthe notice, in relation to environmental quality, public health, and safety, and other factors on which the agency may have expertise. For purposes of a notice, the preliminary analyses should be limited to identifying any aspects of the proposed site and facilities which are likely to substantially affect the ability of the Commission to make findings on conformity of the site and related facility to applicable state, regional, and local laws and regulations. The Commission will not request or expect agencies to perform for review of a notice of complete analysis sufficient to resolve all agency concerns or to satisfy all requirements for an ultimate permit.

Personnel from the Region 3 office inspected the Unit 16 site. This inspection concerned the project site, the steam supply field and surrounding area.

The Unit 16 site is located on a steep ridge about one mile southeast of Unit 13. Preparation of the powerhouse site will require extensive cuts and fills to create sufficient area. Fill from site preparation is expected to extend considerable distance, requiring extensive erosion control measures. Higher on the main ridgeline is a swale adequate for locating the power plant without extensive cuts and fills.

Site vegetation is chaparral, primarily chamise and buckbrush. A small stand of knobcone pine is located to the north.

The power plant would be supplied with steam from wells located to the southwest and northeast of the site. Steamlines would generally follow roadways.

V. Identify mitigation or modifications, if any, to the proposed project required to achieve conformity.

1. The project should be modified to site the power plant higher on the ridge in the swale area. This site would minimize cut and fill requirements, habitat losses, and erosion potential, thus greatly reducing adverse impacts to fish and wildlife.

2. The electrical transmission corridor, steam transmission lines, access roads, and any other proposed facilities should be surveyed for critical wildlife habitats or rare or endangered plants.

3. A berm should be placed around the plant site to contain up to 250,000 gal. condensate that may be spilled from the cooling tower basin.

4. The steam condensate sedimentation pond should be sized to retain any potential overflow of condensate.

5. The condensate injection line should be constructed of material which is not likely to corrode or rupture and should be located so as to extend the minimum possible distance, should avoid hazardous areas, such as steep slopes, landslides, or areas of vehicle operation, and should contain automatic shut-off valves to prevent spills in event of breakages.

6. Sedimentation basins should be placed in tributaries directly below cut or fill slopes. Collected sediment should be removed periodically. The basins should have impermeable clay linings so as to retain water for wildlife during summer months.

7. Roads intended for all-weather travel should be compacted, paved, and drainage systems installed to prevent erosion. Road drainage systems should be designed to eliminate discharges of runoff into erodible areas.

8. Those areas altered by construction activity, but no longer needed for operation of the facilities, such as cut or fill slopes, cleared areas, and elements of the project that are being phased out of operations, should be restored to their former wildlife habitat value. This would require soil preparation, application of fertilizer, immediate seeding with appropriate quantity and mixture of grass and herb species, and planting of trees and shrubs of the kind

which are found in the area. Such plantings should be watered and tended during their establishment period to ensure survival Any of the trees or shrubs which do not survive to maturity should be replaced. For those areas, such as waste disposal sites, that cannot be completely restored to their former condition, arrangements should be made to monitor and care for the areas beyond the expected life time of the project to insure that no chronic pollution problems will develop.

9. The carrying capacity of wildlife habitat not in the immediate vicinity of the well sites should be increased to replace habitat lost with project construction. The area selected for improvement should not be subject to impacts of future development. Management to increase wildlife carrying capacity would continue for the life of the project and would include:

   a. Development of watering sites or small ponds in areas of low water availability. If seeps or springs are not available, then a water well should be drilled, a pump installed and maintained, and a pond to retain water should be constructed. At least one such site should be available on a 100 acre parcel.

   b. The habitat and forage value of brush areas should be increased by controlled burning or mechanical crushing and removal. The selected method would depend on the soil type and physical characteristics of the area. Generally, a strip about 100 feet in width and several hundred yards in length on approximately each 25 acres of dense brush would provide increased forage and trail access.

10. Continuing public use of the Aminoil federal lease area for hunting, camping, or other recreation should not be restricted or prohibited. If restrictions are necessary, then an equivalent area where the public is now excluded should be opened to public use and maintained as such for the life of the project.

Department of Fish and Game personnel are available to discuss our comments and recommendations. To arrange a meeting, please contact Mr. Theodore W. Wooster, Environmental Services Supervisor, Region 3, Department of Fish and Game, Post Office Box 47, Yountville, CA 94599, telephone (707) 944-2443.

E C Fullerton
Director

D-23

State of California The Resources Agency

Memorandum

78-801-6

To : Mike Bathem
Project Manager, ERCDC

Date: November 8, 1978
re 31-03-01

NOV 13 1978

From : Department of Conservation
Division of Mines and Geology
2815 O Street, Sacramento 95816

Subject: NOI Review Geysers Unit 16

As indicated in my correspondence of 5 Oct 1978, attached are the reviews of the individual CDMG staff scientists.

If additional information is needed, please contact either myself or the appropriate staff scientist.

Roger W. Sherburne
Seismology Manager

Attachments

Approved:

J. F. Davis
James F. Davis, Ph.D.
State Geologist

cc: John Alfors, P. Amimoto
L. Mualchin, R. Kilbourne
Gaylon Lee

Memorandum

To : Roger W. Sherburne

Date: November 6, 1978

Telephone: ATSS (597) 3961
(557) 3961

From : Department of Conservation
Division of Mines and Geology - San Francisco 94111
[redacted]

Subject: Potential Geotechnical Issues from Review of Geysers Unit 16 NOI (PG&E)

This NOI and in particular, the detailed Geotechnical Investigations by R. C. Harlan and Associates were exemplary in their scope and the detail presented. The geologic hazards to this site are as clearly defined as one can expect before actual excavation to the proposed 2350' foundation level is commenced. A basic disagreement exists, however, between the conclusions of PG&E's consultant and this reviewer. This disagreement is over the whole question of site suitability in light of the geotechnical hazards portrayed in the NOI. It is difficult to accept as suitable a site with such admitted geotechnical problems as three faults, an active landslide, extensively sheared bedrock, a ridge crest site, a seismically active region, and a region of measured subsidence due to steam withdrawal. The capability of mitigating any one of these hazards is feasible; to mitigate all may be an engineering challenge. As seen from the geologic map and sections presented in the R.C. Harlan Report, the geology of the proposed site is extremely complex. In these sections the depth to unweathered bedrock is only approximately located in any portion of the site area; the location of 24 out of 24 shear zones shown on these sections is queried, indicating the location is inferred. These facts would seem to indicate a low level of certainty that suitable foundation bedrock is available. Because of the complexity of the site geology, I would agree with the uncertainty presented in the sections. I do not feel that more boring, trenching or geophysical surveys are likely to provide the proof of suitable bedrock conditions on the site. It would probably be cheaper to excavate the site to the proposed 2350' contour and examine the results. Based on the problems reported in the NOI and consultants reports it is doubtful that the site will prove satisfactory after such excavations exposed the true bedrock foundation conditions.

Some specific hazards that would be needed to be addressed in the design of this facility would be:

1. Ground shaking - from a geologic point of view, the MCE and MPE for the Maacama and Collayomi faults is based on an unconservative estimate of fault length. Maacama has been mapped as 150 KM, and the Collayomi as 36 KM. (Corps of Engineers 1978, McLaughlin 1978, and Hearn et al 1976.)

2. Surface rupture by sympathetic movement on faults under the site by an earthquake originating on the San Andreas, Maacama or Collayomi is a realistic hazard based on the reported occurrence of such rupture on Mt. Konocti during the 1906 event (Lawson, 1908). Other examples of sympathetic ground rupture would include: (1) movement on the Coyote Hills, San Andreas and Superstition Hills fault as a result of the Borrego Mountain 1968 M = 6.5 earthquake; (2) movement on the fault through the town of Dolomite on the east side of Owens Valley in the 1872 M = 8.0 earthquake: (3) movement on the hospital fault in the 1971 M = 6.6 San Fernando Valley earthquake; (4) movement on the Edison Hills fault in the 1952 M = 7.7 Arvin Tehachapi earthquake.

3. Surface rupture by settlement induced by steam withdrawal is potentially a serious engineering consideration that may be totally mitigated by a setback from the faults (such as is recommended in the phase II Geotechnical report page B-20). The existence of active settlement in this region is confirmed by Lofgren (1978). Maximum subsidence was 12 cm over four years -- a rate of 120 cm over 40 years would be unlikely, but possible in theory. The existence of hydrothermal alteration (observed by the author) along the fault features exposed in the existing road (south side of ridge), suggests the connection of this fault to the geothermal reservoir. This fact adds to the potential danger of induced subsidence along this feature.

   The NOI (page B-20) states that it is prudent and necessary to avoid siting structures on a northwesterly trending fault at site R. I would agree with this recommendation but would extend it to the structures referred to as shear zones on the site as well. There is nothing aseismic inherent in the definition of shear zone as opposed to a fault zone. The AGI dictionary of geological terms defines a shear zone as: "a zone in which shearing has occurred on a large scale so that the rock is crushed and brecciated". The fact that a rock is sheared to the point of non-recognition of original igneous, sedimentary, or metamorphic textures and structures is not a factor that lessens the danger of either earthquakes or surface displacement. It may in fact, do the opposite.

4. In the portion of the site where it is proposed to excavate a portion of a landslide and construct an engineered fill for the foundation pad of the cooling tower, the evidence for the site suitability is meager. The basic instability of the steep slopes on sheared bedrock is not mitigated by the engineered fill. Cross sections in the Harlan and Associates report do not confirm the existence of solid rock in which to anchor this fill.

RICHARD T. KILBOURNE
Geologist
San Francisco District Office
RG 3432

RTK/yo

cc: R.H. Stewart

NAPA COUNTY

CONSERVATION—DEVELOPMENT
AND PLANNING DEPARTMENT

JAMES H. HICKEY
DIRECTOR

1121 FIRST STREET - NAPA, CALIFORNIA 94558
AREA CODE 707/224-8383

78-NOI-6

November 8, 1978

RECEIVED
NOV 9 1978

RECEIVED
NOV 9 1978
ADP

Commissioner Alan P. Pasternak
CALIFORNIA ENERGY COMMISSION
1111 Howe Avenue
Sacramento, CA 95825

Dear Commissioner Pasternak:

This letter concerns Pacific Gas and Electric's proposed 230 kilovolt Geyser's Transmission Corridor location question which is before the California Energy Commission.

During the California Energy Commission's meeting in Napa on November 3, 1978, Dr. Dowell Hartz (Chairman, Napa County Board of Supervisors) stated the County's general opposition to the choice of a new energy transmission corridor through Napa County. At its November 7, 1978 meeting, the Napa County Board of Supervisors adopted the following action program:

1. Napa County Board of Supervisors favors Alternative 'A' (the Lakeville Corridor) shown on the attached map, and;

2. Napa County Board of Supervisors opposes the proposed alternative corridors (Alternatives B, C and D on the attached map) which cross Napa County, and;

3. Napa County Board of Supervisors wishes to be an intervenor in the transmission corridor selection process, and;

4. Napa County will assert its use permit control over the location of any major electrical transmission line through any portion of the County.

Please keep me informed of all Energy Commission or related meetings that will impact on the final decision concerning the transmission corridor selection. Also, if any additional action is required by the County to accomplish the 4 step action program adopted by the Board, I would appreciate hearing from you.

Very truly yours,

JAMES H. HICKEY
Director

JHH:jl
Attachments

cc: Napa County Board of Supervisors
County Administrator
County Counsel

State of California

State Lands Commission

Memorandum

78-NOI-6

To : Mr. Frank Hahn
Deputy Executive Director
California Energy Commission
1111 Howe Avenue
Sacramento, CA 95825

Date : November 29, 1978

File No.: W 9800

DEC 4 1978

From : EXECUTIVE OFFICE
1807 13th Street, Sacramento 95814

Subject: Pacific Gas & Electric Company's Geyser Unit 16
Notice of Intention (Docket No. 78-NOI-6)

In a memorandum to you dated September 29, 1978, I expressed to you our concern with regard to the above-referenced subject. Our staff has, after further examination, determined that the situation is now such that the interests of the State Lands Commission in this matter appear to be presently protected. Accordingly, we do not plan at this time to intervene in the subject matter.

We would be most grateful if you would continue to keep us informed of the progress of this matter. Thank you very much for your assistance.

WILLIAM F. NORTHROP
Executive Officer

D-31

I-E

NAPA COUNTY

CONSERVATION — DEVELOPMENT
AND PLANNING DEPARTMENT

JAMES H. HICKEY
Director

1121 FIRST STREET • NAPA, CALIFORNIA 94558
AREA CODE 707/253-4416

ENERGY COMMISSION
RECEIVED
DEC 7 1978

December 4, 1978

Commissioner Alan P. Pasternak
CALIFORNIA ENERGY COMMISSION
1111 Howe Avenue
Sacramento, California 95825

Dear Commissioner Pasternak:

This letter concerns Pacific Gas and Electric's proposed 230 kilovolt Geyser's Transmission Corridor location question which is before the California Energy Commission.

The attached copy of the Seismic Safety Element of the Napa County General Plan (1975) contains general information (Page 19) which indicates there is a high probability for landsliding in areas being considered for transmission corridors. More recent and more detailed information available from United States Geological Survey is shown on the attached sample of their 1976 study "Reconnaissance Photointerpretation Map of Landslides in 24 Selected 7.5 Minute Quadrangles in Lake, Napa, Solano and Sonoma Counties, California."

Very truly yours,

ANTHONY R. McCLIMANS, Senior Planner

ARM/jm

Attachments: 1. "Seismic Safety Element of the Napa County General Plan"
2. Sample of "Reconnaissance Photointerpretation Map of Landslides in 24 Selected 7.5 Minute Quadrangles in Lake, Napa, Solano and Sonoma Counties, California"

State of California

78-NOI-5
78-NOI-6
78-NOI-7
78-NOI-3

Department of Health Services

ENERGY COMMISSION RECEIVED
DEC 15 1978

Memorandum

To : James A. Walker
Executive Director
California Energy Commission
1111 Howe Avenue
Sacramento, CA 95825

Date : December 7, 1978

Subject: Wastes from proposed Geothermal Power Plants

Telephone: ATSS ( ) 2-2337
( )

From : Hazardous Materials Management Section
1420 5th Street, Room 140

Michael Batham, Stephen Ramirez, and Chris Oliveira of your staff asked if the Department of Health Services considers the following wastes from proposed geothermal power plants in the Geysers KGRA hazardous wastes:

1. The cooling tower condensate sludge;

2. The Stretford solution purge stream produced by the hydrogen sulfide (H_2S) abatement systems;

3. The non-saleable sulfur cake produced by the H_2S abatement system; and

4. The saleable sulfur cake produced by the H_2S abatement system.

Information on cooling tower condensate from Units 1 through 11 was received from the North Coast Regional Water Quality Control Board. Unfortunately, there are no data on heavy metals. We need such data to make a judgment.

Information contained in "Comparative Process Study for Pacific Gas and Electric Company--Hydrogen Sulfide Abatement Facilities for Geothermal Power Production Facilities--The Geysers, California" (Parsons, August 1975) indicate that the Stretford solution purge stream is a hazardous waste.

Based on Parsons, the non-saleable sulfur cake also is hazardous waste.

The saleable sulfur cake would be a hazardous material if the only difference between it and the non-saleable cake were dewatering. However, since it would not be a waste (if sold), the Department would have no jurisdiction. We would recommend against its use for agricultural purposes.

Disposal of hazardous waste must be in conformance with the Health and Safety Code, Division 20, Chapter 6.5, and with Chapter 2 of Division 4, Title 22 of the California Administrative Code.

Harvey P. Collins

Harvey P. Collins, Ph.D.
Acting Chief

Attachments (2)
See attached page for cc's

D-32

cc: Michael Batham
Stephen Ramirez
Chris Oliveira
Wendy Reid
→ Dave Meith
David L. Storm, Berkeley HHS
RWQCB - North Coast

78-NOI-6

SONOMA COUNTY
COMMUNITY AND ENVIRONMENTAL SERVICES

Duane Butler, Director

PLANNING DIVISION
Pranab Chakrawarti, Deputy

Dr. Alan Pasternak, Presiding Commissioner
C. Suzanne Reed, Commissioner
The California Energy Commission
1111 Howe Avenue
Sacramento, California 95825

December 12, 1978

ENERGY COMMISSION
RECEIVED
DEC 14 1978

PROPOSED GEYSERS UNIT 16 AND GEYSERS TO LAKEVILLE TRANSMISSION LINE

Sonoma County, after attending the Energy Commission hearings on October 26, 1978 and additional discussion with various citizens' groups, would like to offer the following additional comments on the proposed Geysers Unit 16 and the Geysers to Lakeville transmission line.

1. Sonoma County has no objection to the Unit 16 power plant except insofar as it relates to the proposed Geysers to Lakeville transmission line. We do hope that our earlier comments regarding the plant will be considered so that the maximum feasible mitigation of potential adverse impacts will be assured.

2. Sonoma County is not convinced that the existing estimates of total field capacity are realistic. Assuming that more energy than now predicted will be developed at The Geysers and that, as stated by the Pacific Gas and Electric Company, an additional transmission facility running eastward to Vacaville-Dixon would be ultimately required, it seems logical to conclude that such an eastward link should be established at this time rather than the proposed Geysers to Lakeville facility. The link to Vacaville-Dixon would be consistent with the Sonoma County General Plan.

3. In the event that the Commission determines that the 2000 MW field capacity estimate is realistic and that the Geysers to Lakeville transmission facility is necessary and preferred, one alternative that would be consistent with the County General Plan and Specific Plans could be achieved by modifying the proposed route as follows:

   a. The new facility could parallel the existing facility for the entire route, and the twelve miles of totally new right-of-way would not be required. This would, in part, relieve the conflict with the General Plan Conservation and Open Space elements and the Franz Valley Specific Plan. Clearly, there exists no overwhelming advantage to the establishment of this new route, and substantial disruption to a highly sensitive area could be avoided by paralleling the existing right-of-way. This would eliminate the objections of the residents of the Franz Valley-Porter Creek areas and the Alpine Valley Homeowners' Association.

2555 Mendocino Ave, Room 105A ■ Santa Rosa, California 95401 ■ (707) 527-2412

D-33

   b. The existing and new facility, if consolidated and undergrounded within all urban areas, including Wikiup/Larkfield and Oakmont, would be consistent with the County Plans. According to the P. G. & E., the proposed facility is the last that will be routed through Sonoma County. Given that fact, now is the opportunity to reduce the impacts of the existing facility while constructing the new. Undergrounding both facilities within urban areas would eliminate visual and aesthetic conflict in highly populated areas and protect area residents from the potential health hazards resulting from exposure to the electrical field of the lines. Undergrounding both facilities within all urban areas would relieve the conflict of the proposed facility with the Open Space and Land Use element of the County General Plan and the Sonoma Valley Plan as well as the City of Santa Rosa General Plan.

   c. The existing and proposed facilities could be consolidated on single towers of the design proposed by the P. G. & E. for the Oakmont area in lands designated Rural Residential, Open Land and Residential, Agricultural and Residential, and Open Space (environmentally sensitive, scenic and visually sensitive areas and parks and other public lands). This would, in part, relieve the conflict of the proposed facility with the General Plan Conservation and Open Space Elements as well as the Bennett Valley and Sonoma Valley Specific Plans.

In summary, the County continues in its belief that careful long-range planning, including serious consideration of the eastward line to Vacaville-Dixon should precede any decision on this matter.

If a facility to Lakeville is determined by the Commission to be necessary and desirable, one alternative that the County could find consistent with the County General Plan and Specific Plans would be a facility that parallels the existing line for its entire route, is consolidated and undergrounded in urban areas and consolidated in populated and sensitive rural areas. We hope the cost of this alternative can be determined for comparison purposes.

We offer these suggestions in the hope of being constructive and helpful in reaching a resolution in these matters. The residents of Sonoma County will have to live with these facilities for the indefinite future, and we therefore feel that it would be highly beneficial to render these facilities consistent with County Plans.

Enclosed find copies of the Plan maps of the affected areas. We have plotted the approximate route of the existing line and indicated those locations where undergrounding or consolidation would render the project consistent with these Plans.

We sincerely appreciate the opportunity to participate in this decision-making process and are available if you have any further questions regarding the County's position on this matter.

PRANAB CHAKRAWARTI
Planning Director

RAYMOND E. KRAUSS
Ass't. Environmental Administrator

REK:vr

* Enclosures (Craig Larson, Energy Commission, only)

cc: Hobart McDaniel
Oakmont Property Owners Association

Daniel L. Parker
California Energy Commission

Craig Larson
California Energy Commission

Brian Kahn, Chairman
Sonoma County Board of Supervisors

Elizabeth A. Strauss
Deputy County Counsel

Bruce Leavitt, City Attorney
City of Santa Rosa

Thomas Lufkin
Alpine Valley Home Owners Association

Ralph R. Gregerson

NORTHERN SONOMA COUNTY AIR POLLUTION CONTROL DISTRICT

141 NORTH STREET, HEALDSBURG, CA. 95448
(707) 433-5911 or (707) 433-5742

78-NOI-3 December 18, 1978

78-NOI-6
78-NOI-7

ENERGY COMMISSION RECEIVED
DEC 22 1978

State of California
Energy Commission
1111 Howe St., M.S. #15
Sacramento, Ca., 95825

ATTENTION: COMMISSIONER SUSANNE REED

SUBJECT: NOI's (No. 16, 17, DWR, etc.)
FOR GEYSERS AREA

Dear Miss Reed:

I am very sorry to inform your agency this District will have to participate at a minimum level with your NOI/AFC procedures. This District just does not have the personnel to handle the volumunous quantity of notices, reports, meetings, etc. that is being produced by your agency. This District must continue with its primary function of permit processing, air monitoring and enforcement, which is very difficult when one is buried behind a desk or attending meetings which chew up 5 - 8 hours of time toward your agency. (For the future to keep up with your agency's barrage of paper, I strongly suggest you include a simple master calendar along with each "notice" so one can keep up with the "total picture")

Therefore, this District, until sufficient time is available, will leave you with the following general statements applicable to all the "geothermal" projects in the Geysers area:

(1) BACT should mean the ability to achieve 8gm/GMW-Hour or 99% level of abatement.

(2) Each project air analysis should consider drainage conditions, limited vertical mixing and downwash conditions. If a study is warranted, then it should have District approval for overall design objectives.

(3) Effectiveness of Stretford scheme and "partitioning of non-condensables" is not important as long as secondary H_2O_2 abatement is available.

(4) Utilities should consider dual units until a satisfactory control system is found for steam transmission line stackings.

(5) The Utility must improve its operational procedures toward shut down warning devices, curtailment rather than shut down and level of manpower to prevent extended shut downs.

(6) The steam transmission line is within the jurisdiction of the APCD unless the utility becomes responsible for "stacking" during shut down.

Finally this District presently feels it will have to rely on its permit process to implement the law we are charged with. Therefore, please inform your applicants to file for District authorities to construct simultaneously with your NOI if this District is to parallel its efforts with yours (especially if some long-term study is needed by this District).

If you have any questions, do not send anymore "paper", but personally contact Mr. Michael M. Tolmasoff at (707) 433 5911.

Sincerely,

Michael M Tolmasoff

MICHAEL M. TOLMASOFF
Air Pollution Control Officer

MMT/ak

cc: Steve Zalusky, Lake County Air Pollution District

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

PROJECT FILE

WESTERN REGION
P.O. BOX 92007, WORLDWAY POSTAL CENTER
LOS ANGELES, CALIFORNIA 90009

December 20, 1978

78-NOI-6

ENERGY COMMISSION
RECEIVED
DEC 26 1978

Ms. Pam Patterson
Energy Resources Conservation
and Development Commission
Office of the Secretariat
1111 Howe Avenue
Sacramento, California 95825

Dear Ms. Patterson:

As requested we have completed the review of Pacific Gas and Electric Company's report titled "Supplemental Environmental Information on the Geysers to Lakeville 230 kv Transmission Line and Alternatives."

Our review indicates that this proposed project will not present any problems to any existing or presently planned FAA facilities.

Please be advised that this preliminary approval does not obviate the requirement for the Pacific Gas and Electric Company to file a notice with the FAA where determined applicable and as stipulated under Part 77 of the Federal Aviation Regulations.

We appreciate the courtesy extended in bringing this matter to our attention.

Sincerely,

W. BRUCE CHAMBERS
Regional Planning Officer

D-36

78-NOI-6

SOLANO COUNTY [illegible]
[illegible]

ENERGY COMMISSION
RECEIVED
JAN 8 1979

WHEREAS: The Solano County [illegible] transmission corridors [illegible] intention that [illegible]

WHEREAS: To integrate the electrical [illegible] 16 into the existing [illegible], Pacific Gas and [illegible] alternative transmission [illegible], and, [illegible] line alternatives, the [illegible] are routed through [illegible]

WHEREAS: The Resource Conservation and Open Space Element of the Solano County General Plan designates the Vaca Mountains to be crossed by the Vaca-Dixon line [illegible] scenic area; and

WHEREAS: Roadways crossing or paralleling the proposed corridors are designated as scenic routes by the Scenic Roadways [illegible] of the Solano County General Plan; and

WHEREAS: Solano County is impacted by an excessive number of existing transmission lines crossing the County's most beautiful hills and mountains and there should be no further degradation of scenic qualities; and

WHEREAS: Costs of mitigating further scenic degradation is very expensive; and

WHEREAS: The Vaca-Dixon and Tulucay-Easterly alternatives that cross Solano County are the lowest corridors being considered and each requires new right-of-way.

Be it, therefore,

RESOLVED: That the Solano County Planning Commission opposes the Tulucay-Easterly and the Vaca-Dixon alternatives; and

Be it, further,

RESOLVED: That if the Tulucay-Easterly or Vaca-Dixon corridor is recommended by the Energy Commission, the corridor would be subject to conditions which would mitigate scenic disruption such as undergrounding, architectural design and path selection which avoids ridgelines and [illegible]; and

Be it, further,

RESOLVED: That if the Energy Commission finds it necessary to recommend the Vaca-Dixon corridor, it should explore alternative routes which parallel existing transmission lines.

****

I hereby certify that the foregoing resolution was adopted at the regular meeting of the Solano County Planning Commission on December 21, 1978 by the following vote:

AYES: Commissioners [illegible], Courtland, [illegible], Lew, [illegible] and Albrecht

NOES: Commissioners None

ABSENT: Commissioners [illegible], Stewart and [illegible]

[illegible], Secretary

State of California — The Resources Agency of California

Memorandum

Date : FEB 14 1979

To : Mr. Alan D. Pasternak
Presiding Member
California Energy Conservation
and Development Commission

From : Department of Parks and Recreation

Subject: Pacific Gas and Electric Company
Proposed Geyser #16 Project

Pacific Gas and Electric Company proposes to construct a transmission line to provide service from their proposed Geyser #16 project.

The preferred route would involve the upgrading of the line through Annadel State Park. This Department prefers a route completely outside of this area as producing the leaast damage to the California State Park System. This and other alternatives do not appear to be emerging in the action under consideration by your Commission.

D-37

The dollar and environmental costs of these alternatives may be very high. As an example, a re-routing through the Kenwood area would have severe visual effects. The upgrading of the existing line, with a strong program of restrictive conditions, may be the least damaging project. The park will be affected, but the restrictions joined with a program of off-site mitigation, may be an equitable solution.

This route will also pass close to Petaluma Adobe State Historic Park; line location in this area will also require care.

The California State Park System has needs relating to energy facilities within some units, and a mitigation program can serve to provide protection of Park System resources, as well as increased opportunities for visitor use and enjoyment of those resources.

James M. Doyle, Supervisor of Environmental Review Section, California Department of Parks and Recreation, P. O. Box 2390, Sacramento, CA 95811, will be attending the coming hearings, workshops and conferences. I will be happy to meet with you to discuss this further or you may call Mr. Doyle at (916) 322-2481.

Russell W. Cahill
Director

FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

78-NOI-6

IN REPLY REFER TO:
7600-21

ENERGY COMMISSION RECEIVED
JAN 15 1979

Mr. James A. Walker
Executive Director
Energy Resources Conservation and
Development Commission
1111 Howe Avenue
Sacramento, California 95825

Re: Request for Comments and Recommendations on Pacific Gas and Electric Company's Geysers Unit 16 Notice of Intention.

Dear Mr. Walker:

This replies to the California State Energy Resources and Development Commission's request that the Commission review the above-referenced Notice of Intention and make any comments or recommendations which we think appropriate.

A review of the Notice of Intention indicates no reference to the construction of communications facilities, which is this Commission's major area of regulatory concern, and therefore, we are able to offer no comments as to potential environmental effects from radio communications facilities which may be involved in this project because no discussion of these facilities is included in the Notice.

Sincerely,

Carlos V. Roberts
Chief, Safety and Special
Radio Services Bureau

THIS INSTRUMENT IS A CORRECT COPY OF THE ORIGINAL ON FILE IN THIS OFFICE.

ATTEST: [illegible] 1979

EDYE T. LEWIS, County Clerk & ex-officio Clerk of the Board of Supervisors of the State of California, in and for the County of Sonoma. By [illegible], Deputy

RESOLUTION NO. 63138

Sonoma County Administration Bldg.
Santa Rosa, CA 95401

February 20, 1979

RESOLUTION OF THE BOARD OF SUPERVISORS OF THE COUNTY OF SONOMA, STATE OF CALIFORNIA, FINDING CERTAIN ALIGNMENT OF THE GEYSERS TO LAKEVILLE TRANSMISSION LINE CONSISTENT WITH THE GENERAL PLAN

WHEREAS, the Sonoma County Board of Supervisors has previously gone on record in opposition to the Geysers-Lakeville Transmission Line as currently proposed (Resolution #62191), and

WHEREAS, the Planning Commission staff presented an alternative transmission line proposal to the California Energy Resources Conservation and Development Commission in a letter of December 12, 1978 which could be consistent with the Sonoma County General Plan, and

WHEREAS, the Planning Commission staff proposal recommended an alignment parallel to the existing 230 k.v. facility including underground lines (both proposed and existing) through Larkfield/Wikiup, across the floor of the Valley of the Moon and through Oakmont and consolidated lines in several sensitive areas, and

WHEREAS, the Planning Commission staff has reviewed other alternative transmission line alignments and has concluded that the non-parallel section of PG&E's preferred alignment through the Franz Valley area, the similar, non-parallel alignment southwest of the preferred alignment known as route "4b," and any non-parallel alignment through the Kenwood/Lawndale area would be inconsistent with the goals and policies of the Sonoma County General Plan, and

WHEREAS, the Sonoma County Planning Commission will consider other alternative alignments and proposals at a March 1, 1979 meeting, now

THEREFORE BE IT RESOLVED that the Board of Supervisors finds that the Planning Commission staff alternative presented to the Energy Commission in December is an alternative consistent with the Sonoma County General Plan.

BE IT FURTHER RESOLVED that the Board of Supervisors is eager to review for consistency with the General Plan any alternative transmission facility that is referred to it by the Planning Commission or which PG&E would be prepared to construct.

SUPERVISORS

Kahn:_____ Putnam:_____ Esposti:_____ Koenigshofer:_____ Rudee:_____

Ayes: 5 Noes:_____ Abstain:_____ Absent:_____

SO ORDERED.

County Administration Building,
Santa Rosa, California.

MARCH 1, 1979

Resolution No. 8558

OF THE PLANNING COMMISSION OF THE COUNTY OF SONOMA, STATE OF CALIFORNIA; REFERRING INFORMATION CONCERNING THE PROPOSED GEYSERS TRANSMISSION LINE TO THE BOARD OF SUPERVISORS.

WHEREAS, the Sonoma County Planning Commission heard a presentation by the Planning staff on The Geysers transmission line and modifications to The Geysers-to-Lakeville alignment, and

WHEREAS, the Planning Commission held a public hearing and took public comment on the proposals, and

WHEREAS, the Planning Commission considered public and staff recommendations, and

WHEREAS, the Planning Commissioners expressed concern about the lack of knowledge of the size of the geothermal resource and the lack of comprehensive transmission line planning, and

WHEREAS, the Planning Commissioners expressed a willingness to meet with the Energy Commission staff, and

WHEREAS, the Planning Commissioners re-affirmed the policy of restricting geothermal exploration to the designated geothermal resource areas, now

THEREFORE BE IT RESOLVED that the Planning Commission forwards the Staff Report and recommendations for Board consideration.

Commissioner Hickelsen	Aye
Commissioner Wayman	ABSENT
Commissioner Keith	Aye
Commissioner Thibodeau	Aye
Commissioner Steiner	Aye

AYES 4 NOES 0 ABSTAIN 0 ABSENT 1

SO ORDERED

State of California — Department of Health Services

Memorandum

78-NOI-6

To : James A. Walker
Executive Director
California Energy Commission
111 Howe Avenue
Sacramento, CA 95825

Date : March 6, 1979

Subject: "Portions of the Geysers to Lakeville 230kV Transmission Line DEIR Referenced in the SEI"

Attn: Michael Batham, Project Director

Telephone: ATSS ( ) 2-2337 ( )

ENERGY COMMISSION RECEIVED MAR 12 1979

From : Hazardous Materials Management Section
1420 5th Street, Room 140

We have no comments on the subject document.

Harvey F. Collins, Ph.D.
Acting Chief

HFC:LAB:lt

D-39

United States Department of the Interior

2800

BUREAU OF LAND MANAGEMENT
District Office
P.O. Box 940
Ukiah, California 95482

78-NOI-6

MAR 19 1979

March 9, 1979

Mr. J.W. Page, Manager
Land Department
Pacific Gas & Electric Company
345 Mission St.
San Francisco, CA 94106

Dear Mr. Page:

One of the proposed corridors for the Geysers to Lakeville 230 KV transmission line crosses federal land in the Cedar Roughs area (T. 8 N., T. 9 N., R. 4 W., MDBM). The federal land in the Cedar Roughs is being inventoried for wilderness characteristics and may be recommended as a wilderness study area (WSA). Because of this, you should be aware that special BLM interim management and policy guidelines for WSA's will be applied to all actions and authorizations for the area.

Sincerely yours,

Dean E. Stepanek
District Manager

cc: Mr. James A. Walker, Executive Director
California Energy Resources
Conservation and Development
Commission
ATTN: Michael Bathom MS39
1111 Howe Avenue
Sacramento, CA 95825

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

State of California — The Resources Agency

Memorandum

To : James A. Walker, Executive Director
California Energy Commission
1111 Howe Avenue
Sacramento, CA 95825

Date: March 13, 1979

78-NOI-6

ENERGY COMMISSION RECEIVED
MAR 21 1979

From : Department of Fish and Game

Subject: PGandE Geysers 16 NOI Supplement, "Portions of the Geysers to Lakeville 230 kV Transmission Line Draft EIR Referenced in the SEI"

The Department of Fish and Game has revieved subject report as transmitted by your memorandum of February 21. We find that the proposed route, Alignment A, would be an acceptable corridor with low long-range impacts on fish and wildlife resources, and recommend this selection.

D-40

Any disturbance of natural communities with new lines, such as the proposed alternatives, would pose greater problems for fish and wildlife resources than a parallel route through urban areas (Alignment A). Specific site reviews indicate the Alignment A route follows off-ridgetop elevations which have access potentials out of critical wildlife habitat areas. All impacts are considered short-term.

Any questions regarding the above comments may be directed to Mr. E. V. Toffoli, Regional Manager, Region 3, Department of Fish and Game, Post Office Box 47, Yountville, CA 94599, telephone (707) 944-2443.

EC Fullerton
Director

State of California — The Resources Agency

Memorandum

78-NOI-6

To : James A. Walker, Executive Director
California Energy Commission
1111 Howe Avenue
Sacramento, CA 95825

Date: March 29, 1979

Telephone: ATSS ( ) 485-3531
(916) 445-3531

RECEIVED
APR 3 1979
ADP

From : Department of Fish and Game

Subject: Addendum comments, PGandE Geysers 16 NOI Supplement, "Portions of the Geysers to Lakeville 230 kV Transmission Line Draft EIR Referenced in the SEI"

This memorandum is to modify our March 13, 1979 response regarding subject project. Our response should have read as follows.

Department review of subject report as transmitted by your letter of February 21, 1979 indicates Alignment A would be an acceptable route with low long-range impacts on fish and wildlife resources if modified to follow the existing route through the Fulton Substation area.

Any disturbance of natural communities with new line corridors, including the proposed "new" section of Alternative A, would pose greater problems for fish and wildlife resources than either parallel or consolidated alternatives and should be avoided. The consolidation of lines on existing corridors would represent the least impact on natural ecosystems and be the most desirable alternative. Parallel routes through non-urban areas would increase corridor width and be less desirable than consolidation.

Specific site reviews indicate a modified Alignment A route follows off-ridgetop elevations which have established access and pose the least impacts for line consolidation and low access potential problems for corridor expansion for the parallel line alternative. All fish and wildlife impacts associated with the consolidation alternative are considered short-term and negligible, and for the parallel alternative, short-term.

We recommend the selection of an alternative or combination of alternatives which do not represent new corridor development.

for Director

78-1101-6

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Division of Ecological Services
2800 Cottage Way, Room E-2727
Sacramento, California

78-NOI-6

APR 2 1979

Mr. James A. Walker
Executive Director
California Energy Commission
1111 Howe Avenue
Sacramento, California 95825

Subject: "Report entitled Portions of The Geysers to Lakeville 230 kV Transmission Line Draft EIR Referenced in Supplemental Environmental Information"

Dear Mr. Walker:

We have reviewed the subject document as requested in your letter of February 21 and offer the following comments.

General Comments

Although the supplemental document is referenced to the Draft Environmental Impact Report (DEIR) on The Geysers to Lakeville 230 kV Transmission Line, we are not convinced that the DEIR adequately addressed the concerns expressed in our October 17, 1978 letter (copy attached for reference).

We are not opposed to the development of geothermal resources as a means of meeting increased demands for energy. However, we are obligated under various Congressional mandates and international treaties to insist on measures which will protect, maintain, and enhance fish and wildlife resources.

We note that the proposed transmission line route will be 38 miles in length, and that approximately 25 miles (or 68 percent) of the route would parallel existing transmission lines. The supplemental document does not propose any measures to compensate for the loss of fish and wildlife resources. We recommend the acquisition and development of similar lands to compensate for the resource loss. This is an accepted practice with water development projects where the construction agency, such as the Corps of Engineers, will acquire and develop lands for wildlife management purposes to compensate for losses.

D-41

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

Specific Comments

1. Page 20, section b., Rare and Endangered Plants -- The Endangered Species Act of 1969 was superseded by the Endangered Species Act of 1973 (ESA). This legislation established two categories of species subject to Federal protection: threatened and endangered. Some 20 plants have been officially classified pursuant to the Act and approximately 1,850 other plants are under consideration for classification as either endangered or threatened species.

2. Page 20, paragraph II. There is no indication that the 40 rare (threatened) and endangered plant species identified by the California Native Plant Society as being located within the study area were compared to those listed in the Federal Register issues of July 1, 1975 and June 16, 1976. Any plants listed in the Federal Register are subject to the provisions of the ESA.

3. Page 28 -- Table 3 contains a number of errors concerning the classification of endangered and threatened species. The correct information is contained in Table 3 (pages B-9 and B-10) of the Supplemental Environmental Information on The Geysers to Lakeville 230 kV Transmission Line and Alternatives, filed by Pacific Gas and Electric Company on November 15, 1978.

4. Page 38, paragraph 4, sentence 2 -- Suggest revising the sentence to read: "As part of the Army Corps of Engineers Russian River Basin Improvement Plan, a reservoir and fish hatchery are planned."

5. Page 47, Section 4, Fisheries -- Removal of riparian vegetation should be avoided for three reasons: (1) to maintain the integrity of the riparian ecosystem; (2) to protect the diversity of wildlife species in areas of riparian habitat; and (3) to conform to the expressed policy of the State of California (Environmental Goals and Policy Report, 1973).

6. Page 164, Mitigation Measures-Consruction Guidelines -- Additional information is needed concerning disturbances caused by construction activities to marsh and riparian habitat. Also, information concerning ownership of the marsh and riparian habitats would be helpful. Federal and State policies now emphasize the protection of wetlands and riparian habitat: (1) Executive Order 11990, entitled "Protection of Wetlands", issued by the President on May 24, 1977; and (2) "Policy for Preservation of Wetlands in Perpetuity", issued by The Resources Agency on September 19, 1977. Pursuant to Assembly Bill 3147, approved by the Governor on September 28, 1978, the California Department of Fish and Game has initiated management plans for the protection of riparian habitat.

7. Pages 117-124, Appendix B, Wildlife Species Within the Geysers Lakeville Study Area -- The term "status undetermined" is no longer used by the Fish and Wildlife Service. The bald eagle, American peregrine falcon, Aleutian Canada goose, and California clapper rail are now classified as endangered species by the FWS. The prairie falcon and spotted owl are not listed as either threatened or endangered species.

Thank you for the opportunity to review and comment on the subject document.

Sincerely,

James J. McKevitt
Field Supervisor

cc: Dir., CDF&G, Sacramento
Reg. Mgr., CDF&G, Reg. III, Yountville

RECEIVED
ADP

STATE OF CALIFORNIA

STATE ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

In the Matter of:	Docket No. 78-NOI-6
Notice of Intention of PACIFIC GAS AND ELECTRIC COMPANY to File an Application for Certification of Geysers 16 and Related Transmission Line Facilities	RESOLUTION NO. 79-64 OF THE BOARD OF SUPERVISORS OF THE COUNTY OF NAPA OF THE STATE OF CALIFORNIA

County of Napa as Intervenor hereby offers the attached Resolution in the above-entitled matter.

Respectfully submitted,

STEPHEN W. HACKETT, County Counsel
COUNTY OF NAPA

for WARREN BEAN
Chief Deputy County Counsel

Attorneys for County of Napa

D-43

ENDORSED
Filed [illegible]
FLORENCE M. [illegible]
BY [illegible]
Deputy Clerk

CERTIFIED COPY

BEFORE THE BOARD OF SUPERVISORS

OF THE COUNTY OF NAPA

In the Matter of Notice of Intention of Pacific Gas and Electric Company to File an Application for Certification Re: Geysers 16.	Resolution No. 79-64

WHEREAS, Pacific Gas and Electric Company has filed an application with the California Energy Resources Conservation and Development Commission for certification to establish, among other features, a corridor for a transmission line to carry electricity generated from geothermal resources located in the Geysers area north of Napa County southerly to the Bay Area; and

WHEREAS, Pacific Gas and Electric Company has indicated three corridors of varying lengths and widths traversing major portions of Napa County as alternatives to an alignment through Sonoma County, in any of which corridors a large transmission line might be constructed; and

WHEREAS, substantially the whole of each of said Napa County corridors runs through remote wilderness areas not heretofore opened to access by man, where construction of roads and erection of towers would threaten the environmental integrity of ecologically sensitive areas, would destroy significant wildlife habitat, scar unique scenic landscapes, and where resulting erosion and siltation would jeopardize valuable fisheries resources; and

WHEREAS, all the proposed Napa County corridors would conflict with the goals, policies, and objectives of the county's general plan, particularly in the absence of firm and reliable assurances that the county's use permit prerogatives would be suitably honored and observed; and

WHEREAS, said commission appears committed to make its decision without acknowledging that the proposal is a "project" under the California Environmental Quality Act and without first certifying as adequate an environmental impact report pursuant to that law, despite repeated and numerous protests from an apprehensive citizenry as to the environmental consequences of its decision, and therefore violating said law,

NOW, THEREFORE, BE IT RESOLVED, that the Napa County Board of Supervisors opposes the selection of any of the alternative corridors traversing Napa County, such corridor options being designated the Tulocay West, Tulocay East, and Vaca-Dixon corridors in these proceedings, and urges the Energy Commission to promptly correct the major deficiency in its proceedings by recognizing the applicability of CEQA to the decision required of it herein and by forthwith implementing said act in all its substantive and procedural aspects.

The foregoing resolution was duly and regularly adopted by the Board of Supervisors of the County of Napa, State of California, at a regular meeting held on the 3rd day of April, 1979, by the following vote:

AYES: SUPERVISORS MARTZ, TUTEUR, NORRISS, MOSKOWITE AND CHAPMAN

NOES: SUPERVISORS NONE

ABSENT: SUPERVISORS NONE

ATTEST:

FLORENCE W. CUNNY, County Clerk

By AGNES DEL ZOMPO APR 3 1979
Clerk of the Board

D-44

-2-

HE FOREGOING INSTRUMENT IS A CORRECT COPY
OF THE ORIGINAL ON FILE IN THIS OFFICE
ATTEST APR 11 1979
FLORENCE W. CUNNY
COUNTY CLERK AND EX-OFFICIO CLERK OF THE BOARD OF SUPERVISORS OF THE COUNTY OF NAPA, STATE OF CALIFORNIA
BY DEPUTY

78-NOI-5

RESOLUTION NO. 79

WIKIUP COUNTY WATER DISTRICT

WHEREAS, the WIKIUP COUNTY WATER DISTRICT is a special district organized and empowered by the California Legislature; and

WHEREAS, the WIKIUP COUNTY WATER DISTRICT encompasses the 800 acres of Wikiup bounded to the south by Mark West Creek, to the east by Faught Road, to the north by the north line of Section 28 and the west half of the northline of Section 27 T8N R8W and to the east by the north south midline of Section 27 T8N R8W, across which, Pacific Gas & Electric Company has placed a 230 kv line; and

WHEREAS, the proposed 230 kv Pacific Gas & Electric Company transmission line presently being reviewed by the California Energy Commission for Geysers 16 of the NOI process would cross the WIKIUP COUNTY WATER DISTRICT service area via "Fulton Alternatives" 2a through 2e and 4a, creating a second major transmission line across the District's boundaries; and

WHEREAS, there has been much opposition expressed by the citizens within the WIKIUP COUNTY WATER DISTRICT opposing new transmission lines within all areas of the District,

NOW, THEREFORE, IT IS RESOLVED that the WIKIUP COUNTY WATER DISTRICT is opposed to any new overhead transmission lines within the WIKIUP COUNTY WATER DISTRICT service area.

****

I hereby certify that the foregoing is a full, true, and correct copy of a Resolution duly and regularly adopted and passed by the Board of Directors of WIKIUP COUNTY WATER DISTRICT, Sonoma County.

1 OF
MPSON
AVE
A 95401
82

-1-

California, at a special meeting held on April 13, 1979, by the following vote:

AYES, and in favor thereof, Directors:

STANLEY M. ANDERSON
MARY JANE ANDERSON
JAMES LOGSDON
GORDON GADDIS

NOES, Directors: None

ABSENT, Directors: GARDNER BURKE

Elaine M. Smith
Secretary
Wikiup County Water District

APPROVED:

Stanley M. Anderson
President
Wikiup County Water District

D-45

LAW OFFICES OF
HILL & THOMPSON
45 WIKIUP DRIVE
SANTA ROSA, CA 95401
(707) 538 3662

D-46

78-101-6

RESOLUTION FROM THE MEMBERS OF
THE LARKFIELD-WIKIUP LAND USE STUDY

WHEREAS the Sonoma County General Plan recommends a specific plan be prepared for the Larkfield-Wikiup area, and

WHEREAS on August 1, 1978, the Sonoma County Board of Supervisors adopted a Study District as per the attached map, and

WHEREAS the Sonoma County Board of Supervisors Resolution No. 62870 dated January 23, 1979, appoints members to the Larkfield-Wikiup Land Use Study, and

WHEREAS there are existing Pacific Gas and Electric Company 230 kv, 115 kv, and 60 kv transmission lines transversing the study area, and

WHEREAS the Pacific Gas and Electric Company has filed a Notice of Intention on Geysers Unit #16 as its associated alternative transmission line routes and the Notice of Intention is presently being heard in front of the State of California State Energy Resources Conservation and Development Commission, and

WHEREAS proposed transmission line routes known as Fulton Alternatives 2a through 2e, 3a through 3c, and 4a transverse the study area, and

WHEREAS the proposed new 230 kv transmission line will not be providing electricty to the study area or to the County of Sonoma, and

WHEREAS there has been opposition expressed by the citizens within the study area opposing the new transmission line,

NOW THEREFORE IT IS RESOLVED that the members of the Larkfield-Wikiup Land Use Study unanimously, and as individuals, are opposed to any additional overhead transmission lines within the study area.

IT BE FURTHER RESOLVED that a copy of this Resolution be presented to the State Energy Resources Conservation and Development Commission.

WE HEREBY CERTIFY that the foregoing is full, true and a correct copy of the Resolution duly and regularly adopted and passed by the Larkfield-Wikiup Land Use Study Committee, at a meeting held on April 16, 1979, Sonoma County, California.

APPROVED:

Co-Chairman

Co-Chairman

78-101-6

MARK WEST UNION SCHOOL DISTRICT

5187 OLD REDWOOD HIGHWAY SANTA ROSA, CALIFORNIA 95401 (707) 545-3858

April 19, 1979

TO WHOM IT MAY CONCERN:

As superintendent of Mark West School District, I am deeply concerned by the possibility that additional power lines may be run over our San Miguel School and pass by our Mark West School. I cannot help but be troubled by the fact that our buses will have to pass under these lines several times each day and that if these lines were to come down due to high winds, an earthquake or some other act of God, or if an airplane were to crash into the power lines that these lines could very easily fall on several hundreds of children who reside in these schools.

It is hard for me to believe, that with all of the rural area to the east and north of our schools, that the energy commission finds it necessary to consider the placing of additional lines along this more urban route. Especially when you consider that it is not the most direct route for accomplishing this project.

In closing, I ask that your comalssion and all other agencies involved in this project consider all potential problems and all other possible solutions before making such a crucial decision.

Your consideration of our concerns will be appreciated.

Sincerely,

Brad Vaughan

Brad Vaughan
District Superintendent

BOARD OF TRUSTEES: ROBERT E. DEMPEL, President; JANE E. CLAYTON, Clerk; PATTIE L. BESTE, ROBERT G. VESPER, CLYDE E. WELLOCK, M.D., Members
BRAD VAUGHAN, Superintendent

APPENDIX E

Tentatively Applicable

Laws and Standards

Tentatively Applicable
Laws, Ordinances, and Standards
on Site Related Issues
Geysers 16

Category	Applicable Laws, Ordinances, Standards	Relevant Findings and Conclusions Regarding Compliance
I. Need/Demand Conformance	Public Resources Code Section 25309	Finding 3; Conclusion 1
II. Air Quality and New Source Review	LCAPCD Rule 411	Finding 2; Conclusion 1
	LCAPCD Rule 412	Findings 5, 6; Conclusion 3
	LCAPCD Rule 430	Finding 7; Conclusion 1
	LCAPCD Rule 421-A	Findings 32, 33; Conclusion 3
	LCAPCD Rule 421-B (if adopted)	Findings 32, 33
	NSCAPCD Rule 455(b)	Finding 10
	State AAQS for H_2S	Findings 12, 14; Conclusions 3, 8
	EPA PSD Rules	Finding 30; Conclusion 4
	Federal New Source Review Requirements	
III. Public Health		
a. H_2S	State AAQS for H_2S	Finding 6
b. Suspended Sulfates	State AAQS for Suspended Sulfate	Findings 11, 12; Conclusion 3
c. Radionuclides	State Standards for ^{222}Rn 17 Cal. Adm. Code 30355	Finding 7; Conclusion 1
d. Sulfur Dioxide	CARB AAQS for So_2	Findings 2, 3
e. Total Suspended Particulates	CARB AAQS for TSP	Findings 2, 4; Conclusion 1
f. Ammonia	Calif. Occupational Safety and Health Standard for Ammonia	Finding 3
	EPA Standard for Ammonia	Finding 3
g. Arsenic	National Institute for Occupational Safety and Health AAQS for Arsenic	Finding 3
	World Health Organ. AAQS for Arsenic	Finding 3
	EPA Standard for Arsenic	Finding 4
h. Mercury	World Health Organization AAQS for Mercury	Finding 3
	EPA Standard for Mercury	Finding 3

Category	Applicable Laws, Ordinances, Standards	Relevant Findings and Conclusions Regarding Compliance
IV. Safety and Reliability	Occupational Health and Safety Act and Implementing Regulations	Finding 3(a)
	Federal Occupational Health and Safety Act and Implementation Regulations	Finding 3(b)
V. Structural Engineering	Seismic Design Criteria, Uniform Building Code, 1976	Findings 4, 5, 9
	Manual of Steel Construction, American Institute of Steel Construction, 7th Edition	Finding 9(a)
	American Concrete Institute Standard on Building Code Requirements for Reinforced Concretes; ACI 318-77	Finding 9(b)
	American Iron and Steel Institute Specification for the Design of Light Gauge Cold-Formed Steel Structural Members (Current Edition in effect at time of AFC Filing)	Finding 9(c)
	American Welding Society Structural Welding Code D1.1-75 (revision in effect at AFC filing)	Finding 9(d)
	American Institute of Timber Construction Manual, Sixth edition 1972	Finding 9(e)
	American Assoc. of State Highway Transportation Officials Standard Specifications for Highway Bridges - 11th edition 1973, (edition in effect in time of AFC filing)	Finding 9(f)
	Uniform Building Code Standards Adopted by Lake County	Findings 10, 15(a)
	Regulations, Title 8, Cal. Adm. Code	Findings 10, 15(b)
VI. Geotechnical	Chapter 70, Uniform Building Code	Finding 6

Category	Applicable Laws, Ordinances, Standards	Relevant Findings and Conclusions Regarding Compliance
VII. Cultural Resources	National Historic Preservation Act of 1966, 16 U.S.C., 470 et. seq. and Implementing Regulations, 36 CFR 800, et. seq.	Finding 2(a)
	Native American Historical, Cultural, and Sacred Sites, Public Resources Code Section 5097.9 et. seq.	Finding 2(b)
VIII. Biological Resources	Federal Endangered Species Act of 1973 and Implementing Regulations	Finding 1
	Ecological Reserve Act of 1963 and Implementing Regulations, Fish and Game Code Sections 1580-1584	Finding 1
	California Species Preservation Act of 1970, Fish and Game Code Sections 900-903	Finding 1
	California Endangered Species Act of 1970, Fish and Game Code Section 2050-2055	Finding 1
	Fully Protected Species Act, Fish and Game Code Sections 3511, 4700, 5000, and 5515	Finding 1
	Federal Regulations Implementing the Geothermal Steam Act of 1970 (30 USC 1001-1025 and CFR 270.34(k))	Finding 1
IX. Water Quality	U.S. Environmental Protection Agency Water Quality Criteria (1976)	Finding 5(a)
	Central Valley Basin Plan (contained in California Water Quality Control Plant, Sacramento River Basin)	Finding 5(b)
	Porter-Cologne Water Quality Control Act	Finding 5(c)
	23 Calif. Adm. Code, Title 23, Chapter 3	Finding 5(d)

Category	Applicable Laws, Ordinances, Standards	Relevant Findings and Conclusions Regarding Compliance
X. Socio-Economic	No Codified Standards	
XI. Hydrology	No Codified Standards	
XII. Soils	Waste Discharge Requirements for Non-Sewerable Waste Disposal to Land Disposal Site Design and Operation Information (January 1978), California State Water Resources Control Board	Finding 2
	Lake County Planning Commission Resolution 76-30 "(Special Use Permit) Burmah Oil and Gas Company Castle Rock Springs", March 18, 1978	Finding 2
	Specifications for the Preparation for Drill Sites and Access Roads, Castle Rocks Spring EIR, Lake County Permit to Aminoil, November 8, 1978	Finding 4; Conclusion 2
	Waste Discharge Requirements for Non-Sewerable Waste Disposal to Land-Disposal Site Design and Operation Information (January 1978) Central Valley Regional Water Quality Control Board	Finding 5; Conclusion 2
XIII. Noise	Noise Element, Lake County General Plan	Finding 1; Conclusion 5
	CAL-OSHA 8 Cal. Adm. Code Section 5095-5099	Finding 2; Conclusion 5
	Cal. Vehicle Code Section 23130	Finding 2; Conclusion 5
	Aminoil USA, Castle Rock Springs, Dillingham and Vought Leasehold Use Permit, Oct., 1978	Finding 10, Conclusion 4

Tentatively Applicable
Laws, Ordinances, and Standards
on Transmission Line Related Issues
Geysers 16

Category	Applicable Laws, Ordinances, Standards	Relevant Findings and Conclusions Regarding Compliance
I. Land Use	a. Annadel State Park Issue, Public Resources Code 25527	Findings 7, 8; Conclusions 1, 4
	Sonoma County General Plan	Finding 16; Conclusion 3
	City of Santa Rosa General Plan	Finding 16; Conclusion 3
	b. Other Land Use Issues	
	Lake County Zoning Ordinance - sec. 21-61.1(n), sec. 21-62, sec. 21-77 and 78.2	Finding 33; Conclusion 8
	Lake County General Plan (9/1/67), Open Space, Conservation and Scenic Highway Elements (adopted 8/14/73).	Finding 33; Conclusions 1, 9
	Sonoma County Zoning Ordinances - Chapter 26, Supp. 8-75 (presently being revised); sec. 26-199	Finding 20; Conclusion 8
	Sonoma County General Plan (1/10/78)	Findings 4, 5, 7, 11, 12, 13, 14, 15; Conclusions 1, 2, 3, 5, 10
	Franz Valley Specific Plan - sec. 4 and 5 (if adopted as proposed)	Finding 5
	Napa County Zoning Ordinance - Ordinance no. 511, sec. 12701 b (6)	Findings 21, 22; Conclusion 8
	Napa County General Plan - Seismic Element (2/11/75)	Findings 23, 24; Conclusion 7
	Land Use Element (12/75) - sec. II & III	Finding 23; Conclusion 17
	Napa County Local Ordinances	Conclusions 7
	Solano County Zoning Ordinances - sec. 28-24 (a) (6)	Finding 33; Conclusion 8
	Solano County General Plan - Land Use (1967)	Finding 33; Conclusions 1, 9
	City of Santa Rosa General Plan "2000" (3/78)	Findings 14, 15, 20; Conclusions 1, 3, 5
	City of Santa Rosa Zoning Ordinances	Finding 20
	Federal Land Policy and Management Act of 1976 and Implementing Regulations	Findings 25 thru 32; Conclusion 6

Category	Applicable Laws, Ordinances, Standards	Relevant Findings and Conclusions Regarding Compliance
II. Cultural Resources	National Historic Preservation Act of 1966, 16 U.S.C. 470 et. seq. 36 CFR 800	Finding 1; Conclusion 2
	Joint Congressional Resolution "American Indian Religious Freedom." (P.L. 95-341, 92 Stat. 496), 8/11/78	Finding 1; Conclusion 3
	Mineral Leasing Act of 1920 (P.L. 66-146 Stat. 437).	Finding 1; Conclusion 4
	Native American Historical, Cultural and Sacred Sites, Public Resources Code Section 5097.9 et. seq.	Conclusion 3
III. Biological Resources	Federal Endangered Species Act of 1973 and implementing regulations. 16 USCA 1531 et. seq., 50 CFR part 17	Finding 1(a); Conclusion 1
	Federal Rivers and Harbor Act of 1899. (33 USCA 403)	Finding 1(a); Conclusion 1
	Federal Executive Order 11990, Protection of Wetlands (42 FR 26951; May, 1977)	Finding 1(a); Conclusion 1
	California Ecological Reserve Act of 1968 and implementing regulations	Finding 1; Conclusion 1
	Fish and Game Code Sections 1580-1584, 14 Cal. Admin. Code §670.5	Finding 1(b); Conclusion 1
	California Species Preservation Act of 1970, Fish and Game Sections 900-903, 141C-1, Admin. Code §670.5	Finding 1; Conclusion 1
	Endangered Species Act of 1970, Calif. Fish and Game Code Section 2050-2055	Finding 1; Conclusion 1
	Fully Protected Species, Calif. Fish and Game Code Sections - 3511, 4700, 5000, 5050, 5055.15.	Finding 1(b); Conclusion 1
	California Fish and Wildlife Protection and Conservation, Fish and Game Code Sections 1600 et. seq.	Finding 1(b); Conclusion 1

	Category	Applicable Laws, Ordinances, Standards	Relevant Findings and Conclusions Regarding Compliance
IV.	Geotechnical/Structural Engineering	C.O. 95, Public Utilities Commission	Finding 4
		Uniform Building Code, 1976, Chapter 70, incorporated by reference in Title 24 of Cal. Admin. Code	*
		Uniform Building Code, 1976, Chapter 70 incorporated by reference in the Lake County Code (Chapter 5), the Sonoma County Code (Chapter 7), Solano County Zoning Regulations (Section 28-26), and the Napa County Code (Article 3, Title 11).	*
		Seismic Safety Elements of Napa and Solano County General Plans	*
		Uniform Building Code, 1976 Ed. (adopted by reference in Cal. Admin. Code, Title 24.)	*
V.	Transmission Line Health, Safety and Nuisance Effects**	Federal Occupational Safety and Health Act of 1970 and implementing regulations, 29 USCA 655 et. seq. 29 CFR 1910 et. seq.	
		Federal Aviation Administration Rules and Regulations, 49 USCA 1348, 14 CFR part 77.	
		Federal Communications Commission Rules and Regulations, 47 USCA 151 et. seq., 47 CFR part 15.25 (incidential radiation devices)	

* The Applicant and Staff will provide the Committee with information as to the applicability of these laws, standards, and ordinances to the project.

** These issues will be the subject of an Evidentiary Hearing following publication of the Preliminary Report. Findings and Conclusions will be established based on evidence presented at that hearing.

Category	Applicable Laws, Ordinances, Standards	Relevant Findings and Conclusions Regarding Compliance
V. Transmission Line Health, Safety and Nuisance Effects** (Continued)	National Ambient Air Quality Standards for ozone and NO_x, 40 CFR part 50 Public Utilities Commission General Order No. 95 and if undergrounding is required General Order No. 128 California standards for ozone and NO_x, Health and Safety Code §39500 et. seq. 17 Cal. Admin. Code §70200 et. seq., Division of Aeronautics, Public Utilities Code §21655 et. seq., 21 Cal. Admin. Code 3500 et. seq. Division of Industrial Safety a. audible noise (construction), Title 8, General Industrial Safety Orders b. safety requirements, Title 8, High-Voltage Electrical Safety Orders City of Santa Rosa Ordinance No. 1555, Chapter 27 (March 21, 1978). Solana County Health and Safety Elements of its General Plan (noise) May 1977; Performance standards - zoning regulations, Chapter 28. Sonoma County - Sonoma County General Plan noise element (adopted January, 1978). Napa County - identified noise elements or ordinances. County of Lake - General Plan - noise element April 1977.	

** See previous page.

APPENDIX F

SOME LEGAL TERMS COMMONLY USED IN NOTICE OF INTENTION PROCEEDINGS

SOME LEGAL TERMS COMMONLY USED IN NOTICE OF INTENTION PROCEEDINGS

AFFIDAVIT
a written statement of facts sworn to be true before a notary public or other person authorized to administer oaths

BRIEF
a written summary of facts, points of law, and arguments filed for the information of the decision-maker

CROSS-EXAMINATION
questioning by one party of another party's witnesses in order to test the truth of the testimony or other evidence given, and for other purposes such as to gain additional information

DECLARATION
a written statement of facts declared to be true under penalty of perjury

DOCKET
the official repository of all correspondence and other information formally received by the Commission, as well as the hearing record, in a proceeding

DUE PROCESS
a legal concept which involves principles of fairness, including the right to notice, an opportunity to be heard and rebut opposing evidence, and a decision based upon the record

EVIDENTIARY HEARINGS
a proceeding in which testimony and other evidence is given under oath and may be subjected to cross-examination

EX PARTE CONTACT
unethical communication by or on behalf of one party alone to the decision-maker outside the hearing process which goes to the merits of the case

EXPERT EVIDENCE
testimony given in relation to some scientific, technical, or professional matter by one qualified to speak because of training, skill, education, or experience

FINDINGS
a decision on a necessary or disputed matter of fact reached by the decision-maker

HEARSAY
a statement made outside the proceeding, but used within the proceeding, to prove or disprove a matter in dispute

INFORMATIONAL HEARING
a Commission Committee sponsored meeting to permit: 1) the Applicant to publicly present its project; 2) the Staff to comment upon issues that arise from the Notice; and 3) the public to ask questions of the Applicant and Staff and make comments regarding the proposed project.

INTERVENOR
a person or public agency who voluntarily elects to formally participate in the proceedings; an intervenor has the full measure of rights afforded to a party

ISSUE WORKSHOPS
a meeting sponsored by the Commission staff for the purpose of discussing with the Applicant, intervenors, and interested public those matters which present issues for resolution by agreement or by Evidentiary Hearings

OFFER OF PROOF
the relevant points one expects to make through testimony offered or a request to cross-examine

ORDER
a direction given by the decision-maker

PARTY
a person who has been granted leave to intervene and therefore may formally take part in a legal proceeding. A party has the right to present evidence and cross-examine witnesses appearing for other parties. A party also refers to one of the principal participants in a proceeding, e.g. the Staff or Applicant.

PERSON
a natural being or artificial being treated as a natural being, such as a corporation; in Commission proceedings, person refers to one who may comment upon the proceedings without becoming a party or intervenor.

PREHEARING CONFERENCE
the time at which Evidentiary Hearings are orgainzed--where matters in dispute and witnesses are identified