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FINAL COMMISSION DECISION

**Pacific Gas and Electric Company's
Geysers Unit 20**

Docket No. 82-AFC-1

February 1983

CALIFORNIA ENERGY COMMISSION

P800-83-004

CALIFORNIA ENERGY COMMISSION

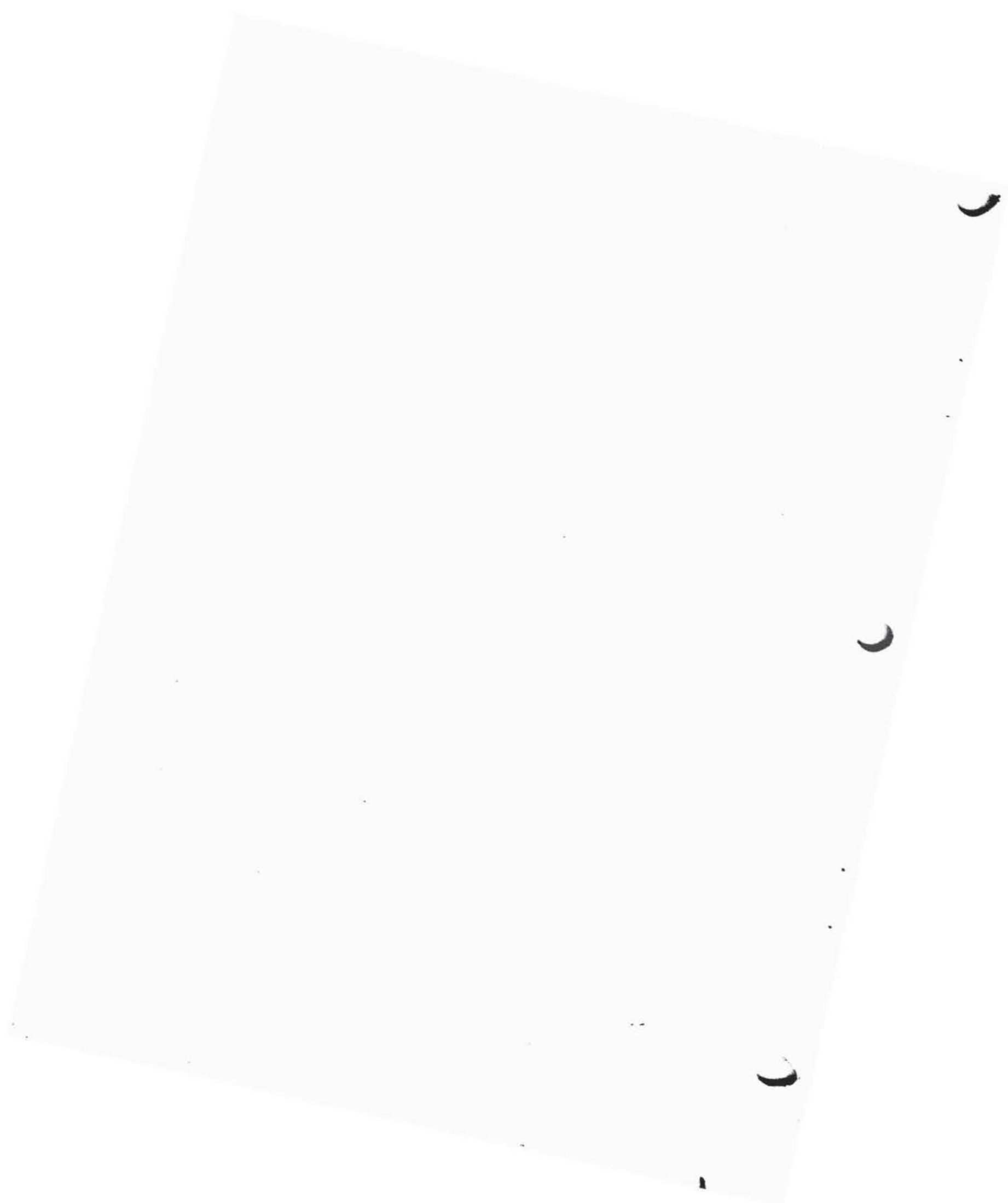
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INTRODUCTION

This document comprises the final Commission Decision for Pacific Gas and Electric Company's Geysers Unit 20 (Docket No. 82-AFC-1). Changes made to the January 20, 1983 Committee Proposed Decision (Publication No. P800-83-003) were contained in an Addendum dated February 8, 1983. The full Commission adopted the Proposed Decision, as amended, at its February 9, 1983 business meeting.

In order to expedite compliance monitoring responsibilities pursuant to Public Resources Code section 25532, the Conditions, Compliance Requirements, and Appendix A (applicable laws) as contained in the Committee's Proposed Decision have been reorganized into an integrated Compliance Plan.. The Plan is contained as Appendix A of this Commission Decision and embodies applicable Conditions (Requirements) and compliance verification procedures for Unit 20 which are more specific, and complementary to, the "General Conditions" contained in the text. PGandE must comply with all Conditions and Requirements contained in the text and Appendices of this Decision.



STATE OF CALIFORNIA
ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

In the Matter of:)	Docket No. 82-AFC-1
)	
Application for Certification of)	Commission Decision
Pacific Gas and Electric Company's)	
GEYSERS UNIT 20)	
)	

I.

The Commission Decision in the above-captioned matter is based upon the evidentiary record of these proceedings (Docket No. 82-AFC-1). The following text contains a summary of the proceedings, the evidence presented, and the rationale for the findings reached and conditions imposed. The Decision includes this narrative text, findings, conditions, compliance requirements, and appendices.

II.

The Commission hereby adopts the following findings in addition to those contained in the accompanying narrative text:

- a. The project is in conformity with the forecast of statewide and service-area electrical power demands most recently adopted by the Commission pursuant to Public Resources Code Section 25309(b), and with Commission policies encouraging the development of geothermal resources.
- b. The Conditions of Certification and Compliance Requirements contained in the accompanying text, if implemented by Applicant, ensure that the

project will be designed, sited, and operated in conformity with applicable local, regional, state and federal standards, ordinances and laws.

- c. Assuming full implementation of the Conditions of Certification and Compliance Requirements, the project will be sited and operated in compliance with identified public health and safety standards, and applicable air and water quality standards.
- d. Implementation of the Conditions of Certification and Compliance Requirements will ensure protection of environmental quality and assure reasonably safe and reliable operation of the facility.
- e. The existing governmental land use restrictions are sufficient to adequately control population density in the area surrounding the facility and may reasonably be expected to ensure public health and safety.
- f. There is no need to require the Applicant to acquire the right to prohibit development of privately owned lands in areas surrounding the facility in order to control population density and to protect public health and safety.
- g. The facility will operate in a reasonably efficient manner, in conformity with Public Resources Code Section 25402(d).

III.

Therefore, the Commission ORDERS as follows:

1. The Application for Certification for the PGandE Geysers Unit 20 is GRANTED, subject to the issuance of a Certificate of Public Convenience

and Necessity by the Public Utilities Commission as provided for in Public Resources Code sections 25517 and 25518.

2. Construction of Unit 20 shall not commence until Applicant has reached negotiated settlement, ratified by the Commission, with Sonoma County over housing and road impacts and negotiated settlement, ratified by the Commission, with Lake County over road impacts. In the event such negotiated settlements are not reached, construction shall not commence until the Commission has resolved any outstanding issues.
3. The granting of the Application for Certification is subject to the timely performance of the Conditions of Certification and Compliance Requirements enumerated in the accompanying text and appendices. The Conditions and Compliance Requirements are integrated with this Decision and are not severable therefrom. While PGandE may delegate the performance of a Condition or Requirement, its duty to ensure adequate performance of such is not delegable.
4. For purposes of reconsideration pursuant to Public Resources Code Section 25530, this Decision is deemed adopted when filed with the Commission's Docket Unit.
5. For purposes of judicial review pursuant to Public Resources Code Section 25531, this Decision is final: 30 days after it is adopted as provided for in item 4, above, in the absence of the filing of a petition for reconsideration; or upon the adoption and filing of an Order upon reconsideration with the Commission's Docket Unit.

6. The Commission hereby adopts the substantive provisions of the accompanying Conditions of Certification, Compliance Requirements, and associated dispute resolution procedures as part of this Decision in order to implement the compliance monitoring program required by Public Resources Code section 25532.
7. The Executive Director of the Commission shall transmit a copy of this Decision and appropriate accompanying documents as provided for by Public Resources Code Section 25537 and 20 California Administrative Code Section 1768.

Dated: February 9, 1983

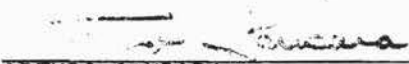
ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION



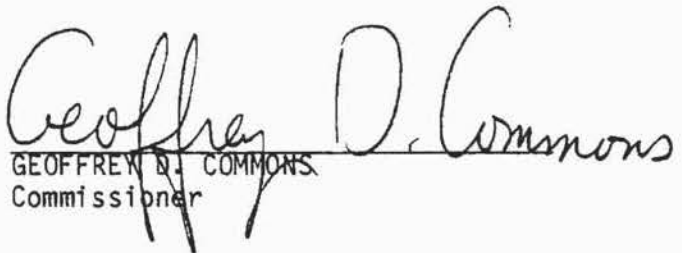
KAREN K. EDSON
Commissioner and
Presiding Committee Member



RUSSELL L. SCHWEICKART
Chairman



ARTURO GANDARA
Commissioner



GEOFFREY D. COMMONS
Commissioner

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FINAL DECISION

PGandE's Geysers Unit 20

PART ONE: Summary of Project and Proceedings

I. PROJECT OVERVIEW

A. Project Location

Pacific Gas and Electric Company's (PGandE) Geysers Unit 20, a 110 MW facility, will be located on a Union Oil Company leasehold in the Geysers Known Geothermal Resources Area (KGRA). Union Oil is the steam supplier. The project lands are leased by Union Oil (Federal geothermal lease CA-5639) and involve lands patented under the Stock-Raising Homestead Act of 1916. The portion of the leasehold dedicated to the Unit 20 power plant and steam field contains approximately 800 acres.

The leasehold is located in the Sonoma County portion of the Geysers KGRA, near PGandE Units 9, 10, 14 (existing) and 18 (under construction). It is within Section 28 of Township 11 north, Range 8 west of the Mt. Diablo Base Meridian. The general area is located approximately 65 miles north of San Francisco and 60 miles northwest of Sacramento.

The specific plant site is located in the eastern portion of Sonoma County. It lies on a spur west of the main ridge of the Mayacamas Mountains, within the Calm Creek drainage (a tributary of Big Sulphur Creek). Healdsburg and Cloverdale are the nearest Sonoma County communities; Anderson Springs, Middletown, Cobb Valley

Whispering Pines, Loch Lomond, and Hobergs are the closest Lake County communities (See Map 1).

B. Project Components

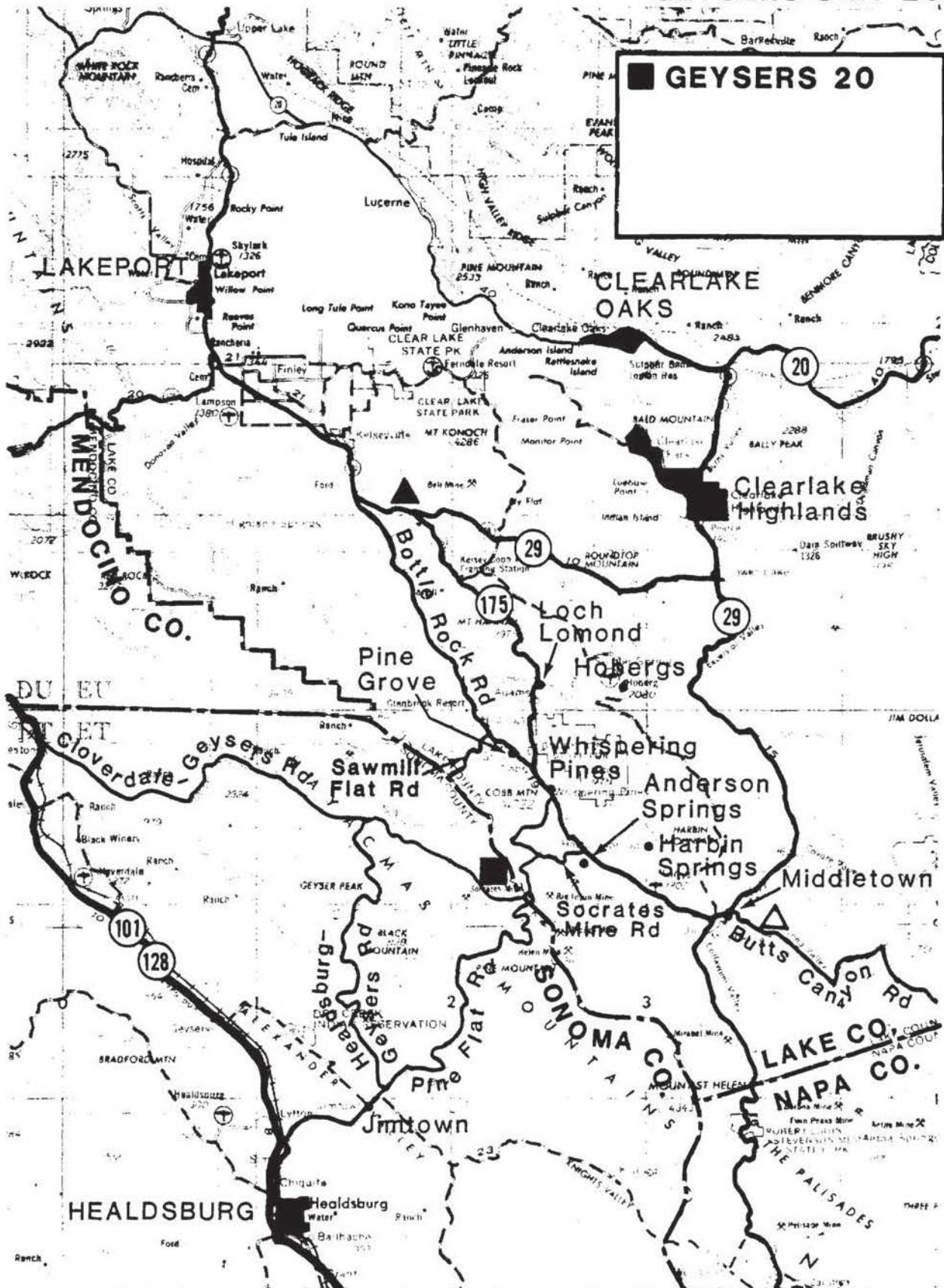
Development of the 110 MW PGandE Unit 20 will necessitate creating a seven acre flat pad area at an elevation of approximately 2,825 feet. PGandE's contractors will prepare this area by excavating approximately 510,000 cubic yards of soil and rock which will be disposed of both on- and off-site; an additional 125,000 cubic yards of landslide debris will be excavated from the on-site fill disposal area and used as engineered fill in the disposal areas. PGandE will construct two sedimentation ponds, one below the on-site disposal fill and one in the stream channel north of the plant site.

The major structures on the plant site will be enclosed with a seven-foot security fence. The open area on the site will be paved with asphalt. PGandE has revised its design so that the 300-foot long retaining wall (mentioned in the PMR) will not be constructed. This revision is reflected in the final design grading plans submitted to the Sonoma County Chief Building Official.

The proposed project will have four principal features:

- o A power cycle consisting of a turbine-generator and condensate and circulating water systems. This will be identical to the power cycles for Units 16, 17, and 18. The turbine generator building will be approximately 195 feet long, 85 feet wide, and 65 feet high.

GEYSERS UNIT 20



- o A multiple cell mechanically induced crossflow cooling tower, which will be approximately 384 feet long, 60 feet wide, and 65 feet high.
- o A transmission switchyard, adjacent to the turbine generator building, containing a 13.8 kV to 230 step-up transformer.
- o A hydrogen sulfide (H_2S) abatement system. Primary treatment will be through a Stretford system, in which H_2S is scrubbed from the vent gas stream and catalytically oxidized to elemental sulfur. PGandE may use a hydrogen peroxide iron catalyst (H_2O_2 /HAA-iron feed) secondary H_2S abatement system to further reduce emissions to an acceptable level; this system is similar to that for Units 13, 14, 15, 17, and 18. PGandE, however, is currently studying secondary abatement systems and will present justification by March 1984 should it prefer to use one different from the H_2O_2 /HAA-iron feed system.

C. Transmission Facilities

A 21 kV overhead electric distribution line will be installed on wood poles to supply standby emergency power through a 750 kVA transformer to the 480 volt station services meter. This standby power source will provide essential power requirements for the plant.

Since the Unit 20 site is adjacent to PGandE's Unit 13 230 kV transmission line, a short tapline (approximately 100 feet) will be constructed to transmission tower 1/9 of the Unit 13 tapline. The

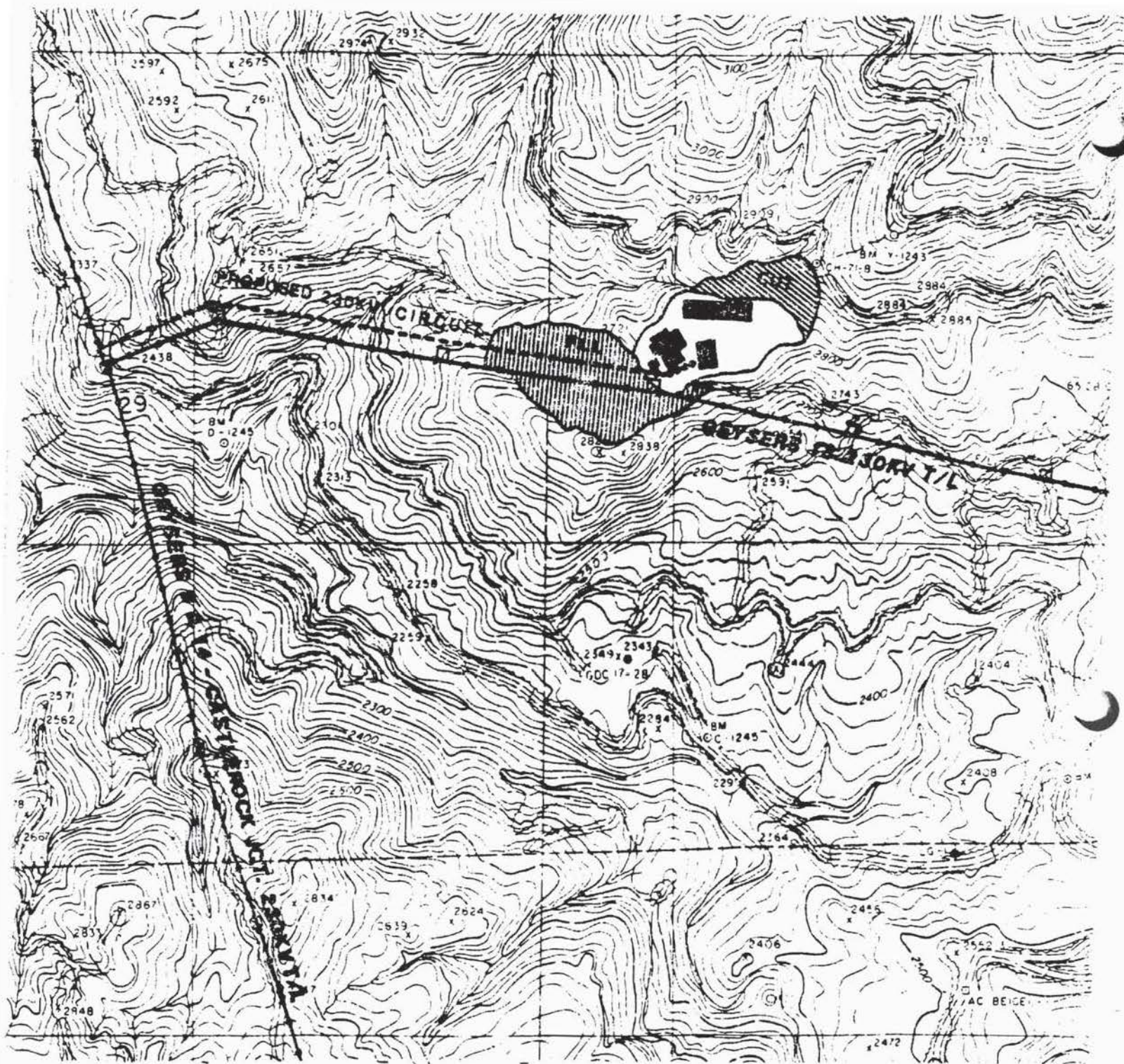
existing suspension tower will be replaced with a new deadend tower. The new tapline will be strung with 1,431 kcmil aluminum (AAL) conductor.

About 0.6 miles of bundled 1,431 kcmil AAL conductor will be strung on the presently vacant #1 circuit of the Unit 13 tap to interconnect with the Geysers Unit 9 and 14-Castle Rock Junction 230 kV transmission line (See Figure 1). The bundled 1,431 kcmil AAL conductor will minimize line losses on the tapline and is adequately sized to permit a transmission outlet for one or more future Geysers units. No clearing or new access roads will be required to construct the new tapline structures or to install the tapline conductor.

D. Steam Field

Union Oil Company will supply PGandE with geothermal steam to be used in Unit 20. The steam field is contained on lands leased from the Federal government (lease CA-5639) and patented under the Stock-Raising Homestead Act of 1916. Approximately 800 geothermally productive acres are dedicated to Unit 20 (see Figure 2).

The 110 MW unit will require approximately 15 steam wells to provide the initially required volume of steam. During the project's 30 year life span, additional wells will be required to make up for the decline in steam flow from producing wells. Presently three production wells have been drilled and completed within the steam supply field. Sonoma County has issued Union Oil a use permit for



GEYSERS UNIT 20 PROPOSED TRANSMISSION TAP

FIGURE 1

LEGEND

Tower



Transmission tap



Existing 230KV circuit

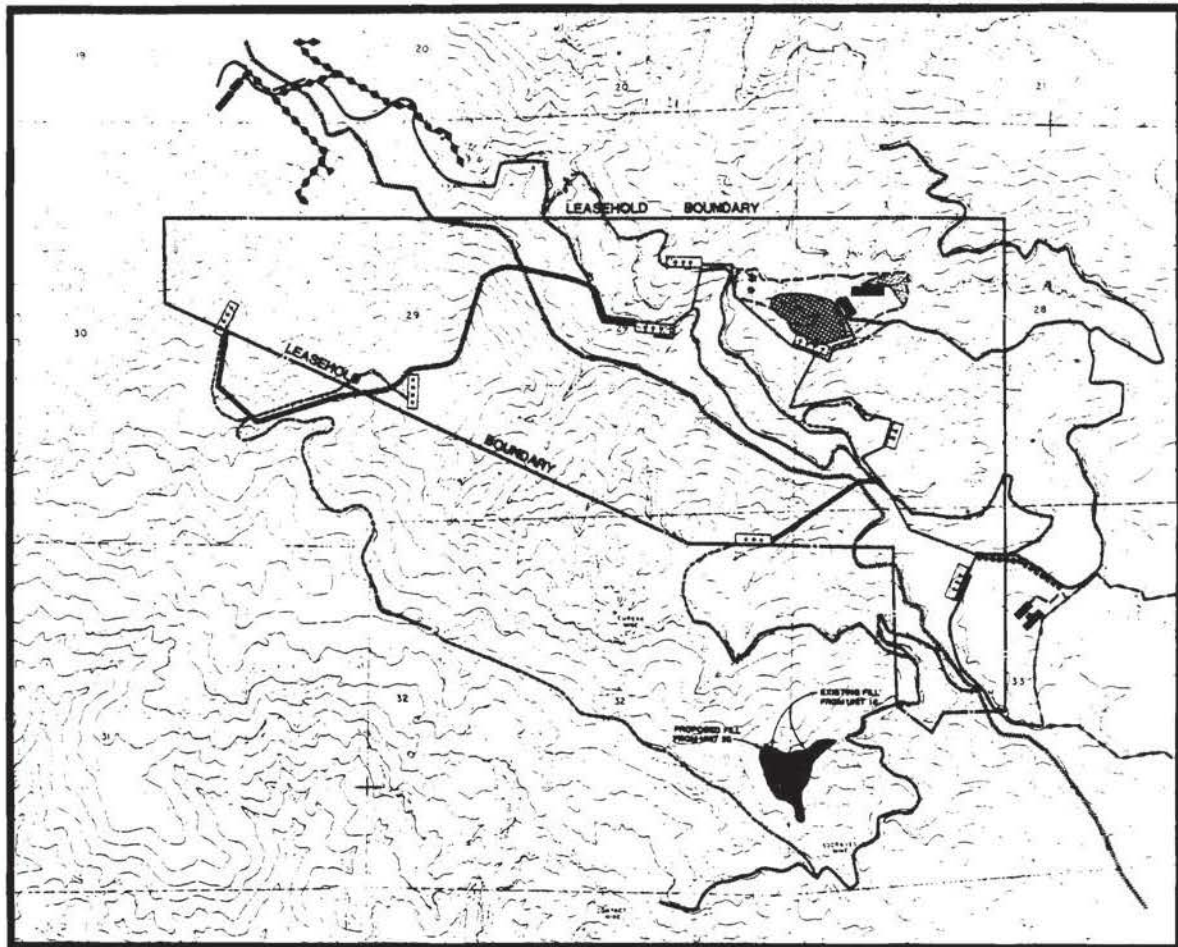


Proposed 230KV circuit



0 500 1000 FEET

GEYSERS UNIT 20



Source: PGandE, Geysers 20 AFC

- LEGEND**
- EXISTING ROADS
 - - - PROPOSED ROADS
 - BIG SULPHUR CREEK
 - UNITS 14, 18, & 20
 - START-UP WELLS
 - MAKE-UP WELLS
 - UNIT 14 PIPING
 - UNIT 18 PIPING
 - START-UP PIPING
 - MAKE-UP PIPING
 - CROSS-OVER PIPING
 - PROPOSED UNIT #20
 - CUT SLOPE
 - FILL SLOPE
 - • • SEDIMENTATION PONDS

N

0 500 1000 1500 2000 2500 FEET
0 100 200 300 400 500 METERS

DESCRIPTION FIGURE 2: PROPOSED DEVELOPMENT PLAN

development of the Unit 20 steam supply field as part of the use permit for the Big Sulphur Creek leasehold.

Union Oil Company, pursuant to contractual arrangements with PGandE, will furnish the steam producing and gathering system, reinjection wells, well pads, access roads, and the associated controls. Insulated steel pipelines will carry the steam from the production wells to the power plant. These steam lines will vary in size from 10 inches in diameter at the well to 42 inches for the main trunk-lines leading to the power plant. Each production well will have an orifice meter to measure the amount of individual well production. The steam lines will be insulated to reduce heat loss and protected by fiberglass blanketing and an aluminum covering which will be colored in order to blend with the ambient environment.

Access roads to the steam wells, maintenance areas, and the power plant follow existing roads where possible (see Figure 2). Additional access roads will be designed, constructed, and maintained by Union and its contractors. These roads will typically follow natural contours with grades of 8 - 12 percent and will normally be 14 feet wide, with turnouts at strategic locations. Road drainage systems will be designed in accordance with the standards of the Division of Highways. Culverts will be sized to accomodate the maximum expected runoff anticipated by hydrological study of the area. Union will fertilize and seed all new construction areas with grasses and forbs before the start of the winter rains, with supplemental plantings in several areas.

II. SUMMARY OF PROCEEDINGS

A. Proceedings to Date

Pacific Gas and Electric Company (PGandE) filed an Application for Certification (AFC) for its Geysers Unit 20 on March 29, 1982. This AFC was filed under Public Resources Code (PRC) section 25540.2 which, conditioned upon demonstration of an adequate steam resource, provides for certification of a geothermal power plant within twelve months of the date of acceptance of the filing.

On April 13, 1982, the Commission's Executive Director informed PGandE that the AFC filing would be deemed complete if PGandE committed to providing a worse case air quality analysis and a mitigation plan for biological impacts. PGandE agreed to provide this additional data in the form of an amendment to the AFC. The AFC was thus deemed filed as of March 29, 1982, the original date of submission.

On April 28, 1982 the Committee, pursuant to PRC section 25540.2(a) and 20 California Administrative Code section 1809(a), held a public hearing to determine whether the proposed site was reasonably capable of supplying geothermal resources in commercial quantities. PGandE, the California Division of Oil and Gas, and the Commission staff each presented oral and written testimony on this issue. The evidence presented to the Committee was unchallenged and established

that the Union Oil leasehold would be capable of supplying geothermal steam in quantities sufficient to operate a 110 MW facility over a 30-year period.

On May 3, 1982, the Committee conducted a public Informational Hearing in Santa Rosa, California in order to provide an opportunity for interested members of the public and governmental agencies to gain information and comment upon the proposed Geysers Unit 20. At this Informational Hearing, both PGandE and Commission staff made presentations concerning the plans for development of the proposed site and related facilities, including the nature and extent of the future assessment of the project's associated environmental impacts. Following the Informational Hearing, PGandE hosted a visit to the site of the proposed project.

In order to provide the parties and public further opportunity to inform the Committee concerning the status of their evaluations of the proposed project, the Committee conducted an Issues Assessment Conference on July 16, 1982, in Sacramento. Potential areas of dispute identified at this Conference included school and transportation impacts, power plant design efficiency, biological impacts, and the need for expanding the transmission line collector system. Federal ownership of the leased lands also surfaced at this time (July 16 RT at 27 - 42).

At the Issues Assessment Conference, the Staff moved that the Committee compel PGandE to provide certain data regarding plans for an additional Geysers area transmission collector line. Applicant

objected, contending that the information requested would not be available until early in 1983. The Committee, in an Order of August 12, 1982, directed the parties to brief the Commission's legal authority for imposing conditions of certification pertaining to construction of an additional collector line. On August 31, 1982, Staff withdrew its motion to compel answers, citing the fact that it had reached accommodation on this issue with PGandE. The Committee accepted this issue as thereby resolved.

After a series of informal public workshops,¹ the Staff released its Preliminary Staff Assessment of the proposed project (as required by Section 1748.5 of the Commission's regulations) on August 19, 1982. The Preliminary Staff Assessment contained Staff's initial evaluation of the project's feasibility and also discussed various environmental impacts and the range of available mitigation measures. On September 17, 1982, the Committee conducted a public Prehearing Conference in order to provide parties the opportunity to discuss the Preliminary Staff Assessment, explain the areas with which they agreed and disagreed, and bring any other issues or comments to the Committee's attention. The Applicant and Staff filed a Joint Prehearing Conference Statement; individual Prehearing Conference Statements were filed on behalf of the Lake and the Sonoma County School Districts and the County of Sonoma. Following

1. Staff has held numerous public workshops concerning this project, including those on the following dates: June 10, 1982 in Sacramento; July 8 in Santa Rosa; July 15 in Yountville; August 20 in Santa Rosa; August 26 and 27 in Sacramento; September 2 in Sacramento; September 15 in Santa Rosa and October 8 in San Francisco. A second site visit was held on September 21.

conclusion of the Prehearing Conference, some degree of dispute apparently existed in several areas among the various parties.²

In a Notice of Evidentiary Hearings and Hearing Order, the Committee scheduled evidentiary hearings for October 12, 13, and 25, 1982 (the evidentiary hearings were in fact continued to October 26, 1982). Evidentiary hearings were conducted on each of these days and the evidence adduced at these hearings is summarized in subsequent sections of this Decision.

B. Other Proceedings

The Committee issued its Presiding Member's Report on November 23, 1982. The comment period on this Report closed on January 7, 1983; the Committee conducted a public conference to solicit suggested amendments on December 21, 1982.

PGandE announced at the Committee's December 21, 1982 Conference on the PMR that it had changed its plans for obtaining construction water from those originally proposed, and that the new plans could require withdrawals from Big Sulphur Creek or its tributaries. Because PGandE's changed plans had not been analyzed, the Committee directed Staff to analyze the proposed change and directed the Public Adviser to disseminate notice of the change to those

2. The Staff and the Applicant disagreed over elements of the transmission collector line issue, air quality, transportation, and fire safety. Sonoma County and PGandE voiced potential dispute concerning transportation and housing issues. The Lake County School Districts indicated that they had satisfactorily negotiated their concerns with PGandE.

reasonably expected to be interested. The schedule was extended in order to provide adequate opportunity for interested individuals to examine the change and offer comments. Thus, the Committee delayed release of its Proposed Decision, and the schedule for Commission action, beyond the January 10 and January 26 dates originally envisioned. These matters are detailed in the "Hydrology" section of this Decision.

A disagreement between PGandE and Sonoma County over the interpretation of various elements of their October 1, 1982, agreement (Appendix C) on roads and housing did not become apparent until submission of PGandE's December 30, 1982, written comments on the PMR. In addition, these PGandE comments seemingly contradicted earlier statements regarding the utility's intention to negotiate over road impacts with Lake County. Consequently, the Committee exhaustively studied the record bearing on these matters and substantially revised the PMR's "Socioeconomic" and "Transportation" sections. The Committee's revised analysis appeared initially in the Proposed Decision, and has been adopted in this Final Decision.

PGandE also modified its spoil disposal plans at the December 21, 1982 Conference and announced its intention to have Union Oil dispose of up to 120,000 cubic yards of excess material on the steam supplier's leasehold, rather than using the Socrates Mine area as originally proposed.

On January 20, 1983, the Committee issued its Proposed Decision. On February 4, 1983, the Committee conducted a public hearing to receive supplemental testimony on the revised spoil disposal and water acquisition plans, and, general comments on its Proposed Decision. As a result of this hearing, the Committee released an "Addendum" to the Proposed Decision. The full Commission adopted the Committee's Proposed Decision, as amended, at its regularly scheduled business meeting on February 9, 1983.

PART TWO: The Project as a Supply Resource

The Public Resources Code requires the Commission to determine whether a proposed project conforms with the most recently adopted forecast of statewide and service area electric power demands. [Public Resources Code Sections 25309(b), 25523(f).] The Public Resources Code also requires the Commission to examine the specific manner in which the proposed facility is to be designed, sited, and operated in order to ensure environmental quality and protect public health and safety. Commission regulations amplify these statutory mandates by requiring an Applicant to submit various data concerning the relevant economic and resource utilization considerations involved in a particular proposal. Finally the Commission, in its 1981 Biennial Report, has declared that as a matter of policy the Commission will ". . . continue to certify the maximum number of geothermal sites and facilities that demonstrate reasonably mitigable environmental impacts and that meet existing air and water quality standards." (Electricity Tomorrow, 1981 Final Report, page 374.)

The Commission's examination of the proposed PGandE Geysers Unit 20 included receiving testimony on whether the project would constitute a viable source of needed electrical energy and capacity, the potential sufficiency of the steam field for supporting the project and proposal, whether the proposed project would use the geothermal resource in an efficient manner, and the magnitude of the financial effects of project construction and financing.

A. Demand Conformance

The PGandE Geysers Unit 20 is expected to begin commercial operation in March 1986. The power generated by this project will provide

an additional 110 MW of firm capacity and 770 GWh of energy annually to the Pacific Gas and Electric (PG&E) Company's service area. Moreover, the testimony of record indicates that even with the projects presently under operation and under construction, the demand of the PG&E service area by 1992 will still require an additional 2,428 MW of capacity and 6,588 GWh of energy; the statewide needs will be 2,332 MW and 42,415 GWh respectively. Thus, the uncontroverted evidence of record indicates that a real need exists for more capacity and energy than will be produced by Geysers Unit 20 (October 12 RT 147; Exhibit 3).

B. Steam Resource

Public Resources Code Section 25540.2 states that the Commission shall issue its decision on an application for a geothermal power plant within 12 months of the filing of such application provided that the Applicant reasonably demonstrates that the proposed site is " . . . capable of providing geothermal resources in commercial quantities . . .". The Committee's determination concerning the availability of commercial quantities of geothermal steam is thus a condition precedent to embarking upon a 12 month certification process.

At the commercial resource hearing, held on April 28, 1982, witnesses explained that the steam supplier, Union Oil, had dedicated an 800 acre portion of its leasehold to supply the Unit 20 project. PGandE's witness testified that the power plant will require approximately 2,000,000 pounds of steam per hour, and that

the combination of a projected excess of steam within the Unit 18 area (which could be transferred to Unit 20) and the potential to drill additional wells as needed would ensure an adequate steam supply to Unit 20 (see generally, April 28 RT 10-50). The witness from the California Division of Oil and Gas testified that, even though he viewed 120 acres of the steam supply area as "non-productive or subcommercial," the remaining 680 acres should be capable of producing 2,550,000 pounds of steam per hour, an amount more than sufficient to initially supply a 110 MW project (Id. at 62). While the Staff witness cautioned that more than 15 start-up wells may be needed, he nevertheless concluded that the subject portion of the leasehold would supply commercial quantities of geothermal resources sufficient for Unit 20 (Id. at 72, 73, 79). All witnesses testified that it is reasonable to conclude that Unit 20 will have sufficient geothermal resources available to allow it to produce 110 MW over a 30 year period. The Committee issued a favorable commercial resources determination on May 7, 1982.

C. Power Plant Efficiency

Commission staff identified power plant efficiency as an unsettled issue at the July 16, 1982 Issues Assessment Conference. Basically, Staff initially felt that the plant could be designed and built more efficiently than proposed in the AFC (July 16 RT 31). PGandE contended that increasing Unit 20's efficiency would not be cost-effective (Id. at 32).

In its August 19 Preliminary Staff Assessment, however, Staff's analysis similarly concluded that it would not be cost-effective to improve Unit 20's efficiency (PSA, Exhibit 2, pp. 403-05). Witnesses for PGandE and Staff testified in support of this conclusion at the October 12, 1982 evidentiary hearing (October 12 RT 152, 155).

Staff's analysis concluded that Unit 20 would utilize a heat rate some 18.4 percent higher (less efficient) than that attainable with currently available commercial equipment. The analysis stated that the efficiency could be improved by either of two technological options: 1) reducing the steam flow rate while maintaining power plant output (thereby resulting in 113 MW of output and a reduced annual steam flow consumption); or 2) maintaining the proposed steam flow rate while increasing the net power plant output to 134 MW [a 15.6 percent efficiency improvement (Exhibit 2, p. 407; Exhibit 3, p. 5)]. The Staff analysis concluded, however, that the first option would result in an assumed capital cost increase of \$42 million, an amount which would not be offset by the resultant savings and which would lead to an increase in the ratepayers's cost of electricity (Exhibit 2, p. 410; Exhibit 3, p. 8). The second option, also entailing an estimated \$42 million in additional capital cost and a two-year plant start-up delay, would likewise be uneconomic (Exhibit 2, p. 412; Exhibit 3, p. 10).

The Committee viewed "Condition 1" as contained in the PMR (pages 15-16) as ambiguous regarding the meaning of "delay" of the next

PGandE geothermal AFC filing. Discussions at the December 21, 1982 Conference clarified the intent of the parties to interpret "delay" as meaning "filing later than July 1, 1984" (December 21, 1982 RT at 15). This clarification has been added to the present Condition 1.

Secondly, the Committee required the parties to address the role of the California Public Utilities Commission in resolving any dispute concerning restoration of plant performance, should the necessity so arise. This role was mentioned in the verification to Condition 9 appearing at page 20 of the PMR (renumbered as Condition 8 of this Decision). Although the language referring the matter to the CPUC for resolution had been jointly stipulated between PGandE and the Staff, the latter party indicated that it would be acceptable to have the Energy Commission resolve any future dispute concerning restoration of plant efficiency (December 21 RT at 23). PGandE, however, while agreeing that the Energy Commission should resolve any dispute if the CPUC declined to act, nevertheless expressed a strong preference to provide the CPUC with the initial opportunity to resolve any potential dispute concerning degradation of efficiency (Id. RT at 17-20).

PGandE's preference for utilizing the CPUC initially appears based on the utility's characterization of the issue involved as centering around rate-making questions, and hence amenable to resolution by the State's rate-making body (Id. RT at 17). PGandE contends, moreover, that any Energy Commission findings concerning the environmental efficacy of a plan to restore plant performance would

probably be secondary to a CPUC determination on the rate impacts of such plan, and thus should follow such rate determination (Id. RT at 22).

The Energy Commission feels, however, that reversing this logic is the preferable course. The Decision imposing the Condition is the Energy Commission's, and it is therefore appropriate that interpretation of such condition should rest with this body. The Energy Commission would determine what constitutes a plan sufficient to restore plant performance in an acceptable manner; economic considerations would of course be a factor in this determination. However, nothing the Energy Commission can do could interfere with the constitutional rate-making authority of the CPUC.

Thus, should the occasion arise, the Energy Commission would be most intimately involved with interpreting its own Conditions and in fact appears to have the logical obligation to do such in furtherance of its statutory mandate. The Commission has therefore modified Condition 8 to reflect its position that it shall determine the merits of any future dispute concerning restoration of power plant efficiency, and shall submit such determination to the CPUC for rate-basing purposes.

D. Financial Impacts

Geysers Unit 20 will cost approximately \$105 million to construct. It will, however, produce electricity at less than one-half the cost of oil-fired generation and will save \$84 million in annual oil costs (May 3 RT 98-99). It therefore appears to be an economical source of electrical generation and should not result in adverse

ratepayer impacts. These matters will be more fully examined by the Public Utilities Commission when PGandE applies for a Certificate of Public Convenience and Necessity as provided by Public Resources Code section 25518.

COMMISSION FINDINGS AND CONCLUSIONS

Based upon the evidence of record the Commission finds that Geysers Unit 20 constitutes a preferred resource and a viable electrical supply alternative. Moreover, the proposed facility comports with the policy directives enunciated in the Biennial Report and is in conformity with the 12-year forecast of statewide and service area electric power demands most recently adopted by the Commission pursuant to section 25309(b) of the Public Resources Code. The Commission further finds that the plant will operate in a reasonably efficient manner over its 30-year economic life.

PART THREE: Nondisputed Areas

ENGINEERING ELEMENTS

Engineering factors receive scrutiny during the Commission's certification process not only to determine the integrity of the structural elements and site viability of a proposed project, but also because projects located in the Geysers Known Geothermal Resource Area are within a region characterized by moderate seismic activity. In addition, site geotechnical investigations have identified unstable terrain. Excavations, embankments, and engineering design and construction parameters must be established so that a proposed project will be able to maintain structural and operational integrity despite reasonably foreseeable natural* or humanly-induced ground instability or seismic events. The ultimate conclusions drawn from the testimony submitted at the evidentiary hearings indicate that the proposed facilities can be designed and constructed to withstand reasonably foreseeable seismic events and natural or humanly-induced ground instability without suffering significant loss of function or causing danger to human occupants.

A. Geotechnical and Civil Engineering

Testimony submitted by both Applicant and Staff indicates that the plant site is underlain by rocks of the Franciscan assemblage, and that the foundation rock and compacted embankment can sustain the maximum loads imposed by project development (these are contained in AFC Figure 4.4-28). The preliminarily established maximum loadings of the major facility components are all less than the allowable loads established by preliminary testing of the rock and soil.

*Such as non-seismically induced landslides.

Moreover, project construction and excavation will create a flat pad area which should be stable, assuming it is designed and constructed according to the plan contained in the AFC document. Uncontroverted testimony further indicates that the Applicant's proposed method of design and construction will be safe, environmentally sound, and in compliance with all existing geotechnical and civil engineering standards and codes. Finally, Applicant has agreed to submit to Commission staff a letter signed by a California certified engineering geologist certifying that he has reviewed preconstruction, construction, and post-construction plans, reports and drawings pertaining to the engineering geologic suitability of the plant site and related facilities. The Applicant will submit final grading plans, specifications, calculations, as-built drawings and other information to the Chief Building Official of Sonoma County (October 12 RT 162-63; Exhibits 1; 2, pp. 263 - 274; 3, p. 20).

PGandE initially announced that it had revised its plans for disposing of approximately 120,000 cubic yards of excess spoil at the December 21, 1982 Committee Conference (December 21 RT 69). The original plans called for spoil disposition at Socrates Mine; the revised plans will require disposal on the steam supplier's leasehold. In its January 20, 1983 Proposed Decision, the Committee ordered Applicant to provide detailed information requested by Staff concerning this revision, and ordered Staff to prepare an analysis of the potential impacts of such proposal.

The Committee received testimony from PGandE and Staff on this matter at the February 4, 1983 hearing. While this matter is

further detailed in the "Soils" section of this Decision, it is relevant to note the Staff analysis concluded that, from the perspective of civil engineering and geotechnical concerns, the proposed disposal site "...appears to be satisfactory... to accept the estimated 120,000 cubic yards of material" (February 4 RT 105).

The Commission has adopted Staff's recommended Geotechnical and Civil Engineering Conditions and Requirements to ensure adequate construction of the disposal site.

B. Seismic Hazards

The Applicant's witness testified that the proposed project will be constructed to withstand damage or destruction from probable seismic activity in the vicinity of the plant and that the Applicant is agreeable to the mitigation measures proposed by Commission staff regarding seismic impacts.

Staff's witness testified that the potential seismic hazards at the plant site include earthquake shaking, fault rupture and seismically induced ground failure. This witness concluded that all of these seismic risks are either insignificant or can be adequately mitigated to prevent unacceptable damage. Finally, Staff's witness testified that while a number of small microearthquakes may be induced by the production of steam for the power plant, it was unlikely that any larger earthquakes would be produced by steam extraction (Id. RT at 177-78; Exhibit 2, pp. 275 - 281).

C. Structural Engineering

Applicant's witness on structural engineering (in sponsoring the AFC as Exhibit 1) testified that the seismic performance criteria are the same as those adopted for Geysers Units 16 and 18 and thus would withstand probable seismic occurrences at the site. The structural engineering for the plant will be performed by PGandE's engineering department which has past experience designing plants located in seismically active areas. The Applicant has agreed that a structural engineer or Chief Civil Engineer will review and certify that all drawings, calculations, and designs are in accordance with the applicable codes and regulations.

Staff's witness, a registered structural and registered civil engineer, testified that with the implementation of Staff's proposed conditions, the Applicant's proposed nonseismic structural design criteria analysis methods were adequate. Furthermore, the seismic performance criteria as inferred from the proposed seismic design criteria and analysis methods are also adequate. The Staff's witness cautioned, however, that he was unable to determine the compliance of the facility's structural design with the applicable laws, ordinances, and standards at this point since the final design was still incomplete. The witness stated that such determination could be made only after careful review of the final design plans, specifications and design calculations. A similar situation also exists concerning the facility's structure as finally constructed (Id. RT 167; Exhibit 2, pp. 301 - 305; Exhibit 3, pp. 23 - 24).

COMMISSION FINDINGS AND CONCLUSIONS

Based upon the evidence of record, the Commission finds that the proposed project can be adequately designed, constructed, and operated insofar as engineering considerations are concerned, provided that the Conditions of Certification and Compliance Requirements contained below and in Appendix A of this Decision are met. Furthermore, the Commission finds that the proposed project can be designed, sited, and operated in compliance with the applicable standards, ordinances, and laws identified in the pertinent portions of Appendix A of this Decision.

General Conditions

A. Geotechnical

1. PGandE shall design and construct the facility, including the off-site disposal area, in a safe and environmentally sound manner, in compliance with pertinent existing geotechnical and civil engineering standards and codes (AFC Section 4.3 and the Harding-Lawson Report).
2. PGandE shall assign an engineering geologist, certified by the State of California, to: monitor engineering geologic conditions; determine whether conditions encountered during excavation are similar to those described in the AFC; and ensure that any adverse conditions encountered are mitigated in a safe and environmentally sound manner.

3. All preconstruction, construction, and postconstruction reports, maps, plans, specifications, etc., pertaining to the engineering geologic suitability of the plant site and the sites of related PGandE facilities shall be reviewed and verified by letter by a California certified engineering geologist to assure that the plant is constructed in accordance with all laws, ordinances, standards, permits, and approvals.
4. PGandE shall implement appropriate erosion control measures specified in this Decision (including Appendix A) under "Soils" to minimize erosion on exposed cut slope and embankment surfaces.

B. Seismic Hazards

PGandE shall follow its proposals and commitments:

1. PGandE shall use the appropriate site response spectra developed by Keith Feibusch Associates engineers, which has an exceedance probability of about 10 percent during the design life of the facility (30 years for critical equipment and 40 years for critical structures), to analyze the design for critical structures and equipment.
2. PGandE shall evaluate and mitigate unstable slope conditions in accordance with the recommendations set forth in the Harding-Lawson Associates Report No. 569, 046.04.

C. Structural Engineering

1. PGandE shall emphasize in the procurement specifications for the cooling tower that compliance with Uniform Building Code (1982 Ed.) Section 2312(e)3, regarding appropriate assumptions of lateral force distribution, is required.
2. Should there be discrepancies between criteria and methods set forth in these Conditions and the pertinent portion of Appendix A of this Decision, PGandE will design to the highest calculated loads using the lowest allowable stresses, unless PGandE can justify, by use of engineering calculations, that a less restrictive set of criteria and methods will meet the seismic performance criteria.
3. The Applicant will use the following references as guides in the final design of the power plant and related facilities.
 - a. Applied Technology Councils, "Tentative Provisions for the Development of Seismic Regulations for Buildings" (NBS-SP-510; ATC-3-06).
 - b. Structural Engineers Association of California, "Recommended Lateral Force Requirements," 1980, Recommendations and Commentary.

4. PGandE shall design steel embedments in accordance with the methods set forth in Appendix B, "Steel Embedments," of ACI 349-76.
5. In the event that the State of California does not complete adoption of the UBC 1982 by reference under Title 24, CAC, prior to construction, PGandE will verify that facility design meets or exceeds the requirements of the UBC 1979.
6. PGandE shall submit plans, calculations, specifications, and reports for review in accordance with the provisions set forth in the Conditions and Compliance Requirements, contained in Appendix A.
7. The Applicant will file with the CEC and CBO any substantial changes to the final plans and specifications and will notify the CEC and CBO at least 15 days in advance of intended filings of such change* orders.

*Substantial changes in facility design would include all changes which required an alteration in design concept and, consequently, the preparation of new design calculations. For example, if newly discovered geologic conditions were encountered which would require the cooling tower basin foundation to be thickened by 1 foot, this condition would be reflected in the as-built drawings, since the facility design changes will be considered minor. However, if newly discovered geologic conditions were encountered which require the foundation to be deepened by 2 or 3 feet or redesigned as a network of pier foundations, these conditions would be substantial and promptly brought to the attention of the Commission.

PART FOUR: Nondisputed Areas

SAFETY AND RELIABILITY

Public Resources Code Sections 25523(a) and (d) require the Commission to examine whether a power plant proposed for certification will meet applicable standards of safety and reliability. A portion of the evidentiary presentations during these certification proceedings was devoted to examining various areas constituent to the broader topics of "safety" and "reliability." Thus, the Commission's examination delved into such areas as waste disposal, operational fire safety, safety of workers involved in the proposed project, and the project's overall reliability factor.

A. Handling and Storage of Hazardous, Toxic, or Flammable Materials

The principal issue examined under this topic area concerned the adequacy of the Applicant's procedures to ensure the safety of plant personnel and the general public from accidents relating to spills and the routine handling and storage of hazardous, toxic, and flammable materials. These materials are quite varied in nature, ranging from diesel fuel and lubricating oil to hydrogen peroxide, sodium hydroxide, caustic soda, and anthraquinone disulfonic acid. The chemicals also range in use, running the gamut from engine fuel to generator coolant and hydrogen sulfide abatement. Because of the volatile nature of certain of these chemicals, either alone or in combination with other chemicals or as a result of contamination, it is necessary to examine the means which will be used to transport these chemicals to and from the proposed project, as well as the

manner in which the proposed chemicals will be used and stored while on the plant site.

PGandE's plans of operation detail the handling and disposal procedures for chemical wastes, and provide for disposal only at approved disposal sites. Moreover, adherence to the various laws and regulations identified in Appendix A of this Decision will minimize unfortunate accidental occurrences. After extensive evaluation, the Staff's witness testified that PGandE's proposed measures and safeguards will adequately protect plant personnel and the general public from accidents relating to spills and routine handling and storage of hazardous toxic, and flammable materials (October 12 RT at 225; Exhibit 1; Exhibit 2, pp. 346 - 349 as amended by Exhibit 3, p. 27).

B. Fire Safety

Applicant will install a multiple component fire protection system to protect the combustible elements of the power plant (Exhibit 1, pp. 4-21, 4-22). Water for the sprinklers and fire hose stations will be provided by three 1,000 GPM fire pumps supplied by two independent electrical sources. Water for the pumps will be taken from the cooling tower basin. An automatic water sprinkler system will be provided for the cooling tower, lube oil reservoir and purifier, seal oil tank, and all oil-filled equipment in the switchyard and within 50 feet of the turbine building. A semi-automatic spray wetting system will be integrated with the cooling tower

sprinkler system, and PGandE will provide a carbon dioxide fire protection system as an automatic purge system to the generator. Staff's witness agreed, contingent upon full implementation of the applicable regulatory standards and verification of compliance therewith, that PGandE's fire safety plans are adequate (October 12 RT at 221-23).

C. Worker Safety

PGandE plans to use an accident prevention program similar to that developed for its previously certified Geysers Units 16, 17 and 18. The primary elements include: the assignment of a project safety representative; the employment of protective clothing such as eye and head protection where necessary; emergency showers and eye wash stations available at work areas where hazardous chemicals are handled; annual medical examinations available to employees as required by CAL/OSHA regulations; and a respiratory protection program. Applicant has submitted its worker accident prevention program for Units 16, 17, and 18 to the California Occupational Safety and Health Administration (CAL/ OSHA). CAL/OSHA has approved this plan as in compliance with applicable law (October 12 RT 229; Exhibit 2, pp. 354 - 363).

D. Reliability

Analysis of the proposed project's reliability aspects centered chiefly around whether the Applicant's proposed procedures and design measures would reasonably result in the proposed project

being able to achieve an 85 percent or greater capacity factor at plant maturity.³

Staff's analysis indicates that, due to the simplicity of design and historical operating data, major operating problems are not anticipated in the proposed Unit 20 project. Furthermore, PGandE will employ equipment redundancy for reliability critical items⁴ such as two 100 percent capacity condensate pumps, three 50 percent capacity fire pumps, three 50 percent capacity Stretford circulating pumps, three 50 percent capacity Stretford oxidizer air blowers, and two 100 percent air compressors. Equipment design and arrangement in redundant systems will allow access and servicing of individual components while the plant remains at full or reduced capacity. The Staff's analysis ultimately concludes that with implementation of proposed measures and the appropriate conditions, Geysers Unit 20 can achieve an 85 percent capacity factor (October 12 RT 226 - 227; Exhibit 2, pp. 423 - 428).

3. Capacity factor is defined as the electricity generated during a period of time expressed as a percentage of the generating unit's power output capacity. Plant maturity is defined as that point in time when all deficiencies have been identified and corrected to the extent practical, and consistent levels of availability and capacity have been achieved. In analyzing this area, Commission staff examined engineering practices used by industry and the effectiveness of such practices in achieving reliable operation of existing geothermal generating units. Other factors considered included the adequacy of equipment redundancy and quality in light of the historical record of similar facilities.
4. This term refers to equipment and components whose failures would result in plant outage.

COMMISSION FINDINGS AND CONCLUSIONS

The topics summarized above were not seriously controverted during these certification proceedings. Applicant and Staff reached agreement on the Conditions of Certification and Compliance Requirements found below; no agency or member of the public contested these agreements. After its independent inspection, the Commission is persuaded that the agreements reached adequately meet safety and reliability concerns, and fulfill the Commission's responsibilities in these areas.

Therefore, based upon the evidence of record, and provided that the Conditions of Certification and the Compliance Requirements contained in Appendix A of this Decision are implemented, the Commission finds that the proposed project can be designed, sited, and operated in a reasonably safe and reliable manner. Furthermore, the Commission finds that the proposed project can comply with the applicable standards, ordinances, and laws specified in the pertinent portions of Appendix A of this Decision.

GENERAL CONDITIONS

A. Fire Safety

1. PGandE shall finalize its fire protection plan with the California Department of Forestry.
2. Prior to commercial operation, PGandE shall file with the Energy Commission an affidavit signed by a registered fire

protection engineer stating that the design, construction, and operation of the on-site fire protection systems reasonably conform to applicable NFPA, UBC, and PRC codes, and standards such that the intent of these codes and standards is met.

3. PGandE shall develop two fire protection plans for Geysers Unit 20 which shall be approved by the California Department of Forestry. One plan shall cover construction and the other shall cover operation activities at the Geysers Unit 20. Each plan shall address, as a minimum, the following:

- a. Objective
- b. Purpose
- c. Organization
- d. Plan of Action
- e. Procedures for Fire Control
- f. Location of Water Sources
- g. Tools and Equipment, Including Vehicles
- h. Names, Titles, and Telephone Numbers of Key Personnel

PART FIVE: Nondisputed Areas

THE HUMAN ENVIRONMENT

The Public Resources Code requires the Commission to assess impacts of a proposed project upon resources closely affecting the human environment. Thus, the statute mandates special consideration of impacts upon land areas devoted to park, wilderness, scenic, recreation, and historic uses (PRC Section 25527). The Code also provides that the Commission may, under appropriate circumstances, require as a condition of certification that an Applicant establish an area for public use (PRC Section 25529). While the appropriate use of a given area is typically established by local zoning and land use ordinances, the Commission nonetheless has the additional authority to require an Applicant to take measures (such as the acquisition of development rights to ensure control of population densities and land use restrictions) necessary to protect societal concerns (PRC Section 25528).

The fact that the PGandE project is located on a Federal leasehold and lands patented under the Stock-Raising Homestead Act of 1916* does not obviate the necessity for Commission inquiry into potential impacts effecting the human environment. The extent to which construction and operation of the proposed facility will tax the resources of nearby communities and of Sonoma and Lake counties, the extent to which the construction and operation of the proposed project will impact nearby human receptors on an ongoing basis, and the potential impacts of the proposed facility on aesthetic and cultural concerns

*The rights of lessors, lessees, and the extent of Federal jurisdiction over such lands is currently the subject of legal dispute.

are germane areas of inquiry during a certification proceeding. Moreover, the Commission is required by statute to examine any effects the proposed project might have on the health and well being of the workers involved in the project construction and the residents in the vicinity affected by the plant. The discussions on these general areas which occurred during the hearings are summarized in Parts Five and Six of this Decision.

A. Aesthetics

The uncontroverted testimony of record indicates that the proposed project site, on a spur west of the main ridge of the Mayacamas Mountains, will be screened from long distance views in every direction. The short range views of the plant site will be limited to the immediate area already altered by geothermal development. Only the steam plumes from the power plant should be visible from the populated areas in Lake County to the east of the project. Moreover, the Applicant will implement various mitigation measures, such as plantings, to shield the project and prevent erosion of the disturbed surface areas. Covering and painting the steam lines with a camouflaging color compatible with the ambient environment will further serve to reduce visual impacts. The witnesses concluded that, with the implementation of the mitigation measures proposed by Applicant, the aesthetic impacts of the proposed project will be minimal (October 12 RT at 210; Exhibit 2, pp. 165-67; Exhibit 3, p.5).

B. Cultural Resources

Evaluation of cultural resources included analysis of the impact of the proposed project site upon paleontological, archaeological, historic, and ethnographic resources. Two intensive field surveys of the project area were conducted in 1974, an ethnographic study of the project area in 1978, and an archaeological survey of the proposed site and leasehold in 1980. During these surveys, no cultural resources of any kind were recorded within the proposed project site.

Field surveys of the Unit 18 leasehold located two archaeological resource sites (CA-SON-792 and CA-SON-793); these sites are located approximately 1-1/2 miles ENE of the Unit 20 site. The project site does, however, possess the possibility that cultural resources will be unearthed during construction. The testimony of record indicates that PGandE will implement a contingency procedure should evidence of some cultural resource be discovered during site preparation. This measure, along with the other Conditions of Certification and Compliance Requirements specified elsewhere in this Decision, are sufficient in Commission staff's estimation to provide adequate protective measures should there be cultural resource discoveries during plant construction (October 12 RT at 217-218; Exhibit 2, pp. 197 - 203, as amended by Exhibit 3, p. 8).

C. Land Use

The proposed project is centrally located within the Geysers KGRA on a Union Oil federal leasehold (lease CA-5639) and lands patented

under the Stock-Raising Homestead Act of 1916. The proposed power plant site and the transmission tapline are in Sonoma County. Union Oil acquired part of the leasehold dedicated to Unit 20 from the Federal government (which retains the mineral rights to the property). Surface land rights are owned by the Geysers Development Partnership, which acquired the land subject to the 1916 Stock-Raising Homestead Act.

The United States Bureau of Land Management has indicated that geothermal activities are an allowable land use for the project area. The Sonoma County "Open Space and Conservation Element" of its General Plan designates the proposed project site as a "primary geothermal resource area." The project area is zoned as "A-2," an agricultural designation which allows geothermal development with a conditional use permit from the County. The evidence of record indicates that the existing land use in the project area has been timbering, mining, and grazing. The evidence further indicates that the facility will not conflict with the existing land uses (October 12 RT at 211; Exhibit 2, pp. 168-69; as amended in Exhibit 3, pp. 168-70).

At the Issues Assessment Conference on July 16, 1982, PGandE informed the Committee that the project was not on Federal lands (July 16 RT at 40). By letter of September 28, 1982, however, the United States Minerals Management Service informed the Commission that the Union Oil leasehold "...involves lands patented under the Stock-Raising Homestead Act of 1916...whereby the Federal Government

retained the subsurface mineral estate and passed the surface estate to private ownership," and that ultimate Federal approval of the Unit 20 project is therefore required. The September 28 letter states that ". . .MMS involvement. . .will be essentially identical to that planned for the NCPA #3 project."

This development initially posed a certain difficulty. In past power plant siting proceedings involving Federal lands, the Commission and the Federal authorities have arrived at certifications which have fulfilled the requirements of both Federal and State law. In these cases, the Federal government has been an active participant, and Commission Decisions have included various Conditions and Compliance Requirements designed to satisfy Federal concerns. Such is not the situation with the present proceeding.

In the present instance, the Conditions and Compliance Requirements adopted by the Commission make no provision for Federal reporting requirements or licensing conditions. By letter of December 9, 1982, the Federal government reiterated its belief that PGandE must secure a Federal permit before beginning construction and operation of Unit 20. This letter also stated that the Commission Decision "...need not contain conditions and/or compliance requirements...to accomodate concerns beyond those of the state." The Committee sought clarification of this matter at the December 21, 1982 Committee Conference.

At this Conference, PGandE explained its position (and that of Union Oil, the steam supplier) is that while the surface rights of the leasehold belong to private landowners, it is arguable whether the

Federal government may require further permitting for use of the subsurface rights, i.e., the steam (December 21 RT at 25-27). PGandE has requested clarification of this issue from the Federal authorities. The Federal authorities reiterated their position that various documentation and data are necessary prior to any type of site disturbance in a letter of January 24, 1983.

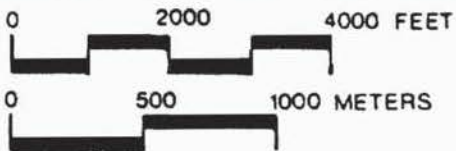
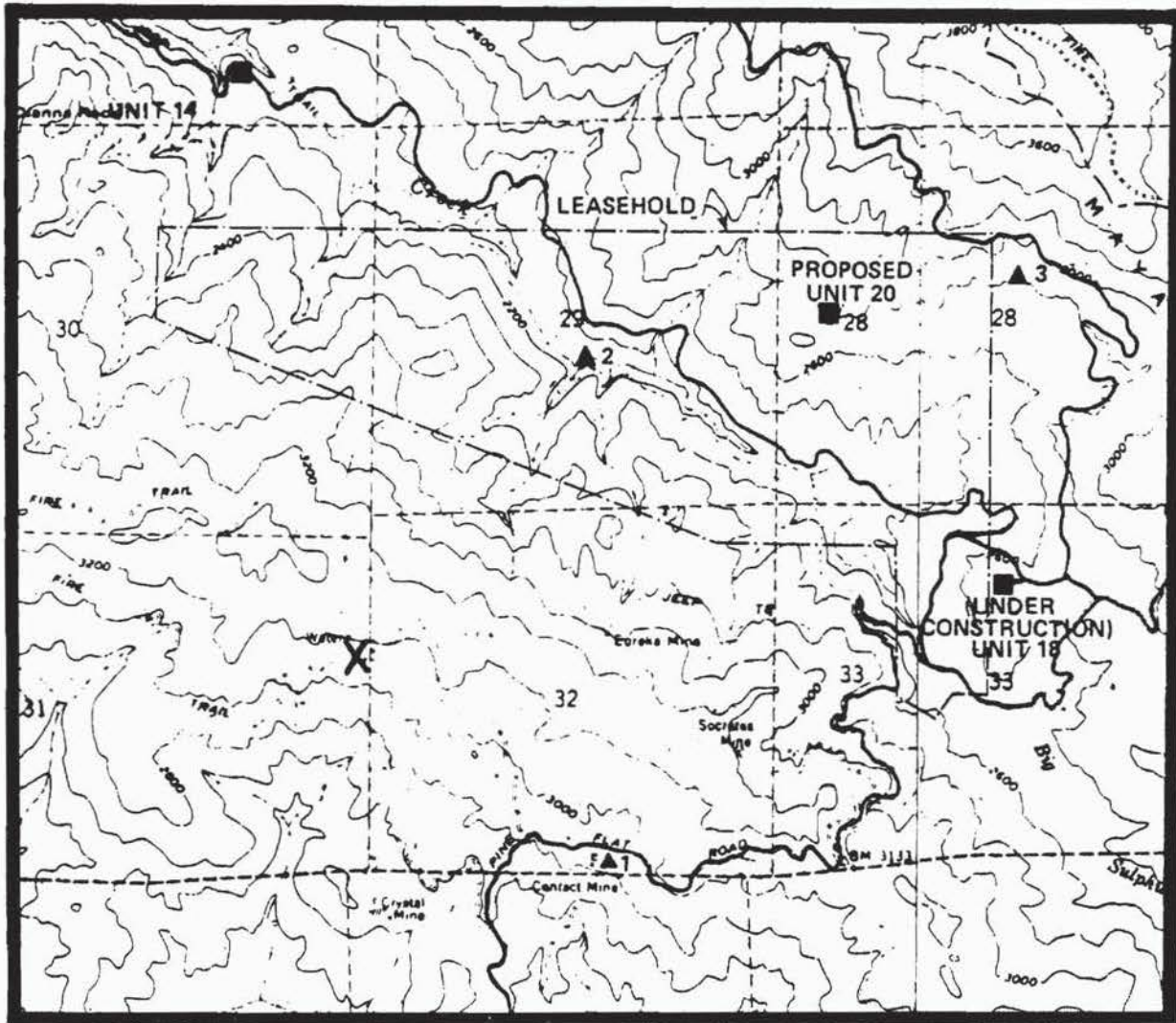
In any event, however, it appears to the Commission that all parties concerned agree that issuance of the Energy Commission certification is not dependent upon resolution of questions pertaining to the nature and extent of Federal jurisdiction or permitting authority (Id. RT at 28-30).

D. Noise

The chief considerations under this topic were whether the construction and operation of the proposed project, and the associated steam field development, would comply with applicable noise regulations, and whether the noise caused by the project would significantly increase the ambient noise level of the area. These considerations are especially important for the 3 noise-sensitive receptors in the vicinity of the proposed project (see Map 2).

The analysis of record indicates that the nearest residences are approximately 3,960 feet distance from the plant site. The plant will be built so that the noise emissions from the plant will not be distinguishable from the ambient noise level at the nearest receptor. The Staff's detailed written testimony, including various noise measurements, concluded that, with implementation

GEYSERS UNIT 20



Source: PGandE, Geysers 20 AFC



AMBIENT SOUND MEASUREMENT LOCATIONS

of the recommended mitigation measures, the combined noise from the 110 MW project would comply with applicable regulations and would have only an insignificant impact on the ambient noise levels in the area (October 25 RT at 645-647; Exhibit 2, pp. 377 - 396, as amended by Exhibit 4).

E. Transmission Line Safety and Nuisance

PGandE proposes to construct a 100 foot tap line to a vacant circuit position on the existing Geysers Unit 13 transmission line. The vacant position will be strung with bundled 1,431 kcmil conductors and connected to the existing Geysers 9 and 14-Castle Rock Junction 230 kV line. No additional right-of-way is needed. The conductor wires will be a minimum of 30 feet above ground level.

One of the operating characteristics of the transmission line is the production of electric and magnetic fields due to the voltage and current associated with the conductors. These fields are capable of inducing a perceptible voltage on large metallic objects in and near the right-of-way. The electric field produced by the transmission line also creates a "corona" which has the capability of producing radio, television, and audible noise. Further potential hazards associated with transmission lines are fires and air craft collisions.

The uncontroverted testimony of record offered by witnesses for both Applicant and Staff indicates that many of these potential hazards

are reduced because of the remote area which the transmission tap-line will traverse. The evidence also indicates that the Conditions and Compliance Requirements proposed by staff and agreed to by Applicant will mitigate identified potential hazards (October 12 RT at 231-232; Exhibit 2, pp. 364-366, as amended by Exhibit 3).

COMMISSION FINDINGS AND CONCLUSIONS

Little controversy was evidenced during the course of hearings on the five topics summarized above, and no party, agency, or member of the public challenged the proposed Conditions and Compliance requirements jointly submitted by Staff and PGandE. After scrutinizing the materials submitted, the Commission adopts them as set forth below and in the pertinent portions of Appendix A.

Therefore, based upon the evidence of record, the Commission finds that, with the implementation of the Conditions of Certification and Compliance Requirements (below and as contained in Appendix A), the proposed project can be designed, sited, and operated in a way to comply with all applicable standards, ordinances, and laws identified in the pertinent portions of Appendix A. The Commission also finds that the proposed project, with implementation of all Conditions of Certification and the Compliance Requirements, will not cause any significant adverse impacts upon the human environment, including public health and safety.

GENERAL CONDITIONS

A. Noise

1. On AFC pages 4-25 and 5-77 PGandE identified the mitigation measures that it intends to apply to the facility. PGandE shall implement these mitigation measures which are summarized below:

- a. Acoustic insulation installed on the exterior surfaces of the steam jet ejectors will consist of mineral wool or equivalent and an impervious membrane (aluminum and/or lead jacket).
- b. The turbine building walls and roof will reduce noise reaching the outside environment.
- c. Although Unit 20 is designed to operate unattended, a soundproof office space will be built on the turbine-generator floor inside the building.
- d. PGandE's present purchase specifications for mechanical equipment specify that manufacturers supply equipment which produces a weighted average sound level no greater than 80 dBA at 3 feet from the boundaries of the device.
- e. During unit outage conditions, steam will be routed through a muffler system installed and operated by the steam supplier.

2. To meet CAL/OSHA requirements:

- a. PGandE shall post signs in any unavoidably high noise areas;
 - b. As necessary, PGandE shall supply and enforce the use of personal hearing protectors during both the construction and operational periods; and
 - c. PGandE shall periodically check the hearing of employees who are routinely subjected to high noise levels.
3. PGandE shall route the steam drain lines from the turbine to the condenser, so that steam will not be discharged into the atmosphere during unit start-ups.
4. The Unit 20 design shall utilize a rock muffler or an equivalent noise reducer to mitigate noise to the maximum extent feasible during unit outages. The proposed inter-connection with the Units 18 and 14 facility would potentially reduce stacking events.
5. PGandE shall limit construction traffic to daylight hours to the maximum extent possible.

PART SIX: Discussion Areas

THE HUMAN ENVIRONMENT

Even though there has been little actual controversy during these proceedings, certain topic areas have been the subjects of somewhat extensive discussions. In large part these discussions, initiated by various intervenors and members of the public, have focused upon the Public Health, Socioeconomics, and Transportation impacts which will be caused by the construction and operation of Geysers Unit 20.

A. Public and Occupational Health

1. Summary

Inquiry in the area of public and occupational health centered on determining whether the operation of the proposed project would cause adverse public health impacts as a result of the emission of both regulated and nonregulated environmental pollutants by the project and the abatement system. As part of this inquiry, the analyses of record also have addressed the measures to be taken to adequately protect the health of workers during the operation of the proposed project.

Testimony of record indicates that the power plant will emit various pollutants such as hydrogen sulfide, particulate matter, sulfates, and nonmethane hydrocarbons. The testimony concludes that, since applicable air quality standards are based in part on the protection of public health,

compliance with these standards will likewise protect public health. The evidence further indicates that nonregulated pollutants such as boron, ammonia, and benzene are not expected to increase ambient concentrations above suggested safe levels at nearby populated areas.

The operation of the Stretford hydrogen sulfide abatement system and, if necessary, a condensate treatment system will result in the emission of particulate matter, vanadium, and anthraquinone disulfonic acid. Based upon exhaustive analysis, however, the testimony of record indicates that emissions of these pollutants are not expected to violate the applicable standards or suggested safe levels. Implementation of an accident prevention program approved by CAL/OSHA should also adequately protect worker health [for public health discussion in general, see Exhibit 4, pp. 2(86) to 53(136)]

The Anderson Springs Community Services District, an intervenor in these certification proceedings, and the Lake County Air Pollution Control Officer extensively questioned PGandE and Staff witnesses concerning the impact of arsenic, asbestos, and radon-222 emissions by Geysers Unit 20 upon the existing ambient concentrations of these pollutants.

Confusion was apparent at the October 25, 1982 evidentiary hearing concerning the relative concentration of arsenic in the

steam supply for Unit 20.⁵ While the concentrations of arsenic, a nonregulated pollutant, could increase above the most stringent suggested safe levels due to emissions from Unit 20 [Exhibit 4, p. 3(87)], adverse health impacts would not necessarily occur (October 25 RT at 624 - 626). The Staff views the potentially increased arsenic level as indicative of the need to monitor nonregulated pollutants in geothermal steam and ambient air; PGandE has agreed to perform this monitoring.

Asbestos, another nonregulated constituent of geothermal steam which will be emitted from Unit 20, also was the subject of discussion during the evidentiary hearings. Although testing by Union Oil revealed no detectable level of asbestos in the steam from one well which will be used for Unit 20 (Id. RT 585), the data is admittedly incomplete. Moreover, the testimony of record further indicates that there is no legal standard by which to determine when a harmful level of asbestos emissions is reached (Id. RT at 586). Rough calculations by the NSCAPCO, however, indicate that detectable asbestos concentrations measured at one geothermal well in the Geysers KGRA would result in concentrations of about 7.5×10^{-6} fibers per milliliter at the cooling tower, and less at Anderson Springs (Exhibit 2, p. 107). Thus, a conservative prediction of ambient asbestos levels resulting from a steam supply with

5. A typographical error in Staff's analysis had placed arsenic concentrations in the steam supply at 10 to 20 parts per million by weight; by Declaration of November 1, 1982, the Staff witness corrected this error to the proper figures of .10 to .20 ppmw (see Exhibit 4, p. 17(101); October 28 RT at 563-565; 625-627).

the highest asbestos content found in a limited number of measurements would not result in a level deemed significant for workers subject to a continuing exposure (2.0 fibers per milliliter; Id. RT at 586-587; 634-635).

The legal limitation for radon-222 emissions is 3 picocuries per liter above natural background levels at a point accessible to the public (Id. RT at 615-616). Although the record contains extensive discussion concerning projected levels of radon at the time when Unit 20 is operating (see, e.g., Id. RT at 573, 589-616), credible analysis indicates that the levels will not exceed legal limits [Id. RT at 616-616; Exhibit 4, pp. 2(86); 9(90)-12(96)].

2. Discussion

The Commission fully appreciates the concerns voiced during the hearings and has considered these in evaluating the public health effects which will be caused by the construction and operation of Geysers Unit 20. In its deliberations concerning the acceptability of the Conditions and mitigation measures proposed by Staff and PGandE, the Committee carefully considered the interplay between the applicable legal standards (identified in Appendix A of this Decision) and the potentially deleterious effects that emissions of substances for which no legal standards exist may have on the local population.

Adopted ambient air quality standards are relatively restrictive as they are intended to protect the general population against effects of long-term exposure to pollutants which have been scientifically established to be harmful. Thus, compliance with standards discussed at greater length in the "Air Quality" portion of this Decision will reasonably shield the local populace from the effects of hydrogen sulfide, particulate matter, sulfates, nonmethane hydrocarbons, and radon-222 emissions. Other standards, such as that for asbestos, are designed to protect workers from the effects of continuing contact.

Admittedly, the worker standard is designed to protect healthy individuals (often wearing protective equipment) from relatively intense exposure over a long period of time. Such a standard is not designed to consider a cross-section of individuals, such as the elderly, children, or those with respiratory sensitivities, as would a general standard. Even though there is no general standard, however, the EPA has typically required steam testing for the presence of asbestos and, if significant concentrations are found, required the use of the Best Available Control Technology as a condition in its PSD (Prevention of Significant Deterioration) permit. At the present point, however, the Commission can evaluate a project's impact only against such standards as exist.

Thus, the absence of standards for nonregulated pollutants such as arsenic, ammonia, boron, benzene, and silica does not mean that these pollutants pose no human health hazard. Rather this absence is typically due to the lack of sufficient data upon which to base a standard. The Commission, within the confines of a power plant licensing proceeding, is constrained to ensure that the standards adopted are not exceeded. The Commission also attempts to mitigate significant identified impacts and take reasonable precautions to prevent potential harmful effects which may be caused by a project.

This triumvirate of concerns is met in this case. First, as explained more fully in the air quality analysis, it is reasonable to conclude that Geysers Unit 20 will comply with all applicable air quality standards, thus assuring protection against deleterious effects of regulated pollutants. Second, the only identifiable potential adverse impact appears to be in the vicinity of the "Beigel Cabin," a part-time residence approximately 0.6 miles from the plant site. As a Condition of Certification, PGandE is required to notify occupants of procedures available should they feel that air quality degradation has occurred (see Appendix B; Id. RT at 647-50).

Finally, the evidence of record does not support a reasonable potential for deleterious public health impacts due to emissions of nonregulated pollutants. The Applicant will, however, conduct monitoring as set forth in the Conditions below; the results may ultimately be used in designing

standards to control unacceptable emission levels (Id. RT 640-641). At this point, such data gathering appears to be a reasonable mitigation of potential impacts.

B. Socioeconomics (excluding transportation impacts)

1. Summary

Development of the proposed project potentially has effects upon the communities of Sonoma and Lake counties because of an increase in population concomitant with an increase in demands upon local fiscal resources, public services, housing availability, and schools. While the permanent operating contingent of Geysers Unit 20 will number only six personnel, the construction work force will fluctuate between 25 and 90 workers, and the operating contingent for all PGandE geothermal facilities (power plants and administrative center) will total approximately 275 people. Of these individuals, approximately 50 percent of the construction force and 20 percent of the operations and administration personnel already reside in the KGRA region (Exhibit 3, pp. 144-150).

However, even with new development and a degree of population influx, demands upon local revenues will be relatively slight. For example, fire protection will be provided by the California Department of Forestry and site security by private security guards. PGandE will, in concert with other geothermal

developers, provide emergency medical services, water, and sewage service. As a private utility, PGandE will pay between 1982 and 1986 an estimated aggregate total property tax of \$8.8 million to Sonoma County and \$2.0 million to Lake County for all its geothermal projects. Union Oil will also pay royalties to the Federal government; a portion of these monies will be returned to Sonoma County (Exhibit 3, p. 154).

2. Discussion

a. The Agreement

The major socioeconomic impacts addressed during the certification proceeding centered on the areas of housing, schools, and road impacts. In the PMR (pages 82-83), the Committee's discussion focused upon on the October 1, 1982 agreement between PGandE and Sonoma County (Appendix C), approved by Commission staff.

At the time the PMR was published, the Committee understood that parties signatory to the October 1, 1982 agreement agreed to its essential meaning: Commission certification of Unit 20 could be granted subject to the parties reaching privately negotiated settlement of cumulative and project-specific roads and housing impacts and Commission ratification of such agreement; failing agreement, the Commission would adjudicate the issues

(following certification if necessary). Construction of Unit 20 could not begin before the subject issues were resolved by one of these methods.

Comments submitted on the PMR, however, indicate a difference of opinion over both the Commission's role in approving any negotiated settlement and, more significantly, over the scope of the issues covered by the agreement.

i) Commission Ratification

Both PGandE and Sonoma County have expressed concern that the Commission may "overturn" elements of any settlement negotiated between the parties (December 15, 1982 County Comments on PMR; PGandE December 30 comments on PMR; December 21 RT at 33-38). At this point, the Commission views ratification of all privately negotiated settlements of issues in power plant licensing cases as a function necessary in the exercise of its responsibility to ensure that identified impacts are mitigated to an acceptable degree. It has, in past cases as well as in the present case, deferred to agreements between the affected parties on the theory that they are in the best position to adequately assess the level of mitigation required. However, in all cases, the Commission has retained the ratification prerogative in order to satisfy itself that

such agreements are in fact sufficient. By practice, this ratification has led to ready acceptance of privately negotiated settlements since such settlements have been uniformly adequate. The Commission fully expects this trend to continue, especially in the present proceeding. The Commission is not prepared, however, to necessarily limit its scrutiny of all privately negotiated settlements to a mere "threshold" level (i.e., inspection of the settlement without possibility of questioning, assessing, or modifying the terms thereof). While this may in practice be considered the typical level of scrutiny to be applied in most instances, the Commission believes it can, and in fact must, retain the option for thorough de novo review should the necessity arise.

b. Areas subject to Agreement

The second point raised in comments on the PMR concerns the issues which are subject to negotiation between PGandE and Sonoma County. The Committee believed, based on the October 1, 1982 agreement and the record of the proceedings, that the project specific and cumulative impacts on County housing facilities and roads were the subjects of negotiation. There is no apparent dispute over the road impacts issues, but such is not the case concerning housing impacts.

Sonoma County, in its December 15, 1982 comments on the PMR, stated in part:

"...the issue that the County raised before the Energy Commission is that PG&E must mitigate the impact that it will have on the housing of Sonoma County during construction and operation of Unit 20, and PG&E must mitigate the cumulative impact that development of the Geysers area for geothermal steam has had and will have on the housing of Sonoma County." (emphasis in original).

This characterization did not seem in dispute at the December 21 Committee Conference, based on the following exchange between counsel for the County and PGandE (December 21 RT at 41, lines 4-14):

MR. FREED: One short comment is the agreement between PGandE and the County of Sonoma goes not only to transportation but also to other socioeconomic impacts, such as housing, and that will either have to be agreed upon or, absent agreement, litigated in front of the Commission.

MR. GILBERT: That accurately reflects the agreement, and it's my understanding that the negotiating teams for PGandE and Sonoma County will be considering the housing issue, as well, and it will be negotiated as a package.

PGandE's written comments filed after the Conference, however, state in part:

"PGandE strongly disagrees with the County's contention that 'PGandE must mitigate the cumulative impact that development of The Geysers area for geothermal steam has had and will have on the housing of Sonoma County.' It is not appropriate to address cumulative impacts of geothermal development in the context of Unit 20."

Thus, this portion of the post-Conference comments would appear to question only whether the cumulative effects of housing are beyond the scope of the agreement. However, the comments continue:

"Moreover, the CEC staff has stated its belief that 'no significant housing shortages attributable to the Geysers Unit 20 or related cumulative geothermal development will occur' (Exhibit 3, p. 153). Sonoma County has not presented any substantive documentation which would refute this statement. Accordingly, it is not PGandE's understanding that there are any housing impacts which need to be addressed in its negotiations with Sonoma County." (emphasis added)

The Commission believes that the foregoing comments illustrate the area of disagreement concerning the topic of housing as a subject of negotiation pursuant to the October 1, 1982 agreement.

Sonoma County interprets the agreement as requiring negotiation of both the cumulative and project specific housing impacts, while PGandE may be alternately characterized as agreeing with the County's contention, as contending that only the project specific impacts are subject to negotiation, or as stating that no housing impacts are properly the subject of negotiation.

The Commission has reexamined the transcript in attempting to construe the reasonable expectations of the parties in entering into the October 1 agreement, with emphasis on

the Committee hearings of October 13, 1982 which dealt in part with socioeconomic issues.

Testimony offered on behalf of PGandE stated agreement with Commission staff's analysis⁶ that construction and operation of Geysers Unit 20 will not promote significant growth of local population, housing, or labor markets (October 13 RT at 246, 249). After entry of this testimony, the following exchange occurred (Id. RT at 251, lines 7-25; 252):

MR. FREED: May I make a statement? One of the issues that Sonoma County has raised in this proceeding is the impact that Geysers Unit 20 will have on housing in (sic) the cumulative impact that will occur to Sonoma County housing by development of the Geysers. The stipulation that PGandE and Sonoma County have entered into reserves this as an issue for litigation to a later time....***

HEARING OFFICER PEREZ: For clarification, your point of concern is with housing impacts?

MR. FREED: Yes.

MR. GILBERT: We are willing, and it quite frankly slipped my mind that that was in fact an issue. We're willing to agree that the stipulation as to this narrow housing issue on Sonoma County would bind PGandE and that Mr. Carter's testimony really relates only to the AFC issues not bound by the stipulation....***

(The transcript (at page 252) then continues with a recitation of Recital paragraph 3(b) of the October 1 agreement, which states that the County believes that PGandE must mitigate both project-specific and cumulative

6. Commission staff did not view Unit 20's impact upon available housing as significant (October 13 RT 264; Exhibit 3 at 142 - 143).

housing impacts, further states that PGandE agrees that it has an obligation to mitigate project-specific housing impacts, and reflects PGandE's contention that it has no obligation to mitigate cumulative housing impacts on Sonoma County and that the Energy Commission has no jurisdiction to order mitigation of said cumulative impacts.)

Following this recitation, the exchange continued (Id. RT at 253, lines 4-15; lines 21-22):

HEARING OFFICER PEREZ: Does that mean then that the issue of whether or not there are impacts to housing in Sonoma County and the mitigation that would be needed therefor is agreed to be left open subject to the provisions contained in the agreement executed between applicant and County of Sonoma?

MR. GILBERT: The answer to that is yes and the reason for it is because if we don't reach agreement, we come back to the Energy Commission anyway under the compliance end of it. ***

So there is no prejudice to the process since it comes right back to the CEC anyway failing an agreement.***

Thus, it is clear that the parties intended that the October 1 agreement bound them to attempt to negotiate suitable mitigation for housing impacts upon Sonoma County. A distinction may be arguably made, however, that "housing impacts" refers only to project-specific impacts not to project-specific and cumulative housing impacts (PGandE implicitly makes this distinction in its written comments on the PMR, quoted supra.)

Since Sonoma County's interpretation that the October 1 agreement applies to both project-specific and cumulative housing impacts is clear (see October 13 RT 251, lines 7-11, supra and December 15 comments on PMR, supra), the only remaining question is whether PGandE's alternate contention that such is not the case is valid.

i) Recitals

The October 1 agreement (Appendix C of the PMR and this Decision; see also October 13, 1982 RT 257-263) contains, inter alia, a "Recitals" section (with paragraphs numbered 1 through 8) and an "Agreement" section (with paragraphs numbered 1 through 5). "Recitals" paragraph 3(a) states the County's contention that PGandE must mitigate project-specific and cumulative road impacts; it also states that PGandE agrees it has an obligation to mitigate project-specific roads impacts, but no obligation to mitigate cumulative road impacts. "Recitals" paragraph 3(a) memorializes PGandE's position that the Commission has no jurisdiction to order mitigation of such cumulative impacts. "Recitals" paragraph 3(b) contains virtually identical statements relating to the project-specific and cumulative impact upon housing. Paragraph 3 concludes with the sentence: "Hearing on these issues is scheduled before a committee of the Energy Commission on October 13, 1982."

"Recitals" paragraph 8 states in part that "The County is willing to waive its right to the October 13, 1982

hearing in view of the above representations made by PGandE and in an attempt to reach a negotiated settlement, so long as the County's rights to hearings and judicial review are fully protected."

Thus, the logical interpretation of the "Recitals" portion of the October 1 document appears to be that both parties agree to negotiate over the project-specific roads and housing impacts and that, while PGandE contends it has no obligation to mitigate cumulative housing and roads impacts, it will nevertheless enter negotiations over such impacts. The reasonableness of this interpretation is reinforced by the statements of record, supra, and the County's avowed intent to postpone, but not waive, the opportunity for eventual resolution of the issues by the Commission. This interpretation is further supported by the Committee's deferring adjudication of the project-specific and cumulative roads and housing impacts pending the outcome of negotiations.

ii) "Now, therefore, be it agreed..."

At this point, however, a discrepancy in the document arises. Paragraph 1 of the "agreement" portion of the document states in part:

"The parties agree that this Agreement substitute for the existing stipulation entered into between PGandE and the Energy Commission staff regarding a road agreement with Sonoma County so that the parties may be allowed to negotiate on the issues stated in paragraph 2 below..."

Paragraph 2 states in part:

"2. The parties will negotiate in good faith on the following issues:

(a) Mitigation of impacts to the roads in Sonoma County caused by construction and development of Unit 20, and mitigation of the cumulative impacts that development of the Geysers area for geothermal steam production has had and will have on the County's roads."

Although Paragraph 2 contains no mention of project-specific or cumulative housing impacts, Paragraph 3 of the "agreement" portion of the October 1 document provides:

"3. In the event that the parties are unable to reach agreement as set forth in paragraph 1 above, then:

A. The parties shall adjudicate before the Energy Commission ...the issues raised in paragraph 3 of the Recitals."

This portion of the agreement thus seemingly includes project-specific and cumulative housing impacts as a subject of adjudication before the Commission in the event that transportation issues referred to previously are not settled between the parties. While such interpretation is arguable on the basis of the agreement's contents, it defies not only logic but the clearly expressed intentions of the parties garnered from the transcript of the proceeding.

c. Commission Construction of the October 1, 1982 "Agreement"

Parol niceties aside, the Commission's interpretation of the agreement is that such document was intended and

represented as providing the opportunity for PGandE and the County to negotiate project-specific and cumulative impacts upon roads and housing. This intent is clearly stated on the record and in the body of the October 1 document, paragraph 3 of the "Recitals".

Therefore, shades of meaning, interpretative intricacies, nuance and innuendo aside, the Commission interprets the basic tenets of the October 1, 1982 agreement as follows:

1. PGandE and Sonoma County have agreed to negotiate concerning the cumulative and project-specific impacts upon roads and housing.
2. If agreement is reached concerning these issues, the parties shall submit the negotiated settlements to the Commission for ratification.
3. If agreement is not reached on all issues, those issues which remain shall be submitted to the Commission for resolution.
4. Construction of Unit 20 shall not begin until the issues identified above have been resolved by a ratified negotiated settlement or otherwise resolved by the Commission.

In its Proposed Decision (pages 91 - 92) the Committee invited comment over the foregoing interpretation at the

February 4, 1983 hearing. PGandE, in its written and oral responses, initially requested that the Commission not interpret the October 1, 1982 agreement to include housing issues as a subject of negotiation. Sonoma County, however, agreed completely with the Committee's interpretation.

In further discussion, PGandE acknowledged that housing and transportation impacts were intended to be negotiated "as a package" under the October 1 agreement, but expressed concerns over submission of housing impact data by Sonoma County during the negotiations. Sonoma County unequivocally stated that it would provide such data in a timely fashion (February 4 RT at 21 - 23).

The Commission views this as satisfactory and therefore endorses the Committee's analysis of this matter contained in the Proposed Decision and repeated above. Furthermore, the Commission will examine any forthcoming settlement between the parties for its overall sufficiency, but will not be inclined to reject such agreement unless the parties indicate that any of the areas subject to negotiation (cumulative and project-specific housing and transportation impact) require adjudication by the Commission.

d. Schools

At the September 17, 1982, Prehearing Conference, the Applicant stated that it had reached full agreement with both the Sonoma and Lake County School Districts concerning compensation for students attributable to development of Unit 20 (September 17 RT at 80). PGandE confirmed this resolution during the evidentiary hearings (October 12 RT at 234 - 237). At the October 13, 1982, evidentiary hearing PGandE offered the partially executed "School Impact Mitigation Agreement" into the record, stating that full execution was dependent only upon scheduling considerations of various school districts (October 13 RT at 266 267; 273-281.

The Committee, at page 83 of the PMR, included as an interim Condition that PGandE submit a fully executed copy of the agreement by December 21, 1982. Due, however, to ministerial problems it became difficult to produce a single document executed by all parties (see December 21 RT at 41-44). The version included in Appendix D of this Decision is accepted as accurately reflecting the final mitigation agreement reached between PGandE and the Sonoma and the Lake County school districts.

C. Transportation

1. Summary

The PGandE Unit 20 project will add to the volume of traffic using roads throughout the Geysers which will increase wear on roads and the potential for accidents. The Unit 20 project will generate an average of 7 to 8 trucks daily traveling the roads in the Geysers. Allocation of traffic to specific roads has not been determined at this time, but it seems likely that, based on PGandE experience in past power plant construction, truck traffic might use the Healdsburg-Geysers Road and contribute to the degradation of the road as it presently exists. Other roads likely to be used include Highway 175, Bottle Rock Road, and possibly Socrates Mine Road. As the volume of traffic increases in the Geysers so does the potential for accidents involving hazardous materials.

The most direct access to the proposed project (including the steam field) from Lake County is via State Highway 175 to Socrates Mine Road and then by the Union Oil road from Gate 3 past Unit 18 to the site. Ford Flat Road is occasionally used by workers to commute from Cobb Village to Socrates Mine Road. With the exception of Ford Flat Road, all roads are paved.

Access from Lake County is also possible from Bottle Rock Road using Union Oil Company's private roads through Gate #2 up Sawmill Flat Road (also known as Geyser Rock Road) and past

PGandE Units 9 and 10 to the Unit 20 site. All roads on this route are paved.

A variety of routes will be used for the disposal of geothermal wastes. Stretford wastes and cooling tower sludge will be transported by either Sawmill Flat Road or Socrates Mine Road in Lake County to Bottle Rock Road and State Highway 175 to either the Middletown or Kelseyville disposal sites. Butts Canyon Road, a paved county road, would be used for access to the Middletown disposal site.

The proposed route for ordinary wastes (primarily construction wastes) has not been determined but likely would be by the foregoing Lake County routes to a landfill dump or by Sonoma County roads to a disposal site in the vicinity of Santa Rosa. Sulfur from the Stretford system will be hauled by trucks using Geysers Road through Healdsburg to a reclamation firm in the Bay Area.

2. Discussion

The evidence of record indicates that transportation impacts will be mitigated to an acceptable level by imposition of the Conditions proposed by PGandE and Staff and contained in this Decision (see generally, October 13 RT at 288-341; 353-367). However, several aspects merit further discussion.

First, at the September 17, 1982 Prehearing Conference, Sonoma County indicated its concern that the roads which will be used

by PGandE for development of Unit 20 are unsafe for heavy traffic and badly deteriorated (September 17 RT at 50-51); the County further stated its readiness to present direct testimony on that issue in an attempt to persuade the Commission to require compensatory mitigation from PGandE (Id. RT at 52-55). PGandE voiced its desire that the Committee defer presentation of evidence, suggesting that pending adjudication would imperil nascent negotiations (Id. RT at 55, 62-63). By the time of the October 12, 1982 evidentiary hearing, Staff, PGandE, and Sonoma County all indicated that they had reached agreement to negotiate compensatory mitigation for road impacts as evidenced by the agreement contained in Appendix C of this Decision (Id. RT at 132; October 13 RT at 254, 257-263, 407-413).

i) Sonoma County

By the terms of this agreement (which is the same agreement discussed above under "Socioeconomics"), PGandE may not commence construction of Unit 20 until negotiated settlement concerning road impacts is reached with Sonoma County or, upon failure to reach negotiated settlement, the Commission resolves the issue before or after certification is granted. Even though the agreement names only Sonoma County as a party with which PGandE must negotiate, the PMR characterized the agreement, read in light of the statements of record, as establishing that Lake County possesses similar rights insofar as negotiation of road impacts and potential delay of

construction are concerned (October 13 RT at 342-347, 367; PMR p. 86).

ii) Lake County

PGandE's comments at the December 21 Conference essentially reaffirmed this characterization when, in attempting to clarify language contained in the PMR, counsel suggested deleting Lake County as a party with which PGandE had in fact signed an agreement, and inserting in the appropriate PMR Condition:

"Prior to construction, PGandE shall have negotiated a (roads impact) contingency agreement with the County of Lake. (December 21, RT, page 40, lines 19-25; see generally, Id. RT at 39-40)."

The Committee interpreted this clarification as consistent with earlier representations made by PGandE regarding the fact that it would likewise be obligated to negotiate a settlement with Lake County concerning road impacts (or have the matter decided by the Commission) before construction of Unit 20 could begin (October 13 RT at 343, lines 9-16):

MR. GILBERT: (concerning the nature of the October 1 agreement) That is correct. Under that process (contained in the agreement), we are going to be issued...a decision which allows us to reach an agreement with Sonoma County and Lake County and submit it to the Commission thirty days prior to construction. If we're not able to do that, in the case of the County of Sonoma or the County of Lake, we will have to come back to the Energy Commission for adjudication of, number one, what the impacts are, and number two, what we would have to do about it.

The exchange continued along these lines. In clarifying the Staff position on a proposed condition concerning these matters, the Committee asked (Id. RT at 346, lines 6-15):

PRESIDING MEMBER EDSON: The staff document as I read it, though, talks about requiring that PGandE reach an agreement with Sonoma and/or Lake County, saying to me that if one is reached with Sonoma County, one need not be reached with Lake.

MR. GILBERT: That is language that always sort of troubled me. I haven't said anything about it. I've always sort of read it to mean "and." I think the 'or' is surplusage. In my mind we are obligated to deal with both counties. I'm not sure why the 'or' was put in there.

Thus the Committee reasonably believed that the Applicant had assumed an obligation to reach a contingency agreement with Lake County concerning road impacts, that failure to reach such agreement would refer the matter to the Commission for resolution, and that construction of Unit 20 could not commence until the roads concerns of Lake County had been disposed of by ratified settlement or Commission resolution. In other words, the basic tenets of the October 1 agreement, dealt with supra, applied to mitigation of Lake County roads impacts.

However, two comments on the PMR cast doubt upon this characterization. In a December 22, 1982 letter from the Lake County Public Works Department, the Director states, in part:

"Lake County has had no contact with PGandE regarding their mitigation of additional problems that will be created on Lake County roads due to the construction of Power Plant Unit 20.

We are very concerned about any additional truck traffic that may use Socrates Mine Road due to this project.***

The second reason for doubt stems from a written comment on the PMR made by PGandE:

"The October 1, 1982 agreement only applied to Sonoma County. Lake County's primary road concern is with Socrates Mine Road (SMR); that concern has already been addressed by the recent reconstruction of SMR and the maintenance agreement between Lake County and a consortium of developers. Lake County's other road concerns apparently were not significant enough to warrant intervention in these proceedings. Mitigation of possible impacts associated with potential future development in Lake County would be addressed on a case-by-case basis in conjunction with such development."

Although this comment correctly points out that Lake County is not a signatory party to the October 1 agreement, it seemingly belies PGandE's earlier representations that PGandE would negotiate with Lake County over the roads issue and that, if negotiations failed, the Commission would resolve the impact of the project upon Lake County roads prior to commencement of construction (October 13 RT at 347, lines 5-9; 345, lines 3-19, 366, line 8 to 367, line 4).

The Committee invited comments on this interpretation of the October 1, 1982 agreement concerning PGandE's obligation to negotiate with Lake County over road impacts (Proposed Decision, pp. 99 - 100). No comments were received challenging or requesting clarification of this interpretation, and the Commission therefore adopts such interpretation.

Based on statements during the hearings, the Commission perceives the clearly expressed intent of PGandE as being bound to enter negotiations with Lake County concerning road impacts under the spirit of the October 1 agreement with Sonoma County. The Commission has incorporated this approach in its Conditions.

Finally, the Commission wishes to emphasize that neither PGandE nor Sonoma and Lake counties have waived any rights regarding presentation of witnesses or cross-examination under the terms of the October 1, 1982 agreement. Any future resolution of the matter by the Commission will be in accordance with customary adjudicatory procedures.

Moreover, the Commission is aware of the parties' concerns over Commission ratification of any agreements reached. As discussed previously regarding the housing issue, Commission ratification of any mitigation agreement is necessary in the due exercise of its licensing responsibilities.

The parties are required to formally present any negotiated agreement to the Commission; ultimate certification of Unit 20 is contingent upon Commission ratification of such agreement. It is not the Commission's intent to necessarily vary any negotiated terms; the Commission will not, however, foreclose this option in a proper case.

COMMISSION FINDINGS AND CONCLUSIONS

The Commission finds that, based upon the evidence of record, and provided that the Conditions of Certification and Compliance Requirements (below and in Appendix A) are met, the proposed project can be designed, sited, and operated to comply with all applicable standards, ordinances, and laws contained in the pertinent portions of Appendix A of this Decision, and that the proposed project will not cause any unmitigatable impacts upon the human environment as herein characterized.

GENERAL CONDITION

A. Housing and Transportation

1. Any settlement concerning the matters covered by the agreement contained in Appendix C of this Decision must be ratified by the full Commission before construction of Unit 20 may commence. In the event that the parties reach negotiated settlement after February 9, 1983 PGandE shall notify the Commission that settlement has been reached and send a copy of the executed agreement to the Committee which conducted the certification proceedings. The Committee shall then schedule a public hearing before itself or the full Commission to examine the settlement reached and determine whether such settlement adequately mitigates the impacts addressed. In no event shall the construction of Unit 20 commence until the Commission has determined that the settlement agreement contains measures sufficient to mitigate impacts identified.

PART SEVEN: Nondisputed Areas

THE NATURAL ENVIRONMENT

Both the Public Resources Code and Commission policies enunciated in the Biennial Report require the Commission to consider the impacts of a proposed project upon the natural environment and determine whether these impacts can be reasonably mitigated. The Commission must also ensure that, absent unusual circumstances, the project is designed and constructed to operate in compliance with applicable standards, ordinances, and laws. In complying with these mandates, Commission staff issued its Preliminary Assessment which analyzed Applicant's proposed project and suggested mitigation measures for identified environmental impacts. The Staff Assessment further measured the impact of the proposed project as a portion of the cumulative environmental impact occasioned by power plant development in the Geysers area and discussed mitigation measures deemed feasible to offset such impacts. The analysis in the Staff Assessment was received as testimony during the evidentiary hearings and is summarized below.

A. Biological Resources

Testimony offered on this topic area centered around determining the existence of any rare, threatened, endangered, or fully protected species present on the project leasehold and determining whether the proposed project would be likely to cause adverse impacts on species of commercial or recreational value, species of special concern, or natural areas of critical concern. The analysis presented to the Committee at the evidentiary hearings further explored the adequacy of mitigation measures

proposed to reduce unavoidable impacts upon any effected biological resources.

Thirteen identifiable vegetation types cover the Unit 20 leasehold and the immediately surrounding areas. While the majority of the area is covered by common vegetation types which are not known to support rare or endangered plants, there are small areas of habitat types which support rare species. Within the area of construction activity (specifically the Little Geysers and along access roads to potential make-up wells)* there are several recognized populations of rare plant species. These are Geysers panicum (Dicanthelium acuminatum var. acuminatum), Socrates Mine jewel flower (Streptanthus brachiatus), and Morrison's jewel flower (Streptanthus morrisonii).

Geysers panicum has been listed as an endangered species by the California Department of Fish and Game under the California Native Plant Protection Act (California Fish and Game Code, Sections 1900 et seq.). It is only found in association with hydrothermally altered soils near hot springs and fumaroles. On the Unit 20 leasehold it is found only near the Little Geysers Natural Area and can be found growing directly in the hot springs.

The Socrates Mine jewel flower is of very limited distribution, occurring only within the Geysers steam resource area, with the majority of the

*Page 99 of the PMR intimated that excess spoil would be disposed of at Socrates Mine. By letter of December 27, 1982, Union Oil indicated that it will place approximately 120,000 cubic yards of spoil on its leased lands.

colonies occurring on the Socrates Mine Ridge immediately adjacent to the Unit 20 leasehold.

Morrison's jewel flower is more widely distributed than Socrates Mine jewel flower but is also of limited distribution and limited to serpentine soils. Isolated colonies are known in Napa, Lake, and Sonoma counties. The U.S. Bureau of Land Management has prepared a formal proposal soliciting cooperative financial support from geothermal developers and mining corporations in and around the Geysers area to study the Streptanthus complex and finally resolve questions of taxonomic classification and rarity status. PGandE's comments on the PMR indicate that the proposed streptanthus study is currently envisioned as emphasizing the resolution of questions on taxonomic classifications and rarity status, while de-emphasizing development impacts and suggested mitigations as stated on page 100 of the PMR. The Bureau of Land Management has requested that PGandE participate in these studies.

Both the California Department of Fish and Game and the U.S. Fish and Wildlife Service list the peregrine falcon (Falcon peregrinus anatum) as an endangered species. The U.S. Fish and Wildlife Service has designated a critical habitat zone approximately 6 miles southeast of the Unit 20 leasehold. The Unit 20 leasehold provides no nesting habitat for the peregrine falcon, although some potential foraging areas do occur on the leasehold.

Golden eagles (Aquila chrysaetos) have been seen regularly in the Geysers. This species is "a fully protected animal" under California law

[Fish and Game Code section 3511 (A)]. The Unit 20 leasehold provides no suitable nesting sites for this species; however, there are acceptable tree nest sites in the Big Sulphur drainage. The sitings may indicate that the area is used for foraging. The leasehold study area contains only limited amounts of good foraging habitat for golden eagles.

The ringtail (Bassariscus astutus) is also a fully protected species in California [Fish and Game Code section 4700 (e)]. In preliminary studies for the Unit 20 AFC, PGandE biologists recorded ringtail tracks at a predator scent station located in chaparral habitat along Socrates Mine Ridge.

There is a potential for significant adverse impacts to rare and endangered plants due to accidental disturbance, dust, cooling tower drift deposition, and possible changes in the hydrothermal regime at the Little Geysers Natural Area. Several of the Socrates Mine jewel flower colonies occur along access roads to the make-up well pads.* Accidental disturbance by heavy equipment operators beyond the access roads could result in significant impacts to the Streptanthus species. In addition, the use of an access road immediately adjacent to these rare plant populations could result in impacts from heavy deposition of dust, which is known to be harmful to vegetation.

In its comments on the PMR, PGandE requested that "Biological Resources" Condition 4 (appearing at page 111 of the PMR) be modified due to its recently revised plan to have Union Oil, the steam developer, dispose of

*PGandE, on December 21, 1982, announced that it would not be using Socrates Mine as a spoil disposal area.

excess spoil. The Committee received evidence concerning the biological resources impacts of disposing excess spoil on the Union leasehold at the February 4, 1983 hearing. The evidentiary presentations indicated that no significant impacts would occur as long as appropriate conditions were imposed (February 4 RT at 145-149). The Commission has adopted the Conditions proposed by staff, with the understanding that revegetation efforts need to be coordinated in light of the actual level and timing of site disturbance.

The Geysers panicum occurs within approximately 600 m of the power plant and could be affected by foliar deposition of cooling tower drift that contains boron. Perhaps an even greater concern is the potential for changes to the surface flows from the springs of the Little Geysers Natural Area. The effect of altering the flows from Little Geysers is not currently known but could be significant if this species is physiologically dependent on high moisture levels and/or high temperatures for growth. PGandE contends that development of the Unit 20 leasehold will not substantially affect either the flows or temperatures at Little Geysers. However, Staff believes that, even in the best circumstances, predicting changes in such sensitive geologic features as stream flow and the temperature of spring waters is an imprecise art. Thus, Staff believes that mitigation measures will be warranted should changes occur which substantially affect the continued existence of this endangered species.

No significant impacts are expected to occur to peregrine falcons or golden eagles as a result of this project. Habitat loss could adversely

affect the fully protected ringtail on the leasehold. Impacts to ringtail are expected to be minor since only a very small amount of preferred habitat will be lost. The evidence of record leads to the conclusion that all impacts may be mitigated to an insignificant level (October 13 RT 192-209; Exhibit 2, pp. 207-220 as amended by Exhibit 3, pp. 9-17).

B. Hydrology

The summary of hydrological analysis contained at page 102 of the PMR indicated that the construction and operation of Geysers Unit 20 would not adversely affect downstream water users on Big Sulphur Creek, nor materially reduce in-stream flows. Site development was expected to increase water runoff, but not to a degree sufficient to endanger downstream properties. At the December 21, 1982 Conference, the Applicant notified the Committee that, due to revised plans and calculations, it would require only 36 acre-feet of water initially rather than the 48 acre-feet originally proposed. Significantly, however, Union Oil had also informed PGandE that the originally anticipated source of this water--the blowout pond--was insufficient to supply this 36 acre-feet. PGandE then stated that these revised plans could necessitate withdrawal of water from Big Sulphur Creek or its tributaries, among other sources. The potential withdrawal from Big Sulphur Creek or its tributaries thus posed a new development at a late stage in these proceedings (December 21 RT at 47-49).

Following a considerable discussion at the December 21 conference, the Committee ordered that Notice of the revised plans for water sourcing be published in local newspapers and also sent to those known to be, or

reasonably expected to be, interested or concerned regarding the potential outtake of water from Big Sulphur Creek. Even though the comment period on the PMR closed on January 7, 1983, the Committee instructed that comments concerning PGandE's change of water source could be submitted until January 14, 1983. The Committee also directed staff to consult with appropriate agencies such as Sonoma County, the Division of Water Rights, and the Department of Fish and Game.

In order to provide as much public awareness as possible concerning the proposed change in water sources, the Committee caused notice of the change to be sent to all those known to be interested in the Geysers 20 proceeding, those known to be interested in other specific geothermal proceedings and geothermal proceedings in general and, in addition, published notice in local newspapers, which in turn generated several feature articles. The Committee further ordered that all inquiries concerning the change in water sources be provided Staff's analysis of the impacts and be otherwise kept abreast of developing information on this issue. Finally, the Committee reopened the evidentiary record at the February 4, 1983, hearing to receive testimony concerning any impacts caused by withdrawing water from Big Sulphur Creek.

Testimony offered by PGandE and Staff indicated that the small amounts of water and relatively short duration of use would not result in significant adverse impacts to downstream users or to fishery and riparian habitat (Id. RT at 169-176). Other concerned agencies also agreed with the testimonial analysis (Exhibit 5).

In discussing Staff's proposed Conditions, it was clear that the intent is to permit withdrawal from Big Sulphur Creek only (Id. RT at 186-187). Two members of the public indicated that PGandE should also install a metering device to accurately gauge the water withdrawn; Staff concurred with this suggestion (Id. RT at 217-218). The Commission has reflected these concerns in its Conditions and Compliance Requirements.

C. Soils

Soils underlying the Unit 20 leasehold badly erode when exposed to direct rainfall and overland flow; development could thus lead to accelerated erosion in the vicinity of the plant site. While current soil losses were calculated to be in the range of 20 to 30 tons per acre per year, up to 100 tons of soil per acre per year could be lost from bare slopes subjected to heavy rainfall. PGandE's proposed mitigation measures should, however, prevent erosion rates from exceeding 2 tons per acre per year on cut or fill slopes. Post-construction erosion control measures should reduce soil losses to approximately one ton per acre per year. PGandE will also monitor turbidity in Calm Creek below the Unit 20 sedimentation basins, and will take other measures as necessary to protect downstream water resources (October 12 RT at 181-181; Exhibit 2, pp. 282-91 as amended by Exhibit 3, pp. 21-22).

In its comments on the PMR, PGandE requested that "Soils" Conditions C.1.a., C.1.g., and 5 (appearing respectively on pages 118, 119, and 122 of the PMR) be deleted due to revised plans providing for disposal of excess spoil by the steam developer. Evidence on the soils impacts of

the revised spoil disposal plans received at the February 4, 1983 hearing indicated that no adverse impacts would occur if appropriate erosion and sediment control measures were implemented (February 4 RT at 111-122). The Commission has adopted Staff's Conditions and Requirements as amended at the February 4 hearing pertaining to the impacts of the revised spoil disposal plan; none of these revisions are intended to obviate any mitigation measure required for the power plant site.

D. Waste Management

Construction and operation of a geothermal power plant naturally leads to the production of potentially hazardous liquid and solid wastes. These wastes include such substances as the contents of steam well drilling sumps, construction wastes, condensate from the geothermal steam, by-products from the hydrogen sulfide abatement systems, and sanitary wastes.

Evidence submitted by the parties addressed the question whether the waste products produced by the proposed project would adversely effect public health or the environment. The witnesses indicated that PGandE had agreed to the mitigation measures proposed by Staff, and Staff's witness indicated that PGandE proposals for disposing of operational wastes were acceptable since the wastes are to be taken to appropriate licensed land fills described in the AFC (October 13 RT at 417-418; Exhibit 2, pp. 320-330, as amended by Exhibit 3, p. 25).

E. Water Quality

1. Summary

Unit 20 will be located within the Calm Creek drainage; this is a tributary of the Big Sulphur Creek drainage. During construction, the plant site will present a high erosion potential accompanied by a possibility of spills of potentially hazardous liquids used at the site. During operation, cooling water, rainwater collected on the plant site, hydrogen sulfide abatement chemicals, oil, and sanitary wastes could degrade existing water quality if discharged from the site.

PGandE's proposed mitigation measures, including surrounding the power plant and cooling towers with an impermeable berm and constructing a sump, sedimentation pond, catch basin, and Stretford containment area will, in the opinion of Staff, render potential impacts insignificant (October 13 RT at 417; Exhibit 2, pp. 238-241, as amended by Exhibit 3, p. 18).

In spite of the jointly stipulated nature of the water quality mitigation measures proposed by Applicant and Staff, the Anderson Springs Community Services District raised various concerns at the October 13, 1982 evidentiary hearing regarding potential impacts upon that community's water supply. The Service District's representative summarized various instances in which its water supply was imperiled (Id. RT at 429-432), though admitting that not all incidents could be attributed to PGandE or an entity controlled

by PGandE (Id. RT 437-438). The Services District also offered certain conditions which it desired imposed upon PGandE in the certification for Unit 20 (Id. RT 373-377).

PGandE's response consisted of three major points. First, PGandE reiterated its commitment (contained in a letter of October 8, 1982) to maintain the temporary water intake system on Gunning Creek until October 4, 1984; responsibility for maintenance of this system is presently due to expire on December 31, 1982. PGandE also offered to implement various measures to ensure that its contractors and employees will notify the Services District and other local officials of any accidental spills. PGandE will also meet with the Services District to discuss water supply concerns prior to filing an AFC for its next Lake County geothermal project (Id. RT 319; these commitments are incorporated as Conditions 11 and 13 under Water Quality). Second, PGandE pointed out, with Staff concurrence, that suggested measures such as posting signs along Highway 175 and guaranteeing a continuous drinking water supply to Anderson Springs were measures more appropriately addressed in the Commission's cumulative impacts proceeding (81-GCI-1) since they actually mitigated general rather than project specific impacts. Moreover, measures such as posting (but not providing) highway signs apparently requires approval of other state agencies. Finally, PGandE emphasized that it would be obligated to follow various laws and regulations in the event of an accident affecting local water quality, and that certain of the measures suggested by the Anderson Springs Community Services District, would impose obligations upon

PGandE requiring mitigation of problems which it did not cause (Id. RT at 377-384).

2. Discussion

The Committee was satisfied that the measures proposed by Staff, and the additional measures proposed by PGandE, would adequately protect the quality of local waters. Remedies are of course available through established procedures should PGandE or one of its operators violate an applicable legal standard. Moreover, the statements and testimony of record indicate that the proposed measures, including those offered by PGandE, satisfy the most legitimate concerns of the Service District.

The Committee was disposed to grant the Service District's proposed Condition 4 regarding the posting of signs at the point where Socrates Mine Road crosses Anderson and Gunning Creeks (see Id., Rt at 376). The Committee was cognizant that this measure will address an impact larger in scope than that directly attributable to construction of Unit 20, but believed that the potential for preventing harmful impacts in a timely manner outweighed the minor cost involved. As stated in Condition 12, PGandE shall provide signs indicating that the creeks are sources of domestic and recreational waters for Anderson Springs, and provide the telephone numbers of the Anderson Springs Community Services District to be called in case of a spill. The Services District shall have the responsibility of posting the signs. PGandE acquiesced to this Condition in its comments on the PMR.

COMMISSION FINDINGS AND CONCLUSION

The Commission finds, provided the Conditions of Certification and Compliance Requirements are met, that Geysers Unit 20 can be designed, sited, and operated in compliance with the applicable laws, ordinances, and standards identified in the appropriate portions of Appendix A of this Decision. The Commission further finds that implementation of the mitigation measures proposed by Applicant and those contained in the Conditions and the Compliance Plan will avoid any significant adverse impacts to the natural environmental, or reduce them to an insignificant and acceptable level.

GENERAL CONDITIONS

A. Hydrology

1. During light rainstorms PGandE shall return all plant runoff to the cooling basin for reinjection.
2. PGandE shall size outfall structures, culverts, and ditches in accordance with "The Sonoma County Water Agency Flood Control Design Criteria Manual."
3. PGandE shall follow the criteria listed in Section 2.3 of the AFC in the design and during construction of the Geysers 20 plant.
4. PGandE shall incorporate these guidelines when designing and building the sediment basins: Vol. IV, Appendix B, of Civil Design Criteria..., "Guidelines for Designing Sediment Basins."

B. Soils

1. 4.2 Facility Description: Prior to commencing earth-moving activities at the plant site and spoil disposition in the alternate disposal area, PGandE or its contractor(s) shall determine whether or not a waste discharge permit is required from the North Coast Regional Water Quality Control Board. If a permit is required, PGandE or its contractor(s) shall forward a copy of the permit to CEC. If the Board does not require a permit, PGandE or its contractor(s) shall so notify the CEC.
2. PGandE or its contractor(s) shall implement and maintain all the following general and special erosion control measures, as applicable, at the power plant and disposal sites:
 - a. Fill Disposal Site: PGandE or its contractor(s) shall punch straw and hydroseed the raw fill material to assure that the fill remains on the alternate fill disposal site and is not eroded into Little Geysers Creek.
 - b. Site Grading: PGandE or its contractor(s) shall grade the power plant site in accordance with AFC figure 4.4-2 and the spoil disposal site in accordance with plan drawings which reduce slope length and steepness. PGandE shall slope step (serrate) and hydroseed cut slopes, as in drawing detail 2 of AFC Figure 4.4.3. Cut and fill slopes and accessory facilities at the plant site shall be built as described in the various details of this figure.

c. Sheet Erosion: PGandE or its contractor(s) shall grade the plant site in accordance with their AFC Figures 4.4-2 and 4.4-3 to reduce both slope length and steepness. PGandE shall grade the alternate spoil disposal site in accordance with drawings prepared by the contractor which reduce both slope length and steepness.

d. Punched Straw: PGandE shall evenly apply and punch cereal straw in the plant areas depicted in their AFC Figure 5.4-4. The straw shall be incorporated with a studded roller to a depth of approximately six inches.

PGandE or its contractor(s) shall evenly apply and grade cereal straw on the alternate fill disposal site slopes. The straw shall be incorporated with a studded roller to a depth of approximately six inches on south and west facing slopes. Tackification may be employed on north and east facing slopes.

e. Hyrdoseeding: PGandE shall hydroseed the plant areas so depicted for such treatment in AFC Figure 5.4-4. The seed mix shall be selected in accordance with plants listed in AFC Table 5.4-4 (Table 1).

PGandE or its contractor(s) shall hydroseed the alternate spoil disposal area. The seed mix shall be selected in accordance with plants listed in AFC Table 5.4-4 (CEC Table 1).

f. Planting: When planting tree and shrub species on fill slopes at the power plant or fill disposal sites, PGandE or its

TABLE 1
GEYSERS UNIT 20 PLANT LIST -
POSSIBLE PLANT SPECIES
TO BE USED DEPENDING ON AVAILABILITY

<u>Common Name</u>	<u>Botanical Name</u>
I. Hydromulch Seeding	
Herbaceous species:	
Zorro fescue	<u>Festuca megalura</u>
Blando brome	<u>Bromus mollis</u>
Smile	<u>Oryzopsis miliacca</u>
Perla koleagrass	<u>Phalaris tuberosa</u> var. <u>hirtiglumi</u>
Kondinin rose clover	<u>Trifolium hirtum</u>
Lana wooly pod vetch	<u>Vicia dasycarpa</u>
Woody species	
Manzanitas various	<u>Arctostaphylos</u> spp.
Chamise	<u>Adenostoma fasciculatum</u>
Bushpoppy	<u>Dendromecon rigida</u>
Mountain mahogany	<u>Cercocarpus betuloides</u>
Knobcone pine	<u>Pinus attenuata</u>
Macnab cypress	<u>Cupressus macnabiana</u>
II. Plant - Local Native Sources	
Knobcone pine	<u>pinus attenuata</u>
Oaks - various	<u>Quercus</u> spp.
California bay	<u>Umbellularia californica</u>
Macnab cypress	<u>Cupressus macnabiana</u>
Sargent cypress	<u>C. sargentii</u>
Madrone	<u>Arbutus menziesii</u>
Manzanitas - various	<u>Arctostaphylos</u> spp.
Chamise	<u>Adenostoma fasciculatum</u>
Ceanothus - various	<u>Ceanothus</u> spp.
Chapparal pea	<u>Pickeringia montana</u>
Mountain mahogany	<u>Cercocarpus betuloides</u>

contractors shall fertilize the adjacent soil and protect young plants from damage by deer, rodents, and birds.

- g. Fisheries: PGandE shall implement standard erosion control measures at the power plant and alternate fill disposal sites. These shall include constructing stable, engineered cut and fill slopes with gunite-lined drains; hydroseeding all exposed slopes; and constructing engineered sediment ponds. Approximately 2.7 km (1.7 miles) of existing dirt roads shall be revegetated to control erosion.
- h. The Little Geysers Natural Area and a buffer zone around Little Geysers Creek shall be protected from soil eroded from the alternate fill disposal area being deposited directly into the creek.
- i. Site Preparation: An adequate quantity of soils to cover cut and fill slopes removed during site development shall be set aside by PGandE for later use as topsoil on cut and fill slopes. Excess top soil should be placed on soil disposal areas.
- j. PGandE shall construct the two sedimentation ponds prior to the start of major earthwork. The sedimentation pond in Calm Creek channel shall be constructed prior to any work in the stream channel.
- k. Appendix D, Civil Design Criteria and Guidelines for Geysers Geothermal Projects Beginning With Unit 16 (Issued December 1977 and Revised January 1979), Volume III Site Design:

PGandE shall adhere to criteria and guidelines to reduce erosion and off-site sediment transport as described in the following sections: 2.3 Drainage, 2.5 Paving, 2.6 Landscape and Erosion Control.

1. Appendix G, Hydraulic and Hydrologic Design of Sedimentation Ponds: PGandE shall determine the cubic yardage of sediment removed from ponds 1 and 2 in accordance with its customary practice and inform CEC of the individual amounts removed during the first 5 such sediment removals. The CEC staff and Applicant may agree to suspend such monitoring if the Staff is convinced that sufficient data have been obtained.
3. PGandE shall assure that the responsible party pave (armor-coat) the road to the Geysers Unit 20 power plant. It shall further assure that pipelines shall be constructed along paved roads whenever possible to reduce vegetation removal and resultant erosion. PGandE shall assure that the responsible party keeps the number of pipeline stream crossings to a minimum, placing them at existing road crossings whenever possible.

C. Waste Management

1. Construction Wastes

Cleared vegetation and miscellaneous debris may be disposed of on site or at an approved disposal site. Wastes which are not hazardous can be transported by unregistered haulers and disposed of in any site which has been approved by the Regional Water Quality Control Board and responsible local agencies. Sanitary facilities shall be

provided during construction, and all resultant wastes shall be hauled to an appropriately licensed disposal site.

2. Operational Wastes

PGandE shall use underground injection to dispose of excess condensate. The Stretford purge stream shall be reinjected or hauled to an appropriately licensed disposal site.

3. PGandE shall develop a waste disposal plan for all operational wastes from the power plant. The disposal plan shall specify:

- a. The manner of handling each operational waste,
- b. The proposed route for hauling the waste to the selected disposal site,
- c. The proposed disposal site,
- d. The available alternative disposal sites as well as PGandE's rights to use those sites, and
- e. PGandE's plans for operating the Geysers 20 power plant if there are no available licensed waste disposal sites.

4. PGandE shall notify the CEC of any enforcement actions against PGandE, the waste hauler, or the disposal site operator, because hindrance of the waste disposal operation may curtail the operation of the power plant itself.

PART EIGHT: Discussion Area
TRANSMISSION LINE ENGINEERING

A. Background

Once geothermally generated electrical power is produced, it must then be carried to the electrical transmission system. In the Geysers KGRA, this transmission system consists of two major 230 KV double circuit transmission lines known as "collector" lines. These collector lines carry power produced in the Geysers south to Castle Rock Junction, where the power is then transmitted via various outlet lines to PGandE's Fulton substation. Commission staff estimates that the eastern collector line will be carrying 1,144 MW or 90 percent of its capacity, and the outlet lines will be carrying 1820 MW (thus exceeding their existing 1,100 MW capacity) when Unit 20 is added⁷ (Exhibit 4, pp. 7, 14; October 25 RT at 467-470).

In its Unit 20 AFC, PGandE proposed to build a transmission tapline running from Unit 20 to the Unit 13 tapline, and to string the existing vacant circuit on the Unit 13 tapline to connect Geysers 20 to the eastern collector line, approximately 3.1 miles north of Castle Rock Junction. From this point Unit 20's power would flow into PGandE's main transmission grid via the proposed Geysers to Lakeville outlet line (see Figure 3).

7. The Commission has recently certified an additional 230 kV outlet line (1,800 MW capacity) which will run from Castle Rock Junction to PGandE's Lakeville substation (Decision on Geysers Unit 16, 79-AFC-5); this line is presently the subject of litigation.

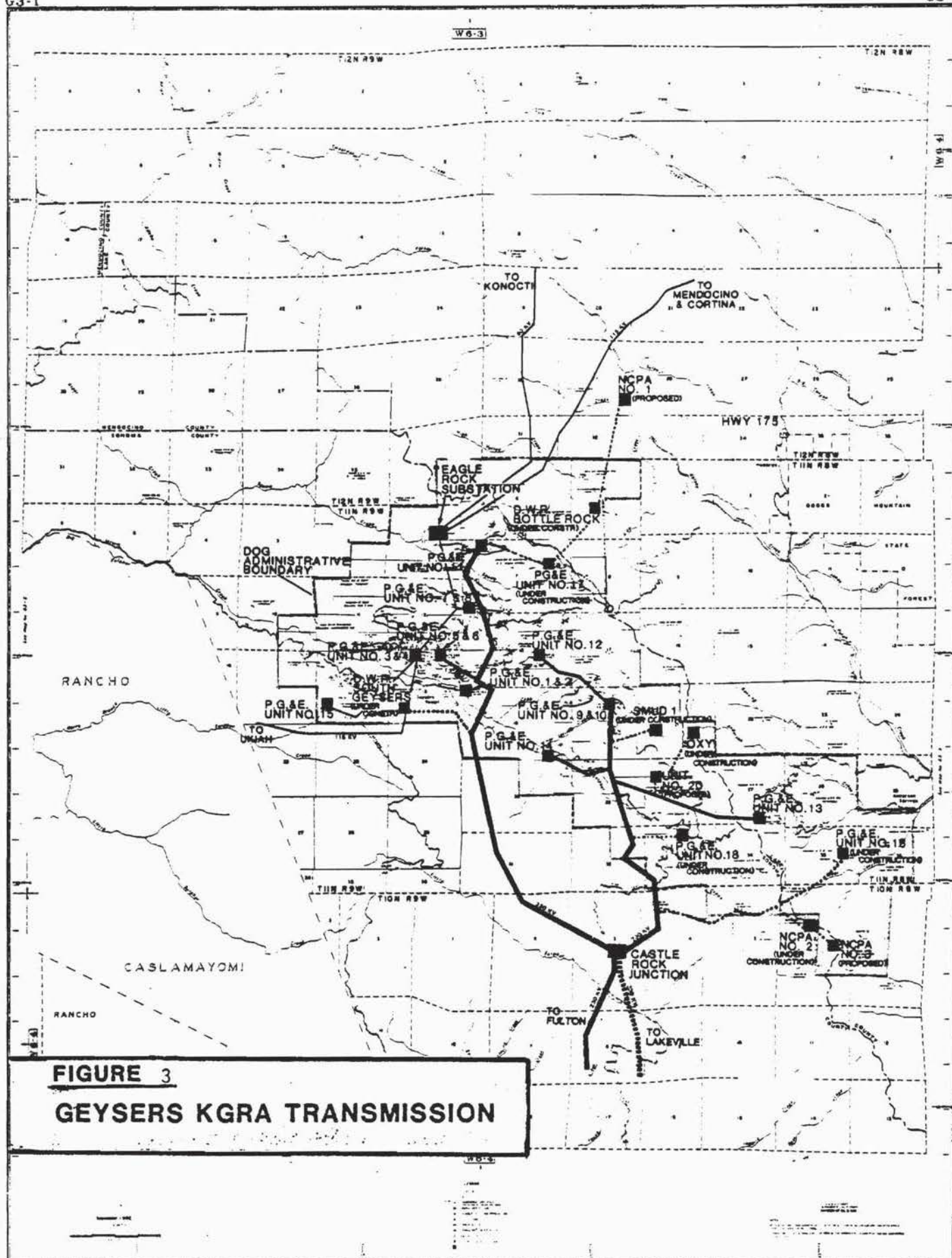


FIGURE 3

GEYSERS KGRA TRANSMISSION

B. Initial Disagreement

Staff initially sought to require PGandE to increase transmission capacity in the KGRA by constructing an additional collector line as early as 1984, in conjunction with the Unit 20 certification proceedings. PGandE agreed that additional collector capacity would be needed but asserted that such capacity could be deferred until 1988. On May 5, 1982, Staff requested PGandE to provide certain data regarding the economic analysis on which it contended that construction of the collector line should be delayed. In its response of June 4, 1982, PGandE indicated that it would indeed provide such data but, due to the complexity involved, could not do so until January 1983. Since a data submission at this point could prevent impact consideration of the collector line issue within the context of the Unit 20 proceedings, Staff moved that the Committee order PGandE to provide the information by mid-August 1982 (July 16 RT at 44).

After considering Staff's motion, the Committee issued an Order requiring the parties to address the Commission's jurisdiction to condition certification of Unit 20 upon construction of the additional collector line. On August 31, 1982, Staff withdrew its motion to compel PGandE to provide the data requested, citing the fact that the parties had reached stipulations on the issue. The Committee accepted Staff's withdrawal of the motion on September 8, 1982.

C. Compromise

At the September 17, 1982 Prehearing Conference, Staff explained that the stipulations reached required PGandE to perform a comparative analysis of

building an additional collector line in 1986 and 1987, as compared to 1988 as originally intended by PGandE. Based upon the results of this study, PGandE has agreed to file an application to build the line by 1986 or assume the burden of proving why construction by such time is not desirable or feasible. The Committee ordered that the parties to present testimony during the evidentiary hearings to clarify the accommodations reached (September 17 RT at 16-19).

At the October 25, 1982 evidentiary hearing, Staff indicated that the tapline connecting Unit 20 with the Unit 13 tapline (and thence the eastern collector circuit) was acceptable as proposed by PGandE. (Id. RT at 468). Staff elaborated on its concern, however, that the eastern collector circuit would be at 90 percent capacity by the time Unit 20 is added and that, based on line losses, PGandE would suffer substantial economic detriment were construction of an additional collector line delayed until 1988 as originally proposed (Id. RT at 469-470). The Staff witness further proposed a route for the new collector line, although clarified upon cross-examination that the routing was only suggested and could be varied depending on future events (Id. RT 471, 493-495).

The upshot of the extensive testimony was that the stipulation offered to the Committee requires PGandE to file an application in July 1983 to build an additional collector line to provide KGRA transmission service in 1986, or accept the burden of establishing why a later date should be found acceptable (Id. RT 481). Both PGandE and Staff view this as an acceptable accommodation addressing Geysers KGRA transmission issues (Id. RT 513; 536-537). In further clarifying the stipulation reached,

PGandE's witness testified that, in his opinion, January 1, 1986 would be the earliest practical operating date for the proposed additional collector line (Id. RT at 544).

D. Discussion

In the PMR (at page 137), based on the extensive discussions of record, the Committee was persuaded that the joint stipulations offered by Staff and Applicant adequately addressed the Geysers area transmission line engineering concerns. Thus, the Committee viewed a July 1983 application for construction of a third collector line as reasonable, and a January 1, 1986 operational date as desirable. The Committee was also satisfied that placing the burden of proof upon PGandE to demonstrate why such operational date is not desirable (should the occasion arise) is the proper allocation of responsibility. The Committee also noted that the agreements do not address the question concerning the proper forum in which to file the collector line application, and expresses no opinion on this matter at this time. The Committee did, however, recommend that the Staff participate in the Public Utilities Commission proceedings for the Certificate of Public Convenience and Necessity on Unit 20, and present its collector line analysis if deemed appropriate. Should PGandE file the collector line application with the PUC, the Committee felt that the Staff should actively participate in such proceeding.

Finally, the Committee noted that Staff Recommendation "V.C" (Exhibit 4, pp. 18 - 19) was much discussed at the October 25 evidentiary hearing.

This recommendation seemingly required transmission system planning data regarding the timing of any additional Geysers KGRA outlet line (subsequent to the previously certified Geysers to Lakeville line) to be filed with the next geothermal filing by PGandE. Although discussions of record seemingly sought to interpret this data requirement to apply to a geothermal filing by any Applicant (see, e.g. October 25 RT at 517), the Committee in including the recommendation as a Condition, intended to require such data of PGandE only in the context of a subsequent geothermal application by that utility.

PGandE raised objection to the inclusion of this Condition at the December 21 Conference (December 21 RT at 73-75) and counsel, in a letter dated December 29, 1982, amplified the Applicant's reasons for desiring the Condition struck or modified. Essentially, PGandE contested the Condition since it does not plan to construct another line out of the Geysers. The Applicant does agree, however, to provide pertinent data and studies to the Northern California Power Agency upon request should that organization figure prominently in construction of the next KGRA outlet line. Commission staff, in its January 7, 1983 comments, stated that the Commission should "formally notify" PGandE that transmission planning data for the next outlet line would be expected with its next geothermal filing, but that conditioning certification of Unit 20 upon submission of such data was not necessary.

The Commission agrees with Staff that submission of this data as soon as feasible is preferable. Thus, the Commission acknowledges the Staff position that the data should be submitted with PGandE's next geothermal filing, and directs Staff to draft a letter to PGandE conveying this

expectation. The Commission will not therefore impose submission of this data as a Condition of Certification, but will instead rely upon good-faith cooperation by PGandE in supplying the data should such data be needed at the time of its next geothermal filing.

The Commission's decision not to require filing of this data as set forth in the PMR rests in large part on PGandE's agreement, as set forth in Condition 1 below, to produce the data upon the request of NCPA or such other entity as may seek to construct the next KGRA outlet line subsequent to the approved Geysers to Lakeville line. By imposing this Condition, the Commission feels that it has insured that the transmission system planning data will be provided, at the worst, by the time certification is sought for an additional outlet line.

Discussion at the February 4, 1983 Committee hearing indicated certain perceived deficiencies in PGandE's January 1, 1983 transmission line submittal, as well as a desire by the Applicant to maintain flexibility in providing future information on the additional collector line. Based on the clarifications recorded at this hearing (February 4 RT 32-73), the Commission has modified the Conditions which originally appeared at pages 155 - 157 of the Committee's Proposed Decision.

COMMISSION FINDINGS AND CONCLUSIONS

The Commission finds that the Unit 20 tapline, as proposed by PGandE, is acceptable. The Commission further finds that the stipulations regarding an additional Geysers KGRA collector line, as incorporated in the Conditions below and in Appendix A, adequately address this issue. Finally, the Commission endorses Staff participation before the California Public Utilities

Commission in the Certificate of Public Convenience and Necessity proceedings on Geysers Unit 20 and, if appropriate, on proceedings involving construction of the additional Geysers collector line.

GENERAL CONDITION

1. PGandE shall provide, upon the written request of NCPA or other lead entity, transmission system planning data in regard to the timing of the next outlet line (subsequent to Geysers-Lakeville line). These studies shall consider all potentially viable lines (including modifications to existing lines) with economic and environmental merit. The studies shall consider routing, voltage, conductor size, and other relevant economic and environmental factors, or such other factors as NCPA or other lead entity may request. The studies shall be provided to NCPA or other lead entity within a reasonable time after their request. PGandE may require NCPA or other lead entity, and all other participants involved, to reimburse it for the actual costs incurred in producing said studies.

PART NINE: Discussion Area

AIR QUALITY

A. Summary

In evaluating the sufficiency of the proposed pollution abatement system, the Commission relied heavily upon the Determination of Compliance (DOC) prepared by the local air pollution control officer. The responsible local official, the Northern Sonoma County Air Pollution Control Officer (NSCAPCO), presented his DOC at the October 26, 1982 evidentiary hearing.

PGandE's Geysers Unit 20 will utilize an atmospheric emission control system to minimize release of air pollutants. This system will consist of a surface condenser, Stretford unit, and a hydrogen peroxide or equivalent secondary condensate treatment. While the DOC provides that the plant is being permitted on the basis of a hydrogen peroxide secondary abatement system (DOC Condition 3.c), it further provides that an equally effective alternate system may be used upon District approval (DOC Condition 3.d;9).

The NSCAPCO further testified that, with full implementation of the provisions contained in the DOC (October 26 RT 665 - 672), Unit 20 will be permitted to emit no more than 5 pounds of hydrogen sulfide (H_2S) per million pounds of steam or not more than 250 lbs./day; this equates to 10.4 pounds of H_2S per hour. Unscheduled outages of the Unit 20 facility will be limited, by DOC Condition 4, to a total of 12 in any consecutive 12-month period. The NSCAPCO concluded that operation of Unit 20 will comply with applicable air quality emissions limitations (Id. RT at 695 - 696). Witnesses on behalf of the Applicant and the Staff also

testified in support of the DOC and similarly concluded that Unit 20 will comply with applicable rules and that the plant's emissions would not result in a significant adverse impact to the environment (Id. RT at 79 - 780; 812 - 813).

The Lake County Air Pollution Control Officer (LCAPCO), commenting as an interested member of the public, strongly disagreed with the conclusions reached by these three witnesses in general, and with certain provisions of the DOC in particular. The LCAPCO argued three major points: 1) the DOC is insufficient because it inadequately provides for control of outages and the release of unabated H₂S emissions during stacking episodes; 2) the NSCAPCO failed in his obligation to define and require the Best Available Control Technology (BACT) for Unit 20;* and 3) the DOC is inconsistent with the Prevention of Significant Deterioration (PSD) permit conditions issued by the Environmental Protection Agency (EPA) (Id. RT at 822 - 824).

Much of the air quality dispute centered around Condition 4 of the DOC. This Condition is designed to reduce steam stacking due to unscheduled outages. The Lake County APCO contended that the DOC must contain requirements for utilization of a specific technology or equivalent proven to be reliable and which will abate emissions to an appropriate level (Id. RT at 737 - 742). In the LCAPCO's view, requiring Unit 20 to use a turbine bypass system would satisfy his interpretation of the BACT requirement.

*PGandE and Staff contend that although NSCAPCD rules do not necessarily require BACT for Unit 20, Condition 4 of the DOC nevertheless constitutes BACT.

The Northern Sonoma County APCO, as the responsible official, detailed his interpretation of District rules as requiring adherence to a performance standard rather than a specific technological requirement. The NSCAPCO stated that DOC Condition 4 was a "major departure ... in terms of trying to have the utility decrease the number of outages or such events that would result in stacking of steam to the atmosphere" (Id. RT at 676, lines 3-7). He however reiterated his belief that by limiting emissions to specified levels, not only will air quality be protected but developers will necessarily be required to use technologies which are capable of meeting the required level of performance in abating emissions (Id. RT 677 - 678). The NSCAPCO also stated that Unit 20 as proposed constitutes BACT as he interprets the term and that it should operate in compliance with all applicable rules (Id. RT at 687 - 689; 693).

B. Discussion

The Commission feels that the LCAPCO raised noteworthy points during the evidentiary hearing and in his January 5, 1983 comments on the PMR concerning the ambiguities regarding BACT and the status of the Federal PSD permit. These two points merit further elaboration.

By regulation and pursuant to the Joint Policy Agreement with the California Air Resources Board, a DOC occupies a unique position in Commission certification proceedings. The Commission traditionally gives great weight to an APCO's Determination of Compliance; if unchallenged, the DOC is customarily adopted as part of the Commission's Conditions of Certification. If challenged as in the present case, the Commission is

faced with evaluating the sufficiency of the DOC in light of the reasons and evidence offered for discrediting it.

The LCAPCO, during the hearings and in his comments on the PMR, basically contended that the project does not incorporate BACT. This is contrary to the NSCAPCO's contention that meeting the designated performance standard fulfills BACT requirements (October 26 RT at 679, 688). The record reflects the LCAPCO's contention that other recently certified power plants utilize what are, in his view, more acceptable technologies such as twin-turbines (NCPA 2 and NCPA 3) or the turbine by-pass (DWR Bottlerock). Thus, it appears as though the LCAPCO's comments, apparently also reflected by the Sierra Club (comments of January 5, 1983), characterize Unit 20 as a "step backward" because it is not required to use these or other more innovative designs.

The points raised by the LCAPCO concerning methods of meeting stacking emissions limitations fall short of establishing that the standards adopted by the NSCAPCO in his DOC will result in violations of any air quality rules.* Rather, given the ambiguous nature of the applicable rules, the "performance" standard suggested by the NSCAPCO seems to address project impacts adequately. The NSCAPCO's determination is apparently supported by the ARB (letter of October 26, 1982), and there is simply a lack of credible evidence sufficient to support alteration of the DOC. Staff, Applicant, and the NSCAPCO have testified that Unit 20

*It should be noted that the LCAPCO, in his January 5, 1983 comments, that the methodology used to predict emissions levels is in "serious error" and "allows zero air emissions for future Lake County development."

will meet all applicable rules. No one has offered a persuasive alternative to that proposed, and the evidentiary record is insufficient to support imposition of the twin-turbine or turbine bypass for Unit 20.

Thus, the evidence of record supports the conclusion that Unit 20 as proposed and the DOC as submitted meet applicable legal requirements. The Commission expresses no opinion regarding the "performance standard" approach* taken by the NSCAPCO, but rather accepts the DOC as sufficient based upon the weight of the evidence of record. The Commission further acknowledges that Unit 20 does not incorporate the "more innovative" technologies suggested by the LCAPCO and others, and recommends that Staff explore available technological options as appropriate in future siting cases.

PGandE has appealed the PSD permit issued by EPA, and EPA has not yet acted on the appeal. This pending appeal of the PSD permit thus creates an aura of uncertainty. Clearly, PGandE must comply with Federal conditions contained in this permit. The Air Resources Board has stated that the conditions contained in the NSCAPCO's Determination of Compliance are not inconsistent with PSD requirements or applicable air quality rules (letter of October 26, 1982). The Committee, however, required the parties to provide additional information on this matter at the December 21 Conference, including any specific impact the Federal PSD permit conditions could have on the Commission's conditions of certification (see PMR, pages 143 - 144).

*The LCAPCO reiterated his basic disagreement with the "performance" standard vis a vis specification of particular technology in his January 5, 1983 comments on the PMR.

At the Conference, PGandE submitted a memorandum (dated December 15, 1982) detailing the following points:

1. The PSD permit issued on July 30, 1982 is presently in full effect, and must be utilized within 18 months.
2. Condition IX C of the PSD permit requires PGandE to "be responsible for control of H₂S emissions during steam stacking". In PGandE's view, this may be in potential conflict with DOC condition 4 which requires the NSCAPCO to approve a stacking control system which will be installed and operated by Union Oil, the steam supplier.
3. PGandE appealed condition IX C of the PSD permit on August 26, 1982. Final action by EPA is pending.

[At the February 4, 1983 Committee Hearing, PGandE submitted a memorandum clarifying its prior statements outlined above. This new information indicated that the PSD permit is not actually "final" because of pending EPA review. PGandE stated, however, that the status of the PSD permit should in no way delay CEC action on the Geysers 20 project (February 4 RT 74-79). Staff agreed with this statement.]

Thus, the crux of the PSD problem, as pointed out by the LCAPCO, is that the DOC does not specifically allocate responsibility for control of stacking emissions to PGandE, as does the currently effective federal PSD permit. PGandE has clearly expressed its position that Union Oil, as steam supplier, is responsible for stacking controls, and has appealed the PSD permit on this basis. Moreover, PGandE urges the Commission to certify Unit 20 pending EPA resolution of this question. Commission

staff and the ARB also agree that the certification should not be delayed awaiting Federal action.

Obviously, the matter is not as settled as the Commission would prefer. However, it is apparent that stacking emissions will be controlled regardless of the outcome of the PSD appeal. If the Federal authorities allocate responsibility for controlling H₂S stacking emissions to PGandE, then the Applicant must necessarily comply regardless of any ambiguities or omissions in the DOC. If, however, PGandE's position prevails, then the steam supplier must ensure that the stacking requirements are met. The Commission accepts Applicant's characterization that the issue involved is jurisdictional, for the record indicates that, in either event, the stacking emissions will be controlled within applicable limitations. Thus, the Commission is persuaded by the weight of credible evidence and opinion that the unsettled nature of the final PSD requirements and the potential technical conflict with the DOC present no reason for modifying the conditions presented by the local Air Pollution Control Officer.

COMMISSION FINDINGS AND CONCLUSIONS

The Commission accepts the Findings jointly proposed by Staff and Applicant. These are contained as Appendix G of this Report and contain a detailed delineation of the rationale for accepting the DOC as submitted by the NSCAPCO. The Commission finds that with implementation of the Conditions of Certification and Compliance requirements, Geysers Unit 20 will be designed, sited, and operated in compliance with the laws, ordinances, and standards identified in the pertinent portion of Appendix A. The Commission further finds that Geysers Unit 20 will not cause any significant adverse air quality impacts.

APPENDIX A
COMPLIANCE PLAN
FOR
PGandE GEYSERS UNIT 20

(82-AFC-1)

This Compliance Plan is intended to be only a ministerial reorganization of the substantive requirements contained in the Committee's Proposed Decision, as amended, and approved by the full Commission on February 9, 1983.

February 1983

California Energy Commission

PREFACE

The Commission's certification is statutorily designated as "in lieu of any permit, certificate, or similar document required by any state, local or regional agency, or federal agency to the extent permitted by federal law" (Public Resources Code Section 25500). The Compliance Plan is the principal operative means of ensuring that conditions imposed are complied with. While arguably the Commission could perform the inspection and other like activities necessary to ensuring adequate construction, operation, and design of a power plant consistently with its preemptive licensing authority, it has, through the Compliance Plan, conceptually delegated these functions back to the agencies which would otherwise be responsible for performing permit issuance and inspection functions. Thus issuance of the consolidated Commission permit remains, but initial responsibility for enforcement of conditions is delegated. The Commission retains, again through the Compliance Plan, a monitoring function (pursuant to Public Resources Code Section 25532) as a means of tracking fulfillment of its conditions of certification. In cases of dispute, the Compliance Plan contains procedures available for resolution.

Thus, the Compliance Plan contains only a repetition of Commission-approved Conditions and Requirements. The "Compliance" element, per se, of the Plan is essentially a means of tracking condition fulfillment; the added dispute resolution mechanism reflects an expeditious method of clarifying or modifying conditions should circumstances so dictate. Commission delegation to local agencies, through the Compliance Plan, does not denigrate the preemptive power plant siting authority of its statutorily authorized certification.

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I. INTRODUCTION AND GENERAL PROVISIONS

Section 25532 of the Public Resources Code provides that the California Energy Commission (CEC) shall establish a monitoring system to assure that any facility certified is constructed and operated in compliance with air and water quality, public health and safety, and other applicable regulations, guidelines, and conditions adopted or established by the CEC or specified in the written decision on the application. The following plan is formulated to satisfy that directive for the PGandE Geysers Unit 20.

The CEC's jurisdiction extends only to the power plant and related facilities, including the transmission tap line to the point of interconnection with the power grid. The CEC's jurisdiction does not extend to the steam gathering or reinjection system, the well pads and access roads thereto, or the steam wells.

Significant features of the plan include:

- o Utilization of delegate agencies, where possible, to monitor specific elements of the compliance plan,
- o Compliance verification of each condition by a qualified professional,
- o Periodic compliance reports to be filed by PGandE,
- o An annual compliance report to be filed by PGandE, and
- o A dispute resolution procedure.

Delegate Agencies

The Warren-Alquist Act provides the CEC with exclusive siting authority for thermal power plants and related facilities. To the extent permitted by law, the CEC will delegate authority for compliance verification to various state and local agencies who have expertise in subject areas where specific requirements have been established as a condition of site certification. In the event that a delegate agency is unwilling or unable to participate in this program, the CEC will establish an alternative method of verification.

Verification of Compliance

Verification of compliance with the terms and conditions of certification shall be accomplished either by periodic compliance reports filed by PGandE, by appropriate letters from delegate agencies verifying compliance, by auditing project records, or by inspecting the power plant site and related facilities.

Periodic Compliance Reports

Information required by the compliance plan to be submitted by PGandE to the CEC shall be filed as periodic compliance reports. These reports shall be filed at least once each quarter, numbered consecutively, and contain as a minimum:

- o The current project construction or operating status;
- o A listing of compliance plan requirements scheduled during the reporting period, with a corresponding description of the status of the requirement, i.e., completed, not started, or in progress;

- o For those compliance plan requirements which PGandE had expected to satisfy during the reporting period but which were not satisfied, include a statement of how and when PGandE intends to satisfy the requirements;
- o A listing of any changes to the compliance plan which has resulted from negotiations between PGandE and the CEC or its delegate agencies; and
- o Notification of any filings made with other governmental agencies having permitting authority over any aspect of the project.

Annual Compliance Report

PGandE will submit an annual compliance report to the CEC which will contain the information required by the compliance plan to be filed on an annual basis. An explanation will be provided for any missing information, including an estimate as to when the information will be provided. The annual report shall summarize the primary compliance activities during the previous year.

Compliance Auditor

The CEC shall designate a compliance auditor for the PGandE Geysers Unit 20. The auditor will be responsible for implementing the approved compliance plan after certification, for maintaining the compliance record files, and for initiating the dispute resolution procedure.

All correspondence pertaining to PGandE Geysers Unit 20 compliance matters should be addressed as follows:

Compliance Auditor (82-AFC-1C)
California Energy Commission (MS-2000)
1516 Ninth Street
Sacramento, CA 95814

Noncompliance

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the CEC and can result in proceedings pursuant to Title 20, California Administrative Code, Article 4, Sections 1230 et seq.

Enforcement

The CEC's legal authority to impose legal sanctions for noncompliance is specified in Title 20, California Administrative Code, Sections 1230 et seq. and California Public Resources Code, Sections 25531(c), 25532, 25534, and 25900 et seq. Moreover, delegate agencies, as set forth in this document, are authorized to take any action allowed by law in accordance with the delegate agencies' statutory authority, regulations, and administrative procedures to ensure compliance with the terms and conditions of certification and applicable laws, ordinances, and standards.

CEC may exercise all administrative measures authorized by applicable law in the event of noncompliance.

Compliance Record

PGandE will maintain for the life of the project files of all "as-built" documents referenced in this report. Staff of the CEC and delegate agencies will, upon reasonable notification, be given access to the files.

The CEC will maintain as a public record:

- o All attestments to the fulfillment of legal requirements,
- o All periodic and annual compliance reports filed by PGandE,

- o All documents relative to complaints of noncompliance filed with the CEC, and
- o All documents relative to this compliance plan brought before the CEC.

Confidential Information

Any information which PGandE deems proprietary shall be submitted to the Executive Director pursuant to Title 20, California Administrative Code, Section 2505(d). Any information which is determined to be confidential shall be kept confidential as provided for in Title 20, California Administrative Code, Sections 2501 et seq.

Dispute Resolution Procedure

The following mediation procedure is designed to resolve informally, when possible, disputes concerning interpretation of compliance with the requirements of the PGandE Geysers Unit 20 Compliance Plan. Either PGandE, the CEC, or any other party may initiate this procedure when time is critical in resolving a problem or when the alleged noncompliance does not appear significant enough to warrant a more formal investigation and proceeding.

The procedure is not intended to be a substitute for or prerequisite to the more formal complaint and investigation procedure specified in Title 20, California Administrative Code, Sections 1230 et seq. Nor may the procedure be used to change the terms and conditions of certification as approved by the CEC.

The procedure encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a matter cannot be resolved, then the matter must be referred to the CEC for consideration.

- o Request for Informal Investigation--Any individual, group, or agency may request the CEC to conduct an informal investigation of an alleged non-compliance with the CEC's terms and conditions of certification for the PGandE Geysers Unit 20. All requests for an informal investigation shall be made to the CEC compliance auditor by either telephone or letter.

Upon receipt of a request for investigation, the compliance auditor shall promptly notify PGandE by telephone and subsequently by letter of the allegation. All known and relevant information of the alleged noncompliance shall be provided to PGandE and to the CEC staff. PGandE shall promptly investigate the matter and within seven working days shall provide a written report of the results of the investigation, as well as all corrective measures undertaken to the compliance auditor and the person requesting such investigation. If the exigencies of the noncompliance demand otherwise, the compliance auditor may request PGandE to provide an initial report within 48 hours by telephone, followed by a written report filed within 7 days.

- o Request for Informal Meeting--In the event that either the party requesting an investigation or the CEC staff is not satisfied with the PGandE report and investigation of the event, as well as the corrective measures undertaken, either may, by written request to the compliance auditor with a copy to PGandE, request a meeting with PGandE. Such request shall be made within 14 days of PGandE's filing of its written report as described above. Upon receipt of such a request, the compliance auditor shall:

- Immediately schedule a meeting with the requesting party and PGandE to be held promptly at a mutually convenient time and place,

- Secure the attendance of appropriate CEC staff and staff of any other agency with general jurisdiction and expertise in the subject area of concern,
 - Conduct such meeting in an informal and objective manner to encourage the voluntary settlement of any dispute in a manner which is fair and equitable to the interests of all parties, and
 - Promptly after the conclusion of such meeting, prepare a memorandum which fairly and accurately sets forth the positions of all parties and any conclusions reached and distribute copies to all attendees.
- o Request for Commission Hearing--If either PGandE, CEC staff, or the party requesting an investigation is not satisfied with the results of said informal meeting, such party may, within 10 working days, request in writing a hearing before the Committee of the Commission, designated for the hearing of such matters. The Committee shall, upon receipt of a written request stating the basis of the dispute and the attempt at informal resolution thereof, grant a prompt hearing on the matter consistent with the requirements of noticing provisions and shall have authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction.
 - o Appeal from Committee to Commission--Pursuant to Title 20, California Administration Code, Section 1215, PGandE, CEC staff, or the party requesting an investigation may request review of any committee order or decision.
 - o All recommended amendments to conditions of certification resulting from Committee investigations shall be approved by the full Commission.

Section 1: AIR QUALITY

A. Applicable Laws, Ordinances, Standards, and Practices

- o Northern Sonoma County Air Pollution Control District (NSCAPCD) Rules and Regulations, including but not limited to 220, 230, 260(b), 400(a), 410(a), 420(d), 430, and 455 (a and b).
- o Clean Air Act and implementing federal regulations.
- o California Health and Safety Code, and implementing regulations.

B. Requirements

- 1-1. The NSCAPCD shall perform all duties and functions normally conducted by the APCD and shall have authority to issue a Permit to Operate, collect the permit fees, levy fines, order correction of operational or mechanical procedures or functions, and perform compliance tests. The established NSCAPCD appeal procedures shall apply for all contested NSCAPCD actions.

Verification: PGandE shall summarize in an annual compliance report to the CEC any significant interactions related to Geysers 20 with the NSCAPCD. PGandE shall immediately inform the CEC and ARB in writing of any formal appeals filed with the NSCAPCD.

- 1-2. PGandE shall comply with the requirements specified in the NSCAPCD document entitled "Determination of Compliance," dated September 16, 1982.

NSCAPCD DOC Conditions:

1. This shall be your DOC for construction and temporary Permit to Operate once construction is complete. The District must be notified approximately 30 days prior to commencing construction and operating the geothermal power plant and control system. The Applicant shall allow representatives of the District to enter the premises in order to observe construction testing as is necessary to determine compliance with the rules and regulations of the District and the terms and conditions of this DOC for construction and temporary Permit to Operate. The Applicant shall notify the District when construction is completed.
2. In the operation of PGandE Unit 20 geothermal power plant the Applicant shall control H_2S emissions to 5 lbs H_2S per million pounds of steam or 10.4 lbs H_2S/hr as well as comply with all applicable federal, state, and local laws, standards, and ordinances and the terms and conditions set forth herein.
3. The atmospheric emission control system described in the 82-AFC-1 shall be utilized. The system as described shall consist of the following concurrently operating major components:
 - a. A surface condenser to facilitate the partitioning of H_2S into the noncondensable gas phase,
 - b. A Stretford unit as specified in the AFC to reduce the H_2S concentration in the treated noncondensable gases to 125 ppm by volume or less, but in no event greater than 0.5 lb/hr,
 - c. Secondary condensate treatment which includes sufficient hydrogen peroxide (H_2O_2) and catalyst injection and reaction time to ensure the power plant will comply with the emission limitation specified in Condition 2, and
 - d. An equally effective alternative to (c) provided the District gives prior approval.

In addition,

- a. The emission control system specified above shall be properly winterized, and
 - b. If a solids removal system is necessary as a result of solids formation in condensate, such facility shall be incorporated into the system.
4. The Applicant shall, in any consecutive 12 month period limit unscheduled outages to no more than a total of 12. The following shall not be used in computing the total outages:

- a. Scheduled outages (defined as outages with 24 hours advance notice* between steam supplier and Applicant),
- b. Steam supplier induced outages (such as pressure surge, strainer plugging, etc.), and
- c. Outage of less than 2.0 hours.

The Applicant shall not start-up Unit 20 until a control system, approved by the District, for stacking emissions is installed and operational by Union Oil Company of California. The outage "count" shall start seven months after initial start-up (defined as once steam passes through the turbine) of Unit 20 in order to allow steam supplier and Applicant to gain experience with Unit 20. A violation of the above performance standard is considered a violation of this condition.

The Applicant shall, on a monthly basis, provide the District with the number of outages, cause of each outage, and the balance of outages for the past 12 months. The Control Officer may change the frequency of reporting at the request of the Applicant. The Applicant shall inform the District and CEC when the total number of outages reaches 12 or greater, within 5 working days. The Applicant shall allow the District and CEC to inspect all operating logs to verify the total number of outages. These requirements are in addition to the applicable requirements of Rule 540.

The Applicant shall submit by January 15, 1983, to the District and CEC a preliminary "plan" on how the Applicant plans to achieve the outage standard set forth above. This good faith effort shall consider those measures outlined in the next paragraph and shall contain an explanation as to why a newer approach will meet the outage standard when compared to the current operations. Other than the submittal date this preliminary "plan" shall be nonbinding.

In the event the Applicant is not able to meet the standards specified above, the following shall be required. Applicant shall prepare and submit a revised "plan" to the Control Officer, within 30 days of the end of the month in which the outage limit is exceeded to achieve the outage standards set forth above. At a minimum, the measures to be considered in the "plan" shall include: operational protocol, improved coordination of the power plant and steam field operations, improved alarming and control systems, increased duration of manned operation of the power plant, improved preventative maintenance, and design modifications as may be indicated by the operating histories of Unit 20 and other similarly designed PGandE units.

*Except in the case of Unit 20 outages resulting from an abundance of hydro-power in which case a scheduled outage shall be defined as one hour's notice.

Within 30 days of receipt of the "plan" the Control Officer shall determine whether the "plan" is satisfactory and, if so, shall approve the "plan." Upon approval of such "plan" it shall supercede and become a part of the terms and conditions of the DOC and shall be incorporated in any certification and any Permit to Operate issued for Geysers Unit 20 at this site.

(The intent of this Condition 4 is for the Applicant to reduce by some 45 percent over the life of the proposed unit, the total steam stacking resulting from unscheduled power plant outages when compared to the current practices and history of similar Units 12 and 14 from 1979 through 1981. Although one method to achieve such a reduction would be the use of a turbine bypass, the Applicant is confident that alternate measures as mentioned for inclusion in the "plan" will be equally effective. In any event the net effect will be reduced steam stacking to the atmosphere.)

5. The Applicant shall design and install cooling towers to have a drift rate of no more than .002 percent of the circulation water flow as described in the AFC.
6. The off-gas vent to the atmosphere with untreated vent gas shall be used only during upset/breakdown situations. During periods of cold start-ups, the H₂S vent gas treatment system shall be operated to preclude the release of untreated vent gases to the atmosphere unless it is required for human or equipment safety.
7. The Applicant shall comply with all appropriate sections of Rule 540. All breakdown information and responses shall be public record when not in conflict with Public Records Rule 150.
8. All construction areas in the immediate vicinity and under the Applicant's responsibility for the power plant during the construction phase shall be properly treated to meet the requirements of Fugitive Dust Rule 430.
9. The Applicant will be licensed on the basis of a hydrogen peroxide/catalyst and Stretford/surface condenser system. However, the Applicant may propose to use other means to comply with the hydrogen sulfide emissions limitation of Condition 2. The Applicant shall submit, no later than two years* prior to the scheduled commercial operation, the conceptual design of the finally selected abatement system if different than proposed in the AFC along with supporting documents, including

*If the Applicant can establish a different system that could be operational at the start-up date, then the two-year requirement can be waived by the CEC and the District.

data demonstrating compliance with the emissions limitation of Condition 2. Such data shall be submitted to the CEC, the ARB, and the District within 60 days prior to the date intended for commencement of the final design of the proposed system. Final design shall not proceed until the District determines that the material submitted is adequate to demonstrate compliance with the H₂S emissions limitation. The District shall render a determination within 30 days following the receipt of the material from the Applicant.

10. At least 60 days prior to scheduled commercial operation, the Applicant shall submit to the District, for approval, a detailed plan for testing the performance of the PGandE Unit 20 power plant H₂S abatement system at normal full load operation. A copy of the plan shall also be sent to the ARB for comment. Normal full load for this purpose is defined as operating at a minimum of 90 percent of the 2,000,000 lbs/hr steam flow capacity. The District shall approve, disapprove, or modify the plan within 30 days of receipt from the Applicant. Within sixty (60) days after achieving the highest practical production rate of the geothermal generating unit but no later than 180 days after initial start-up of the plant, the Applicant shall conduct performance tests on the power plant.
11. The Applicant shall conduct performance tests as delineated in CEC Public Health Compliance Plan Condition 5 (dealing with well test steam constituent analysis). Test results shall be furnished to the district.
12. (Intent--The District fully believes H₂S emissions from power plants should be continuously monitored for compliance purposes because of the changing H₂S content of geothermal steam due to its nonhomogeneity or due to steam supplier switching steam supplies. However, specific equipment has not been yet adapted to geothermal environment to a fully satisfactory extent. Therefore, the Applicant shall pursue a program to develop suitable monitoring, but in the meanwhile they shall be required to implement provisions of Part "A" of this condition below.)

A. Until such time as a continuous emission compliance monitor is installed, the Applicant shall be held responsible for the following commitments relative to a computer based alarm system (CBAS):

1. Applicant shall install and have operational commencing as of unit start-up a computer based system which monitors the following critical equipment on or about the Stretford facility and the secondary abatement:

a. Position of the Stretford bypass valve,

- b. Circulation of the Stretford chemicals,
 - c. Operation of oxidizer blowers, and
 - d. Chemical feed pumps of secondary system.
2. During operation, this system shall detect, alarm, and log the failures or operation of the above equipment or systems which could lead to a significant loss of abatement. This CBAS system shall be used to initiate an investigation by plant operators, manual H_2S concentration tests of the Stretford exhaust, and/or corrective actions as necessary. Such investigation, testing, or corrective action shall be logged by the plant operator. The computer system shall be maintained, and any failures or alarms shall be logged, along with the actions taken. The Control Officer will determine the applicability of this system as a monitoring system relative to the reporting requirements of District Rule 540.
3. Plant personnel will also normally inspect the operating Stretford and secondary abatement facilities once per shift, checking for proper operation. Stretford solution chemistry and off-gas H_2S concentration will be checked weekly when the system is in operation.
4. Computer system alarm logs and operator logs showing normal checks and abnormal or alarm conditions, responses, and corrective actions shall be available for inspection on site upon request.
5. Quarterly reports on the performance of the CBAS shall be submitted to the APCD.
- B. Until such time that a continuous emission monitoring system is installed or in the event that the Control Officer determines that monitors meeting the specifications below are not commercially available within 1 year after initial start-up, the Applicant shall conduct source testing no less than once every 30 operating days to ensure compliance with (DOC) conditions. Part "A" of this condition is to be in effect commencing upon start-up. The testing procedures to determine compliance with DOC conditions shall be submitted 90 days prior to start-up for District approval. A log of such testing shall be maintained and made available to the District upon request.
- C. A summary of monitoring data or source test data is to be forwarded to the District every 30 days. This summary is subject to the requirements of Rule 455(c).

D. The Applicant shall submit within a reasonable period of time (target date approximately January 14, 1983) to the District for approval, a proposal which outlines an "in-house" development program for continuous compliance H₂S monitoring devices to meet the following requirements:

1. H₂S emissions shall be monitored by measuring the following parameters: (a) total process mass or volume flow rates and (b) H₂S concentrations within those process streams.
2. The following process streams are to be sampled: (a) the treated gas outlet of the Stretford unit, (b) the main condensor condensate prior to any secondary abatement chemical injection or the condensate upstream of the cooling tower after chemical injection, and (c) the cooling tower. It is allowed that item (c) can serve in lieu of (a) and (b), therefore, the Applicant can pursue item (c) first. However if (c) proves infeasible, then items 2(a) and (b) would have to be pursued as a means of overall unit compliance monitoring.
3. As a development goal the H₂S monitoring devices should strive for a relative accuracy of +10 percent of full scale (as compared to a standard reference method or reference analysis acceptable to the District), an average weekly calibration drift of +10 percent (assumes weekly calibrations averaged over a 30 day period), and provide over a 30 day period), and provide measurements at least every 15 minutes. Monthly data capture should be 80 percent or better of the operational hours, and the monitor should not require more than 16 hours of maintenance per month. The Control Officer may for good cause change the specifications above.
4. Flow rate measuring devices must have accuracies of +5 percent at 40 percent to 120 percent of total flow rate and calibrations must be performed as necessary and at least quarterly. The Control Officer may for good cause change the specifications above.
5. All monitoring records and calibration information must be made readily accessible to District staff upon request.

Once an "in-house" program has met District approval it shall be implemented.

E. Participation by the Applicant in a cooperative continuous emission monitor development program will be deemed acceptable in place of Part 12.D above provided the goals and

requirements set forth are the same as those identified in 12.D.1 through 12.D.4 and it is submitted within a reasonable period of time (target date approximately January 14, 1983). Such a cooperative program must first meet NSCAPCD approval prior to it being implemented. Since such a venture willing to offer its assistance in obtaining relief from any applicable time restrictions provided the Applicant and cooperative partners demonstrate adequate commitment to such a program.

- F. Within 60 days after completion of the program described in 12.D or 12.E, Applicant shall submit a final report to the District on the availability of acceptable continuous monitors which satisfy criteria 12.D.1 through 12.D.4. Within 30 days of receipt of the report, the Control Officer shall determine whether or not such monitors are available and should be installed at Unit 20.
 - G. Any dispute relative to this Condition 12 may be heard before the Hearing Board of the NSCAPCD and such resulting decision shall be honored.
- 13. Participation by the Applicant in the Geysers Air Quality Monitoring Program (GAMP) shall be deemed to satisfy all the ambient air quality monitoring requirements of the DOC. However, (1) if the Applicant does not participate in such program or (2) if the Applicant does participate and GAMP is completed prior to completion of the equivalent of one full year of ambient monitoring after Unit 20 begins initial start-up, then the Applicant can be required by the Control Officer to install and operate one H₂S/meteorological monitoring station/TSP High Volume station at a location approved in advance by the Control Officer for a period not to exceed two consecutive years beginning one year prior to the power plant's initial start-up (July 1985 unless the Applicant has bonafide reasons based upon construction delays). Credit for participation in GAMP shall be given toward the two years requirement for any time overlaps relative to the initial start-up time.
 - 14. Within 90 days after the scheduled commencement of commercial operation the Applicant shall file with the District an application for a Permit to Operate together with all appropriate information.
 - 15. Once construction has been completed and operation has commenced all equipment must be properly maintained and operated and kept in good working condition at all times.

Verification: PGandE shall provide the CEC with copies of all reports relating to Unit 20 submitted to the NSCAPCD and copies of all notices relating to Unit 20 received from NSCAPCD.

- 1-3. PGandE shall obtain written approval from both NSCAPCD and CEC before using any abatement systems other than the hydrogen peroxide/catalyst and Stretford/surface condenser, as approved in the CEC certification, to control H₂S emissions.

Verification: PGandE petition the CEC for an amendment to the CEC certification. CEC in consultation with the NSCAPCD shall issue a written approval for any changes granted prior to beginning construction of any alternative H₂S emissions abatement system.

- 1-4. DOC Condition 10 requires submittal of a detailed plan for testing the performance of the Unit 20 H₂S emissions abatement systems at normal full load operation. If continuous H₂S monitors are available as described in DOC Condition 12, PGandE shall ensure that the detailed plan includes the following test parameters: (1) the test data shall reflect a minimum of 80 percent of the gross electricity-generating capacity, and (2) in the event that at least 30 days of qualifying data could not be obtained during the 90-day test period specified in the Determination of Compliance, PGandE shall continue to collect test data until the required information has been obtained. The application for a Permit to Operate shall be filed as specified in DOC Condition 14.

Verification: PGandE shall provide the CEC with a copy of the detailed plan submitted to the NSCAPCD for review and approval and a copy of the plan as approved. In addition, if the test period extends beyond the initial 90 days after commercial operation, PGandE shall file a supplementary report with the CEC and the NSCAPCD which reflects all the results of the performance test.

1-5. NSCAPCD can require PGandE to install and operate one ambient monitoring station (with TSP) for H₂S for a one-year period before initial operation and one year after initial operation in a manner to be specified by the NSCAPCD in consultation with LCAPCD, ARB, and CEC. To meet this requirement, PGandE can participate in the Geysers Air Monitoring Program (GAMP) if it is implemented. If the GAMP ends before completing the equivalent of the above, the NSCAPCD can require PGandE to continue monitoring to meet the requirement.

Verification: If PGandE participates in GAMP, PGandE shall notify the CEC. If PGandE does not participate in GAMP, PGandE shall submit to the NSCAPCD, ARB, and CEC, for their review, a detailed H₂S ambient monitoring plan at least 60 days before the monitoring begins.

Section 2: PUBLIC HEALTH

A. Applicable Laws, Ordinances, Standards, and Practices

- o California Administrative Code, Title 8, Article 110, Section 5208.
- o California Labor Code, Chapter 3, Sections 6400 and 6401.
- o California Administrative Code, Title 17, Section 30355.
- o California Health and Safety Code, Section 25607.
- o California Public Resources Code, Section 25532.

B. Requirements

- 2-1. PGandE shall conduct quarterly sampling and analysis of radon-222 concentrations either: (1) in noncondensable gases entering the power plant in incoming steam; (2) in vent off-gas; or (3) in the condensate, in accordance with the most recent California Department of Health Services, Radiologic Health Service (CDHS/RHS) requirements for monitoring and reporting on radon-222.

The radon-222 steam monitoring program will be conducted for at least the first three years of commercial operation. If monitoring results indicate that the radon-222 release from Unit 20 is well within applicable standards, the monitoring program may be modified, reduced in scope, or eliminated, provided PGandE obtains the permission of CDHS/RHS. With concurrence of PGandE and CDHS/RHS, changes may be made to the program as new information and techniques become available.

Verification: PGandE shall provide annual reports to CDHS/RHS and CEC summarizing the results of the quarterly sampling. The annual report will comply in format and content with the most recent CDHS/RHS requirements for reporting.

- 2-2. If the radon-222 concentration exceeds 3.0 pCi/liter in the cooling tower exhaust, PGandE must inform the CDHS/RHS with an advisory report.

Verification: PGandE shall provide a written report of sample results to CDHS/RHS within 30 days of confirmation of levels in excess of 3.0 pCi/liter radon-222 in the cooling tower exhaust.

- 2-3. If the radon-222 concentration exceeds 6.0 pCi/liter in the cooling tower exhaust, PGandE shall notify the CDHS/RHS and the CEC by telegram or telephone upon confirming the sample result. The sample result shall be confirmed by reanalyzing the sample using the normal analysis procedure. The reanalysis may be performed by PGandE, CDHS/RHS, or other qualified laboratories. Confirmation of sample results must be accomplished in the most expedient manner possible and should take less than five calendar days.

Verification: PGandE shall notify CDHS/RHS and the CEC within 24 hours of confirming the sample. PGandE shall provide an advisory report to CDHS/RHS and the CEC within 30 days outlining corrective actions taken.

- 2-4. PGandE shall conduct ambient monitoring for arsenic, mercury, silica, vanadium, ammonia, benzene, boron, and radon-222 for a one year period before initial operation and one year after initial

operation, at Anderson Springs in an equivalent manner to that in the Geysers Air Monitoring Program (GAMP). This program may be reduced in scope upon agreement by CEC, NSCAPCO, and PGandE. PGandE can participate in the GAMP, if it is implemented, to meet this requirement. If the GAMP ends before completing the equivalent of the above, the NSCAPCO and CEC can require PGandE to continue monitoring to meet the requirement.

Verification: If PGandE participates in GAMP, PGandE shall notify the CEC. If PGandE does not participate in GAMP, PGandE shall submit to the NSCAPCO, CARB, and CEC, for their review, a detailed ambient monitoring plan at least 60 days before the monitoring begins.

- 2-5. PGandE shall design and perform a program of quarterly steam analysis for ammonia, arsenic, mercury, silica, boron, benzene, fluoride, and asbestos in steam entering Unit 20. The quarterly steam analysis program shall commence within 45 days after commercial operation of Unit 20 and shall run for 1 year. After one year, the NSCAPCO, in consultation with CEC, shall determine if annual testing is sufficient.

Verification: PGandE shall submit the program design to the CEC staff, NSCAPCO, and CARB for approval 60 days prior to commercial operation. PGandE shall submit steam reports and analysis to the CEC staff, NSCAPCO, and the CARB. Such reports shall be submitted within 60 days of the quarterly sampling.

- 2-6. In the second year of commercial operation, PGandE shall perform measurements to determine concentrations of mercury and arsenic in Unit 20 incoming steam and cooling tower exhaust. Calculations will be made to quantify the incoming and emission rates (in pounds per hour) of arsenic and mercury. PGandE will prepare a report on these measurements and calculations. The report will describe sampling and analysis methods used, identify the error associated with these methods, and list all assumptions used in the calculations.

Verification: PGandE shall send a report on the mercury and arsenic measurements and calculations to CEC staff, CARB, and NSCAPCO within 60 days after completing the measurements. The program results will be evaluated to determine requirements, if any, for continuation of this program.

- 2-7. PGandE shall request the CAL/OSHA Consultation Service or CAL/DOSH to review the accident prevention program for Unit 20. If detectable levels of asbestos are found in the Unit 20 steam supply, PGandE shall request the involvement of the CAL/OSHA Consultation Service in determining the need for and, if necessary, designing a program to protect worker health from possible exposure to asbestos.

Verification: Within 30 days of detecting asbestos in the Unit 20 steam supply, PGandE shall submit to the CEC a copy of the letter to CAL/OSHA Consultation Services requesting their involvement in the design of a program to protect worker health from possible exposure to asbestos, if necessary.

Prior to commercial operation, PGandE shall submit to the CEC a copy of a letter from the CAL/OSHA Consultation Service or CAL/DOSH verifying the adequacy of PGandE's accident prevention program for Unit 20.

- 2-8. PGandE shall promptly fund reasonable studies or tests as required by the NSCAPCO to ascertain the impact of Unit 20 when operating, specifically at the residence located approximately 0.6 miles south and west of the plant site, in the event that the residents, in good faith, file complaints with the NSCAPCO or the CEC indicating the air quality is worsening or becoming a nuisance or unhealthful as a result of Unit 20's operation. Reasonable mitigation steps shall be applied upon request of the NSCAPCO to attempt to remedy any unlawful impacts of the power plant upon the residence.

Within 60 days after certification of Unit 20, PGandE shall post the notice shown below to residents of the Beigel Cabin. PGandE shall also ensure that the notice contains the most recent address and telephone number of the NSCAPCO.

NOTICE TO OCCUPANTS OF THE BEIGEL CABIN

Pacific Gas and Electric Company (PGandE) has received a permit to construct and operate Geysers 20, a geothermal power plant located approximately 0.6 miles northeast of this cabin. As a means of mitigating possible air pollutant impacts, should they occur, the California Energy Commission (CEC) staff and PGandE have agreed to the following condition:

"PGandE shall promptly fund reasonable studies or tests as required by the Northern Sonoma County Air Pollution Control Officer (NSCAPCO) to ascertain the impact of Unit 20 when operating, specifically at the residence located approximately 0.6 miles south and west of the plant site, in the event that the resident, in good faith, files complaints with the NSCAPCO or the CEC indicating the air quality is worsening or becoming a nuisance or unhealthful as a result of Unit 20's operation. Reasonable mitigation steps shall be applied upon request of the NSCAPCO to attempt to remedy any unlawful impacts of the power plant upon the residence."

Any questions or complaints that the air quality is worsening or becoming a nuisance or unhealthful should be directed to:

Northern Sonoma County Air Pollution
Control Officer
118 North Street
Healdsburg, CA 95448
(707) 433-5911

Verification: PGandE shall indicate in a periodic compliance report the date the notice was posted at the Beigel Cabin. PGandE shall forward to the CEC copies of all correspondence with the NSCAPCO and cabin owner regarding complaints, studies or tests, and mitigation measures related to Unit 20.

Section 3: SOCIOECONOMICS/LAND USE/TRANSPORTATION/AESTHETICS

A. Applicable Laws, Ordinances, Standards, and Practices

- o Warren-Alquist Act, Public Resources Code Section 25540.3.
- o California Environmental Quality Act, Public Resources Code, Section 21100.
- o Sonoma County General Plan (1978), Sonoma County Zoning Ordinance.

B. Requirements

- 3-1. PGandE shall negotiate with Sonoma County in good faith concerning housing impacts as specified in the October 1, 1982, agreement between those two parties, contained as Appendix C of the Commission Decision. Construction of Geysers Unit 20 shall not commence until agreement is reached between PGandE and the County, and the Commission ratifies such agreement, or until the Commission itself resolves the issues.

Verification: Should PGandE and Sonoma County negotiate settlement of the housing impacts issue, PGandE shall immediately file the fully executed agreement thereto with the Commission and its Compliance Audit Unit.

- 3-2. PGandE shall comply with the terms of the "Schools Impact Mitigation Agreement" (Appendix D of the final Decision).

Verification: PGandE shall annually file a report with the CEC indicating actions undertaken to comply with the terms of the "Schools Impact Mitigation Agreement."

- 3-3. PGandE shall select appropriate colors for its steamline coverings and main structures to minimize the contrast with the surrounding environment.

Verification: After project completion, PGandE shall submit a letter to the CEC verifying compliance with this requirement.

- 3-4. PGandE shall revegetate all land surfaces disturbed by construction of Unit 20, including all cut and fill slopes as proposed in AFC Section 5.4.3.6. et seq., to soften excavation scars.

Verification: After project completion, PGandE shall submit a letter to the CEC verifying compliance with this requirement.

- 3-5. PGandE shall, to the maximum extent feasible, provide incentives intended to reduce passenger vehicle traffic related to Unit 20. Such measures may include, but are not limited to, car/van pooling, restricted parking, and ride-sharing.

Verification: Thirty days prior to the start of construction, PGandE shall provide the CEC, Lake County, and Sonoma County with a description of its incentive program. One year later, PGandE shall provide the CEC, Lake County, and Sonoma County with an evaluation of the program, including a description of the efforts and progress made and a statement of PGandE's recommendations for change, if necessary.

- 3-6. PGandE, in order to mitigate potential conflicts between truck and Middletown Unified School District bus traffic, shall request

contractors (or their delegate agents) to schedule truck trips so as to minimize truck traffic in the vicinity of the Highway 175-Anderson Springs Road intersection within plus or minus 15 minutes of the scheduled arrival time of the Middletown Unified School District bus. For the purpose of determining school bus arrival times, PGandE shall maintain communication with the Middletown Unified School District. PGandE shall provide contractors with a document that informs them that the Unit 20 certification requests that they schedule truck traffic to avoid the vicinity of the Highway 175-Anderson Springs Road intersection by trucks at times when Middletown Unified School District buses are scheduled to pick up or deliver school children. The document shall specify the time periods during which traffic is to be minimized.

Verification: Thirty days prior to the start of construction, PGandE shall provide to the CEC and the Middletown Unified School District copies of the document being provided contractors and subcontractors.

- 3-7. Pursuant to the terms of its October 1, 1982, agreement, PGandE shall attempt to reach a contingency agreement with Sonoma County to pay for mitigation of damage or increased safety hazards to Healdsburg-Geysers Road or any other public road which is caused by actual use by truck traffic (three axles or greater) for PGandE Unit 20. PGandE shall also negotiate with the County of Lake and attempt to reach a contingency agreement. For purposes of this requirement, the term "contingency agreement" shall mean any formal agreement

between the parties. In the event that the parties are unable to reach agreement as required herein, this matter shall be referred to the CEC for resolution, as specified in the October 1, 1982, agreement (Appendix C of the Commission Decision).

Verification: Thirty days prior to the start of construction, PGandE shall send CEC copies of the above listed contingency agreements.

- 3-8. During the period of construction, PGandE shall arrange for each guard station leading into the Geysers power plant to maintain a log showing the number of trucks (three axles or greater) going to the Unit 20. At Gate 1, the log shall record whether the trucks used Healdsburg-Geysers or Cloverdale-Geysers road. Such other record-keeping mechanisms as may be negotiated between Lake County/Sonoma County and PGandE may be used in lieu of this procedure with the approval of the CEC.

Verification: PGandE shall maintain the logs for a period of three years. These logs shall be made available, on reasonable notice, to the CEC, Lake County, or Sonoma County for inspection.

Section 4: CULTURAL RESOURCES

A. Applicable Laws, Ordinances, Standards, and Practices

Federal:

- o National Historic Preservation Act of 1966 (as amended) and implementing regulations.
 - 16 U.S.C. 470 et seq.
 - 36 CFR 800.
- o Public Law 95-341 (American Indian Religious Freedom).
- o Public Law 96-95 (Archaeological Resources Protection Act, 1979) and 36 CFR, part 69.

State:

- o California Environmental Quality Act (CEQA), PRC sections 21000 et seq.

B. Requirements

- 4-1. PGandE shall designate a qualified cultural resources specialist who will be available prior to and during site preparation and construction activities for the Geysers Unit 20 power plant.

Verification: PGandE shall provide the CEC with the name and telephone number of the cultural resources specialist at least 30 days prior to the start of any construction activities.

- 4-2. PGandE shall continue to maintain the existing fencing around the archaeological site identified as CA-SON-793, located approximately one and one-half miles ENE of the proposed Unit 20 project site.

Verification: PGandE shall annually submit a statement verifying that the fencing around the site has remained intact.

- 4-3. If previously unidentified cultural resource sites are discovered or unearthed during construction, work in the immediate area will be halted and the designated cultural resource specialist will be consulted to provide an evaluation of the resource. PGandE shall promptly notify the CEC of the resource discovery and work stoppage. Representatives of PGandE, the CEC, and the Anthropology Lab at Sonoma State University shall meet with PGandE's designated specialist within one working day of the notification to discuss the possible mitigation measures. Pending resolution of this matter, construction activity in the resource area shall remain stopped.

Verification: PGandE shall notify the CEC within 24 hours of the resource discovery and the work stoppage.

Section 5: BIOLOGICAL RESOURCES

A. Applicable Laws, Ordinances, Standards, and Practices

Federal

- o Endangered Species Act of 1973 and implementing regulations, 16 USC 1531 et seq., 50 CFR part 17.
- o Federal Regulation Implementing the Geothermal Steam Act of 1970 [30 USC 1001 - 1015 and CFR 270.34(k)].

State

- o Warren-Alquist Act, Public Resources Code, Sections 25003 and 25523.
- o Ecological Reserve Act of 1973 and implementing regulations, Fish and Game Code, Sections 2050 through 2055.
- o California Species Preservation Act of 1976, Fish and Game Code, Sections 900 through 903.
- o California Endangered Species Act of 1970, Fish and Game Code, Sections 2050 through 2055.
- o Fully Protected Species Act, Fish and Game Code, Sections 3511, 4700, 5000, and 5516.
- o Fish and Wildlife Protection and Conservation, Fish and Game Code, Sections 1600 et seq.
- o Native Plant Protection Act of 1977, Fish and Game Code, Sections 1900 et seq.

- o California Environmental Quality Act, Public Resources Code, Sections 21000 et seq.
- o Guidelines for Implementation of the California Environmental Quality Act of 1970, California Resources Code, Sections 15000 through 15203.

B. Requirements

5-1. PGandE shall reduce the potential for erosion as stated in the AFC by:

- o Terracing cut and fill slopes,
- o Lining ditches with gunite,
- o Constructing and maintaining sediment ponds as designated in the AFC,
- o Constructing a berm as described in the AFC,
- o Applying cereal grain straw or rice straw as designated in the AFC,
- o Revegetating all exposed slopes as described in Section 5.4 of the AFC and in the Unit 20 Biological Resource Mitigation and Monitoring Plan,
- o Revegetating approximately 1.7 miles of existing unpaved roads as described in the Monitoring and Mitigation Plan,

- o Protecting the Little Geysers Natural Area as defined in the AFC Appendix J, and
- o Implementing an erosion control program to reduce erosion at the Little Geysers (described in the PGandE and Union Oil proposal to CEC submitted September 1982).

Verification: PGandE shall submit an annual compliance statement to CEC to notify them of the status of each of the above items. CEC may, at its discretion, choose to inspect the power plant site for compliance and effectiveness.

- 5-2. PGandE shall participate in the KGRA Aquatic Resources Monitoring (ARM) program to determine the effect on the aquatic environment of constructing Geysers Unit 20. If, for any reason, ARM fails to operate as per the written agreement, if this program is not extended beyond its initial two-year period, or if PGandE withdraws from ARM, PGandE shall conduct alternative studies to document the impact of Unit 20 on Big Sulphur Creek for a period of three years after the start of construction.

Verification: CEC will receive ARM reports as a participant in the ARM program. Should PGandE ultimately conduct adequate monitoring separately from the ARM program, compliance statements shall be provided to CDFG and CEC. Within five years after the start of construction, PGandE will submit a final report on the aquatic monitoring study to the CDFG and CEC.

- 5-3. PGandE shall take steps to protect the Little Geysers Natural Area from future disturbance in order to: (1) protect aquatic resources,

and (2) protect the state endangered Geysers panicum (Dicanthelium acuminatum var. acuminatum). This shall be accomplished by:

- a. Securing a written agreement from Union Geothermal to avoid all surface disturbance within the Little Geysers Natural Area for the life of Unit 20 (letter from Union Oil to PGandE, August 1982).
- b. Monitoring the Dicanthelium population at Little Geysers as described in PGandE's proposal to the CEC dated September 1982.
- c. If the plant population is shown to be declining significantly, PGandE will:
 - (1) Conduct an evaluation of the habitat and habitat requirements of the plant to determine what habitat parameters are necessary for its survival, and
 - (2) Attempt to determine reasons for the population decline.

If the CDFG determines that the significant decline is likely to be related to Unit 20, then PGandE shall work with CDFG and the CEC to develop and implement appropriate and technically feasible mitigation measures.

CDFG, in consultation with PGandE and the CEC, shall determine whether or not a significant decline has occurred.

- d. Attempting to propagate Dicanthelium acuminatum var. acuminatum in a controlled environment (PGandE proposal for erosion control at the Little Geysers submitted to CEC, August 1982).

- e. Reporting annually the population status of Dicanthelium acuminatum var. acuminatum to CEC and DFG, using the DFG field survey form or other equivalent written form (PGandE Proposal to Monitor Hot Springs Panic Grass, dated September 1982).
- f. Obtaining a Memorandum of Understanding from the Department of Fish and Game prior to any work on this state endangered species.

Verification: PGandE shall provide CEC with the following written materials:

- a. A copy of the written agreement with Union to prevent surface disturbance at the Little Geysers Natural Area. (PGandE has already complied with this aspect of verification.)
 - b. A detailed study plan of the monitoring program to be carried out at the Little Geysers Natural Area within 60 days of certification.
 - c. A copy of the Memorandum of Understanding issued by the Department of Fish and Game within 90 days of certification.
 - d. Reports on the status of monitoring including results of population monitoring, propagation efforts, and any mitigation attempts. (PGandE Proposal to Monitor Hot Springs Panic Grass submitted to CEC in September 1982.)
- 5-4. PGandE shall protect the streptanthus brachiatus and S. morrisonii population that occur near access roads from disturbance due to development of makeup wells for Unit 20 by (1) placing fences along

all S. brachiatus and S. morrisonii population boundaries which border access roads (this fencing may be temporary but shall be in place during development of makeup wells for Unit 20); (2) clearly marking the protection zone on all appropriate engineering drawings; and (3) employing dust control measures during heavy use periods.

Verification: PGandE shall notify CEC in an annual compliance statement that fencing has been completed.

- 5-5. PGandE shall maintain a photo record of the vegetation surrounding the Unit 20 power plant by using false color infrared aerial photography. PGandE shall photograph annually for the first three years of operation and every five years thereafter. If significant changes are noted in the vegetation by PGandE or CEC, the photography will be used to assess changes as compared to the first three years of photography. PGandE and CEC accept that preoperational data from the stress monitoring study for Units 13, 17, and 18 can also be used as baseline data for Unit 20.

*Amended
95-0315-07
D. [unclear]*

Verification: PGandE shall provide CEC copies of aerial photographs upon written request.

- 5-6. PGandE shall mitigate wildlife habitat loss by the following enhancement measures as specified in the Monitoring and Mitigation Plan (AFC, Appendix J, pp. 21 - 29):

- a. Prescribed burns (to be initiated the first fall season following power plant certification) or participation in the California Department of Forestry Chaparral Management Plan,

- b. Development of three springs,
- c. Development of a wildlife guzzler with annual maintenance and inspection during dry periods to ensure a year-round water supply,
- d. Revegetation with wildlife food and cover plants, and
- e. Construction of two raptor perch sites.

Verification: PGandE shall submit an annual compliance statement to the CEC to notify them of the completion of the above tasks each year until the work is completed. CEC may, at its option, inspect for mitigation implementation.

- 5-7. PGandE shall determine if there is available literature to document the relative value of spot burns for use by various wildlife species as compared to larger burns and unburned chaparral. PGandE will submit a recommendation to the CEC by August 1983 on the adequacy of available literature to describe the value of spot burns. If it is determined that there is insufficient information to determine the value of spot burns, PGandE shall carry out a study to document the value of such techniques to wildlife. If PGandE determines that there is sufficient information currently in existence, PGandE shall document this in a report which shall accompany PGandE's recommendation. CEC, CDFG, and PGandE shall attempt to reach mutual agreement on the recommendations provided by PGandE within 60 days of submittal to CEC. If the parties are not able to agree, CEC, in

consultation with DFG, will then determine whether or not PGandE shall conduct the spot burn study.

Verification: PGandE shall provide CEC a written description of the study proposal, annual reports on study progress, and a final report.

5-8. PGandE shall implement the following mitigation measures which it proposed specifically to compensate for potential impacts to the ringtail.

- a. If any clearing in riparian areas occurs between April 15 and July 1, PGandE will thoroughly survey the area for ringtail den sites and attempt to identify dens being used by breeding ringtail. PGandE shall attempt to assure that breeding ringtail are not in dens during clearing;
- b. PGandE shall avoid where possible all riparian areas not specified for construction in the AFC;
- c. PGandE shall construct five den sites in appropriate areas and maintain them so long as the ringtail retains its protected status under California law but not longer than the life of the power plant. Den sites will be placed after power plant construction is complete. PGandE will check the den sites and near vicinity for ringtail use (by checking for scat, tracks, and other signs) four times a year for a period of three years after installation to see if the dens are being used; and

d. PGandE shall incorporate native plants known to comprise part of the ringtail's diet into the revegetation and erosion control plans for the power plant.

Verification: In a yearly compliance statement, PGandE shall notify CEC when the construction of artificial dens is completed. CEC may, at its option, inspect artificial den sites. PGandE shall notify CEC of the results of den site inspections for ringtail use. Inspections shall be conducted at least four times per year for three years following artificial den construction.

5-9. PGandE shall participate in a cooperative study (with other developers in the Geysers area) proposed by BLM to describe the taxonomy, ecology, and rarity for the Streptanthus morrisonii-brachiatus complex.

Verification: PGandE shall provide a written verification of its participation in the BLM study. If the proposed study fails to occur, PGandE shall be relieved of this condition. All reports resulting from this study shall be submitted to CEC when completed.

5-10. A PGandE biologist will be assigned to monitor construction activities as needed. The PGandE biologist will advise the supervising construction engineer as required of details concerning required mitigation prior to need for its implementation and shall advise the supervising construction engineer as necessary to ensure proper implementation of all mitigation measures. The supervising construction engineer will act on the advice of the assigned PGandE

biologist to correct construction practices which are not in conformance with the compensation/mitigation plan or the terms and conditions of AFC approval to protect biological resources, including temporarily halting construction activities in sensitive areas until corrective action can be taken. If any specific mitigation measure or monitoring program is not implemented, is done incorrectly, or is determined to be substantially ineffective, PGandE, in consultation with CEC and CDFG, will take action to correct the problem.

Verification: PGandE shall inform the CEC and CDFG as soon as possible of difficulties pertaining to this requirement, and PGandE shall submit within 30 days a written report describing the problem and corrective actions taken. PGandE shall submit an annual statement of progress to the CEC and CDFG indicating the various phases of the compensation/mitigation program that have been completed and the progress of ongoing measures. Reporting will be continued until all measures have been completed.

5-11. PGandE may dispose of excess fill from the Geysers 20 power plant site by either:

- a. Using the Socrates Mine as the fill disposal site, incorporating all mitigation measures described in the AFC and other appropriate documents filed during the siting process.

OR:

- b. Developing the off-site disposal site described in PGandE's letter dated January 26, 1983, incorporating the following mitigation measures to avoid significant environmental effects:

1. PGandE shall bench the excess spoil fill slope at 25 foot intervals. Drainage ditches shall be constructed on each bench and shall flow into collector ditches running down the side of the fill slope. Ditches shall be lined with an impervious material and shall be sized to collect all of the runoff from a severe rainstorm of the magnitude known to occur in the Geysers. An energy dissipator shall be placed at the bottom of the collector ditches and shall be adequately sized to prevent erosion from runoff leaving the site.
2. The entire fill slope shall be revegetated to reduce erosion. The site shall be hydroseeded with a mixture similar to that used for the power plant fill slopes. Straw mulch shall be applied at a rate not less than 2000 lb/ac and held in place with either a tackifier on north and each facing slopes or on south and west facing slopes, jute netting may be used or punched straw, incorporated with a studded roller.
3. To reduce the impact upon wildlife species and to reduce erosion on a more permanent basis, PGandE shall revegetate the entire slope with native woody species which may be selected as deemed appropriate from the list of species proposed for revegetation on the Unit 20 fill slope. In addition, a new prescribed burn location shall be identified (to substitute for the one lost should the new spoil

disposal site be developed) if PGandE chooses not to participate in the regional chaparral management plan described in condition 5-6a.

These revegetation efforts will be completed not later than October 1, 1983.

Verification: PGandE shall submit an annual compliance statement to the CEC to notify them of the progress of the above tasks each year until the work is completed. CEC may, at its option, inspect for mitigation.

Section 6: WATER QUALITY/HYDROLOGY/WATER RESOURCES

A. Applicable Laws, Ordinances, Standards, and Practices

- o Federal Clean Water Act.
- o California Water Code, Section 1243 and 1257.
- o Porter-Cologne Water Quality Control Act.
- o California Fish and Game Code, Section 1603.
- o California Administrative Code, Title 23.
- o Water Quality Control Plan, North Coastal Basin (1B).
- o The Code of Sonoma County, Chapter 7, Building Permits.
- o Sonoma County Water Agency, "Drainage Requirements for Grading Permits."
- o Sonoma County Water Agency, "Flood Control Design Criteria," Revised April 1973.
- o International Conference of Building Officials, "Uniform Building Code," Section 7012 (drainage and terracing: size and number, sub-surface drainage, water disposal, and interceptor drains).
- o California Department of Water Resources, Bulletin 195, "Rainfall Analysis for Drainage Design, Volume 1, Short Duration Precipitation Frequency Data," October 1976.
- o James H. Brown, "Hydrologic Design Methods," The Institute of Transportation and Traffic Engineering, University of California, 1965.

- o Ven Te Chow, "Handbook of Applied Hydrology," McGraw-Hill Book Company, 1964.
- o Horace W. King and Ernest F. Brater, "Handbook of Hydraulics," McGraw-Hill Book Company, Fifth Edition, 1963.
- o United States Department of Commerce, National Oceanic and Atmospheric Administration, "Preliminary Probable Maximum Thunderstorm Precipitation Estimates South West States," prepared by John T. Riedel and E. Marshall Hansen, August 1972.
- o United States Department of Interior Corps of Engineers, "Standard Project Criteria for General and Local Storms, Sacramento-San Joaquin Valley, California," April 1971.
- o United States Department of Interior, Geological Survey, "Flow of Springs and Small Streams in the Tecolote Tunnel Area of Santa Barbara County, California Water Supply Paper 1619-R, by S.E. Rantz, 1962.
- o U.S. Geological Surveys, "Magnitude and Frequency of Floods in California," Water Resources Investigation 77-21 by A.O. Waanen and J.R. Crippen, June 1977.

B. Requirements

- 6-1. If PGandE uses an H₂S abatement system, PGandE shall ensure that any chemicals will be stored within the bermed area of the plant site.

Verification: The final design plans and "as-built" drawings submitted to the Sonoma County CBO shall reflect the storage facilities for any chemicals stored on site.

- 6-2. To prevent spills of Stretford process material from leaving the immediate vicinity, PGandE shall surround the H₂S abatement process area with an impermeable barrier. Spilled process chemicals shall be drained to a sump where they will be pumped to a chemical storage tank for reuse or off-site disposal at an approved waste disposal site.

Verification: PGandE shall submit final design plans and "as-built" drawings to the Sonoma County CBO incorporating this design requirement.

6-3. Design Aspects to Assure Water Quality

- a. To prevent spills of steam condensate and other materials from leaving the site, PGandE shall construct an impermeable concrete or asphaltic concrete retention barrier around the plant. PGandE shall also pave the site with 2 inches of asphaltic concrete and attain a permeability of at least 1×10^{-6} cm/sec. As a result of this construction, the paved area of the plant site will serve as a spill retention basin.
- b. PGandE shall design the proposed retention basin referring to the Sonoma County Water Agency "Flood Control Design Criteria," revised April 1973, to determine the rain fall recurrence intervals. The basin will be capable of retaining the maximum condensate spill expected to occur before plant personnel can

correct the cause of the spill. In addition, the design shall accommodate the runoff from a 100-year storm of 30-minute duration.

c. PGandE shall equip storm water sumps with 100-gallon per minute pumps to return spilled material to the cooling tower basin for reinjection. Should a spill occur which exceeds the capacity of the pumps, PGandE plant personnel shall use portable pumps to remove excess materials.

d. Alarm systems will notify plant operators when a spill has occurred and when the catch basin pumps have started. PGandE plant personnel shall respond to the alarms within 30 minutes and take measures necessary to correct the problem.

Verification: PGandE shall submit final design plans and "as-built" drawings to the Sonoma County CBO incorporating the design requirements listed in requirements 6-3a, b, c, and d. In addition, the plant superintendent shall file a statement with the CVRWQCB and the CEC at the start of the power plant operations verifying that plant personnel are trained and prepared to handle spills.

6-4. PGandE shall ensure that rainwater entering the Stretford process area will not enter surface water or groundwater. PGandE shall use the rainwater in the Stretford process or pump it to the cooling tower overflow structure.

PGandE shall use the steam condensate from the plant for cooling water and reinject any excess into the geothermal reservoir.

Verification: PGandE shall submit final design plans and "as-built" drawings to the Sonoma County CBO incorporating this design requirement.

- 6-5. To minimize the potential adverse impacts of storm runoff on the water quality of the area, PGandE shall route plant site runoff to the cooling tower basin for subsequent injection into the geothermal reservoir. When the capacity of the return system is exceeded, the runoff will be released. Under such conditions, the impacts on water quality should be minimal due to pollutant material dilution from heavy rainfall.

Verification: PGandE shall submit final design plans and "as-built" drawings to the Sonoma County CBO incorporating this design requirement.

- 6-6. PGandE shall dispose of domestic waste water by injection into the reinjection system or other appropriate method. PGandE shall treat the waste in a septic tank to remove solids and then discharge it to the reinjection line at a point between the cooling tower basin and the reinjection well, or implement such other discharge method as is appropriate and in conformity with all applicable laws.

Verification: PGandE shall obtain an in-lieu sanitation permit in accordance with Sonoma County ordinances and shall provide final design plans and "as-built" drawings to the Sonoma County CBO incorporating this design requirement for the domestic waste disposal system.

6-7. PGandE's participation in the ARM water quality sampling program shall be as described in the KGRA-ARM agreement. Should the ARM program be discontinued, then PGandE shall continue to monitor three years after the start of commercial operation at those stations which reflect potential water quality impacts from the Geysers 20 project, i.e., the stations designated as BSC 13 and BSC 18.

Verification: PGandE shall notify the CEC within 30 days of the discontinuance of the ARM Program and of the implementation of the contingency monitoring at BSC 13 and BSC 18.

6-8. PGandE shall design the on-site sump and discharge pipe to pass a 100-year storm with 30-minute duration.

PGandE shall construct a spill containment barrier around the plant site capable of containing the amount of rainfall expected during a 10-year 30-minute storm.

Verification: PGandE shall submit final design plans and "as-built" drawings to the Sonoma County CBO incorporating these design requirements.

6-9. During heavy rainstorms, when the water level in the retention basin continues to rise to a level that could inundate the road within the yard, PGandE shall be allowed to open the valve and drain the site water into Calm Creek.

Verification: Within 30 days after receipt, PGandE shall forward to the CEC a copy of the waste discharge permit issued by the NCRWQCB.

6-10. PGandE shall design the Calm Creek Channel to pass a 100-year flood flow without overflowing.

PGandE shall procure a stream bed alteration permit from the CDFG before beginning construction in the Calm Creek Channel.

Verification: PGandE shall, prior to construction in the Calm Creek Channel, forward a copy of the CDFG stream bed alteration permit to the CEC Compliance Unit.

6-11. PGandE shall develop the Unit 20 drainage system in accordance with the "Proposed Site Grading Plan" as depicted in AFC Figure 4.4-2.

Verification: PGandE shall submit final design plans and "as-built" drawings to the Sonoma County CBO for the drainage system.

6-12. PGandE shall provide, to all of its contractors working on Geysers Unit 20, a letter documenting the necessary procedures to be followed if any material is spilled into Anderson Creek or Gunning Creek. These procedures are to immediately:

- a. Notify the local police,
- b. Notify the Anderson Springs Community Service District, and
- c. Notify PGandE.

The letter shall include phone numbers for the specific individuals to be contacted in each instance.

Verification: PGandE shall send the CEC a copy of the letters sent to all of its contractors working on Geysers Unit 20.

6-13. PGandE shall supply the Anderson Springs Community Services District with two (2) appropriately sized signs for posting at Anderson and Gunning Creeks which clearly state that the creeks are the source of domestic and recreational waters for Anderson Springs and which contain the telephone numbers of the Anderson Springs Community Services District to be called in case of a spill.

Verification: PGandE shall notify the CEC when it has provided these signs to the District.

6-14. In the event that any vehicle used during the construction process or operating process of Unit No. 20 ejects or releases matter into the waters of Anderson or Gunning Creeks or impedes the natural flow of Anderson or Gunning Creeks, thereby causing adverse impacts to the ASCSD, PGandE will cooperate fully with the CVRWCB, CDF&G, State Health Department or any other appropriate agency investigating the incident, and will expeditiously comply with all applicable regulations of such appropriate agencies in reestablishing the condition of water quality in the Anderson Springs Drainage. PGandE will consult with the ASCSD in developing appropriate actions.

Verification: PGandE shall notify the CEC immediately following an accidental discharge into Anderson or Gunning Creeks and shall provide a description of the problem and necessary corrective actions.

6-15. Prior to the filing of an AFC for the next PGandE Geysers unit in Lake County, PGandE will meet with the ASCSD to discuss their water quality/supply concerns.

Verification: In the next PGandE AFC for a Geysers unit in Lake County, PGandE shall provide the CEC a summary of the meeting including areas of agreement or disagreement regarding the Anderson Springs Community District water quality/supply concerns.

- 6-16. PGandE will maintain the temporary water intake system of Gunning Creek until October 4, 1984.

Verification: PGandE shall notify the ASCSD and CEC at least 30 days prior to the date that PGandE will cease to maintain the temporary water intake system.

- 6-17. PGandE and its contractor(s) shall divert water from the Geysers Development Corporation (GDC) Pond whenever feasible. PGandE or its contractor(s) may divert additional water from Big Sulphur Creek only, consistent with riparian rights, for the period of construction of the Geysers 20 power plant. The flow rates shall not be greater than $0.07 \text{ ft}^3/\text{sec}$ (31.4 gpm), as measured by an accurate and reliable in-line water meter, which shall be installed prior to PGandE removing water from Big Sulphur Creek.

Verification: PGandE shall annually supply the CEC with a monthly tabulation of the amounts (in gallons) of water removed from Big Sulphur Creek for construction use at the Geysers Unit 20 power plant site.

- 6-18. PGandE shall identify the point, approved by the California Department of Fish and Game, at which it will withdraw water from Big Sulphur Creek.

Verification: Within 30 days of commencing water withdrawal from Big Sulphur Creek, PGandE shall forward to the CEC a stream bed alteration agreement from CDFG (if required) or a map, not less detailed than 1:24,000 scale, which clearly shows the point of diversion.

Section 7: GEOTECHNICAL/SEISMIC HAZARDS

A. Applicable Laws, Ordinances, Standards, and Practices

- o California Business and Professions Code 7835.
- o Uniform Building Code (1982 edition), Chapters 29 and 70.
- o Public Resources Code, Sections 25511 and 25532.
- o Good engineering practice.

B. Requirements

- 7-1. PG&E shall assign a qualified geotechnical engineer to the project to be present as needed (and to work in consultation with the certified engineering geologist) to evaluate actual site conditions by applying the principles of soil mechanics in the investigation, evaluation, design, and construction of site earthwork.

Verification: PGandE's responsible civil engineer in direct charge of design and who will be working in concert with the resident civil engineer in charge of project construction shall verify to the CEC in writing through PG&E's Chief Civil Engineer at least 10 days prior to the start of construction activity that a qualified geotechnical engineer has been assigned to the project and is performing the duties described in the requirement.

- 7-2. PGandE shall assign to the project a certified engineering geologist who will be present as needed during all phases of site excavation and grading to: (a) monitor compliance with design intent in

engineering geologic matters; (b) provide consultation during the design and construction of the project; (c) evaluate geologic conditions and geologic safety on the site; and (d) recommend field changes to the responsible civil engineer.

Verification: PGandE's responsible civil engineer in direct charge of design, and who will be working in concert with the resident civil engineer in charge of project construction, shall verify to the CEC in writing through PG&E's Chief Civil Engineer at least 10 days prior to the start of construction activity that a certified engineering geologist has been assigned to the project and is performing the duties described in the requirement.

7-3. PGandE shall submit the following documents to the Sonoma County Chief Building Official (CBO):

- o A Soil Grading Report, and
- o A Geologic Grading Report prepared and signed by a certified engineering geologist.

Verification: PGandE shall submit to the CBO the Soil Grading Report and the Geologic Grading Report within 180 days after completion of the rough grading. These reports will be deemed approved by the CBO unless PGandE is notified otherwise within 60 days of receipt. PGandE shall submit a supplementary report to the CBO after completing excavation of all foundations and the finish grading.

- 7-4. If geologic conditions do not differ substantially from those conditions represented in the AFC, PGandE shall implement the AFC'S recommended mitigation measures for adverse geologic conditions.

Verification: PGandE's certified engineering geologist shall verify compliance with the AFC's recommended geologic mitigation measures in the Geologic Grading Report and "As-Graded" Grading Plan. (See Civil Engineering Requirement 9-2.)

- 7-5. PGandE shall immediately report to the Sonoma County CBO and the CEC any geologic conditions which deviate enough from those predicted in the AFC to warrant substantial changes in design of site earthwork, power plant facilities, or site viability.

PGandE shall cease earthwork and construction in the affected area (unless safety requires continuing work), pending approval of the revised design by the Sonoma County CBO. PGandE's responsible civil engineer or geotechnical engineer will notify the Sonoma County CBO and the CEC of all such substantial design changes.

Verification: If the revised plans are not approved or disapproved by the CBO within five working days of receipt, the matter shall be considered under the provisions of the Dispute Resolution Procedures.

- 7-6. PGandE shall ensure that geologic records of site inspections, especially detailed logs of excavated surfaces, will be made during site preparation and submitted to the CEC upon request.

Verification: PGandE shall notify the CEC of the availability of geologic records of site inspections in the periodic progress reports.

Section 8: SOILS

A. Applicable Laws, Ordinances, Standards, and Practices

- o Porter Cologne Water Quality Control Act and in connection therewith, "Waste Discharge Requirements for Nonsewerable Waste Disposal to Land," published by the California Water Resources Control Board, particularly Appendix A, pg. 63, "Sample Waste Discharge Requirement for "Soil Disturbance-Earthen Materials."
- o North Coastal Basin (I) Water Quality Control Plan, Part 1, Chapter 5, particularly the section dealing with "Action Plan for Logging, Construction and Associated Activities."
- o Sonoma County Water Agency "Drainage Requirements for Grading Permits."
- o International Conference of Building Officials, "Uniform Building Code," 1982, Sections 7009 (limitations on cut slope steepness), 7010 (fill slopes: location, preparation, types of material, compaction, slope drainage, and terracing), 7011 (set back), 7012 (drainage and terracing: size and number, subsurface drainage, water disposal, and interceptor drains), and 7013 (erosion control: slopes, erosion, and control devices).
- o United States Department of Agriculture, Soil Conservation Service, "Guides for Erosion and Sediment Control in California," Davis, California, January 1975.
- o V.C. Miller, "Soil Survey of Sonoma County, California," USDA, Soil Conservation Service, 1972.

B. Requirements

- 8-1. PGandE shall install two sedimentation ponds as described in AFC Figure 4.4-3 and in accordance with an agreement with the CDFG.

Verification: PGandE shall supply to CEC a copy of any agreement negotiated with CDFG or a written explanation of why such an agreement was not consummated.

- 8-2. PGandE shall keep record of the cubic yards of sediment removed from both sediment basins during the first five such removal operations, beginning with the first such removal after site preparation. The CEC staff and PGandE may agree to suspend such monitoring if the staff is convinced that sufficient data has been obtained.

Verification: PGandE will submit to CEC an annual report stating the cubic yards of sediment removed from each pond.

- 8-3. Prior to placement of fill at the power plant site or the alternate spoil disposal site PGandE or its contractor shall contact the North Coast Regional Water Quality Control Board to determine the need for waste discharge permit(s) covering the plant and spoil disposal site. If permit(s) are required PGandE or its contractor shall forward a copy of the permit to CEC. If the Board does not require a permit PGandE or its contractor shall so notify the CEC.

Verification: PGandE or its contractor shall inform the CEC of contacts made with the North Coast Regional Water Quality Control Board and the need to procure a discharge permit(s). If discharge permit(s) are issued, PGandE or its contractor shall forward copies of the permit(s) to the CEC Compliance Section.

- 8-4. PGandE or its contractor shall implement erosion and sediment control measures at the power plant site and the alternate fill disposal site equivalent to those described in the AFC.

Verification: Upon reasonable notice, CEC compliance and monitoring staff shall be allowed access to the power plant site and the alternate fill disposal site by PGandE or its contractor to verify that the mitigation measures are in place and effective.

- 8-5. PGandE shall comply with NCRWQCB waste discharge specifications governing freeboard for sediment ponds.

Verification: PGandE shall submit to the CEC copies of correspondence between PGandE and the Regional Board or any permits which address the question of adequate sediment pond freeboard.

- 8-6. PGandE shall continue to monitor streambed sediment composition for the power plant site and steam field as a participant in the KGRA ARM program. If the ARM program is not extended beyond its initial two year period, PGandE shall develop an appropriate site-specific monitoring plan.

Verification: PGandE shall either continue to submit ARM monitoring data to CEC or the results of an independent, site monitoring effort.

- 8-7. PGandE and its contractor(s) shall confine earth-moving activities connected with the power plant site and spoil disposal site to the period May through October. CEC delegates authority to approve deviations from this schedule to Sonoma County.

Verification: PGandE or its contractor(s) shall notify the CEC before the fact and in writing of any proposal for earth moving outside of the May-October time frame. PGandE or its contractor(s) shall forward to the CEC copies of correspondence from Sonoma County which approve any deviation from the dry season construction schedule.

Section 9: CIVIL ENGINEERING

A. Applicable Laws, Ordinances, Standards, and Practices

- o Uniform Building Code (UBC) (1982).
- o Sonoma County Ordinance 2395.
- o American Concrete Institute (ACI) Standard 318-77, "Building Code Requirements for Reinforced Concrete."

B. Requirements

- 9-1. PGandE shall submit two sets of the final design grading plans, geotechnical investigation reports, specifications, and calculations to the Sonoma County CBO for review at least 90 days prior to construction. PGandE's responsible civil engineer and PGandE's certified engineering geologist shall verify that the proposed grading plans, including accompanying reports, comply with the requirements set forth in the applicable laws, ordinances, and standards. PGandE shall make payments to Sonoma County equivalent to the fees listed in Chapter 70, Section 7007 of the UBC for review of the grading plans and calculations. The CBO shall check the plans, specifications, and calculations in accordance with the county's plan check procedures. If the plans do not comply with the UBC and/or other pertinent laws, ordinances, or standards, the CBO shall notify PGandE's civil engineer within 30 days of submittal, identifying all discrepancies for correction. Within 60 days of the original submittal, PGandE shall submit revised plans to the CBO rectifying

all discrepancies. PGandE shall do no grading until the corrections are accepted and the requirements are met.

Verification: If the work described in the grading plans conforms to the requirements, the CBO shall return to PGandE one complete set of the submittals stamped and signed with his approval and shall issue a grading permit. PGandE shall notify the CEC within 5 days following receipt of the grading permit.

9-2. PGandE shall prepare and submit to the Sonoma County CBO one copy each of the following:

- o A summary of Soils Compaction Tests;
- o A Soil Grading Report;
- o A Geologic Grading Report signed by a certified engineering geologist;
- o "As-Graded" Grading Plan. (PGandE's responsible civil engineer shall certify on the "As-Graded" Plan that all site earthwork was done in accordance with the approved final grading plan, including subsequent change orders, and that it satisfies the design intent); and
- o A final report and site approval signed by a civil engineer.

Verification: All submittals listed above shall be submitted by PGandE within 180 days after completion of the rough grading. These documents will be deemed approved by the CBO unless PGandE is

notified otherwise within 60 days of receipt. PGandE shall submit a supplementary report to the CBO after completing both the excavation of all foundations and the finish grading.

- 9-3. PGandE shall prepare and submit a copy of the monthly summary of construction progress to the Sonoma County CBO and the CEC.

Verification: These periodic construction progress reports shall be submitted monthly until the unit has started commercial operation.

- 9-4. PGandE shall prepare and submit to the Sonoma County CBO one copy of the "as-built" drawings for the construction of civil work.

Verification: "As-built" drawings of the construction of civil work shall be submitted by PGandE within 180 days after completion of such work.

- 9-5. PGandE shall comply with all the recommendations (e.g., removal of all old landslide debris in the foundation area of the disposal fill on the west side of the site) in the Harding-Lawson Report (Geotechnical Investigation Element II, Proposed Site 18, Geothermal Power Plant Unit 20, The Geysers Geothermal Area, Sonoma County, California, November 30, 1981) if the conditions are substantially similar to those predicted in the report.

Verification: PGandE shall verify compliance by means of the grading reports submitted to the Sonoma County CBO.

- 9-6. PGandE shall ensure that appropriate erosion control mitigation measures are implemented when stabilizing the cut and fill slopes in the plant site area and related access roads.

Verification: PGandE's Chief Civil Engineer shall provide the CEC with a statement of the implemented mitigation measures in a periodic compliance report.

- 9-7. On-site inspections shall be performed in accordance with Chapter 3 of the UBC. Inspection shall be done by the Sonoma County CBO or his agent. Inspections may be delegated by the CBO as provided in Chapter 3 of the UBC.

Verification: If the inspector finds that work is being done in accordance with the approved plans, he shall report this in a monthly report to the CBO and CEC. If the inspector finds that the work is not being done in accordance with the approved plans, the discrepancies shall be reported immediately in writing to the CBO, the CEC, and PGandE's responsible civil engineer.

- 9-8. The embankment at the spoil disposal site shall be designed and constructed in accordance with the Uniform Building Code (latest adopted edition) as adopted by Sonoma County in County Ordinance 2395.

Verification: PGandE shall notify the CEC Compliance Unit, by letter, of the issuance of the grading permit within 30 days of issuance.

Section 10: STRUCTURAL ENGINEERING

A. Applicable Laws, Ordinances, Standards, and Practices

Law:

- o Title 8, California Administrative Code, adopting American Society of Mechanical Engineers' Boiler and Pressure Vessel Code (ASME BPV Code).
- o Title 24, California Administrative Code, adopting the Uniform Building Code (UBC) as minimum legal building standards.
- o Chapter 7, Division 3, Business and Professions Code, requiring state registration to practice as a civil engineer or structural engineer in California.

Ordinances:

- o Sonoma County 2395.

Standards:

- o Uniform Building Code, 1982 Edition (UBC 82).
- o American Society of Mechanical Engineers' Boiler and Pressure Vessel Code.
- o American National Standards Institute (ANSI), "B 31.1 Power Piping Code."
- o American Concrete Institute (ACI), "Building Code Requirements for Reinforced Concrete" (ACI 318-77) and Supplement of Provisions through 1981.

- o ACI, "Building Code Requirements for Structural Plain Concrete" (ACI 322-72).
- o ACI, "Commentary on Building Code Requirements for Reinforced Concrete" (ACI 318c-77) and Supplement through 1981.
- o American Institute of Steel Construction (AISC), "Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings" (AISC SDFESS 78).
- o AISC, "Commentary on the Specifications of the Design, Fabrication, and Erection of Structural Steel for Buildings" (AISC CSDFESS 78).
- o AISC, "Specification for Structural Joints Using ASTM, A325, or A490 Bolts," April 1978 (AISC SST 78).
- o AISC, "Code of Standard Practice for Steel Buildings and Bridges," September 1976 (AISC CSPSBB 76).
- o American Welding Society, "Structural Welding Code AWS D1.1-82" (AWS D1.1-82).
- o AWS, "Reinforcing Steel Welding Code" (AWS D12.1-75).
- o "National Design Specification for Stress-Grade Lumber and Fastenings, 1977" (NDS 77).
- o American Institute of Timber Construction, 1974, "Timber Construction Standards," AITC-100.

- o American Iron and Steel Institute (AISI), "Specification for the Design of Cold-Formed Steel Structural Members," 1968 (AISI SDCFSS).
- o Steel Joist Institute, "Standard Specifications and Load Tables," (SJI SSLT), 1982.
- o American Association of State Highway and Transportation Officials, "Standard Specifications for Highway Bridges," 1977 Edition (AASHTO Bridge 77).
- o Cooling Tower Institute, "CTI Code Tower, Standard Specifications for the Design of Cooling Towers with Douglas Fir Lumber," 1978 (CTI STD 114-78).
- o ACI, "Code Requirements for Nuclear Safety Related Structures," "The methods set forth in Appendix B, Steel Embedments," ACI 349-76, adopted August 1979."

In addition, the following standards shall be used as guides in the final design of the power plant and related facilities:

- o Structural Engineers Association of California, "Recommended Lateral Force Requirements," 1980 recommendations and commentary.
- o Applied Technology Council, "Tentative Provisions for the Development of Seismic Regulations for Buildings" (NBS-SP-510, ATC-3-06).

B. Requirements

- 10-1. PGandE shall demonstrate that the final design plans, design calculations, and specifications conform with the criteria

and requirements set forth in the Conditions in the Final Decision. Final plans, as used herein, are the plans upon which the construction will be based (i.e., used for bid purposes).

Verification: PGandE shall certify to the CBO and CEC that the final plans and specifications conform to the requirements listed herein.

10-2. PGandE shall design and construct Geysers Unit 20 and its related facilities to be in conformance with the applicable laws, ordinances, standards, and practices set forth above, and with the information, criteria, and methods set forth in the following documents:

- o PGandE Geysers Unit 20 AFC, Sections 4.3.3. and 4.4, and Appendix D; and
- o PGandE responses to staff's first set of data requests dated June 1982.

In the case of discrepancies between the design criteria contained in the applicable laws, ordinances, standards, practices, or conditions of certification, PGandE shall design to the highest calculated loads using the lowest allowable stresses in the final design of the facility.

PGandE shall specify and use design stresses for the proposed wooden cooling tower structure in accordance with CTI 114-78. In addition, PGandE shall emphasize UBC Section 2312(e)3 regarding appropriate assumptions of lateral force distribution. PGandE shall design and construct bolted and/or welded anchorages on H₂O₂, acid, caustic,

and chelating agent tanks in accordance with ATC 3-06, Sections 8.3.1 through 8.3.3 using Eqn. 8-2 with a value of 1.0 for the coefficient "p."

PGandE shall design and construct tanks containing H_2O_2 , acid, caustic, and chelating agent, or the containment surrounding these tanks, in accordance with API 650, Sixth Edition, Revision 3, including Appendix E.

PGandE shall design piping, valves, and anchorages to withstand equivalent static loads (ESL) in accordance with ANSI B31.1. The ESL shall be as specified in PGandE responses to CEC's first set of data requests, dated June 1982.

Verification: At least 120 days prior to the intended start of construction of each structure or foundation, PGandE shall submit 2 sets each of final (i.e., bid) design plans, specifications, and calculations for each structure or structure foundation, to the Sonoma County CBO and to the CEC. The final plans, calculations, and specifications shall clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. PGandE shall certify to the CBO and the CEC that the final plans and specifications conform to the listed requirements. PGandE shall make in-lieu payments to Sonoma County equivalent to the fees set forth in Sonoma County's plan check fee schedule, and obtain an in-lieu building permit for each submittal. The CBO, in consultation with the CEC, shall review the plans, specifications, and calculations.

If the CBO discovers nonconformance with the stated requirements, he shall notify PGandE's responsible Structural Engineer or Chief Civil Engineer within 75 days of the submittal date and shall return that nonconforming portion of the plans to PGandE for correction. PGandE's responsible Structural Engineer or Chief Civil Engineer shall resubmit the corrected plans within 30 days of the return to PGandE of the nonconforming submittal. The CBO shall return one complete set of original or revised submittals stamped and signed with his approval to PGandE within 120 days of original submittal, provided the plans comply with the stated requirements. "Certification" or "certify" as used herein means:

- a. All structural plans, calculations, and specifications shall be signed and stamped by the responsible registered structural engineer who shall have the authority to use the title "Structural Engineer" in California, or the responsible registered California civil engineer who shall be fully competent and proficient in the design of comparable power plant structures. All piping plans, stress calculations, and specifications shall be signed and stamped by the responsible registered mechanical engineer. A California registered professional engineer is required to work only within his or her area of professional competence as set forth in California Board of Registration of Professional Engineers Rule 415.
- b. The structural plans, calculations, and specifications shall be accompanied by a letter signed by PGandE's Chief Civil Engineer certifying that the design conforms to the requirements listed

herein. The piping plans, stress calculations, and specifications shall be available for review at the PGandE General Office in San Francisco upon seven days notice to the Chief Siting Engineer. PGandE's Chief Mechanical and Nuclear Engineer shall certify in a letter that the design conforms to the requirements listed herein. The letter shall be signed over his California professional registration number to practice mechanical engineering.

10-3. PGandE shall prepare and submit 1 set of the following documents to the Sonoma County CBO within 180 days after completion of construction. The CBO shall review these documents and notify PGandE of his approval of the documents within 60 days of receipt.

- o "As-built" drawings for the construction of structural and architectural work (changes approved by the CBO shall be identified on the "as-built" drawings).
- o Summary of concrete strength tests.
- o Copies of concrete pour sign-off sheets.
- o Bolt torque inspection reports.
- o Field weld inspection sheets.

Verification: PGandE shall notify the CEC following the submittal of these documents to the Sonoma County CBO.

10-4. PGandE shall keep the Sonoma County CBO and the CEC informed regarding the status of construction.

Verification: PGandE shall submit a monthly construction progress report to the Sonoma County CBO and the CEC.

- 10-5. PGandE shall file with the Sonoma County CBO and the CEC substantial design changes to the final plans as required by UBC Section 302. "Substantial changes" include all changes requiring an alteration in design concept and preparation of new design plans or design calculations consistent with the AFC conditions of certification. Minor changes shall be reflected in the "as-built" drawings submitted after construction.

Verification: PGandE shall submit two sets of the revised drawings, specifications, and calculations to the Sonoma County CBO and two sets to the CEC for review and shall notify the CBO at least 15 days in advance of the intended filing. The CBO shall expeditiously review these plans in consultation with the CEC. The CBO shall return 1 set of submittals stamped and signed with his approval to PGandE within 30 days, provided the plans comply with the stated requirements.

- 10-6. Inspections shall be performed in accordance with Chapters 3 and 70 of the Uniform Building Code (1982 edition). The Sonoma County CBO may delegate responsibility for special and continuous inspections to PGandE as provided in Section 305, Chapter 3, of the UBC 1982. The CBO or his agent and the CEC may, upon reasonable notice, inspect the construction at any time.

Verification: PGandE shall notify the CEC if the Sonoma County CBO delegates responsibility for inspections to PGandE. In addition, PGandE shall assign a resident civil engineer, who shall be present on site to monitor construction activities and who shall have authority to require changes or remedial work if the work does not conform to the applicable requirements and to halt construction in the affected area if the work does not conform to these requirements.

- 10-7. In the event that the Uniform Building Code (1982 edition) is not adopted prior to the final plans submittal by either the state under Title 24 CAC or by Sonoma County ordinance, PGandE shall verify that the facility design meets or exceeds the requirements of UBC 1979.

Verification: In the event that final plans have been submitted for review prior to the adoption of UBC 1982, PGandE shall file a statement by the responsible engineer to the CEC verifying conformity of the submitted plans with UBC 1979.

Section 11: SOLID WASTE MANAGEMENT

A. Applicable Laws, Ordinances, Standards, and Practices

- o California Water Code, Section 13260.
- o California Health and Safety Code, Division 20, Chapter 6.5.
- o California Administrative Code, Title 22, Division 4, Chapter 30; Title 23, Chapter 3, Subchapter 15.
- o Federal Resources Conservation and Recovery Act.

B. Requirements

11-1. PGandE shall ensure that any hazardous waste hauler employed by PGandE has a certificate of registration from the California Department of Health Services (CDOHS), Hazardous Materials Management Section.

Verification: PGandE shall keep a letter on file verifying that hazardous wastes haulers for the Geysers 20 project have valid CDOHS certificates of registration.

11-2. The Stretford process wastes include a sulfur and a Stretford purge stream. PGandE shall ensure that the sulfur is properly stored in accordance with CDOHS regulations, and removed periodically to be sold or to be disposed at a site approved for such wastes.

Any sludge which accumulates in the cooling tower basins will be removed and hauled by a registered hazardous waste hauler to an approved disposal site.

Verification: PGandE shall submit final design plans and "as built" drawings to the Sonoma County CBO incorporating these storage design features. In addition, PGandE shall each month submit completed hazardous waste manifests to CDOHS in compliance with Section 66475 to Title 22, CAC.

- 11-3. PGandE shall ensure that hazardous wastes are taken to a facility permitted by CDOHS to accept such wastes.

*modification
1/10/05
1/10/05* { Verification: PGandE shall notify the CEC, CDOHS, and Solid Waste Management Board of the selected disposal site. Any notice of change in disposal sites will be submitted as changes occur.

- 11-4. If hazardous wastes, including Stretford sulfur effluent, are stored on site for more than 60 days, PGandE shall obtain a determination from the CDOHS that the requirements of a hazardous waste facility permit have been satisfied.

Verification: PGandE shall promptly notify the CEC if it files an in-lieu application with CDOHS for the operation of a hazardous waste facility.

- 11-5. Construction wastes from Unit 20 will be disposed of by a PGandE contractor at sites approved by the Regional Water Quality Control Board and local agencies.

Verification: As soon as the specific disposal sites are known, PGandE shall submit a letter to the CEC listing the disposal sites to be used. PGandE will provide the CEC a copy of the provision in PGandE contracts requiring compliance with all applicable waste

management laws and regulations designed to protect the public health and the environment.

- 11-6. The sewage wastes include a liquid effluent and sludge. PGandE shall ensure that the liquid effluent is conveyed by pipe to the injection wells and not exposed prior to injection or disposed of by such alternative disposal methods as are consistent with all applicable laws.

Any sludge which accumulates in the sewage system shall be hauled by a liquid waste hauler to an approved disposal site, or disposed of by such alternative disposal methods as are consistent with all applicable laws.

Verification: PGandE shall submit final design plans and "as built" drawings to the Sonoma County CBO incorporating these design features.

- 11-7. PGandE shall comply with all applicable provisions of the Resource Conservation and Recovery Act (RCRA) and the California Hazardous Waste Laws, and shall provide copies of all required documents under said laws to the CEC.

Verification: Within 60 days of filing the appropriate documents with the appropriate agencies, copies shall be filed with the CEC. In the event that the appropriate agency disapproves said documents, the CEC shall be informed as soon as practicable by PGandE.

- 11-8. PGandE shall notify the CEC of any known enforcement actions against PGandE, the waste hauler, or the disposal site operator.

Verification: Within 10 days of notification of an impending enforcement action, PGandE shall notify the CEC.

Section 12: SAFETY

A. Applicable Laws, Ordinances, Standards, and Procedures

- o Code of Federal Regulations, Title 49, Sections 173.245, 174.249, 173.302, 178.36, and 178.37.
- o Title 8, Article 138, California Administrative Code.
- o Title 8, Section 5162, California Administrative Code.
- o Title 8, Section 5204, California Administrative Code.
- o Title 8, Chapter 4.1, California Administrative Code.
- o Title 8, Article 145, California Administrative Code.
- o Title 8, Group 10, California Administrative Code.
- o Title 8, Article 76, California Administrative Code.
- o Title 8, Article 107, California Administrative Code.
- o Title 8, Section 3203, California Administrative Code.
- o Title 8, Section 5179, California Administrative Code.
- o American Petroleum Institute (API) Standard 650, Sixth Edition, Revision 3, including Appendix E.
- o ASME Pressure Vessel Code, Section VIII.
- o ATC 3-06, Section 8.3.
- o National Fire Code, Sections 20, 30, 51, and 49.

- o Title 8, California Administrative Code, Chapter 4, Subchapter 7, Groups 20 and 27.
- o Uniform Building Code (1982 Edition): 5, 7, 19 (Type II-N), 32, and 33.
- o National Fire Protection Association (NFPA) Standards (1981): 10, 12, 13, 14 (Class II Service), 19B, 20, 26, 27, 30, 70, 214, 231A, 241, 601A, 1961, 1962, and 1963.
- o Title 8, California Administrative Code, Section 1509.

B. Requirements

- 12-1. PGandE shall comply with the handling procedures for hydrogen peroxide as specified in Title 8, CAC, Section 5204.

Verification: PGandE shall submit a letter signed by the plant superintendent and verifying compliance with CAL/OSHA regulations within 90 days after beginning commercial operation.

- 12-2. PGandE shall comply with the storage procedures for hydrogen peroxide as specified in Title 8, CAC, Section 5179.

Verification: PGandE shall submit a letter signed by a registered mechanical engineer and verifying compliance with CAL/OSHA regulations prior to commercial operation.

- 12-3. PGandE shall comply with the handling and transportation procedures for caustic soda as specified in 49 CFR Section 173.249, and Title 8, CAC, Section 5162.

Verification: PGandE shall submit a letter, signed by the plant superintendent and verifying compliance with CAL/OSHA regulations, within 90 days after beginning commercial operation.

- 12-4. PGandE shall comply with the handling and storage procedures for hydrogen gas as specified in Title 8, CAC, Article 138.

Verification: PGandE shall submit a letter signed by the plant superintendent and verifying compliance with CAL/OSHA regulations within 90 days after beginning commercial operation.

- 12-5. PGandE shall ensure that the Stretford system pressure vessels have been designed and fabricated in accordance with Title 8, CAC, Chapter 4.1, and API 650, Sixth Edition, Revision 3, including Appendix E, and anchored in accordance with ATC 3-06, Section 8.3.

Verification: PGandE shall submit a letter, signed by a registered mechanical engineer and verifying compliance to referenced standards, prior to commercial operation. In addition, CAL/DOSH should verify compliance through an on-site inspection.

- 12-6. PGandE shall ensure that the Stretford system tanks have been designed and fabricated in accordance with Title 8, CAC, Chapter 4; and API 650, Sixth Edition, Revision 3, including Appendix E; and anchored in accordance with ATC 3-06, Section 8.3.

Verification: PGandE shall submit a letter signed by a registered mechanical engineer verifying compliance to the CEC prior to commercial operation. In addition, CAL/DOSH should verify compliance through an on-site inspection.

- 12-7. PGandE shall ensure that the hydrogen peroxide tanks have been designed and fabricated in accordance with MCA Chemical Safety Data Sheet SD-53, and API 650, Sixth Edition, Revision 3 (including Appendix E) and anchored in accordance with ATC-3-06, Section 8.3.

Verification: PGandE shall submit a letter signed by a registered mechanical engineer verifying compliance to the CEC prior to commercial operation. In addition, CAL/DOSH should verify compliance through an on-site inspection.

- 12-8. PGandE shall ensure that certified code papers for the facility and pressure vessels are available for review at the plant site.

Verification: Prior to commercial operation, PGandE shall notify CAL/DOSH and the CEC of the availability of the documents.

- 12-9. PGandE shall certify that design and construction are in reasonable conformance with the intent of applicable fire safety codes and standards listed above.

Verification: Prior to commercial operation, PGandE shall submit to the CEC a compliance report which contains certification from a registered fire protection engineer that the project is in reasonable conformance with the intent of the above listed codes and standards.

- 12-10. PGandE shall submit its construction fire protection plan for Geysers Unit 20 to the California Department of Forestry for approval 45 days prior to scheduled site clearing. The fire protection plan shall be approved 30 days after submission to CDF unless the CEC receives written notification of nonacceptance from CDF.

Verification: Prior to site clearing, PGandE shall submit to the CEC a copy of CDF's written acceptance of PGandE's fire protection plan for Geysers Unit 20.

- 12-11. PGandE shall submit its operation fire protection plan for Geysers Unit 20 to the California Department of Forestry for approval 45 days prior to first turbine roll. The fire protection plan shall be approved 30 days after submission to CDF unless the CEC receives written notification of nonacceptance from CDF.

Verification: Prior to first turbine roll, PGandE shall submit to the CEC a copy of CDF's written acceptance of PGandE's fire protection plan for Geysers Unit 20.

- 12-12. Prior to each major construction phase, PGandE and the California Department of Forestry shall hold sequential preconstruction conferences with contractors who are to perform the next construction activities at Geysers Unit 20.

Verification: A week prior to each preconstruction conference, PGandE shall notify the CEC in writing of such conference. PGandE shall reference the completed conferences in its periodic compliance reports.

- 12-13. PGandE shall furnish the CDF with a copy of the final fire protection system design.

Verification: Prior to construction, PGandE shall notify the CEC of the submittal to the CDF.

12-14. PGandE and the California Department of Forestry shall annually re-examine the fire protection plan.

Verification: PGandE shall note and summarize the joint re-examination of the fire protection plan in its periodic compliance report.

12-15. On-site worker safety inspections shall be conducted by the CAL/DOSH (California Division of Occupational Safety and Health) during construction and operation of the facility or when an employee complaint has been received.

Verification: CAL/DOSH shall notify the CEC in writing in the event of a violation that could involve DOSH action affecting the construction or operation schedule and shall notify CEC of the necessary corrective action. PGandE shall note any CAL/DOSH inspections and actions in its periodic compliance reports.

Section 13: TRANSMISSION LINE SAFETY AND NUISANCE

A. Applicable Laws, Standards, and Criteria

- o Noise: (Construction) CAL/DOSH, Title 8, California Administrative Code, Sections 5095 - 5099.
- o Noise: (Operation) Sonoma County--Sonoma County General Plan Noise Element (adopted January 1978).
- o Safety/Reliability: California Public Utilities Commission (CPUC) GO-95.
- o Safety: CAL/DOSH, Title 8, California Administrative Code, Article 85, Sections 2940 et seq.; Article 86, Sections 2946 et seq.; Article 87, Sections 2950 et. seq.; Title 8, Chapter 4, Subchapters 4 and 7.
- o Safety: (Interference with Navigable Airspace) FAA, 49 USCA 1348, 14 CFR, Part 77.
- o Nuisance: (Radio Interference) Federal Communications Commission Rules and Regulations, 47 CFR Part 15.25 (Incidental Radiation Devices).
- o Electrical Clearances: Title 14, California Administrative Code, Sections 1254 - 1256; Public Resources Code, Sections 4292 - 4296, State and Private Land Fire Protection.
- o PGandE Grounding Standard (DWG 020607, Geysers Unit 16 AFC, Volume II, Appendix C).

- o Staff RI/TVI Criteria.
- o CPUC General Order 131B.

B. Requirements

13-1. PGandE shall file a "Notice of Construction or Alteration" form with the Federal Aviation Administration if it anticipates that a transmission line tower or any appurtenance would be more than 200 feet above the ground level, per 14 CFR, Part 77.

Verification: PGandE shall forward a copy of any such filing to the CEC within 30 days of the filing.

13-2. PGandE shall construct, operate, and maintain the transmission lines in accordance with Title 14, California Administrative Code, Sections 1254 - 1256, and Public Resources Code, Sections 4292 - 4296.

Verification: Within 60 days after completion of construction, PGandE's registered engineer in responsible charge shall submit a statement to the appropriate PGandE Chief Engineer who shall transmit it to the California Department of Forestry (CDF) and the CEC indicating that the transmission line has been constructed in accordance with applicable requirements. PGandE shall also inspect the transmission line annually to ensure that the line maintains required clearances, especially during the fire season.

In the event that noncompliance is determined by the CDF, the CDF shall require PGandE to take measures necessary to correct the noncompliance.

- 13-3. PGandE shall ensure that, regardless of location or ownership, all ungrounded metallic fences longer than 150 feet within the right-of-way shall be grounded following the procedures outlined in the PGandE grounding standard (Geysers Unit 16 AFC, Volume II, Appendix C).

Verification: Within 60 days after completion of transmission line construction, PGandE shall file a statement verifying compliance with these grounding procedures.

- 13-4. In the event of complaints regarding induced currents from vehicles, portable objects, large metallic roofs, fences, gutters, or other objects, PGandE shall investigate and take all reasonable measures at its own expense to correct the problem for valid complaints, provided that: (a) the object is located outside the right-of-way; or (b) the object is within the right-of-way and existed prior to right-of-way acquisition.

For objects constructed, installed, or otherwise placed within the right-of-way after right-of-way acquisition, PGandE shall notify the owner of the object that it should be grounded. In this case, grounding is the responsibility of the property owner. PGandE shall advise the property owner of this responsibility in writing prior to signing the right-of-way agreement.

Verification: PGandE shall maintain a record of activities related to this paragraph. These records shall be made available to authorized CEC staff upon request.

13-5. PGandE shall ensure that the design and construction of the transmission line satisfies or exceeds both the requirements of PUC General Order 95 and the terms and conditions of CEC certification. PGandE shall receive CEC approval for a waiver of any General Order 95 requirements. PGandE shall also receive CEC approval for any of the following significant changes in transmission line design:

- o Any change in conductor size from 1,431 kcmil;
- o Any tower configuration other than as proposed in the AFC;
- o Change to the number of circuits;
- o Change to the voltage level of the line;
- o Changes in normal or emergency conductor capacity greater than 15 percent;
- o Change in termination point; and
- o Change in route.

Verification: Within 60 days following completion of the transmission line, PGandE's registered engineer in responsible charge shall submit a statement to the appropriate PGandE Chief Engineer, who shall transmit it to the CEC. Said statement shall verify compliance with the requirements of PUC General Order 95 and with the terms and conditions of CEC certification. The statement shall note any waivers granted by the CEC for General Order 95 requirements.

- 13-6. On-site worker safety inspections may be conducted by the California Division of Occupational Safety and Health (CAL/DOSH) during construction and operation of the transmission line or when an employee complaint has been received. PGandE shall notify the CEC in writing in the event of a violation if such violation may delay the transmission line construction schedule.

Verification: PGandE shall maintain records of CAL/DOSH inspections and shall make them available to authorized CEC staff upon request.

- 13-7. PGandE shall make every reasonable effort to locate and correct, on a case-by-case basis, all causes of radio interference and television interference attributed to the transmission line facilities, including, if necessary, modifying receivers and furnishing and installing antennas. In addition, PGandE shall take reasonable care to prevent the conductors from being scratched or abraded.

Verification: PGandE shall maintain records of complaints and corrective action and shall make these records available to authorized CEC staff upon request.

- 13-8. Within seven days of a serious accident (as defined under State Labor Codes) or fatality, PGandE shall file a report by telephone with the CEC.

Verification: Within 30 days of an injury or fatality, PGandE shall prepare a report which includes: (1) the date the accident occurred; (2) the name and job title of the employee or the name of

the member of the public; (3) a description of the injury; (4) a description and cause of the accident; (5) a discussion of compliance with General Order 95 requirements and applicable DOSH regulations in the vicinity of the accident; and (6) a statement of corrective/preventative measures taken or to be taken.

PGandE shall keep copies of all such applicable reports in a separate file under Geysers Unit 20 and make such reports available to the CEC in PGandE's offices upon reasonable notice.

- 13-9. The CPUC and PGandE shall take all reasonable steps to ensure that the PUC's decision on the application for Certification of Public Convenience and Necessity (CPCN) accurately reflects the conditions adopted by the CEC.

Verification: Within 30 days of PGandE's receipt of the CPUC's decision on the CPCN, PGandE shall provide copies of the following to the CEC:

- a. All revisions to the CPCN, and
- b. A copy of the CPUC decision with all attachments.

Section 14: TRANSMISSION LINE ENGINEERING

(Compliance requirements are included in Section 13.)

A. Applicable Laws, Ordinances, and Standards

- o California Public Utilities Commission's (CPUC) General Order 95.

These standards primarily provide for public and utility worker safety, but are also intended by the CPUC to "materially contribute to the standard of public service rendered," that is, to improve reliability. The safety and reliability factors are so interrelated as to be inseparable. Accordingly, and to avoid duplication of effort, transmission line safety and reliability considerations are considered together in Section 13: Transmission Line Safety and Nuisance.

B. Requirements

- 14-1. PGandE shall submit to staff economic load level tables which are comparable to those in the Geysers Transmission System Master Plan Study.

Verification: PGandE shall provide CEC staff with the economic load level tables by March 9, 1983.

- 14-2. PGandE will build a new collector line in the Geysers KGRA to be operational by January 1, 1986. By July 1, 1983, or at such later time as is agreed to by CEC staff, PGandE will file an application with either the CEC or the CPUC to build the new collector line. If PGandE chooses to file for a later operational date, then PGandE will assume the burden of proof to justify the later date.

Verification: PGandE shall either file an application with the CEC or provide a copy of a filed PUC application to the CEC by July 1, 1983, or at such later time as is agreed to by CEC staff.

- 14-3. PGandE shall provide knowledgeable participants in future Geysers KGRA transmission hearings held by the CEC regarding taplines, collector lines and outlet lines.

Verification: Within one week of receipt of notice of a workshop, PGandE will notify the CEC as to who the PGandE representative will be.

- 14-4. PGandE shall within 30 days of receipt or within a mutually agreeable timeframe, respond to questions posed by staff regarding the PGandE Geysers 230 kV Collector Line and Power Value Derivation studies, coordinated planning activities and information with respect to PGandE's collector line and any other lead entity's outlet line, and questions relating to the staff's Master Plan Study. PGandE shall also provide knowledgeable participants in workshops if proposed by staff.

Verification: Within 30 days of receipt of staff's questions, or within the mutually agreed timeframe, PGandE shall provide staff with its written response(s) to the questions. Within one week or receipt of a workshop notice PGandE will notify the CEC as to whom the PGandE participant(s) will be.

Section 15: TRANSMISSION LINE BIOLOGICAL RESOURCES

(Compliance requirements are included in Section 5.)

Section 16: NOISE

A. Applicable Laws, Ordinances, Standards, and Practices

- o Occupational Health and Safety Act of 1970 (29 CFR 1910 et seq.).
- o Title 8, California Administrative Code, Article 105.
- o Noise Element of the Sonoma County General Plan.
- o Draft Sonoma County Zoning Ordinance.
- o Sonoma County Geothermal Use Permit Conditions (1981).

B. Requirements

16-1. PGandE shall comply with Sonoma County Geothermal Use Permit Standard Conditions (1981), which are 65 dBA for daytime hours (7 a.m. to 10 p.m.) and 45 dBA for nighttime hours (10 p.m. to 7 a.m.) for residences, or with conditions given in the Sonoma County Zoning Ordinance if adopted. In the event the Sonoma County Planning Department or PGandE receives public complaints of the noise due to construction or operation, Sonoma County and PGandE agree to promptly conduct an investigation to determine the extent of the problem. PGandE shall take reasonable measures to resolve the complaints.

Verification: At least 90 days before construction begins, PGandE shall develop and submit to the Sonoma County Planning Department a procedure for handling public complaints. The Sonoma County Planning Department will notify PGandE and the CEC when the County deems the PGandE plan acceptable.

16-2. Within 10 days of a request by the Sonoma County Planning Department, PGandE shall conduct noise surveys at the sensitive receptors which register complaints and at the facility property line nearest the complaining receptors. PGandE shall conduct surveys for the period of the construction working day and, if possible, under circumstances similar to those when the noise was perceived. The survey should be reported in terms of the L_x and L_{eq} levels ($x = 10, 50, \text{ and } 90$). PGandE shall identify and implement feasible mitigation measures necessary to assure compliance with the county standards.

Verification: PGandE shall promptly forward to Sonoma County the survey results, the mitigation measures applied to resolve the problem, and the results of these efforts. Sonoma County shall advise the CEC of any continuing noncompliance conditions.

16-3. Within 90 days after the plant reaches its rated power generation capacity and construction is complete, PGandE shall conduct a noise survey at 500 feet from the generating station or at a point acceptable to PGandE, CEC, and Sonoma County Planning Department. The survey will cover a 24-hour period with results reported in terms of L_x ($x = 10, 50, \text{ and } 90$), L_{eq} , and L_{dn} levels.

PGandE shall prepare a report of the survey that will be used to determine the plant's conformance with county standards. In the event that county standards are being exceeded, the report shall also contain a mitigation plan and a schedule to correct the noncompliance.

No additional noise surveys of off-site operational noise are required unless the public registers complaints or the noise from the project is suspected of increasing due to a change in the operation of the facility.

Verification: Within 30 days of the noise survey, PGandE shall submit its report to the Sonoma County Planning Department.

- 16-4. Within 180 days after the start of commercial operation, PGandE shall prepare a noise survey report for the noise-hazardous areas in the facility. The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, CAC, Article 105. The survey results will be used to determine the magnitude of employee noise exposure. If employee complaints of excessive noise arise during the life of the project, CAL/DOSH, Department of Industrial Relations, shall make a compliance determination.

Verification: PGandE shall notify CAL/DOSH and the CEC of the availability of the report.

Section 17: POWER PLANT EFFICIENCY AND RELIABILITY

A. Applicable Laws, Ordinances, Standards, and Practices

- o Public Resources Code, Section 21100(c).
- o Public Resources Code, Section 25523(a).
- o Public Resources Code, Section 25511.

B. Requirements

17-1. PGandE shall perform a study concerning power plant efficiency from a cost/benefit point of view, including the impact upon the rate payers. In this study, PGandE shall evaluate and incorporate all of the CEC staff's parameters which were submitted on or before January 1, 1983. PGandE shall submit its study to the CEC by May 1, 1983, solely for the purposes of showing compliance with this requirement. PGandE will consider the merits of power plant efficiency for the next PGandE geothermal power plant prior to completion of site selection and committing to a plant design or procuring major equipment (e.g., turbine-generator, main condenser, and components of the circulating water and cooling system).

Submission of the study shall not be considered as establishing any precedent or as a prefilings of the next PGandE geothermal AFC. In the event that the submission of the next PGandE geothermal AFC is delayed past July 1, 1984, PGandE and the CEC staff shall agree on a later date for submission of the study.

Verification: By May 1, 1983, PGandE shall submit to CEC a copy of the study identified in the above requirement, inclusive of CEC staff's parameters as mentioned in the requirement. In the event that the submission of the next PGandE geothermal AFC is delayed past July 1, 1984, PGandE and the CEC staff shall agree on a later date for submission of the study.

17-2. PGandE shall continuously obtain performance-related data over the life of the plant for the following operating parameters:

- a. Main condenser absolute pressure,
- b. Turbine inlet steam pressure, and
- c. Plant generation capacity as net and gross megawatts.

PGandE shall start obtaining the above data on the first day of plant operation which attains at least 90 percent of the net rated electrical power output at the plant busbar for a minimum of 48 hours of continuous steady state operation.

Steady state operation is defined as sustained operation of the plant, wherein the net electrical power output at the plant output busbar does not vary by more than plus or minus 5 percent over a one hour time period.

If the monitoring instrumentation systems are off-line for more than 24 hours, PGandE shall manually collect sufficient data as defined above in order to provide the required performance-related data.

Verification: PGandE shall submit to the CEC, at least 30 days prior to scheduled operation, a letter describing the instrumentation, its accuracy, and the intended frequency of calibration.

- 17-3. PGandE shall retain the plant performance-related data for each five years of plant operation or as required by the FERC or the CPUC or until the CEC has given its approval to dispose of the data. Further, PGandE shall provide a representative of the CEC, upon reasonable notice, access to the performance-related data at the plant site.

Verification: PGandE shall inform the CEC of the location of the performance-related data in a periodic compliance report.

- 17-4. Within 60 days of achieving at least 90 percent of net rated electrical power output at the plant output busbar for a minimum of 48 continuous hours of steady state operation, PGandE shall undertake an initial power plant performance test. The results of this test shall be submitted to the CEC within 60 days of test completion.

Verification: PGandE shall file the data with the CEC as defined above.

- 17-5. PGandE shall collect the routine performance-related data defined in requirement 17-2.

Verification: PGandE shall file the data with the CEC in a periodic compliance report.

17-6. After each overhaul of the Geysers 20 plant (estimated to be after 24 months of operation) or major emergency overhaul or repairs, PGandE shall undertake a post overhaul power plant performance test.

The power plant performance test results for the Geysers 20 power plant will include, but not be limited to, information on the following parameters:

- a. Mass-flow rate of inlet steam,
- b. Steam temperatures and pressures,
- c. Power plant auxiliary usage in megawatts,
- d. Power plant output at the busbar in megawatts,
- e. Power plant auxiliary steam flow,
- f. Turbine steam inlet pressure, and
- g. Main condenser absolute pressure.

Verification: PGandE shall submit the results of this test to the CEC within 60 days of test completion.

17-7. Information regarding the following parameters, at a minimum, will be available to the CEC staff for review at the power plant site upon request:

- a. Mass-flow rate of steam,
- b. Steam temperature and pressures,

- c. Power plant auxiliary usage in megawatts,
- d. Power plant electrical generation output at the busbar,
- e. Power plant auxiliary steam flow,
- f. Turbine steam inlet pressure, and
- g. Main condenser absolute pressure.

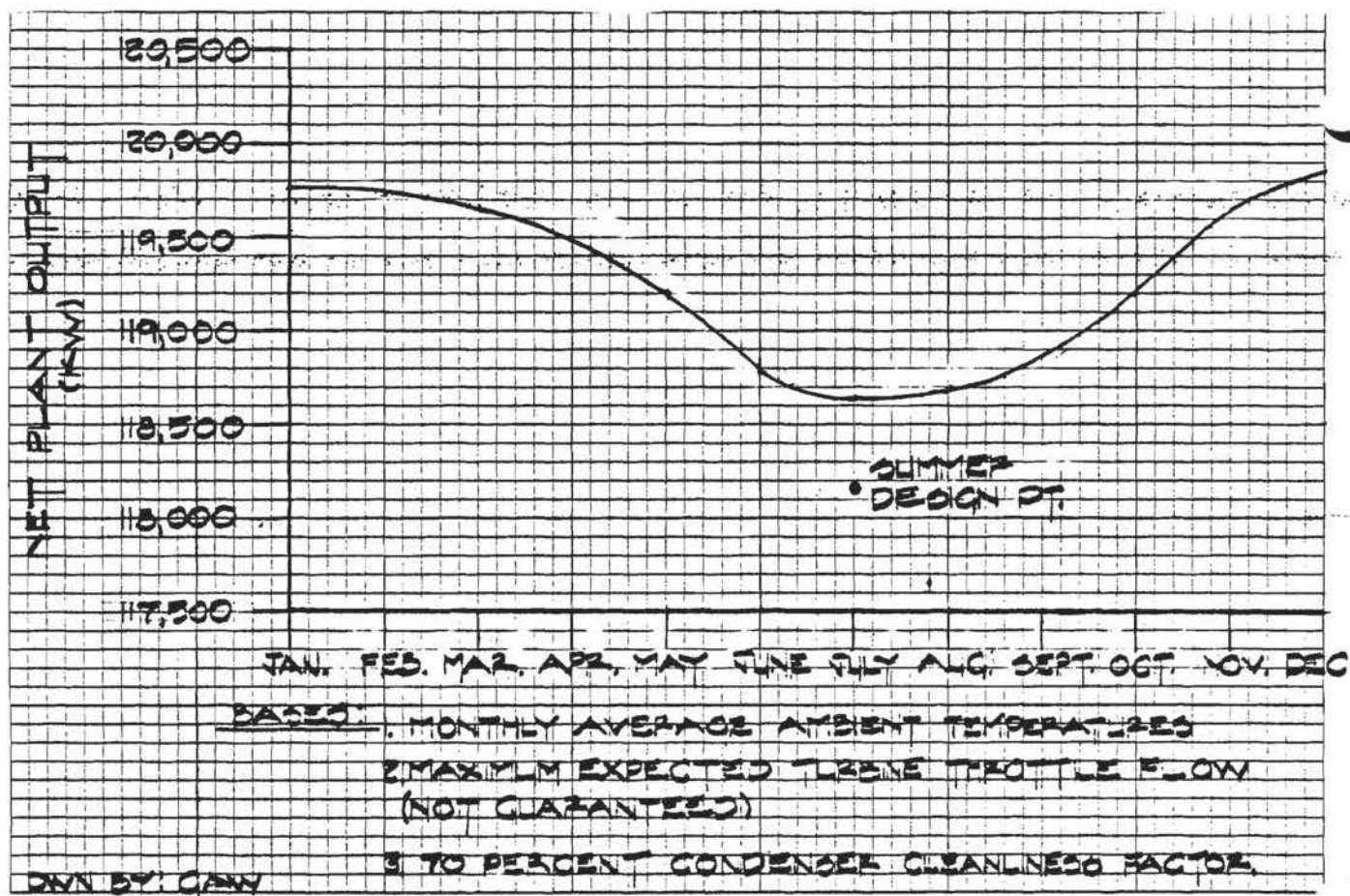
Verification: PGandE shall provide CEC staff with access, upon reasonable notice, to this data at the plant site.

17-8. If the routine data defined in requirement 17-2 indicates a significant degradation (defined as plant electrical output dropping 15 percent below the month to month levels indicated in the figure below) in performance prior to a regularly scheduled maintenance overhaul, PGandE shall develop and submit to the CEC a plan to restore performance to a level comparable to that indicated by the immediately preceding post-overhaul test results unless limited by economics or replacement parts availability.

17-9. PGandE shall report all forced outages and curtailments exceeding 24 hours. This reporting shall include possible causes and total downtime.

Verification: PGandE shall submit to the CEC such information in the periodic compliance reports.

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by Amendment
Order #
95-0315-09*



Verification: Within 60 days of detecting a significant degradation of performance, PGandE shall submit a plan for corrective action to the CEC. CEC staff shall respond within 15 days to PGandE's proposed plan. In the event that PGandE and the CEC cannot achieve an agreement on the plan to restore plant performance as defined in requirement 17-8, the matter shall be referred to the CEC for resolution under the procedures contained in the Compliance Plan Dispute Resolution Procedures. If PGandE so requests, the CEC will solicit comments from the CPUC concerning the rate impacts of any such plan, and, in any event, shall forward its final determination on this matter to the CPUC.

17-9. PGandE shall report all forced outages and curtailments exceeding 24 hours. This reporting shall include possible causes and total down time.

Verification: PGandE shall submit to the CEC such information in the periodic compliance reports.



APPENDIX B

Following is the Notice which PGandE
will post at the Beigel Cabin



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NOTICE TO OCCUPANTS OF THE BEIGEL CABIN

Pacific Gas and Electric Company (PGandE) has received a permit to construct and operate Geysers 20, a geothermal power plant located approximately 0.6 miles northeast of this cabin. As a means of mitigating possible air pollutant impacts, should they occur, the California Energy Commission (CEC) staff and PGandE have agreed to the following condition:

"PGandE shall promptly fund reasonable studies or tests as required by the Northern Sonoma County Air Pollution Control Officer (NSCAPCO) to ascertain the impact of Unit 20 when operating, specifically at the residence located approximately 0.6 miles south and west of the plant site, in the event that the resident, in good faith, files complaints with the NSCAPCO or the CEC indicating the air quality is worsening or becoming a nuisance or unhealthful as a result of Unit 20 operation. Reasonable mitigation steps shall be applied upon request of the NSCAPCO to attempt to remedy any unlawful impacts of the power plant upon the residence."

Any questions or complaints that the air quality is worsening or becoming a nuisance or unhealthful should be directed to:

Northern Sonoma County Air Pollution
Control Officer
118 North Street
Healdsburg, CA 95448
(707) 433-5911

APPENDIX C

Following is the transportation agreement between
PGandE and Sonoma (and Lake) Counties



AGREEMENT BETWEEN PACIFIC GAS AND ELECTRIC
COMPANY AND THE COUNTY
OF SONOMA REGARDING PACIFIC GAS
AND ELECTRIC COMPANY'S APPLICATION FOR
CERTIFICATION OF GEYSERS UNIT 20

CALIF. ENERGY COMMISSION

OCT 12 1982

RECEIVED IN DOCKETS

This is an Agreement between PACIFIC GAS AND ELECTRIC
COMPANY (PG&E) and the COUNTY OF SONOMA (COUNTY).

R E C I T A L S :

1. PG&E has filed with the Energy Resources
Conservation and Development Commission (Energy Commission) an
Application for Certification for the Geysers Unit 20 (Unit 20)
in Sonoma County, California.

2. County's petition to intervene in the Unit 20
proceedings was granted by the Energy Commission.

3. County raised issues before the Energy Commission
that must be considered by the Commission before Certification is
granted. They are:

(a) County contends that PG&E must mitigate the
impacts that it will have on the roads of Sonoma County during
construction and operation of Unit 20, and PG&E must mitigate the
cumulative impact that development of the Geysers area for
geothermal steam has had and will have on the roads of Sonoma

County.

PG&E agrees that it has an obligation to mitigate the impacts on roads caused by construction and operation of Unit 20, but contends that it has no obligation to mitigate cumulative impacts on Sonoma County roads and contends that the Energy Commission has no jurisdiction to order mitigation of said cumulative impacts.

(b) County contends that PG&E must mitigate the impacts that it will have on the housing of Sonoma County during construction and operation of Unit 20, and PG&E must mitigate the cumulative impact that development of the Geysers area for geothermal steam has had and will have on the housing of Sonoma County.

PG&E agrees that it has an obligation to mitigate the impacts on housing caused by construction and operation of Unit 20, but contends that it has no obligation to mitigate cumulative impacts on Sonoma County Housing and contends that the Energy Commission has no jurisdiction to order mitigation of said cumulative impacts.

Hearing on these issues is scheduled before a committee of the Energy Commission on October 13, 1982.

4. The Staff of the Energy Commission recommended in its Preliminary Staff Assessment, "Transportation" as revised on September 7, 1982, that PG&E and the County negotiate outside the Energy Commission proceeding to reach agreement about the issues. PG&E and the County desire to so negotiate.

5. PG&E has advised County that it cannot complete negotiations until after Certification is granted. PG&E has asked the County to withdraw its request that its issues be heard on October 13, 1982, so that meaningful negotiations may take place.

6. The Certification of Unit 20 by the Energy Commission is expected to be completed by January 26, 1983. PG&E does not want to delay granting of this Certification because it has applied for and must be granted a Certificate of Public Convenience and Necessity by the Public Utilities Commission. PG&E does not expect the Public Utilities Commission to act until the Energy Commission's decision is final. PG&E anticipates that the Public Utilities Commission will take ninety (90) days thereafter to grant its Certification.

7. If the granting of these certificates occurs as is anticipated by PG&E, PG&E will be able to start its site preparation work for Unit 20 in the spring of 1983. PG&E does not want to delay the granting of these certificates as it would

delay commencement of construction and would delay completion of Unit 20 by a year or more.

8. The County is willing to waive its right to the October 13, 1982, hearing in view of the above representations made by PG&E and in an attempt to reach a negotiated settlement, so long as the County's right to hearings and judicial review are fully protected. PG&E has represented to the County that its rights to raise its issues, to hearings and judicial review will be fully protected if the County consents that Certification before the Energy Commission go forward and that PG&E be granted Certification with the condition that PG&E shall not begin construction on Unit 20 until an agreement is reached between the County and PG&E, or if no agreement is reached, until a final decision on the issues has been made.

NOW, THEREFORE, BE IT AGREED THAT:

1. The parties agree that this Agreement shall substitute for the existing stipulation entered into between PG&E and the Energy Commission staff regarding a road agreement with Sonoma County so that the parties may be allowed to negotiate on the issues stated in paragraph 2 below, until February 1, 1983, or the time when either party requests the Energy Commission to resolve the matter (but in no event later than 30 days prior to construction). County withdraws its request that the Energy

Commission consider this matter prior to Certification and agrees not to request that the Commission consider this matter prior to Certification unless County reasonably determines that PG&E will no longer negotiate in good faith or the parties have reached an impasse.

The parties jointly request that if the Certification of Unit 20 is granted, it be on the express condition that PG&E shall not begin construction of Unit 20 until agreement is reached between PG&E and County, or if agreement is not reached, until final decision on the issues raised by County is made. PG&E agrees that it shall not challenge the Energy Commission's authority or jurisdiction to impose this condition.

2. The parties will negotiate in good faith on the following issues:

(a) Mitigation of impacts to the roads in Sonoma County caused by construction and development of Unit 20, and mitigation of the cumulative impacts that development of the Geysers area for geothermal steam production has had and will have on the County's roads.

(b) PG&E will solicit industry participation in an agreement to mitigate the impacts to the roads of Sonoma County caused by development of the Geysers area for geothermal steam

production.

3. In the event that the parties are unable to reach agreement as set forth in paragraph 1 above, then:

A. The parties shall adjudicate before the Energy Commission, or before a committee as the Energy Commission may designate, the issues raised in paragraph 3 of the Recitals.

B. The parties agree that all statutes, ordinances and rules in effect on October 13, 1982, shall be applied to the proceedings, and amendments to same thereafter shall not be applied to this proceeding.

C. PG&E's highest offer and County's lowest demand shall be made a part of the record at hearing.

4. In consideration for the County's agreements, PG&E further stipulates that:

A. The PG&E Unit 20 Project may result in increased demand on the emergency medical services of County. PG&E agrees to reimburse County for actual costs incurred by County in responding to an emergency medical situation at the project, including evacuation and medical treatment.

B. PG&E agrees to participate in any proceedings conducted by the Energy Commission to evaluate cumulative socioeconomic impacts at the Geysers. PG&E further agrees to participate in joint action to mitigate its share of significant cumulative socioeconomic impacts on a voluntary basis with other geothermal developers. There are no intended third party beneficiaries of this paragraph.

5. The parties understand that this Agreement imposes obligations upon the Energy Commission and the parties agree that this Agreement shall bind the parties unless it is not thereafter stipulated to by Staff of the Energy Commission, approved by the Energy Commission and incorporated into the Certification.

Dated: October 1, 1982

COUNTY OF SONOMA

By 

MARK J. FREED

Chief Deputy County Counsel

Dated: October 1, 1982

PACIFIC GAS AND ELECTRIC COMPANY

By 

DAVID C. GILBERT, ATTORNEY

²
AGEED and ACCEPTED:

ENERGY COMMISSION STAFF

By 

Dated:



APPENDIX D

Following is the agreement reached between
PGandE and the Sonoma and the Lake County
school districts.





7152 SOUTH MAIN STREET
LAKEPORT, CALIFORNIA 95453

GEORGE CHAPMAN
Assistant Superintendent
707/263-6877

WILLIAM WOOD MERRILL
Schools Attorney
707/263-3080

SUSAN THOMPSON
Projects Director
707/263-7089

JUDITH E. LUCHSINGER
County Superintendent of Schools
Telephone 707/263-3080

RUSSELL E. PULLMANN, SR.
Director, Business Services
707/263-6892

DON F. HENTHORN
Director, Pupil Personnel
707/263-6877

RICHARD B. GAGE
Director, Special Education
707/263-8248

December 17, 1982

David C. Gilbert, Esq.
Pacific Gas and Electric Company
P.O. Box 7442
San Francisco, California 94120

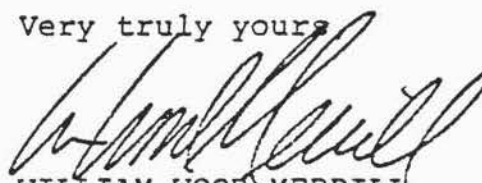
RE: P.G. & E. UNIT 20
SCHOOLS IMPACT MITIGATION
AGREEMENT

Dear Mr. Gilbert:

Enclosed please find the executed letter of modifications in regards to the Geysers Unit 20 Schools Impact Mitigation Agreement.

Thank you for your cooperation and assistance in this matter. If you have any questions, please contact me.

Very truly yours



WILLIAM WOOD MERRILL
Schools Attorney

WWM/da
Encl.

707/263-3080

707/263-3080



PACIFIC GAS AND ELECTRIC COMPANY

PG&E +

77 BEALE STREET, SAN FRANCISCO, CALIFORNIA 94106
P.O. BOX 7442, SAN FRANCISCO, CALIFORNIA 94120

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J. PETER BAUMBAUMER
JAMES A. FARE
J. MICHAEL EIDENBACH
WILLIAM C. SAMPSON
SHIRLEY A. MOE

DAVID W. ANDERSON
CHRIS M. BUCHHEIM
LEWIS S. EMBERTON
ANDREW A. CHAMBER
DAVID D. COLEMAN
DAVID C. SHERIDAN
GAIL A. GOSSEL
JAMES H. JAY
MERRIT E. LORSON
JESSIE A. LOONAN
A. S. K. MCKENNA
RICHARD L. HARRIS
KENNETH G. GLENN
SHIRLEY A. SAMPSON
JACK W. SMITH
KIMBERLY TAYLOR

JOHN T. AMMON
STEVEN P. BUEDE
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GAIL B. CHAMBER
DAVID M. FLEMING
PATRICIA S. GILBERT
STEVEN F. GILBERT
RICHARD C. JONES
WALTER W. LORSON, JR.
JAMES B. LORSON
ROBERT S. MCKENNA
RICHARD M. MCKENNA
ROBERT J. PETERSON
JOHN A. SAMPSON
LEWIS C. VINCIGUERRA

ATTORNEYS

September 24, 1982 **82-AFC-1**

Mr. Rene Auguste Chouteau
Schools Legal Counsel
Sonoma County Office of
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County Administrative Center
Rm. 111E, 410 Fiscal Drive
Santa Rosa, California 95401

✓Mr. William Wood Merrill
Schools Attorney
Lake County Office of
Education
1153 South Main Street
Lakeport, California 95453

CALIF. ENERGY COMMISSION

Re: Geysers Unit 20
Schools Impact Mitigation Agreement

DEC 21 1982

Dear Messrs. Chouteau and Merrill:

RECEIVED IN DOCKETS

Pursuant to our recent telephone conversations, enclosed is PGandE's executed Schools Impact Mitigation Agreement.

As we discussed, this letter modifies that Agreement in the following ways:

1. On page 1, paragraph 1, this Agreement will result in the full mitigation of any potentially adverse impacts from Geysers Unit 20, whether direct or cumulative impacts in the KGRA. By signing this Agreement PGandE does not admit that there are, necessarily, any cumulative impacts. Rather, we are stating that if there are such impacts, this Agreement is in full mitigation thereof.
2. On page 2, paragraph 3d, at the beginning of line 3, the word "shall" is replaced by the word "may".
3. On page 4, paragraph 8, for purposes of clarification, the intention of this paragraph is that in the event that a school no longer has a physical capacity problem, PGandE's intention will be to

Messrs. Chouteau and Merrill
Page 2
September 24, 1982

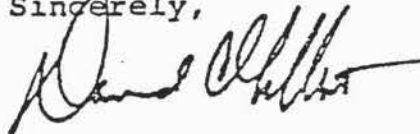
reopen negotiation so that no further payments are required to said School District until such time as a physical capacity problem is shown by the Districts to exist.

4. On page 5, paragraph 12, the language should read "Statements shall be sent to Manager, PGandE Land Department, 77 Beale Street, San Francisco, California 94106."

Upon receipt of this letter and document, please proceed to obtain the balance of the signatures and/or ratifications necessary on your parts. Once you have received said signatures and authorizations, please sign this letter and return it along with the executed agreements so that they can be filed with the CEC.

If you have any questions, please do not hesitate to contact me.

Sincerely,

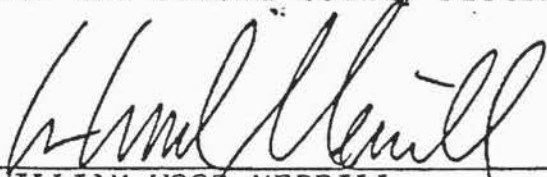


DAVID C. GILBERT

DCG:et
Enclosure

Agreed and Accepted:

RENE' AUGUSTE CHOUTEAU
For the Sonoma County Districts



WILLIAM WOOD MERRILL
For the Lake County Districts

589:0.10.1

Y. 10.10.1

PACIFIC GAS AND ELECTRIC COMPANY

PG&E +

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RICHARD M. MOSS
ROBERT J. PETERS
JOHN SHAPPEL
LOUIS C. VINCENT

September 24, 1982

✓ Mr. Rene Auguste Chouteau
Schools Legal Counsel
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County Administrative Center
Rm. 111E, 410 Fiscal Drive
Santa Rosa, California 95401

Mr. William Wood Merrill
Schools Attorney
Lake County Office of
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1153 South Main Street
Lakeport, California 95453

Re: Geysers Unit 20
Schools Impact Mitigation Agreement

Dear Messrs. Chouteau and Merrill:

Pursuant to our recent telephone conversations,
enclosed is PGandE's executed Schools Impact Mitigation
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As we discussed, this letter modifies that Agreement
in the following ways:

1. On page 1, paragraph 1, this Agreement will result in the full mitigation of any potentially adverse impacts from Geysers Unit 20, whether direct or cumulative impacts in the KGRA. By signing this Agreement PGandE does not admit that there are, necessarily, any cumulative impacts. Rather, we are stating that if there are such impacts, this Agreement is in full mitigation thereof.
2. On page 2, paragraph 3d, at the beginning of line 3, the word "shall" is replaced by the word "may".
3. On page 4, paragraph 8, for purposes of clarification, the intention of this paragraph is that in the event that a school no longer has a physical capacity problem, PGandE's intention will be to

Messrs. Chouteau and Merrill
Page 2
September 24, 1982

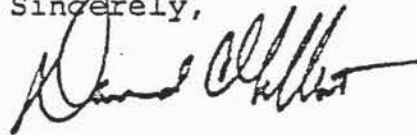
reopen negotiation so that no further payments are required to said School District until such time as a physical capacity problem is shown by the Districts to exist.

4. On page 5, paragraph 12, the language should read "Statements shall be sent to Manager, PGandE Land Department, 77 Beale Street, San Francisco, California 94106."

Upon receipt of this letter and document, please proceed to obtain the balance of the signatures and/or ratifications necessary on your parts. Once you have received said signatures and authorizations, please sign this letter and return it along with the executed agreements so that they can be filed with the CEC.

If you have any questions, please do not hesitate to contact me.

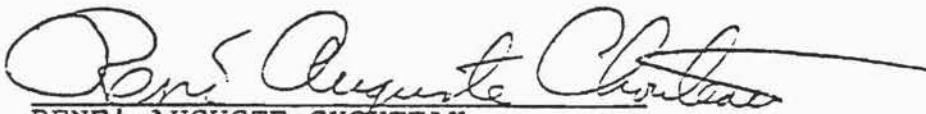
Sincerely,



DAVID C. GILBERT

DCG:et
Enclosure

Agreed and Accepted:



RENE AUGUSTE CHOUTEAU
For the Sonoma County Districts

WILLIAM WOOD MERRILL
For the Lake County Districts

SCHOOL IMPACT MITIGATION AGREEMENT

This Agreement is entered into by and between Pacific Gas and Electric Company, (hereinafter referred to as "P.G. & E.") and the following educational entities of Lake County and Sonoma County (hereinafter referred to as "the School Districts"): Kelseyville Unified School District, Konocti Unified School District, Lakeport Unified School District, Lucerne Elementary School District, Upper Lake Union School District, Upper Lake Union High School District, Middletown Unified School District, Lake County Board of Education, Lake County Superintendent of Schools, Piner-Olivet Union School District, Healdsburg Union High School District, Healdsburg Union School District, Cloverdale Unified School District, Geyserville Unified School District, West Side Union School District, Windsor Union School District, the Sonoma County Board of Education, and the Sonoma County Superintendent of Schools, on the following terms and conditions.

1. This Agreement is entered into pursuant to the provisions of the California Environmental Quality Act (Public Resources Code Sections 21000 et seq.) and the Warren-Alquist Act (Public Resources Code Section 25500 et seq.) for the purpose of mitigating the potentially significant adverse impact on the public school facilities in Lake County and Sonoma County expected to result from the construction and operation of a geothermal power plant (hereinafter referred to as "the Power Plant") by P.G. & E., P.G. & E. having applied for permission to construct and operate such a power plant to the State of California Energy Resources Conservation and Development Commission (hereinafter referred to as "the CEC") (Docket No. 82-AFC-1). In consideration for and as part of the terms and conditions of this Agreement, the School Districts agree that performance under the terms and conditions of this Agreement will result in mitigation of said potentially significant adverse impacts, including but not limited to the Power Plant's share of cumulative impacts in "The Geysers" Known Geothermal Resources Area.

2. On or before December 1 of each year beginning in 1982, once each year during the term of this Agreement, the School Districts shall cause to be prepared and distributed, at the expense of School Districts, a survey questionnaire to each student enrolled in each school operated by School Districts who is in attendance on the day designated by each School District for distribution of the survey questionnaire. Said survey questionnaire shall be collected and analyzed by School Districts, at the expense of School Districts, the results thereof being summarized and distributed, within a reasonable time, to the parties to this Agreement.

3. SURVEY. This survey questionnaire is to be designed to collect the following information about each such student as well as such other information as the School Districts may deem appropriate:

a. Whether at least one parent of each such student owns or is employed by a power plant developer or a power plant construction contractor or subcontractor and, if so, whether such employment is primarily on the site of or primarily connected to a power plant, specifying the name of the power plant; or whether said parent owns or is employed by any other business firm and, within the course and scope of said employment, is primarily on the site of or primarily connected to a power plant, specifying the name of the power plant.

b. Whether at least one parent of each such student owns or is employed by an off-site or multiple-site firm whose operations are primarily involved in providing service for construction and/or operation of geothermal power plants including but not limited to the following: waste disposal, water supply, trucking and other transportation, heavy equipment operation, equipment maintenance and repair, specifying which power plants, including but not limited to the Power Plant, are served by the firm.

c. "Primarily" when used in this section shall mean "50 percent or more".

d. On or before December 1 of each year beginning in 1982, once each year during the term of this contract, P.G. & E. shall cause to be prepared, at P.G. & E.'s expense, a list of employees of P.G. & E., its contractors and subcontractors and their children, who fall within the scope of Section 3(a) hereof. This P.G. & E. Survey shall be compared to the School District Survey. In the event of substantial inconsistency between the two surveys, the parties hereto shall review and discuss them with an intent to resolve the inconsistency, for a period of thirty (30) days. Pending such review and in the event there is no resolution, the School District Survey shall control, and the time schedules for billing and payment shall not be affected.

4. STUDENT UNITS.

a. Each student who is identified in the survey each year as having at least one parent who falls within the scope of Section 3(a), if the student is enrolled in a School District for the first time on or after January 31, 1983, and if the project specified is the Power Plant, shall be assigned the value of one student unit.

b. Each student identified in the survey as having at least one parent who falls within the scope of Section 3(b), if the Power Plant is among the power plants served by said parent's

firm, shall be assigned the value of four percent of a student unit.

c. If either party believes that the definition set forth in 3(c) and/or the formula set forth in 4(b) do not accurately reflect the actual impact of the Project's pro rata share of the impacts of off-site or multiple-site firms involved in providing service for construction and operation of geothermal power plants, or upon written notice pursuant to Section 8, either party may, by written notice to the other party no more than once every twenty-four (24) months during the term of this agreement, reopen negotiations on Section 3(c) or 4(b) or pursuant to Section 8. In the event the parties cannot reach agreement on these items, the matter may be submitted for dispute resolution pursuant to Section 9. At no time shall either party be entitled to reopen negotiations based upon or concerning the way in which any of the School Districts has expended or otherwise used or disposed of any sums paid or to be paid pursuant to this Agreement.

d. If there is a change in either Section 3(c) or 4(b) following negotiations entered into pursuant to Section 4(c), calculations of impact mitigation payments made pursuant to Section 5(a) prior to the change shall be readjusted and those made after the change shall be calculated according to the change. Any sums due either party as a result of readjustment for calculations made prior to the change shall be paid within 60 days of a final determination regarding the change.

5. CALCULATION OF IMPACT MITIGATION PAYMENTS.

a. The School Districts shall be due the sum of five thousand four hundred dollars (\$5,400.00) for each student unit calculated under 4(a), 4(b), and 4(c).

b. An example of how this section would work is as follows:

Year 1: Project student units are 10; therefore, School Districts are due \$54,000. P.G. & E. pays that sum.

Year 2: Project student units are 20; therefore, School Districts are due \$108,000. P.G. & E. pays the balance of \$54,000 for Year 2.

Year 3: Project student units are 10; therefore, School Districts are due \$54,000. P.G. & E. has paid \$108,000 which has been credited to the sums due in previous years. P.G. & E. pays no money to School Districts for Year 3.

Year 4: Project student units are 30; therefore, School Districts are due \$162,000. P.G. & E. has paid \$108,000 which has been credited to the sums due in previous years. P.G. & E. pays the balance of \$54,000 for Year 4.

Year 5-8: Project student units each year are 5; therefore, School Districts are due \$27,000 each year. P.G. & E. has paid \$162,000 which has been credited to the sums due in previous years. P.G. & E. pays no money to School Districts for Years 5-8.

6. Any sums due from P.G. & E. to the School Districts shall be paid once a year by P.G. & E. to the School Districts of each County, in care of the Lake County and Sonoma County Superintendents of Schools respectively, within thirty (30) days of the date of receipt by P.G. & E. of a statement of the amount due from the School Districts of each County enclosing a copy of the annual survey questionnaire summary and of the calculations upon which said statement of amount due is based. The School Districts of each County shall be responsible for the questionnaire distribution, analysis, summary, and for preparation and presentation of the statement of amount due to the School Districts of said County. P.G. & E. shall have the right to inspect the completed survey questionnaires and all records pertaining thereto at any reasonable time, at the offices of the Lake County and Sonoma County Superintendents of Schools. The School Districts shall have the right to inspect all records pertaining to the P.G. & E. survey at any reasonable time, at the Lake or Sonoma County offices of P.G. & E.

7. Said sums shall be deposited in the Treasuries of the Counties of Lake and Sonoma respectively in restricted capital outlay funds to the credit of the School Districts of the respective County jointly. Distribution of said funds among the School Districts of each County shall be by mutual agreement among the School Districts of said County, according to their respective pro rata shares of students based upon the annual survey questionnaire. Upon completion of the fifth annual survey, the distribution for the preceding five years shall be adjusted based upon the average pro rata share of each District over said five year period. Upon completion of the eighth annual survey, the distribution shall be adjusted based upon the eight-year average pro rata share. The parties hereto authorize the Lake County and Sonoma County Superintendents of Schools, respectively, to disburse said funds based upon said mutual agreements.

8. In the event that any of the School Districts shall determine that its student capacity at any time currently exceeds its enrollment by more than ten percent it shall notify P.G. & E. in writing within thirty days of said determination. P.G. & E. may, pursuant to the terms of Section 4(c) hereof, reopen, by written request, for negotiation the future eligibility for impact mitigation payments pursuant to this Agreement of each of said School Districts making such determination.

9. Any dispute arising between or among any of the parties to this Agreement shall be submitted for informal dispute resolution to the CEC pursuant to the Compliance Plan for the

Power Plant, or by any other method of resolution mutually acceptable to the parties hereto.

10. The term of this Agreement shall be from January 31, 1983, through January 31, 1991, inclusive.

11. All information and calculations shall be based on the survey, as of the dates of completion of the survey, irrespective of any subsequent change in employment of parents or enrollment of students prior to the next annual survey.

12. Statements shall be sent to P.G. & E. Land Development, 77 Beale Street, San Francisco, California 94106.

This Agreement is executed at Lakeport, California.

PACIFIC GAS AND ELECTRIC COMPANY

By: _____

Dated: _____

LAKEPORT UNIFIED SCHOOL DISTRICT

By: *Robert Jensen*

Dated: 11/8/82

KONOCTI UNIFIED SCHOOL DISTRICT

By: *William E. Carle*

Dated: 11/8/82

KELSEYVILLE UNIFIED SCHOOL DISTRICT

By: *Ed Orzard*

Dated: 11/8/82

MIDDLETOWN UNIFIED SCHOOL DISTRICT

By: *William H. Landon*

Dated: 11/8/82

LUCERNE ELEMENTARY SCHOOL DISTRICT

By: *W. Palover*

Dated: 11/8/82

UPPER LAKE UNION SCHOOL DISTRICT

By: Richard L. Oetgen

Dated: 11/8/82

UPPER LAKE UNION HIGH SCHOOL DISTRICT

By: Phyllis T. Voe

Dated: 11-8-82

LAKE COUNTY BOARD OF EDUCATION

By: Judith E. Luckey

Dated: 11/8/82

LAKE COUNTY SUPERINTENDENT OF SCHOOLS

By: Judith E. Luckey

Dated: 11/8/82

PINER-OLIVET UNION SCHOOL DISTRICT

By: Gerome D. Schaefer

Dated: 11/9/82

HEALDSBURG UNION HIGH SCHOOL DISTRICT

By: Gerome D. Schaefer

Dated: 4/17/82

HEALDSBURG UNION SCHOOL DISTRICT

By: Jack Hansen

Dated: 11-17/82

CLOVERDALE UNIFIED SCHOOL DISTRICT

By: James D. McAuley

Dated: 11-17-82

GEYSERVILLE UNIFIED SCHOOL DISTRICT

By: Robert H. Hilman

Dated: 12-9-82

WEST SIDE UNION SCHOOL DISTRICT

By: Benny L. L. L.

Dated: 12-14-82

WINDSOR UNION SCHOOL DISTRICT

By: Norman G. G.

Dated: 12-13-82

SONOMA COUNTY BOARD OF EDUCATION

By: Walter A. L.

Dated: 12-15-82

SONOMA COUNTY SUPERINTENDENT OF SCHOOLS

By: Walter A. L.

Dated: 12-15-82



APPENDIX E
Exhibit List



STATE OF CALIFORNIA
ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

CALIF. ENERGY COMMISSION

FEB 8 1983

RECEIVED IN DOCKETS

In the Matter of:)
)
Application for Certification)
of Pacific Gas and Electric)
Company's Geysers Unit 20)
Project)
_____)

Docket No. 82-AFC-1

Exhibit ListExhibit Number

- 1 Pacific Gas and Electric Company, PG&E staff, Application for Certification Geysers Unit 20, dated March 18, 1982. Submitted and marked for identification on October 12, 1982.
 - 2 California Energy Commission, CEC staff, Preliminary Staff Assessment of the Pacific Gas and Electric Geysers 20 Geothermal Project, dated August 1982. Submitted and marked for identification on October 12, 1982.
 - 3 California Energy Commission, CEC staff, Testimony and Qualifications of CEC Staff Witnesses, dated October 1, 1982. Submitted and marked for identification on October 12, 1982.
 - 4 California Energy Commission, CEC Staff, Testimony and Qualifications of CEC Staff Witnesses, dated October 15, 1982. Submitted and marked for identification on October 25, 1982.
- Errata to Exhibit 4
- California Energy Commission, Joel Klein, Errata to Joel Klein's Transmission Line Engineering Testimony, pages 25, 27, and 29, dated October 25, 1982. Submitted and marked for identification on October 25, 1982.
- 4A California Energy Commission, Joel Klein, Transmission Losses as a Function of Line Loading for a Single Circuit 1,113 kcm (for one mile). Submitted and marked for identification on October 25, 1982.

Exhibit Number

5

Pacific Gas and Electric Company, Alan Soneda, letter to Alan Soneda from Zene Bohrer, CEC, regarding Geysers Unit 20 Water Supply, CEC Requirement 6-14, dated January 27, 1983. Letter to Alan Soneda from Tom Soike and Michael J. Cale, Sonoma County Department of Planning, regarding Geysers Unit 20 water supply, dated January 24, 1983. Letter to Alan Soneda from Brian Hunter, Department of Fish and Game, regarding PGandE's Proposed Revisions to the CEC staff's Proposed Language on Geysers Unit 20 Water Supply, dated January 20, 1983. Submitted and marked for identification on February 4, 1983.

APPENDIX F
Proof of Service List



STATE OF CALIFORNIA
STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

In the Matter of:)	
)	
Application for Certification of)	Docket No. 82-AFC-1
Pacific Gas and Electric Company's)	
Geysers Unit 20 Project)	(Revised 10/15/82)
)	

PROOF OF SERVICE

I, Eurlyne Geiszler declare that on November 23, 1982, I deposited copies of the attached Presiding Member's Report in the United States mail at 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:

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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.


Eurlyne Geiszler

Attachment

APPENDIX G

These stipulated air quality findings proposed by Applicant and Staff are acceptable to the Commission as further elaboration of its discussion in this Decision.



APPENDIX G

1. PGandE Geysers Unit 20 is proposed to be located in the Northern Sonoma County Air Pollution Control District (NSCAPCD). The following laws are applicable to the Unit 20 facility:

- a. Clean Air Act and implementing regulations,
- b. California Health and Safety Code and implementing regulations, and
- c. NSCAPCD Rules and implementing regulations. Specific rules of concern are:

- (1) 220 and 230 (New Source Review),
- (2) 260(b),
- (3) 400(a),
- (4) 410(a),
- (5) 420(d),
- (6) 430, and
- (7) 455(a) and (b).

2. PGandE has applied for a federal PSD permit. On July 27, 1982, the U.S. EPA issued a PSD permit for the Unit 20 facility. Permit Condition IX.C. states the following:

"PGandE shall be responsible for control of H₂S emissions during steam stacking caused by scheduled and unscheduled outages of the power plant. Prior to startup of Unit 20 PGandE shall submit a plan for controlling H₂S emissions during

stacking. PGandE may not commence operation of Geysers Unit 20 until EPA has approved such a plan. This condition shall become null and void upon the issuance of federal PSD permit to Union, covering the wells and steam supply for Geysers Unit 20."

PGandE is currently appealing the PSD permit. In a letter dated March 1, 1982, Union Oil Company indicated that it intends to comply with all applicable NSCAPCD regulations (AFC, Appendix B).

3. NSCAPCD Rule 260(b) specifies that the New Source Review procedure in accordance with Rule 220(b), Rule 230(a)(4), and Rule 230(a)(2) shall not be required for geothermal power plants or steam transmission lines which will not under all normal operating conditions emit greater than 5 lbs H₂S/1,000,000 lbs steam (but in no event greater than 250 lbs/day provided it is not considered a major source or a major modification).
4. PGandE has applied for a permit under NSCAPCD Rule 260(b). Therefore, the H₂S emission limitation for the Unit 20 facility is 10.4 lbs/hr (based upon the maximum emission rate of 250 lbs/day).
5. A general emission limitation contained in NSCAPCD Rule 400(a) prohibits the discharge of any contaminant in any amount which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or which causes injury or damage to business or property.
6. Complaints from the Anderson Springs-Cobb areas as a result of H₂S air pollution continue although H₂S standard violations and complaints have been markedly reduced in the past years. The NSCAPCD and Lake County Air Pollution Control District (LCAPCD) specifically regulates H₂S emissions to attain and maintain the California Ambient Air Quality Standards

(CAAQS) for H_2S , which are based in part on an odor threshold. Compliance with the H_2S standard and Determination of Compliance (DOC) conditions of the NSCAPCD is adequate to ensure compliance with Rule 400(a).

7. NSCAPCD Rule 410(a) prohibits any discharges for more than 3 minutes per hour which are as dark as the No. 2 shade on the Ringelmann Chart or 40 percent opacity. The Unit 20 facility will comply with the prohibition of Rule 410(a).
8. NSCAPCD Rule 420(d) limits emissions of particulate matter to whichever is the lesser of:
 - a. 0.2 grains per cubic foot of gas, or
 - b. 40 pounds per hour.
9. The maximum expected particulate emission rate from the proposed facility is 2.85 lbs/hr, or 0.000018 grains per cubic foot of gas. This emission rate will comply with NSCAPCD Rule 420(d).
10. NSCAPCD Rule 430 prohibits the handling, transporting, or open storage of materials, which results in "unnecessary amounts" of fugitive dust. PGandE will use proper construction and storage practices to ensure compliance with Rule 430.
11. NSCAPCD Rule 455(a) limits emissions of sulfur compounds from any geothermal operation to less than 1,000 parts per million (ppm) calculated as sulfur dioxide (SO_2).

12. Design specifications for the Stratford Unit should require that H₂S in the tail gas be controlled to 10 ppm or less. This requirement should not be interpreted to impose a standard more restrictive than that set forth in the DOC. Total sulfur compound emissions from the main cooling tower, calculated as SO₂, are approximately 0.12 ppmv. These emissions will comply with NSCAPCD Rule 455(a).
13. NSCAPCD Rule 455(b) limits H₂S emissions from geothermal power plants receiving a DOC after July 1, 1981, to not more than 50 grams per gross megawatt hour (g/GMWh). PGandE has agreed to operate the facility such that H₂S emissions will not exceed 10.4 lbs/hr, or approximately 41.8 g/GMWh, which complies with Rule 455(b).
14. NSCAPCD Rule 455(b) also limits H₂S emissions from steam field operations. Effective December 31, 1986, (subject to the District's review in 1984), for any outages the steamfield operator shall reduce H₂S emissions within 10 minutes or less than 39 kg/hr. For an unscheduled outage the steamfield operator shall, within 4 hours, reduce H₂S emissions (a) by 90 percent or more or (b) to not more than 20 kg/hr (44 lbs/hr). For a scheduled outage, these emission standards shall apply within an hour.
15. The proposed Unit 20 facility meets the prescriptive requirements of NSCAPCD Rule 260(b) and is, therefore, exempt from New Source Review (NSCAPCD Rules 220 and 230). Nevertheless, the parties have examined the environmental impacts of the proposed project which are summarized below.

Environmental Impacts

16. It is not expected that emissions of TSP, nonmethane HC, or SO₂ will prevent the attainment, interfere with the maintenance, or cause a violation of any AAQS for these emissions.
17. To determine whether the proposed project's H₂S emissions will cause or contribute to a violation to the AAQS for H₂S, PGandE provided an analysis of the likely incremental impacts of the project based upon the Systems Applications Incorporated (SAI) analysis conducted for the SMUDGE0 #1 power plant.
18. PGandE's analysis included an evaluation of the applicability of the SMUDGE0 #1 SAI analysis to the PGandE Geysers Unit 20 facility. This evaluation considered such things as site location, meteorology, site elevation, and site location relative to receptor areas. A summary of PGandE's findings are contained in the PSA.
19. Based on the tracer tests and SAI modeling analysis conducted for the SMUDGE0 #1 facility, a reasonable estimate of the worst-case incremental impacts under the limited mixing meteorological conditions of the Unit 20 facility is 2.6 parts per billion (ppb) H₂S at receptor areas (based on a 10.4 lbs/hr emission rate). The location of the SMUDGE0 #1 maximum impacts was important, since the SMUDGE0 #1 impacts were in the same general location as the maximum predicted background. However, the location of the Unit 20 maximum impacts will not be in the same location as the SMUDGE0 #1 impacts. Nevertheless, the NSCAPCD, CEC, and PGandE agree that this estimate is a good approximation of the likely impacts of

the Unit 20 facility although the analysis provided would not necessarily be sufficient for New Source Review.

20. To evaluate whether operation of the Unit 20 facility will cause or contribute to a violation of the AAQS for H₂S, the Unit 20 impact must be added to the ambient H₂S level expected in 1986 when the facility begins operation. During the NCPA 3 proceedings, the SAI Hybrid Model projected the H₂S ambient air quality in 1986 using worst-case meteorology and the expected emission rates from the Wild Well and units operated by PGandE, DWR, SMUD, Oxy, and NCPA. The projected ambient H₂S from the sources was approximately 8 to 12 ppb in the Anderson Springs area.
21. The ARB, which sets and enforces state ambient air quality standards, has determined that measured ambient concentrations of H₂S which equal or exceed 25 ppb constitute violations. Others do not necessarily agree with this determination.
22. The projected worst-case background ambient of approximately 12 ppb H₂S is sufficiently below 25 ppb that it is not likely that the worst-case concentrations from the Unit 20 facility when added to the background would cause or contribute to a violation of the standard.

Abatement Systems

23. PGandE proposes the Stretford process to abate H₂S emissions from the noncondensable gas stream and the Hydrogen Peroxide process to abate H₂S entrained in the condensate.
24. After the steam supply is exhausted by the turbine, the H₂S in the steam separates (partitions) into both the noncondensable gas stream and the

liquid condensate stream. The expected H_2S abatement efficiency of the Stretford Unit is 99+ percent of the H_2S in the noncondensable gas stream. The Hydrogen Peroxide process is capable of abating 95 to 98 percent of the H_2S in the liquid condensate. The partitioning efficiency (i.e., the percentage of H_2S in the noncondensable gas stream) experienced at PGandE Unit 15 was initially approximately 65 percent. The Unit 15 facility has since been retrofitted and now is obtaining a partitioning efficiency of approximately 80 percent. PGandE Units 13 and 14 are obtaining partitioning efficiencies in the range of 80 to 90+ percent. Based on even the low partitioning efficiency, the proposed abatement systems will achieve the required H_2S emission limitation. If the partitioning efficiency is high or the inlet H_2S concentrations are low, Hydrogen Peroxide system may not have to be operated to obtain the required emission rate.

25. PGandE has indicated that they have experienced corrosion effects on stainless steel screens located downstream of the Hydrogen Peroxide system on Unit 15. PGandE indicated that it will use more corrosive resistant materials and heat treat some components to resolve the potential corrosion problem on the Unit 20 facility.
26. Drift eliminators will be installed on the cooling tower, which will limit the drift to 0.002 percent of the circulation water flow rate. The use of this control measure will reduce particulate and noncriteria pollutant emission rates from the facility.
27. The NSCAPCD in its DOC, Condition 4, requires PGandE to, in any consecutive 12 month period, limit unscheduled outages to no more than a total

of 12 (see DOC Condition 4, attached, for a detailed discussion of the stacking requirement). PGandE agrees to provide the NSCAPCD, ARB, and CEC with a conceptual plan of how it will achieve this requirement in conformance with the DOC.