



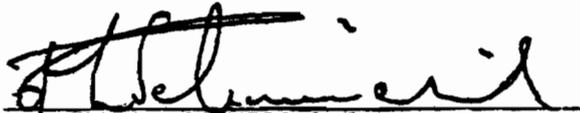
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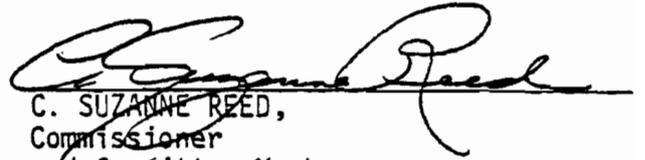
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ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION



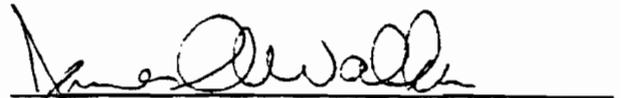
RUSSELL L. SCHWEICKART,
Chairman
and Presiding Committee Member



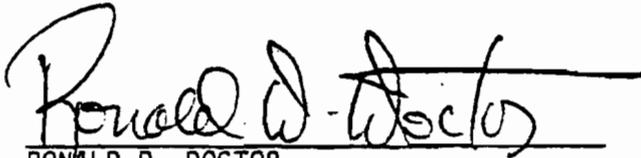
C. SUZANNE REED,
Commissioner
and Committee Member



EMILIO E. VARANINI, III,
Commissioner



JAMES A. WALKER,
Commissioner



RONALD D. DOCTOR,
Commissioner

DATED: November 5, 1980



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CALIFORNIA ENERGY COMMISSION
11 HOWE AVENUE
SACRAMENTO, CALIFORNIA 95825



October 21, 1980

The California Energy Resources Conservation and Development Commission, through the Commission Committee assigned to the Department of Water Resources' Application for Certification of the Bottle Rock Geothermal Project (79-AFC-4), hereby submits its Proposed Final Decision pursuant to Public Resources Code section 25522.

A handwritten signature in black ink, appearing to read "Russell L. Schweickart", written over a horizontal line.

RUSSELL L. SCHWEICKART, Chairman
and Presiding Committee Member

Due to other Commission time commitments, Commissioner C. Suzanne Reed, the second member of the Committee, did not have an opportunity to review the contents of the Proposed Final Decision before its publication.



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PROLOGUE

On October 5, 1978, the Applicant, the California Department of Water Resources (DWR), filed a Notice of Intention (NOI) to file an Application for Certification (AFC) to build a 55 megawatt (MW) geothermal power plant and related facilities in Lake County. This proposed facility, designated DWR's "Bottle Rock Project", is to be located on the Francisco leasehold in the Lake County portion of the Geysers Known Geothermal Resource Area (KGRA). On June 1, 1979, the Commission approved the NOI and on July 27, 1979, DWR filed the AFC. The application was suspended at the request of the Applicant on January 1, 1980, and March 6, 1980.

The Findings of Fact and Conclusions of Law that follow are limited to those required by the Public Resources Code. Because of this abbreviated approach, the Committee emphasizes that Appendices A and F are substantive legal elements of the Decision, containing enforceable conditions affecting the development of the DWR Bottle Rock Project. Appendix E describes the process through which the Commission Staff will monitor compliance of Appendices A and F.

Finally, because many mitigation measures are adopted from variously-authored documents, the Committee establishes the following rules of construction in complying with its Findings and Conclusions: the Applicant shall implement all measures phrased as "shall", "must", and "will"; those phrased as "should", "might", and "could" are to be interpreted as identifying further impacts to be mitigated, although the actual method of implementation may reasonably vary from those suggested.

PART ONE

A. Findings on Compliance with Statutory Site-Certification Requirements

I. Need

The Commission's exclusive power plant siting authority is not limitless; certification authority exists to approve only environmentally acceptable power plant sites and related facilities required to provide a supply of electric power sufficient to meet the demand projected in the Commission's most recently adopted forecast of statewide and service area electric power demands (PRC section 25500 ff.). Moreover, no facility can be certified unless it is in conformity with the current 12-year forecast (see also PRC sections 25523(f) and 25309(b)).

In Chapter 4 of the 1979 Biennial Report, the Commission stated that its "assessment of need is based on a balance of factors which include protecting public health and safety and the environment, and conserving resources." Conventional sources of energy (nuclear power, oil, gas and coal) are seen as having a "severely limited" capacity to meet the "environmental/demand" definition of "need" required by the Warren-Alquist Act. In contrast, alternative sources of energy (e.g., geothermal, cogeneration) have the capacity to produce energy at a significantly reduced level of environmental impact. Geothermal power, in particular, is a desirable alternative energy source because it is currently available, efficient, cost stable, and increasingly significant - indigenous to California. The Committee notes that in the Bottle Rock AFC, Applicant and Staff predict that the 55 MW plant will produce geothermal energy in an amount sufficient to displace 674,000 barrels of oil annually.

As the parties to this proceeding can attest, the Committee follows a presumption (as distinguished from a conclusion) that alternative sources of energy

create environmentally acceptable risks and effects. Consistent with the 1979 Biennial Report, page 50, the Committee has reviewed the proposed project to assess its ability to "demonstrate reasonably mitigable environmental impacts which meet existing air and water quality standards." To meet this burden, both parties have provided witnesses and documentary evidence to support jointly-sponsored Findings and Conclusions.

Subject to the provisions specified in this Decision, including the conditions contained in Appendices A and F, the Committee finds that the proposed project possesses no unacceptable environmental impacts, is needed, and therefore recommends that the DWR Bottle Rock Project be APPROVED.

II. Environmental Impact

PRC section 25523(a) requires the Commission's Final Decision to contain specific provisions regarding the manner in which the proposed project is to be "designed, sited, and operated" in order to protect environmental quality and assure public health and safety. Section 25523(d) further requires that the Decision contain Findings regarding conformity with public safety standards, air and water quality standards, and with "other relevant" local, regional, state, and federal standards, ordinances or laws. Section 25525 prohibits approval of an AFC where conformity is not demonstrated, "unless the Commission determines that such facility is required for public convenience and necessity and...there are not more prudent and feasible means of achieving such public convenience and necessity."

The Committee finds that the applicable local, regional, state and federal standards, ordinances, and laws have been identified in the record of this proceeding and that, for the reasons stated in Part Two of this Decision and with implementation of the measures as contained in Appendices A and F

of this Decision, the project can be designed, sited and operated to comply with all applicable standards, ordinances, and laws.

III. Compliance Monitoring

PRC section 25532 requires the Commission to establish a monitoring system to assure that any project certified is constructed and operated in compliance with air and water quality, public health and safety, and other applicable regulations, guidelines, and conditions. Appendix E contains the required compliance monitoring program. This program was presented for public and other agency comment at a workshop conducted in Lakeport, California on October 16, 1980. The Committee finds this program sufficient to satisfy the requirements of PRC section 25532.

IV. Efficiency and Load Management Standards

The Public Resources Code prohibits certification of a power plant without consideration of, and conformity to, if appropriate, the applicable efficiency and load management standards (PRC sections 25402(d); 25403.5; and 25523(d)). DWR is not subject to any such standards. The Committee therefore finds that these provisions of the Public Resources Code pose no bar to certification of the DWR Bottle Rock Project.

B. The Final Environmental Impact Report

The California Environmental Quality Act (PRC section 21000 ff.) and the Commission's regulations (20 CAC section 23000 ff.) require the preparation of an Environmental Impact Report for proposed power plants and related facilities.

On December 10, 1979, the staff of the Commission released the initial Draft Environmental Impact Report (DEIR) on the proposed project. During the

forty-five (45) day public comment period, changes were made in the AFC and the Staff decided to revise the DEIR. The Revised DEIR (RDEIR) was released on August 21, 1980, and public comment was accepted until October 6, 1980. During the public comment period a workshop was conducted in Middletown, Lake County (September 15, 1980) for the purpose of receiving local reactions to the Revised DEIR.

Following review of comments received on the Revised DEIR, the Commission staff prepared the Final EIR which was distributed on October 14, 1980. The Final EIR is a crucial document since it encompasses the degree of environmental review required by Federal and State law, and comprises a large part of the evidentiary base for Staff's position.

The Committee certifies that the Final EIR has been prepared in compliance with the California Environmental Quality Act and all applicable State and Commission guidelines. The Committee further certifies that the Final EIR has been considered in adopting this Decision. Finally, the Committee finds that the DWR Bottle Rock Project site and related facilities, if the measures as identified in Part Two of this Decision, including Appendices A and F are implemented, shall cause no significant adverse environmental impacts.

C. Procedural Steps

On June 21, 1979, the Commission approved the DWR Bottle Rock Project NOI. The NOI Final Report adopted by the Commission, especially in Part V, pages 134 through 150 and the Commission's "Decision", identified numerous conditions which reflected tasks to be performed and information to be submitted before the Commission could ensure that the project would be designed, sited and operated in compliance with applicable standards, ordinances

and laws. The Committee considered the project in light of this additional information during the AFC proceeding.

On July 27, 1979, DWR submitted the AFC and on August 29, 1979, the Executive Director conditionally accepted the AFC. On October 25, 1979, the Committee formally requested public agency comments on the proposed project and suggestions for monitoring compliance of the project with applicable standards, ordinances and laws.

Although April 22, 1980 was originally designated as the date on which the Commission would issue a Final Decision in this project, the Applicant's requests for extensions were granted by the Committee several times (January 24, and March 6, 1980), resulting in an initial revised Final Decision date of October 13, 1980. This date was delayed to November 5, 1980, due to events at the Prehearing Conference, scheduling of Evidentiary Hearings and late receipt of the Determination of Compliance.

On November 15, 1979, the Committee held an Information Hearing in Lakeport, California, to gather the views and comments of members of the public. Additionally, the Commission staff sponsored several informal public workshops to discuss technical issues with the Applicant, interested agencies, and members of the public. The Northern California Power Agency, the Cobb Valley Residents and Property Owners Concerned, the Camp Beaverbrook, Inc., the Capital of the Age of Enlightenment for Northern California, Donald F. X. Finn, and the County of Lake joined the proceeding formally as intervenors. All public agency comments and others received during the AFC proceedings were carefully considered by the Committee in reaching its Final Decision.

On August 28, 1980, the Committee held the first Prehearing Conference for the purpose of identifying disputed issues, organizing the presentation of testimony at the subsequent evidentiary hearings, and verifying all parties' interests to present witnesses and/or exercise an opportunity for cross-examination and rebuttal. At the Conference, the Public Advisor objected to continuation of the proceeding on the grounds that timely notice of Prehearing Conference Statements had not been provided. The Committee therefore ordered a second Prehearing Conference on September 17, 1980. Thereafter, evidentiary hearings were conducted on September 18, 1980, in Sacramento, and on October 9 and 10, in Lakeport. In all issues, Applicant and Staff presented jointly-sponsored proposed findings and conclusions. Cross-examination and rebuttal witnesses are noted in Part Two.

D. Evidentiary Bases

The Final Decision is based on the written and oral testimony presented during the three days of evidentiary hearings, consideration of the Final Environmental Impact Report (which incorporates by reference the Revised Draft EIR), the Determination of Compliance submitted by the Lake County Air Pollution Control Officer, and comments from public and governmental agencies including those offered at the hearings on this project. All of these items are a matter of public record in this proceeding. In evaluating the evidence the Committee has been further guided by its own expertise and policy considerations such as those enunciated in the 1979 Biennial Report.

The Applicant and Staff have arrived at common positions supported by the weight of evidence on the record with respect to all areas. However, as indicated in the following text, the intervenors expressed dissatisfaction with certain elements of the Application. NCPA challenged the proposed transmission line route, the County of Lake proposed a condition to mitigate socioeconomic impacts; and Camp Beaverbrook testified on the impact of Bottle Rock Road.

PART TWO

Introduction

The Final Environmental Impact Report describes the proposed project in detail and addresses environmental concerns in depth; the record also contains corroborating oral and written testimony. Due to the undisputed nature of the bulk of evidence presented, and its preservation on the record, the Final Decision briefly summarizes the presentations, explains resolution of factual disputes and offers reasoned conclusions of law in the areas of Need, Environmental Resources, Public Health and Safety, Plant and Site Safety and Reliability and Socioeconomics, Land Use, and Cultural Concerns. However, in the area of Socioeconomics because of the significant condition proposed by the County of Lake, the Committee has included the briefs filed by the Applicant, Staff, and Lake County as well as the Legal Opinion submitted by the Commission's General Counsel. These documents are located in Appendix B. Appendix C has been included to record the Applicant's concern for confidentiality of the EIC process and establish the Committee's concurrence with DWR's proposed procedure for protecting this information.

A. Need

PRC section 25500.5 limits the Commission's authority to certify power plant sites and related facilities to those "which are required to provide a supply of electric power sufficient to accommodate the demand projected in the most recent forecast of statewide and service area electric power demands adopted pursuant to subdivision (b) of section 25309". Section 25309(b) requires the Commission to prepare the Biennial Report for the Governor and Legislature to include:

"The level of statewide and service area electrical energy demand for the forthcoming 5- and 12-year forecast or assessment period which, in the judgment of the commission, will reasonably balance requirements of state and service area growth and development, protection of public health and safety, preservation of environmental quality, maintenance of a sound economy, and conservation of energy and resources reasonably expected to occur. Such 5- and 12-year forecasts or assessments established by the commission shall serve as the basis for planning and certification of facilities proposed by electric utilities. ..."

The 1979 Biennial Report, at page 50, responds to the above mandate by stating:

"We 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. Any facility that meets these criteria will be deemed needed."

Thus, the "energy demand" side of the Commission's "need" assessment is conclusively disposed of by the Biennial Report and the Committee finds that the DWR Bottle Rock Project complies with the Commission's most recently adopted 12-year demand forecast. However, it is significant to note that in this project immediate benefit from the preferred technology approach will be realized in the anticipated production at Bottle Rock of energy equivalent to displace the use of 674,000 barrels of oil per year (Appendix E, Exhibit 7, Finding #5).*

As is found in the subsequent portions of this Decision, with implementation of the measures contained in Appendices A and F, associated environmental impacts are reasonably mitigable and the project will comply with applicable air and water quality standards.

*Each issue area reviewed by the Committee during evidentiary proceedings was assigned an exhibit number.

B. Environmental Resources

Both the Public Resources Code and the policies enunciated in the Biennial Report require the Committee to carefully consider and determine whether the impacts which a proposed project will have upon the natural and human environment can be reasonably mitigated and to ensure that, absent unusual circumstances, the project is designed and constructed to operate in compliance with applicable standards, ordinances, and laws. The Committee, in complying with these directives for the purposes of this Final Decision, has categorized the presentations during the hearings on the topics of air and water quality, water resources, hydrology, soils, solid waste management and biological resources as integrally related to the broad "environmental resources" concept.

1. Air Quality

Geothermal power plants emit hydrogen sulfide and particulate matter from the cooling tower, along with small quantities of mercury vapor, ammonia, arsenic and certain other compounds. The most troublesome pollutant emitted is hydrogen sulfide (H_2S), an odorous substance that has been characterized by residents of the Geysers area as a nuisance. The state standard for H_2S emissions (based on a nuisance odor threshold) has been exceeded in the project area. (See Revised DEIR, p.37).

The Applicant proposes three separate H_2S abatement systems (EIC process, Stretford with surface condenser, and a hydrogen peroxide condensate treatment system) in addition to a turbine bypass system to achieve an emission rate no greater than 5 pounds/hr. which meet the "New Source Review" rules (sections 602, 604 H_2S emission limit; RT, 1608 and Appendix A).

The EIC process will clean the steam supplied to the power plant. Although data is insufficient to determine maximum abatement efficiency, it is estimated to be between 90-99 percent. Moreover, the Bottle Rock Project is the first plant employing this process and it will be used in conjunction with the Stretford and hydrogen peroxide systems, which have been previously identified as the best available control technology (BACT). This process will also treat steam during outages (using an emergency generator) and feature a demister to avoid problems of equipment corrosion (detected in tests of 100,000 lb/hr steam at PGandE Unit 7).

The Stretford system will receive the noncondensable H₂S gas flow and treat it with a maximum abatement efficiency rate of 99 percent. In the event of a repair or emergency shutdown, flow will be redirected via a bypass system to the cooling tower. Reliability is unknown but estimated at 90 percent-plus availability.

The hydrogen peroxide system will be used downstream as a secondary abatement measure to treat condensate. Efficiency is predicted in the 95-98 percent range and on January 1, 1982, Bechtel National, Inc., will provide results of a sixty-week efficiency test program.

During shutdowns, a turbine bypass system will be employed. DWR is the first Applicant to use this system on a geothermal power plant.

The Air Resources Board (ARB) indicates that the H₂S content in steam at the Bottle Rock site is 600 ppmw (ARB letter to Lake County Air Pollution Control District (LCAPCD), January 1, 1980), subject to variations by time (see: "Workshop on environmental control technology for the Geysers-Calistoga KGRA Lawrence Livermore Laboratory Report", January 28, 1980).

A Determination of Compliance (Appendix A) was submitted to the Committee on September 24, 1980 by the Lake County Air Pollution Control Officer (LCAPCO) and reviewed during the October 10, 1980 Evidentiary Hearing. It indicates an H₂S content in steam of 450 ppmw. The LCAPCO testified that the conditions listed in the Determination of Compliance (including the Errata Sheet thereto, dated October 10, 1980), when met by the Applicant, would ensure operation of the proposed facility in compliance with all applicable local air district rules and regulations. Thus, with the implementation of such conditions, the LCAPCO testified that the facility will not prevent the attainment, interfere with the maintenance or cause a violation of any state or national ambient air quality standard.

Witnesses for Applicant and Staff testified that the power plant will comply with all applicable emissions limitations and new source review requirements during normal plant operation (RT, 1604-08) provided that conditions 1-13 jointly sponsored in their written testimony (see Appendix F, "Air Quality" Section) are met. It should be noted that condition 1(a) was added during the evidentiary hearing to meet the Applicant's concern for confidentiality in examining the EIC system (see Appendix C, General Counsel's Opinion and Applicant's Supplemental Filing).

Finally, the FEIR (p.95) contains an independent analysis of air quality impacts which concludes that the facility is not expected to produce significant adverse effects provided that the proposed mitigation measures specified in "Air Quality" section, Appendix F are implemented.

The County of Lake has granted a Use Permit to the steamfield operator (see Appendix D).

2. Water Quality - Water Resources - Hydrology - Soils - Solid Waste Management

Potential water quality impacts have been identified as sedimentation/siltation, discharge of toxic wastes/substances, cooling tower drift deposition, and waste disposal (Revised DEIR, p. 98). The Final EIR concludes that the mitigation measures proposed by the Applicant will avoid significant environmental impacts. Staff and Applicant presented witnesses who classified potential impacts in three groups: spills, drifts and disposal (RT, September 18, 1980). To prevent spills of H₂S abatement process materials, the Applicant will separately berm or basin the cooling towers, the condensate reinjection sump, the H₂S abatement systems, and berm and cover the pad with an asphaltic layer. Total spill retention volume will be 389,000 gallons, or 2.3 times the maximum anticipated spill of 170,000 gallons. Pollution from drift accumulation (boron, mercury and ammonia) and oil drip (from machinery and vehicles) could adversely affect water quality as storm runoff. To minimize this possibility, the Applicant will divert to the condensate reinjection system at least the first one-half inch of precipitation runoff of the first continuous storm and either as much as possible of lesser storms or the maximum possible of "first" storms (after an extended dry period). To handle waste the Applicant will utilize a 3,000 gallon septic tank and dispose of effluent by injection into the steam reservoir. Finally, Applicant and Staff jointly proposed conditions to certification which they testified are necessary to mitigate water quality impacts (Appendix F, "Water Resources").

Witnesses for Applicant and Staff testified that the water requirements for this project will not significantly impact the region's water resources if condition 1, as specified in jointly sponsored testimony (Exhibit 6, p. 3) is met. Water will not be obtained from surface supplies or streams; rather the initial supply of cooling tower water will be from local purchases or DWR's projects (RT, 1135).

In addition, the Staff witness sponsored portions of the RDEIR (p.97), which stated the project would have minimal impacts on water quality if: 1) the surface drainage system has capacity to convey a one-hundred year flood and 2) Applicant completely paves and grades the plant site to prevent percolation of accidental spills into the groundwater basin.

Witnesses for Applicant and Staff testified that two main environmental impacts may result from accelerated soil erosion at the site: 1) loss of the soil resource itself (with an associated loss of watershed and biological habitats); and 2) degradation of the water quality of High Valley and Kelsey Creeks by sediment deposition (with the consequent adverse impact on beneficial uses of those waters). Both parties, however, presented evidence to show that these impacts could be controlled at acceptable standards, and will meet applicable laws and regulations if mitigation measures and conditions specified in Appendix F are met (RT, 1194).

Witnesses for Applicant and Staff testified that if the mitigation measures specified in Appendix F ("Safety") are met, transportation and disposal of toxic waste material will avoid adverse environmental effects and comply with all applicable standards, ordinances and laws (RT, 1247).

3. Biological Resources

The FEIR indicates that the primary impact on vegetation associated with the proposed project will result from 1) direct disturbance or removal of vegetation during construction and maintenance activities; and 2) aerosol deposition of toxic substances on vegetation or accumulation of these substances in the soil (cooling tower drift) (see Revised DEIR, p. 103). Staff and Applicant witnesses testified that use of a drift eliminator system for the

cooling tower with a drift loss rate of 0.002 percent of the circulating water rate and use of the EIC abatement system will probably reduce loss of vegetation from boron in the cooling tower drift to a level less than other existing units in the Geysers region (RT, 1163). To ensure this result, Staff and Applicant proposed that a vegetation stress monitoring program be conducted during the first three years of plant operation (Exhibit 5, p.2), and that if significant stress, damage or changes are identified, the Applicant, Staff and California Department of Fish and Game will meet to decide what further mitigation measures are necessary. In response to inquiries by the Public Advisor on behalf of the Cobb Valley Residents Association Concerned and questions from the Committee, Applicant's witness testified that monitoring would continue beyond the first three years if necessary but that six years of experience at other sites having a drift rate of approximately .2 percent indicates that significant vegetation stress is observable, if at all, within the first three years (RT, 1163).

The Final EIR (p. 104, Revised DEIR) states that "the primary impacts on the area's wildlife will occur as a result of vegetative loss, disturbance from construction activities, and release of toxic substances." Assuming that the mitigation measures proposed by the Applicant and Staff in related areas (e.g., Soils, Biological Resources, Water Resources and Quality) are implemented, the Final Environmental Impact Report concludes that no significant impacts on wildlife or vegetation will occur. The FEIR and Applicant and Staff witnesses all indicate that although the American Peregrine Falcon, Golden Eagle and Ringtail have been observed in the Geysers-Calistoga KGRA, there is no evidence to suggest that this plant site area is a significant breeding or feeding region for these species. Staff and Applicant witnesses testified that if condition 1 (Exhibit 5, p.8) is met, the project will be environmentally acceptable and compatible with applicable laws, rules and regulations.

COMMITTEE FINDINGS AND CONCLUSIONS

The DWR Geothermal Bottle Rock Project can be designed and constructed to operate in compliance with all applicable standards, ordinances, and laws, including air and water quality standards, insofar as the potentially impacted environmental resources are concerned. The measures to ensure adequate mitigation of impacts to environmental resources and the program for implementing such measures have been identified and are contained in Appendices A and F.



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C. Public Health and Safety

Evidence presented on this broad category consisted of testimony and exhibits on the topics of public health and safety, worker health and safety, noise impacts, and additional safety-related matters. With regard to public and worker health both parties asserted that there will be no adverse impacts if the conditions enumerated in Appendix F ("Safety") are met.

The power plant will emit both regulated pollutants (those subject to established ambient air quality or emissions standards) such as H₂S, sulfur dioxide, particulate matter, sulfates and radon-222 (²²²Rn); and nonregulated pollutants (those for which there are no presently established standards) such as mercury, arsenic, boron, and ammonia. The hydrogen sulfide abatement systems can produce emissions of anthraquinone disulfonic acid (ADA), vanadium, copper, sulfates, and other particulate matter. Staff witnesses also sponsored the "Health and Safety" portion of the Revised DEIR which concludes that public health will be protected if the conditions proposed by the Applicant and the requirements existing under current law are met. The Revised DEIR recommends, and the Applicant agrees, that DWR will consult with Cal/OSHA to evaluate the adequacy of its program to protect worker health.

Witnesses for both Applicant and Staff identified the following safety factors: fire; hazardous, toxic and flammable materials; and worker safety; and testified that with conditions indicated in Appendix F ("Safety") the project will conform with applicable laws, standards, and ordinances.

Testimony introduced by Staff and Applicant established that the highest plant construction noises will be caused by large earth moving equipment but that such activity will be temporary and performed during daylight hours (7 a.m. to 10 p.m.) whenever possible. Normal operating noise will be barely audible

at the nearest sensitive receptor. Staff and Applicant witnesses jointly proposed mitigation measures (Appendix F, "Noise") which they testified would conform noise levels to applicable laws, regulations and ordinances. Commission staff, in the Revised DEIR, conclude that the noise impact of this project will be acceptable so long as the mitigation measures proposed by Applicant are implemented (Revised DEIR, p.131).

COMMITTEE FINDINGS AND CONCLUSIONS

The DWR Bottle Rock Project can be designed and constructed to operate without causing significant adverse impacts to public health and safety. The measures to ensure adequate mitigation of impacts to public health and safety and the program for implementing such measures have been identified and are contained in Appendix F of this Decision. With such implementation, the project will cause no significant adverse impacts to public health and safety.

D. Plant and Site Safety and Reliability

The area of safety and reliability examined the topics of geotechnical, seismic hazards, civil and structural engineering, systems engineering and reliability.

Staff and Applicant jointly sponsored testimony and exhibits, including portions of the Revised DEIR, showing that, except for the location of the proposed cooling tower, no hazardous or adverse geologic conditions exist at the project site. As to the location for the cooling tower, both parties explained that final determinations of safety cannot be made until site preparation begins. Staff and Applicant testified that geological factors can be mitigated and construction completed in compliance with applicable law if the conditions in Appendix F ("Geotechnical") are met (RT, 1187-91).

Staff and Applicant witnesses testified that the design of facilities will withstand a level of earthquake shaking which has a 10% probability of being exceeded during a 30-year facility lifetime. The 10% exceedance probability corresponds to a peak ground acceleration value of 0.22g. Staff witness pointed out that currently there are no legal standards which establish an acceptable level of seismic risk (RT, 1409).

Staff and Applicant witnesses testified that if the conditions in Appendix F ("Geotechnical") are met, the proposed project will use civil engineering standards that conform to applicable law (RT 1423). Testimony highlighted project plans for achieving slope stability and foundation construction. Witnesses also testified that if the conditions in Appendix F ("Structural Engineering") are implemented, the project's structural engineering plans will conform to applicable laws (RT, 1420-25).

With respect to systems engineering, Staff and Applicant witnesses testified that the plant will be designed in accordance with appropriate design criteria (RT, October 10, 1980) and concluded that the Applicant's plans are acceptable provided that condition #1 (Exhibit 22, p. 2) is implemented.

With respect to plant reliability, Applicant and Staff witnesses testified that the plant will operate with an 80 percent capacity factor (lifetime average) and an availability factor of 90 percent. All major components have planned redundancies of 100 percent capacity except the cooling water pumps (50 percent), hydrogen coolers (50 percent) and steam jet ejectors (33-1/3 percent). Subject to conditions in Appendix F ("Reliability"), both parties stated that system reliability is adequate (RT, 1125-27).

COMMITTEE FINDINGS AND CONCLUSIONS

The DWR Bottle Rock Project can be designed and constructed to provide a reasonably safe and reliable source of electrical power if the measures and conditions contained in Appendix F are implemented.

E. Socioeconomic, Land Use, and Cultural Concerns

The Public Resources Code requires the Commission to assess impacts of a proposed project upon resources closely affecting the human environment. Applicant and Staff identified the following socioeconomic issues affecting this proposed project; land use, visual impacts, labor force impacts, school population impacts, taxation, and realignment and construction of Bottle Rock Road (offsite impacts). Witnesses testified that with respect to land use, the plant will be located on the Francisco Leasehold which is located in an unclassified zoning district which allows geothermal development upon receipt from the County of a use permit. Evidence was introduced to show that this permit was obtained from the Lake County Board of Supervisors on February 19, 1980. Staff witness was cross-examined by two intervenors, the Cobb Valley Residents Concerned Association and Camp Beaverbrook; Applicant's witness was cross-examined by the Cobb Valley Residents Concerned Association.

In the area of visual impacts, Staff and Applicant witnesses identified a number of mitigable impacts (RT, 1298) and singled out cooling tower plume as the only nonmitigable impact. Staff witness explained that although the size of the plume will be variable, it will not create a substantial visual intrusion with respect to the entire Cobb Valley area. Since, however, the determination of visual degradation is very subjective and because the plume cannot be mitigated and will occur in an area noted for its scenic quality, it could represent a significant visual impact.

With respect to labor force impacts (new workers entering the area of Cobb Valley as the direct result of geothermal development), Staff presented estimates that the cumulative peak demand for construction labor from all geothermal development currently planned for the Geysers KGRA (NCPA Units 1 and 2; PGandE Units 16, 17, and 18; DWR's Bottle Rock and South Geysers Projects; and

SMUD's Unit 1) would total approximately 610.*

Staff assumed that some of the workers would be part of a large resident work force already residing in the Sonoma - Lake Counties area as a result of prior geothermal activity and that most of the new immigrating workers would reside in Lake County. The total population increase in Lake County attributable to the cumulative geothermal development was estimated by Staff to be approximately 280, of which approximately 90 are expected to be school residents.

Evidence was introduced to show that the Middletown Unified School District, which is expected to be directly impacted by new residents working on the Bottle Rock Project, has already attained enrollment capacity. To mitigate this impact, the District has obtained the necessary funding and is seeking property for construction of new facilities. During the evidentiary hearing on October 9, 1980, Applicant submitted a letter by Ronald B. Robie, Director of DWR, dated September 26, 1980, supporting the District's negotiations with other governmental agencies for school property (RT, 1321-22).

Applicant and Staff addressed the issue of taxation by pointing out that DWR will be constructing a state-owned, and therefore tax exempt, power plant.** The County of Lake proposed a mitigation to the loss of revenue (ad valorem property taxes applicable to non-state developers) by having the Commission impose as a condition to granting the application for certification a requirement that DWR, "...pay to the County of Lake a sum equal to the total amount of ad valorem property taxes it would have paid but for the exemption of Article XIII, Section 1 of the Constitution of the State of California to be distributed by the County of Lake to those local agencies who would otherwise be entitled to them pursuant to the provisions of Revenue and Taxation code sections 2201 et. seq." To support its contention that the Commission has

*FEIR (p.25) errata to Revised DEIR (p.138).

**The steamfield is, however, subject to taxation.

the legal authority to impose such a condition to the granting of the AFC, the County submitted the brief at Appendix B. Both Staff and Applicant opposed the County of Lake's proposed condition for the reasons expressed in their briefs at Appendix B. As a result of this dispute, the Committee requested and received an Opinion from the General Counsel of the Commission (also included at Appendix B). The General Counsel disagreed with the position of the County of Lake and stated, in part:

* * * * *

"In my opinion there is insufficient indication in the Warren-Alquist Act, even given the need to give it a 'liberal construction' (Pub. Res. Code § 25218.5), of any legislative intent to delgate to the Commission the power to require another state agency to pay local government a fee in lieu of the taxes which the state agency is constitutionally exempt from paying.

The Energy Commission does have very substantial authority to impose conditions on certification of facilities, in order to mitigate adverse environmental and economic impacts of the facility and in order to carry out critical energy policies established by the Commission in its planning function pursuant to Public Resources Code sections 25300, et. seq. (See Pub. Res. Code Sections 25514(d), 25523). Where the clear purpose of a condition is to insure (1) that provision of needed electricity will not unduly harm environmental quality, (2) that California will have a reliable supply of electricity at a reasonable cost, or (3) that limited carrying capacities will be stretched as

far as possible, there is a strong basis for finding legislative intent in the opening sections of the Act (Pub. Res. Code Sections 25000-25507) to provide Commission authority to impose the condition.

Where, as in this case, the purpose of a condition is to address some more general societal concern, not directly addressed in the Warren-Alquist Act, the Commission's authority is subject to question. Here the goals of environmental protection and reliability of electricity supply could, at most be incidentally benefitted by county expenditure of the in lieu payments, but the main goal is clearly to aid a local government with its fiscal problems. Nothing in the purposes or provisions of the Warren-Alquist Act suggests that the Legislature intended to have the Commission address this problem in carrying out its facility certification function."

Additionally, the General Counsel notes that his opinion does not leave Lake County without a remedy since it is his belief that the county may "raise its concern in the Legislature which does have the power to cure any unusual inequities resulting from application of Article XIII, section 1^{*} of the Constitution in the context of geothermal development by the Department of Water Resources."

As to impacts on Bottle Rock Road (offsite impacts) Staff and Applicant witnesses testified that an agreement for realignment and reconstruction of this road has been reached between the Applicant and the County of Lake. The Lake

*Amended to Art. XIII, Section 3, November 5, 1974.

County Public Works Director testified that the agreement will be beneficial to the local area because it will lessen future maintenance costs and reduce anticipated safety hazards. He stated that while the average speed of traffic will increase slightly (1-2 mph), traffic volume is expected to significantly increase during the construction phase.

Ron Garrison, representing the Camp Beaverbrook intervenor, testified that use of the Bottle Rock Road during construction would expose the Camp's youth participants, who number about 100 at all times during a three month summer period, to heavy construction equipment. He stated that in order to reach a nature observation area camp participants must walk along the Bottle Rock Road for approximately 1/16 mile. Applicant's witness and the Lake County Public Works Director testified on cross-examination that Camp Beaverbrook's concerns for the children's safety could be met with the installation of flashing lights with signs warning of the 1/16 mile section and the painting of a cross-walk. Applicant's witness also testified that DWR is engaged in two CEQA proceedings and prior to construction will bring to Lake County's attention the safety concerns of Camp Beaverbrook.

With respect to all of the above concerns, Staff and Applicant witnesses testified that if the conditions specified in Appendix F ("Socioeconomics") are implemented, the socioeconomic and land use impacts will be environmentally acceptable and in conformity with applicable laws, standards and regulations. With respect to the labor force impacts, Staff will continue to monitor the enrollment growth at the Middletown Unified School District and the Applicant has agreed to participate in a comprehensive planning program to mitigate all growth-induced impacts on public services as a result of continued geothermal development, if such a program is deemed necessary by the Commission (RT, 1294-1326).

Staff and Applicant witnesses testified that with respect to cultural resources, a recovery program for archaeological site CA-LAK-610 has been submitted to ensure that with implementation of the conditions in Appendix F ("Cultural Resources", Finding #7) the impact is acceptable and in accordance with applicable laws, standards and ordinances (RT, 1425-30).

COMMITTEE FINDINGS AND CONCLUSIONS

With respect to land use, visual impacts, labor force impacts, school population impacts, and cultural resources, the preponderance of evidence establishes that if the conditions specified in Appendix F are implemented, the project will be environmentally acceptable and in conformity with applicable laws, standards and ordinances.

With respect to the proposed condition by the County of Lake to mitigate the loss of tax revenue due to operation of the power plant by a state agency, the Committee notes that no issue of fact was involved and that all parties agreed that the proposed condition raised a question of law. On that question the Committee accepts the Opinion by the General Counsel as determinative, thus rejecting the county's proposal.

With respect to the impacts of Bottle Rock Road, new evidence was introduced by the Camp Beaverbrook intervenor to identify possible safety hazards arising from increased traffic during construction which could represent a danger to summer camp youth participants. Because of the Applicant's agreement to pursue this concern in CEQA hearings, the Lake County Public Works Director's agreement that mitigation measures could be developed

if necessary (flashing lights, signs and cross-walk), and the Camp Beaverbrook intervenor's expression of satisfaction with such measures, the Committee finds the socioeconomic impacts acceptable provided that the Applicant implements the signs and cross-walk as safety measures, as well as provide any other appropriate mitigation measures identified during subsequent CEQA proceedings in Lake County.

F. Transmission Tap Line

Staff and Applicant witnesses testified that the project will utilize a 230 kV transmission line from the 55 MW Bottle Rock power plant on the Francisco leasehold to the PG&E Unit 17 power plant tap line (RT 1196). Written testimony focused on an economic analysis of six transmission route configurations, specifically excluding an assessment of environmental factors. Based on this analysis, Staff and Applicant jointly-sponsored a finding that "...if Bottle Rock is connected with Unit 17 and if NCPA 1 is subsequently constructed, it will be uneconomical for NCPA 1 to connect to Bottle Rock" (Exhibit 9, p.2).

Notwithstanding this consideration, Staff and Applicant both concluded that "Future development in the vicinity of the Bottle Rock power plant is uncertain at this time. The proposed route for the Bottle Rock transmission line from Bottle Rock to PG&E Unit 17 is economically acceptable if (1) the Applicant or another developer does not connect a future unit on either of the other leaseholds to which the Applicant has rights for the Bottle Rock line, and (2) NCPA 1, if constructed, does not connect to the Bottle Rock line. Otherwise Unit 11 would be the preferable termination point, according to the analysis in Finding 4".* (Exhibit 9, p. 3).

On cross-examination by NCPA, Staff witness corrected his testimony from September 18, 1980, by stating that the transmission line route from the proposed site to Unit 11 is .7 miles longer than the route to Unit 17. Proposed Findings and Conclusions offered by the NCPA intervenor

* Finding 4 (Exhibit 9, p. 1) reads: "CEC staff and consultant Dr. Hans Puttgen have conducted a transmission engineering economic analysis of six transmission configurations for the area, assuming varied degrees of development. Environmental factors were not included as a part of this particular study."

at the October 9, 1980 evidentiary hearing were rejected by the Committee due to the intervenor's failure to notice their presentation at the previous Prehearing Conferences, or to provide at least ten days' notice to the other parties. In addition, NCPA offered no witnesses to support the validity of the proposed findings.

At the September 18, 1980 evidentiary hearing Applicant's witness specifically testified that during the NOI proceedings the various possible transmission line routes were evaluated on the basis of environmental advantages and that the jointly-sponsored route (to PG&E 17) was determined to be one of four acceptable alternatives (RT 1198-99).

The FEIR, p. 30 (embodying p. 153, Revised DEIR) states:

"To determine the best route from the Bottle Rock site to Geysers 17, DWR evaluated various routes from an engineering, economic, and environmental standpoint. DWR identified and evaluated three potential routes from Bottle Rock to Unit 17 and one route from Bottle Rock to Unit 11. DWR chose the route shown on figure 4 (to Unit 17) primarily because it required the least amount of transmission and access roads already exist along portions of this route and environmental damage would be minimized. CEC staff are concerned that the proposed inter-connection point and transmission facilities do not adequately consider the overall transmission needs of the area. An adequate plan should be developed to consider transmission needs (with regard to adequacy of capacity, transmission losses, reliability and costs), for DWR as well as future plants."

The Staff and Applicant, subject to the conditions enumerated in Exhibit 9, pp.1-4, presented testimony that a line from the Bottle Rock site to PGandE Unit 17 is environmentally acceptable and in conformity with all applicable laws, standards and ordinances.

In the AFC (IX-1 through -4), Applicant explained its choice of the transmission line route to PGandE Unit 17 as being based on an analysis of various alternative routes. The AFC states, "The transmission route was selected on the basis of minimizing environmental and economic impacts." To support this evaluation the AFC incorporated by reference the analysis submitted in the NOI which states in part:

"However, before deciding which route may be the most advantageous from an engineering, environmental and economic viewpoint, the Department evaluated the leasehold and surrounding environs to identify any potential conflicts in land use. Since the Francisco leasehold and neighboring leaseholds are devoted to geothermal development, with the exception of environmental concerns, there is no problem locating transmission corridors in the area.

The Department then analyzed the various features of the region which would be affected by transmission. These features included: the biological environment; slope stability; geologic information, etc.

Once the environmental features were analyzed, the Department identified and evaluated three potential routes from the Bottle Rock power plant to PGandE's Unit 17 and one

proposed route from Bottle Rock to Unit 11. Figure VI-2 shows the various routes the Department evaluated. Table VI-1 shows the segments of the routes and their respective lengths. The table also shows elevations of the segments.

* * * * *

At the present time, long range development of geothermal power generating units in The Geysers are being planned by PGandE, the Department, and Northern California Power Agency (NCPA). Through the 1980's, PGandE contemplates expansion of their geothermal field to 2000 MW while the Department is contemplating installation of 165 MW and NCPA at present is contemplating installation of 386 MW of capacity. PGandE has formulated and announced plans for upgrading and expanding the existing transmission system of the area to meet basic requirements for 2000 MW of capacity. In order for all parties at The Geysers, including NCPA and the Department, to best proceed, an overall development plan is important to coordinate transmission plans to the mutual benefit of all parties. To this end, the Department has been negotiating with PGandE for transmission service and has signed a stipulation to work with PGandE on reaching an agreement for this service. However, the Department and NCPA have retained R. W. Beck and Associates to develop additional alternatives which are both economically and technically feasible. It is intended that these plans be coordinated, to the extent possible, with the PGandE plans as will be most beneficial to all parties and to minimize impacts and other considerations at The Geysers.

Until this study is completed the Department will continue to proceed with the intention of building a transmission line to either PGandE Unit 17 or Unit 11."

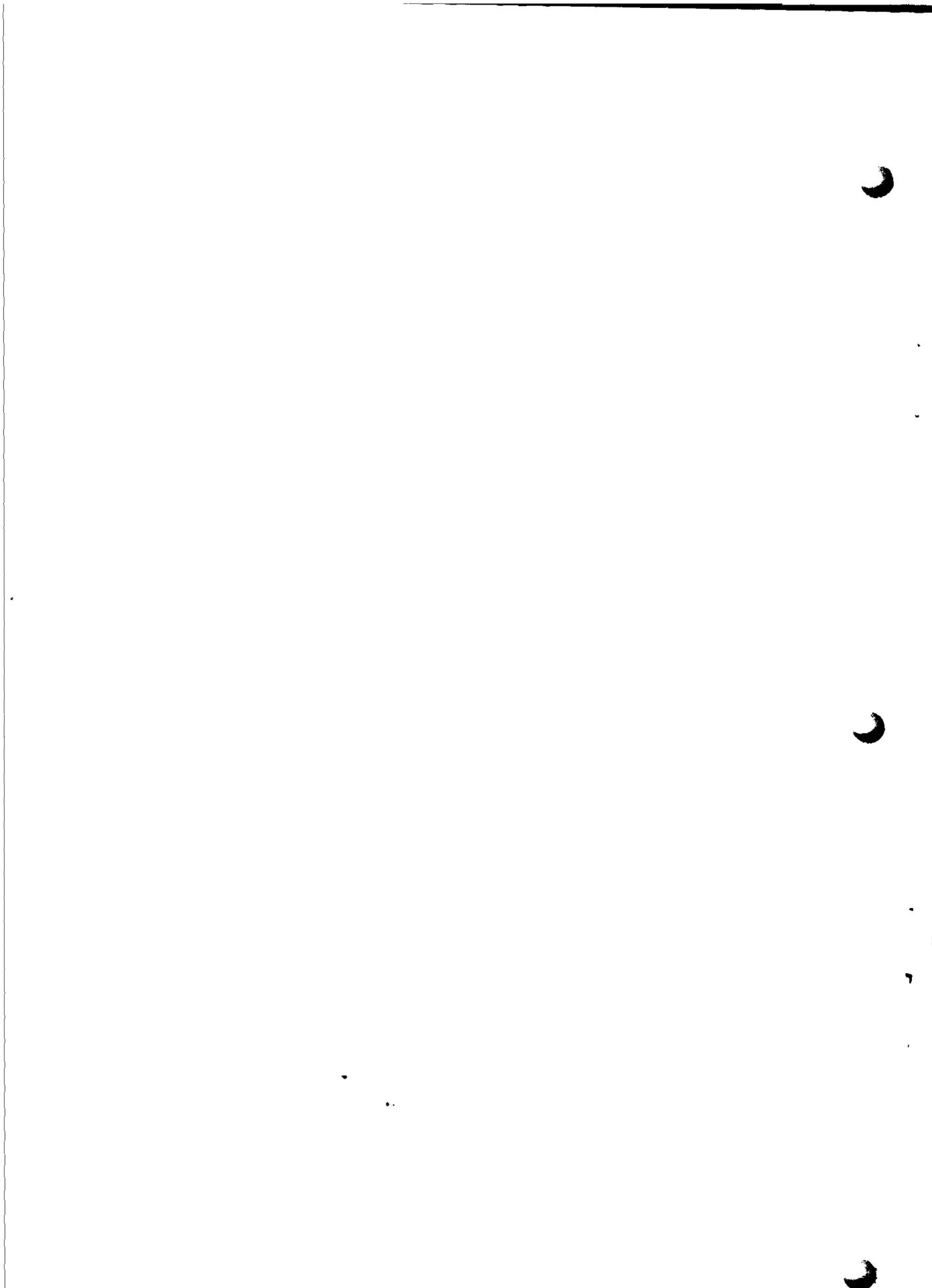
COMMITTEE FINDINGS AND CONCLUSIONS

Although questions were raised as to the extent of investigation conducted to evaluate the environmental impacts of the Applicant's proposed route, it is important to distinguish Staff's expressed reluctance. First, during the evidentiary hearings, the Staff witness explained that the ranking of possible routes on the basis of economic preferability did not include an assessment of environmental impacts. When this qualification is noted and the Applicant's evidence that the proposed route will run primarily along existing roadways is weighed, the Bottle Rock to PGandE Unit 17 route can be found environmentally acceptable. Secondly, it is important to note that the preferences for transmission routes expressed in the FEIR are similarly oriented to non-environmental issues, especially KGRA-wide capacity and economics. Thus, in weighing all evidence submitted during the proceeding, the Committee determines that the Applicant's proposed route conforms to applicable laws, regulations and ordinances, and is environmentally acceptable provided that the mitigation measures specified in Appendix F are implemented.

Finally, the Committee would like to clarify that in adopting the jointly-sponsored Findings, Conclusions and Conditions, all references to NCPA which would suggest that this Decision will bind that utility to any specific KGRA-wide transmission line routing plan have been rejected. Because of the broad nature of transmission system planning the routing of an NCPA transmission line is more appropriately considered in an NCPA or generic proceeding and the Committee does not choose to constrain these future proceedings by this Decision.

APPENDIX A

Lake County Air Pollution
Control Officer's Determination
of Compliance (with attached
errata).



ERRATA SHEET FOR

LAKE COUNTY AIR POLLUTION CONTROL DISTRICT

DETERMINATION OF COMPLIANCE

DWR/BOTTLE ROCK GEOTHERMAL POWER PLANT

10 October 1980

Robert L. Reynolds, Air Pollution Control Officer
Donald L. Saderlund, Deputy APCO/Meteorologist

ERATA

Condition #2

Change ...concurrently operating major components.

Toconcurrently available major components.

Condition #3

...components.

...components. If such design criteria can not be established, abatement systems shall be retrofitted as necessary to achieve performance at this level.

Condition #5, line 3

...to the power plant during direct venting

Addto the power plant during direct venting of untreated non condensable gases in the steam.

Condition #6

...cold start-ups are to occur and ...

Addcold start-ups in excess of 5# H₂S/hr are to occur and ...

Condition #7, line 3

...stacking.

Addstacking. Alarm/trip conditions noted with an asterik have a separate alert and trip alarm function and those alarm/trip conditions without an asterisk are coincident alarm/trip functions. Functions with asterisks include:

Turbine Generator Unit #3, #4, #5, #7, #8, #9, #10, #11, and #12

Condensers - 1, 2 and 3

Cooling Tower - #1

Electrical System - #6, #13, and #14

Condition #9

AddIf for considerations of safety, DWR can not comply with such a specific request, DWR shall forward in writing within one week a letter explaining the reasons entry within one hour could not be allowed the LCAPCD staff.

Condition #10, line 1

...DWR's approved for construction drawings of the EIC...

Add.....DWR's approved for construction drawings or other drawings acceptable to the LCAPCO of the EIC...

Conditions #10, line 4

...date.

Add.....date. DWR shall not be required to submit proprietary information unless specifically requested by the LCAPCO pursuant to section 91010, Title 17, California Administrative Code.

Condition #11, line 3

...before the finishing of final design of the power plant and abatement system.

Change....before finishing the final design of the hydrogen peroxide/catalyst abatement system.

Condition #14

Change to read...The access road from Bottle Rock road to the power plant shall be paved to ensure that the regeneration of fugitive...

Condition #15, line 1

...Within sixty (60) days of commercial operation...

Change....Within sixty (60) days after initial power production...

Condition #19, line 11

...impacts of the power plant upon...

Change....impacts caused by the Bottle Rock power plant...

Condition #21, line 10

...In the event that continuous...

Change....In the event that acceptable continuous...

Condition #21, line 5

Delete....(or 1/6 of full scale),

Condition 21, line 9

Add.....Monitoring shall be required pursuant to
Section 42303 of the California Health and
Safety Code.

Condition 21, line 14

Add.....The Applicant shall on an annual basis after the
date of the decision submit for approval by the
LCAPCD, CEC and ARB a summary of the applicant's
efforts to develop, research, let for contract
to research, or let for contract to implement
use of equipment, that is to be a likely
candidate for a continuous condensate and non
condensable gas monitor for hydrogen sulfide.

Page 10, line 20

...power plant shutdowns

Change to.power line losses.

Page 19, line 10

...3.6 millicuries/hr

Change....18 millicuries/hr

DOCKET 79-AFC-4
DATE: <u>SEP 24 1980</u>
RECD: <u>SEP 26 1980</u>

LAKE COUNTY AIR POLLUTION CONTROL DISTRICT

DETERMINATION OF COMPLIANCE

DWR/BOTTLE ROCK GEOTHERMAL POWER PLANT

24 September 1980

Robert L. Reynolds, Air Pollution Control Officer

Donald L. Saderlund, Deputy Air Pollution Control Officer/Meteorologist

Submitted by

Robert L Reynolds

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TO: Department of Water Resources Committee of the
California Energy Development and Conservation Commission
Russell L. Schweickart, Chairman
Presiding Member of the Committee

The Lake County Air Pollution Control District hereby submits a positive Determination of Compliance for the Department of Water Resources Bottle Rock Power Plant, provided the twenty-three (23) conditions listed below are acceptable.

Signed Robert L. Reynolds Date 24 September 1980
Robert L. Reynolds, APCO

Condition 1

Hydrogen sulfide (H_2S) emissions from the DWR/Bottle Rock power plant shall be limited to a maximum of five (5) pounds per hour during power plant generation and all possible generation outages. All untreated steam or condensate shall be returned to a treatment or re-injection point to ensure this level of emissions is maintained.

Condition 2

The atmospheric emissions control system (AECS) described in the AFC and revisions to the AFC, April 18, 1980, shall be utilized. The system as described which constitutes the best available control technology, shall consist of the following concurrently operating major components:

- a) An EIC system to reduce H_2S and other emissions prior to entering the power plant;
- b) A surface condenser to facilitate the partitioning of H_2S into the noncondensable gas phase;
- c) A Stretford unit as specified in the AFC to reduce the H_2S concentration in the noncondensable gases to 10 parts per million by volume (ppm_v) or less;
- d) 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 #1;
- e) A turbine by-pass system sufficiently sized to accept 100% of full steam flow during generating outages so that the power plant emission control system can be utilized to treat steam normally stacked during the outage.

In addition,

- f) The air emissions control system specified above shall be properly winterized.
- g) If a solids removal system is necessary as a result of solids formation in the condensate, such facility shall be incorporated into the system.
- h) In the event of Bottle Rock generation loss, an alternate source of power to enable the continued use of the air emissions control system specified above shall be available.

- i) A stand-by generator capable of sustaining the EIC system shall be available and fueled with low sulfur fuel of 0.5% or less.

Condition 3

The major components of the air emissions control system (EIC, Stretford, and condensate abatement) shall incorporate a design to enable a 99% availability excluding scheduled maintenance on these individual major components.

Condition 4

Upon failure of H₂S abatement equipment, DWR shall curtail to a level necessary to comply with the five (5) lbs/hr H₂S emissions limitation or provide for a mechanism allowing an immediate determination of prevailing atmospheric conditions to enable the LCAPCO to make a decision as to whether it is acceptable to continue operation at a higher emissions level.

Condition 5

The cooling towers shall have a guaranteed drift rate of no more than 0.00002 as described in the AFC.

Condition 6

The off-gas vent to the atmosphere shall be used only during legitimate emergencies and to enable the cold start-up of the power plant turbine. Steam flows shall not exceed 25,000 lbs/hr to the power plant during direct venting. The turbine by-pass shall be used if possible to avoid direct venting into the atmosphere of undiluted non-condensables. The LCAPCD shall be notified when cold start-ups are to occur and may cancel such activity if deemed necessary.

Condition 7

DWR shall install alarms and switches on the following units to ensure immediate corrective action is initiated to prevent outages and potential stacking.

Turbine Generator Unit

1. Excessive vibration switch, alarm and trip;
2. Lateral motion switch on the turbine shaft, alarm and trip;
3. High lube oil temperature switch, alarm and trip;
4. Low lube oil pressure switch with indicating light in control room;
5. Low lube oil sump level switch, alarm;
6. Overspeed switch, alarm and trip;
7. High hydrogen gas temperature and low purity hydrogen alarm and trip;
8. Seal oil level switch and alarm;
9. Differential pressure switch to prevent low differential pressure between the seal oil and hydrogen pressure, alarm and trip;
10. Generator moisture detector and alarm;
11. Vacuum switch to prevent low vacuum in the seal oil detaining tank, alarm and trip;
12. Turbine bearing metal temperature alarm and trip.

Condensers

1. Pressure switch to prevent condenser pressures from exceeding design levels, alarm and trip;
2. Condensate level switches to start and stop pump, prevent

3. excessively high condensate levels in hot well;
High or low condensate levels alarms.

Cooling Towers

1. Float switches and indicators to start and stop the pump in the cooling tower overflow basin and provide alarms;
2. Vibration switches and alarms on each cooling tower fan.

Electrical System

1. Generator differential current trip and alarm;
2. Generator over-current trip and alarm;
3. Generator ground fault trip and alarm;
4. Generator anti-motoring trip and alarm;
5. Generator field ground trip and alarm;
6. Generator stator over temperature alarm and trip;
7. Loss of excitation trip and alarm;
8. System negative phase sequence trip and alarm;
9. Transformer differential current trip and alarm;
10. Transformer over-current trip and alarm;
11. Transformer ground fault trip and alarm;
12. Transformer sudden pressure trip and alarm;
13. Transformer winding temperature alarm;
14. Transformer oil temperature alarm.

Condition 8

The LCAPCD shall be notified within one hour following any power plant outage or malfunction resulting in emissions in excess of five (5) pounds per hour H₂S at (707) 263-2391, 263-3121, or a number to be provided by the LCAPCD. DWR shall maintain a log of power plant outages along with explanations for the outages and malfunctions. In the event that power plant outages recur because of equipment malfunctions that are not indicated by alarms, DWR shall retrofit alarms on the malfunctioning equipment as possible. The log shall be available for inspection upon the request of the staffs of the LCAPCD, ARB, CEC, and EPA.

Condition 9

The power plant abatement system shall have an operator on site at all times. The operator must be able to immediately take necessary corrective action in the event of power plant outage or equipment malfunction in order to meet the conditions of this Determination of Compliance. DWR shall provide a telephone number at which the Bottle Rock operator or a representative can be reached to ensure LCAPCD entry for inspection purposes within one (1) hour of notification.

Condition 10

DWR's approved-for-construction drawings of the EIC system, Stratford unit, turbine by-pass, and secondary abatement (condensate treatment) system shall be submitted to the LCAPCD and CEC for comment and review at the earliest possible date.

Condition 11

DWR shall submit to the LCAPCD, ARB, and CEC the results of the pilot test program performed by Bechtel National, Inc., no later than February 1, 1982, or within one month before the finishing of final design of the power plant and abatement systems.

Condition 12

Before the start-up of the power plant, DWR shall submit to the LCAPCD certification by EIC Corporation that DWR's operators have been trained to operate and maintain the EIC system in accordance with EIC's approved procedures.

Condition 13

Although the applicant is to be licensed upon the use of BACT as described in Condition #2, DWR may use other means to comply provided the LCAPCD, ARB and CEC are provided performance data indicating the other means are capable of achieving the same emissions limitations and reliability as those defined in Condition #2. Any such changes shall be decided at a properly noticed public hearing to be convened jointly by the LCAPCD and CEC, no later than two years prior to anticipated power plant operation at which the ARB and all intervenors shall be invited to participate. The LCAPCD concurrence upon any changes must be given.

*Amended
3/25/82*

Condition 14

All roads to and from the power plant shall be paved to ensure that the generation of fugitive particulate matter is minimized.

Condition 15

Within sixty (60) days of commercial operation, DWR shall demonstrate that the applicable emissions limitations are being maintained during normal power plant operations. DWR shall submit a detailed performance test plan to the LCAPCD at least thirty (30) days prior to such tests. Such plans shall also be designed to determine the particulate emissions rate and components of particulate emitted. DWR's proposed test plan must receive LCAPCD and CEC staff approval before such tests may be conducted to determine compliance.

Safe sampling access and ports to enable the LCAPCD to gather samples from the freshly treated condensate, cooling tower stack, treated gas from the Stretford system, and treated steam from the EIC system shall be provided.

Condition 16

Reports shall be issued quarterly to the LCAPCD detailing: a) hours of operation; b) any periods for which abatement equipment malfunctioned and the action taken; c) chemicals utilized for treatment of condensate; d) periods of scheduled and unscheduled outages and the reasons for such outages; and e) summary of the output of continuous emissions monitors with explanations of any irregularities.

Condition 17

Within ninety (90) days after commercial operation DWR shall file with the LCAPCD an application for a Permit to Operate together with all appropriate information to ensure compliance with the certification and submit permit fees.

Condition 18

DWR shall take all reasonable measures to comply with any future air emittent or ambient standard or guideline adopted for present non-criteria pollutants (i.e., mercury, boron, arsenic, radon²²², etc.) by responsible State or Federal agencies and/or comply with guidelines established as part of DWR/Bottle Rock's certification by the California Energy Commission.

Condition 19

DWR shall promptly fund reasonable studies or tests as required by the LCAPCO to ascertain the impact of DWR/Bottle Rock when operating, specifically at the residence located approximately 1900 ft east of the Francisco pad, should the resident in good faith file complaints with the LCAPCO indicating the air quality is worsening or becoming a nuisance or unhealthful as a result of Bottle Rock's operation. These studies shall include, but not be limited to, monitoring at the residence to determine H₂S levels and particulate or other components which are believed or known to be in geothermal steam, tracer tests or source tests. Such studies shall be approved by the LCAPCO prior to initiation. Reasonable mitigation steps shall be applied upon request of the LCAPCO to attempt to remedy any unlawful impacts of the power plant upon the residence.

Condition 20

The incoming steam to the power plant shall be analyzed quarterly and reported to the CEC and LCAPCD for radon²²² and its daughters, mercury, arsenic, silica, boron, benzene, ammonia, and total suspended solids for the first two years of operation. The results of these tests shall be reviewed by the LCAPCO to determine if thereafter annual testing will suffice. DWR may join with the steam supplier in performing such tests. Results of any tests performed upon the cooling tower sludge shall also be forwarded to the LCAPCD.

Condition 21

H₂S emissions shall be monitored continuously by measuring total volume/flow rates and H₂S concentrations at the following locations: a) outlet of the EIC system; b) outlet of the Stretford unit; and c) in the condensate. A log of such monitoring shall be maintained and be made available to LCAPCD staff upon request. The devices must have accuracies of ±1 ppm (or ±1% of full scale), provide measurements at least every 15 minutes, and be accessible to LCAPCD staff. Flow rate measuring devices must have accuracies of ±5% at 40% to 100% of the total flow rate and calibrations must be performed at least quarterly. Calibration records must be made available to LCAPCD staff upon request.

In the event that continuous monitors are not available, DWR shall conduct testing no less than once every thirty (30) days to ensure the efficiencies of the H₂S abatement systems are being maintained. The testing procedure used to determine compliance must be approved by the LCAPCO. A log of such testing shall be maintained and be available to LCAPCD staff upon request.

In either case, a summary of the monitoring and/or testing shall be forwarded to the LCAPCD every three (3) months.

Condition 22

DWR shall, at the request of the APCO, install, operate and maintain an on-site meteorological station capable of determining wind direction, wind speed, standard deviation of the direction, and temperature. Such data shall be furnished to the LCAPCD on a monthly basis in an hourly/day format and quarterly in a summary format acceptable to the APCO.

Condition 23

Compliance monitoring shall be conducted for a minimum one (1) year period before initial operation and one (1) year period after initial operation. Constituents to be monitored include arsenic, boron, mercury, radon²²², benzene, silica, and particulates in addition to H₂S. Constituents shall be measured both as suspended aerosols and fall-out. Monthly composite samples of fall-out shall be collected using a wet/dry collector. Constituents other than H₂S may be measured every sixth day, per the ARB particulate sampling schedule. DWR, CEC, and LCAPCD shall agree upon methods used in sampling and analysis. At the end of the indicated period, the monitoring program will be reviewed by the APCO and the feasibility and necessity for continuance determined. The site for such monitoring shall be in the Cobb Valley area unless DWR and the LCAPCD agree upon a mutually acceptable alternative site.

If DWR enters into a combined effort with other developers or an alternative monitoring program acceptable to the LCAPCD and CEC, this condition shall not be exercised.

Conclusion

A review of the original and additional materials submitted during the AFC and NOI process have resulted in the issuing of a positive determination of compliance (DOC) for DWR/Bottle Rock. Conditions attached to the DOC will ensure that the DWR/Bottle Rock project will not have a significant detrimental effect on air quality and that potential air quality problems will not go unaddressed.

A review of tracer tests, coincident meteorology, existing control strategy, and future development indicate that DWR/Bottle Rock will contribute to expected exceeds of the CAAQS for H₂S but in an amount less than 5 ppb. The heaviest singular contribution will occur during subsidence inversion conditions similar to Test #5 in an amount of approximately 10 ppb H₂S. This impact will occur concurrent to lower H₂S background and the combined level has been determined to be less than 25 ppb H₂S. A contribution of 5-10 ppb to an H₂S AAQS exceed is considered significant and would necessitate denial of the project. The raw tracer test #5 data were conservatively corrected for a release height of 750 ft instead of 500 ft using three approaches and resulted in an estimated impact of 10 ppb as opposed to the original 20.8 ppb (uncorrected).

Since DWR/Bottle Rock will contribute to an AAQS exceed, best available control technology must be required. The air emissions control system proposed by DWR/MCRGC constitutes best and full application of abatement technology. MCRGC, the steam supplier, and DWR have combined to not only address normal operation but to fully address upset operations in a manner which allows the District to omit stacking events in making a permit decision.

Concern over the potential deleterious effects of geothermal steam constituents other than H₂S, such as boron, radon²²² and its daughters, mercury, arsenic, etc.,

will be addressed by periodic source tests and a monitoring program to establish a baseline in the localized area.

Introduction

It is the intent of the Lake County Air Pollution Control District to use this document to inform the public as well as for CEC purposes.

The LCAPCD as the responsible air regulatory agency is required to evaluate proposed projects which can have an actual or potential impact on ambient air quality. DWR/Bottle Rock obviously requires such an analysis and permitting decision by the LCAPCD. The Warren-Alquist Act, the subsequent ARB-CEC Joint Policy Statement, and the California Energy Conservation and Development Commission regulations (Title 20, Section 1752.3) affects the normal permitting process.

Section 1752.3 states

1752.3. Proposed Decision; Air Quality Findings.

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

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

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

It is in recognition of the above factors and the spirit of their intent that the LCAPCD has actively participated in the DWR/Bottle Rock proceedings.

DWR filed the AFC in July of 1979 with the California Energy Conservation and Development Commission. The AFC proceedings were suspended in January of 1980 at DWR's request as a result of the revelation that several environmental questions and apparent unmitigated impacts of the project remained unresolved. Of most concern was the inability to mitigate air quality impacts. After

suspending the proceedings, DWR and the steam supplier in a combined effort proposed innovative solutions through the use of redundant and new technologies. Additionally, the LCAPCD was funded to further study and characterize steam quality on the Bottle Rock leasehold and has been assured by both parties that an adequate monitoring program will be funded.

The new proposed atmospheric emissions control system consists of four major components: 1) Stretford/surface condenser; 2) condensate abatement using $H_2O_2/Fe \cdot HAA$; 3) turbine by-pass; and 4) an EIC upstream abatement system.

The District has, on several occasions, stated its concerns in writings and at public meetings. The project is going to be extremely difficult to construct and operate in a fashion which will not cause, on occasion, undesirable air quality impacts; however, DWR/MCR has initiated the necessary effort to minimize these concerns. Additionally, DWR/MCR's combined effort and commitment has brought about a new uncompromising attitude in the Geysers regarding the solving of technological problems with technology that is known to be available now through a cooperative effort, and not hoping to be able to retrofit later. This attitude by DWR and MCR deserves compliment and the District's full support in the efforts to ensure that the optimistic air quality objectives are achieved.

Included within this document is pertinent information on matters relating to air quality and the potential air quality degradation to be expected as a result of DWR Bottle Rock's proposed construction and operation. Major topics covered include:

- a) A determination of the likelihood of compliance with each applicable LCAPCD rule as the permit is conditioned;
- b) The LCAPCD's determination that the proposed abatement system qualifies as Best Available Control Technology;
- c) The assessment of the contribution of DWR's emissions to the prevailing

ambient air in the Cobb area; and

- d) Certification conditions the District believes are necessary to assure conformance of the DWR project with air quality concerns, laws, and regulations.

Other information included in the report address the expected steam quality and potential emissions, the environmental setting, air quality and meteorological measurements, expected and worst possible impacts from the associated steamfield, and the need for monitoring of air pollutants. The reader is referred to the DWR/Bottle Rock Environmental Impact Report, NOI, Application for Certification and subsequently submitted material for more and general details on the subject project.

Project Description^a

DWR proposes to construct and operate the Bottle Rock geothermal power plant to provide an economic and nonfossil fuel source of baseload electrical generation for the State Water Project (SWP).

The SWP provides water conservation, flood control, recreation, and fish and wildlife enhancement benefits throughout most of California. The SWP, which is designed to ultimately supply over four million acre-feet of water annually, includes water storage facilities, pumping plants, power generating plants, and a total of 540 miles (864 km) of aqueduct. Thirty-one public water agencies (Water Contractors) who wholesale and/or retail water to over two-thirds of the people in California, have contracted for water supplies from DWR. (DWR, 1978).

Electric energy is needed to operate the pumps of the SWP and the Bottle Rock power plant will provide a portion of this electricity requirement. Bottle Rock will expand the electrical generating capacity in The Geysers KGRA by 55 MW and reduce the need for constructing other types of electrical generating facilities, (i.e., coal, nuclear, gas turbine, combined cycle, or hydroelectric).

In The Geysers KGRA (Figure B), a geothermal development area contains steam wells, well pads, access roads, steam supply pipelines, power plants, and transmission lines connecting the power plant with the intended electricity service area. Ownership of the surface rights where the steam wells and power plant are located are privately or federally owned. For Bottle Rock, the surface rights and mineral rights are privately owned. The resource is leased to a steam developer who supplies the steam to an electric utility company. The steam supplier is also responsible for disposing of or reinjecting any steam condensate generated by the power plant. MCR Geothermal Corporation is the steam supplier for DWR's Bottle Rock project.

^aThe above portion of the project description is taken from the revised draft EIR produced by the CEC and dated August 1980.

Protection of air quality will be mitigated by installation and good faith usage of the EIC abatement system; turbine by-pass, Stretford H₂S abatement system and condensate abatement systems as proposed by DWR and MCRGC.

The location of the proposed project and predominate areas of impact can be seen on Figure A-1.

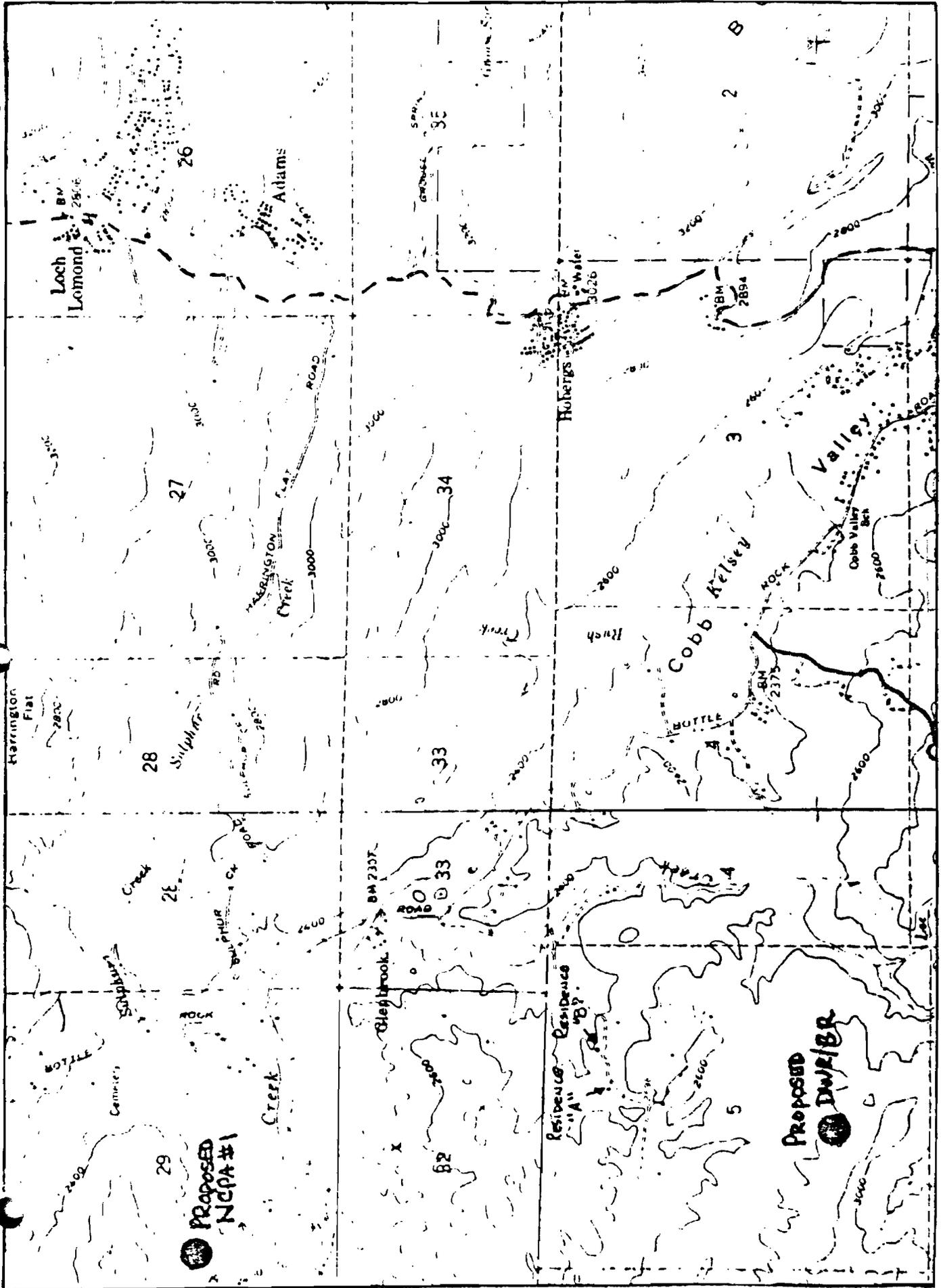


Figure A-1

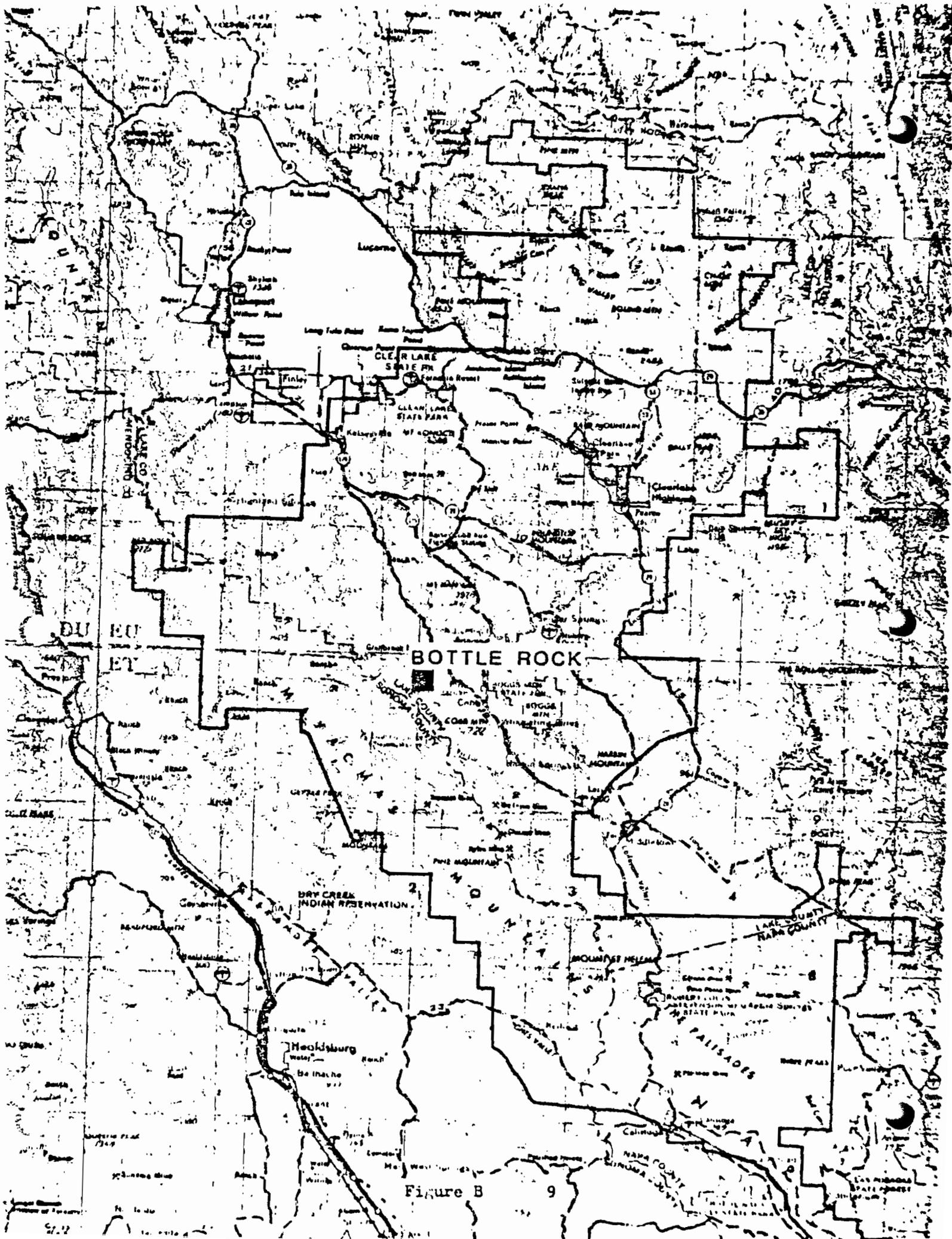
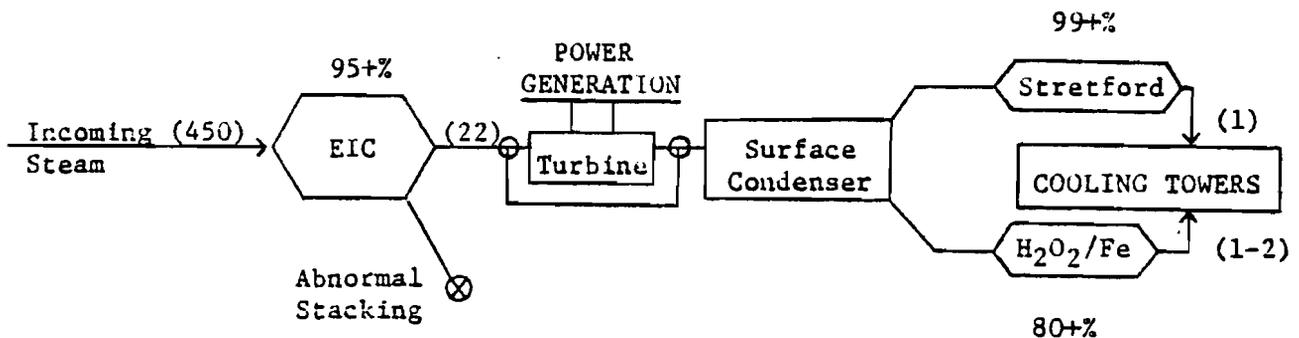


Figure B

Description of the Air Emissions Control System

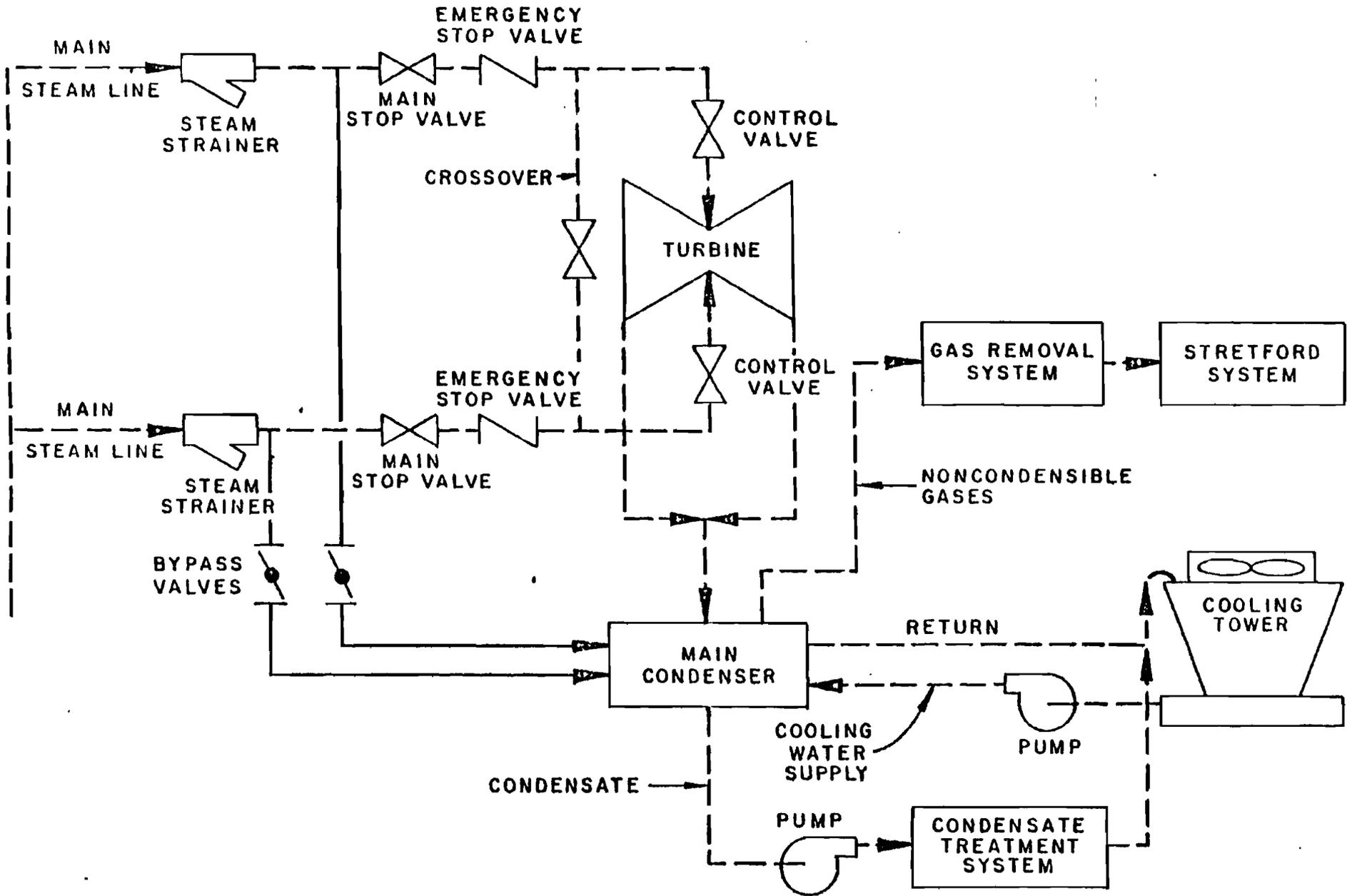
The diagram below describes the H₂S abatement facility. The EIC and/or other facilities utilized in the H₂S abatement systems almost completely remove entrained rock, dust and other particulate from the steam prior to emissions. The flow process is shown briefly below and in the figure that follows. The revisions to the AFC submitted by DWR in April 1980 provide the best description of the total system and its intended operation.



Shown in () parentheses is the estimated level of unabated H₂S in the flow process for a 450 lbs H₂S/hr incoming steam rate. The actual amounts unabated during an upset and subsequent steam flow curtailment would be markedly less. The efficiency of the H₂O₂/Fe system is unknown for high H₂S levels which are likely to be encountered in the condensate. Additionally, the beneficial partitioning of H₂S into the non-condensables as a result of NH₃ removal in the EIC system and slight acidification is a reasonable expectation but has not been proven to be fact.

The generating facility and associated steam supply line will incorporate many attributes which serve to remove the necessity of considering stacking events simultaneous with other power plant outages. These include:

- a) A diesel powered generator capable of operating the EIC system during power plant shutdowns;



TURBINE BYPASS SYSTEM
FLOW DIAGRAM

- b) The ability to remotely and within minutes curtail steam supply to 35% or less;
- c) A by-pass of the turbine to allow continued abatement and operation of the power plant during curtailed loads. The generator is to have a 5 megawatt load level which will allow self support of the plant in the event of a transmission line loss;
- d) A 450 kw generator capable of sustaining circulation pump operation and emergency power needs; and
- e) The ability for redundant major abatement components to significantly compensate in the case of failure of any single major component.

Conclusion:

As mentioned, the above capabilities will enable an analysis which does not address the combined impacts of venting large quantities of unabated steam, though this could conceivably occur during the initial start-up and during unforeseen events. The problem with initial start-up is acknowledged and addressed in conditioning the DOC such that desirable meteorological conditions will be required to initiate start-up and be aborted if undesirable meteorological circumstances develop. The APCO's approval of start-ups resulting in more than 5 lbs H₂S/hr emissions will be required. This is expected to be necessary only when condensate bleeds are being utilized on the steamline (extremely rare occasions). The low emissions obtainable by EIC, Stretford and H₂O₂/Fe have been demonstrated as feasible as part of the DOE pilot EIC project and source tests of Geysers plants for Stretford and H₂O₂/Fe.

Environmental Setting

The purpose of this section is to describe the physical and social environment in the vicinity of the proposed DWR/Bottle Rock power plant. The proposed site is located just west of the Alder and Lee Creek drainages which empty into the Kelsey Creek drainage in Cobb Valley. There are several communities or residential concentrations in and around Cobb Valley that will be directly impacted by the proposed development. Among these are Glenbrook (Camp Beaverbrook), Pine Grove, Cobb, Hobergs, Adams Springs, Loch Lomond, and several subdivisions along Pine Ridge and the western flanks of Boggs Mountain. The make-up of these communities is well-rounded and consists of seasonal vacation (recreational), retirement, and other permanent (working) residences. All age groups are represented on a year-round basis with a trend toward the young and elderly during the late spring to early fall months when recreational usage increases significantly. Many small springs and streams contribute to the drainage of the region and the vegetation runs from near desert chaparral to heavy forest interspersed with meadows. The air quality is generally clear and clean but odor from H₂S and exceeds of the CAAQS for H₂S occur. However, it is the opinion of the LCAPCD that these exceeds are on the decline.

LCAPCD Rules Applicable to DWR Bottle Rock Power Plant

Comments

Rule 411	Defines particulate emission.	Conformance expected; (see table, page 19), less than 40lbs/hr including plant outages.
Rule 412	Defines emissions from sulfur recovery units.	Conformance from Stretford and EIC Units expected.
Rule 421.2A&B	Establish general minimum performance standards for H ₂ S emissions from geothermal power plant operations.	Conformance expected and easily achieved.
Rule 430	Catch-all <u>Nuisance</u> provision.	Conformance is anticipated but cannot be determined prior to actual emissions impacting receptors and people.
Rule 439	Governs fuel storage parameters.	Conformance is expected and additional permit components for emergency diesel generator may be issued.
Rule 440	Defines new source performance standards (NSPS)	New source performance standards have not been promulgated for geothermal power plants.
Rule 450	Defines National Emissions Standards for Hazardous Air pollutants (NESHAP)	Conformance is difficult to ascertain since NESHAP standards have not been promulgated for geothermal power plants.
Rule 510	Defines emissions allowed under a malfunction condition.	Cooperation and conformance by DWR is expected, and as conditioned, should comply.
Rule 511	Defines operational time limits under malfunction condition.	"same as above"
Rule 520	Covers evasion.	"same as above"
Rule 530	Covers emission data and sampling access.	"same as above"
Rule 555	Covers Trade Secrets.	Conformance by the LCAPCD and DWR is expected.

Rule 600	Covers Authorities to Construct (A/C).	Conformance determined but complicated by CEC process.
Rule 602	Defining parameters for granting or denying A/C's.	Conformance expected if conditions suggested by the LCAPCD are implemented in the certification.
Rule 604	Provides option for requiring conformance with rule 602.	Option exercised.
Rule 605	New source Review. Requires analyses, consideration of public input, noticing, etc.	Conformance determined if AFC issued as LCAPCD conditioned and by separate agreement with the County of Lake.
Rule 606	Requires applicant to comply with all applicable local, state or national air pollution rules and regulations.	Conformance expected.
Rule 607	Requires ARB review and concurrence within 30 days.	Conformance expected.
Rule 610 thru 617	Covers the issuance of a permit to operate.	Conformance expected.
Rule 620	Covers the posting of permits.	Conformance expected.
Rule 650	Covers Source Emission testing.	Cooperation expected, and certification of suggested conditions will insure conformance.
Rule 661	Covers analysis fees.	Cooperation and conformance expected.
Rule 700	Covers emergency conditions.	Conformance and cooperation expected.

Steam Constituents of Concern
for
DWR/Bottle Rock Steam

A. H₂S Steam Content

✓ The H₂S content of the steam reported in the Bottle Rock Steam Field EIR was 500ppm_w (240-60 ppm_w). As part of the CEC proceedings several submitted source tests performed by LFE, Inc. for MCR on the Francisco leasehold wells were reviewed by the LCAPCD and it was determined the tests had been erroneously interpreted. Tests when properly interpreted showed an expected H₂S content of 600 ppm_w (one tallied 80% confidence, 495±132). The LCAPCD position that original tests indicated a much greater H₂S content was acknowledged correct by DWR, MCRGC and LFE. Abatement equipment sizing and efficiencies are very dependent on this value and a conservative number must be used.

As part of an evaluation of bleeding wells and possible violation of rule 421.B, the LCAPCD requested that the State Air Resources Board tests wells in Lake County which were on a high sustained bleed and/or had steam of high H₂S content. The Coleman 1-5 and Francisco 1-5 were tested by the ARB using new and at that time not fully proven techniques during the middle of January 1980. A DOE source test team also tested Francisco 1-5 at the end of January 1980. These ARB, DOE and LCAPCD tests preliminarily indicate levels lower than previously reported values but also some values as high as earlier tests. PG&E Unit 17 which is geographically near the Francisco leasehold was sited assuming 450ppm_w H₂S. The LCAPCD joined in an agreement with MCRGC and DWR to study Francisco and Coleman leasehold geothermal wells to ascertain H₂S under temporal variations. This study was completed and while a final report has not yet been prepared, the results indicate that the H₂S content of one well on the leasehold does not vary greatly over a period of a day, week or month, at least while on bleed. This was an unexpected result. Shown below is a summary of H₂S test results for the Bottle Rock steam field. It should be noted that samples were collected under different conditions of steam flow and that a great deal of time elapsed between various measurements.

	<u>H₂S ppm_w</u>	<u>H₂S ppm_w (Avg.)</u>
Well #1	284±11 ^a , 362, 240, 220	283.3
Well #2	475, 340, 478, 336 ^b , 367 ^b	399.2
Well #3	674, 481	577.5
Well #4	262, 224, 263, 159 ^b , 176 ^b , 125 ^b	<u>201.5</u>

equally weighted mean 365.4

- a) Results of 42 tests while on bleed.
- b) Source tests performed after the initiation of a cycling program to limit emissions of bleeding wells.

Conclusion: The measured H₂S value for the Bottle Rock steamfield wells indicate H₂S variability in steam occurs or that analytical measurement error has occurred. The recent addition of a fourth well indicates

steam of a quality which is superior to previously completed wells, but even this well showed unexpected behavior in showing a higher H₂S content during flow tests than while on bleed. An estimate of the equally weighted mean for the four wells gives a value of 365. To assign an approximate deviation when it exists both between and within wells, over time, would be difficult and require a larger data base than presently exists. A value of 450 ppm_w H₂S or greater is suggested.

B. Components other than H₂S

The AFC and other submittals address components other than H₂S. Specific source tests are included in the DWR AFC. Two additional tests have also been incorporated in the table below. It should be noted that these results are also subject to variations and it is difficult to sample and analyze for the components in question. The information is provided to enable an awareness, but an extreme confidence as to the accuracy of each component does not exist.

Steam Content of Bottle Rock Steam
(Other than H₂S)

<u>Unit</u>	<u>Component</u>	Well #1	Well #2	Well #3	Well #4
ppm _w	NH ₃ (range)	56-90	130-140	33-90	35-90
pci/kg x10 ⁵	Radon	9.6	28.8	36,25	—
		12.0			
		11.0			
ppm _w	Boron	0.5*,14	31,30		29
ppm _w	Silica	5.3,41	0.68,0.57	0.055 0.11	<0.02
ppb _w	Fluoride	45, 60	< 100	440, 445	140
ppb _w	Arsenic	<10			<100
ppb _w	Mercury	19	4,8	25, 8.8	< 30

A variety of techniques have been utilized in the measurement of the above components from the subject wells. Additionally, benzene has been measured in noncondensable gas of one well at 10-30 ppm_v and the concentration in the condensate, though not measured, could be significant. Mercury exists in both the dissolved and vapor phase within the noncondensables and condensed steam.

Particulate & Minor Pollutants Emissions

Particulate emissions result from dissolved components and small suspended particulate in the cooling water being suspended into the air which is mechanically drawn through the cooling tower. The dissolved solids are concentrated by the evaporation process within the cooling tower water and further concentrated by the entrainment process.

This concentration factor over that of incoming steam is difficult to estimate. A concentration factor of 5 occurs within the cooling tower (80% evaporation). Further evaporation and concentration of the particulate occurs while the droplet is suspended within the cooling tower and prior to exiting. This phenomena is enhanced by the preferential exiting of small particles (they escape the drift eliminators). An enhancement factor of 5 is assumed for this parameter. DWR/Bottle Rock is to be equipped with an EIC system which will reduce the levels of boron, arsenic, particulate, etc., and perhaps cause the level of suspended sulfur to increase. If significant quantities of H_2S must be abated in the condensate, dissolved solids would also be expected to increase markedly.

Provided below is a summary of maximum expected quantities of pollutants of concern entering the plant and expected maximum emissions. It should be noted that the high reported value for each component is utilized.

	<u>lbs/hr to Plant</u>	<u>Removal Efficiency</u>	<u>Maximum Expected Emissions Rate</u>
Boron ^a	30	50%	0.26 lbs/hr
Fluoride ^a	0.445	0%	0.008 lbs/hr
Arsenic ^a	0.1	50%	0.001 lbs/hr
Silica ^a	41	90%	0.070 lbs/hr
TDS	150	0	2.5 lbs/hr
NH ₃ ^a	140	~99%	<1 lb/hr
Hg ^b	0.02	unknown	<0.02 lbs/hr
Radon ^c	36,000 pci/kg	0%	3.6 millicuries/hr
H ₂ S	450	--	5 lbs/hr

^aComponents are assumed to concentrate by a factor of 25. A drift rate of 0.002% and a circulating water rate of 34×10^6 lbs/hr were utilized.

^bHg is volatile in the steam. Its eventual fate is uncertain.

^cRadon is inert and passes through the system.

Conclusion: Even with extremely conservative assumptions the particulates emissions limitations can be met. The emissions of various holding tanks, the sulfur (Stretford) handling system, etc., have been conservatively estimated in the AFC and subsequently submitted materials and need not be recalculated here. A proposed steam sampling and ambient monitoring program should give a better understanding of potential non criteria pollutant significance.

Historical Air Quality and Studies

A review has been completed of the Environmental Impact Report (EIR) for the Department of Water Resources (DWR) Bottle Rock power plant dated December 1979 and reissued August 1980 by the California Energy Commission; the Notice of Intent and Application for Certification (AFC) submitted by DWR and subsequently submitted material; modeling analyses by the ARB, SAI and an MCR consultant of tracer tests and plume rise calculations; SMUD and PG&E geothermal power plant AFCs; and other relevant environmental documents. Also reviewed were numerous tracer tests conducted on or near the leasehold since 1976.

During the last three years the LCAPCD has obtained considerable air monitoring data on the leasehold, at the old SIR sites (1, 3, 4, 5, and 7), and at short-term nearby monitoring sites. As late as July 1980 violations of the CAAQS for H₂S of .03 ppm were noted within the potential impact area of the development.

DWR funded a site-(power plant)-specific H₂S air quality monitoring program which started in September 1978. For the year September 1, 1978 to August 31, 1979, data capture was 63%, 31 hours with exceeds (H₂S \geq 26 ppb) or approximately 10% of the days. The highest one-hour value recorded was 79 ppb which is two and two-thirds the State H₂S air quality standard. This H₂S data compares favorably with the 1976, 1977 and 1978 H₂S data (see Attachment A-2, A-3, and A-4) collected in Cobb Valley by SRI at Kahm Ranch and Pine Ridge. Though the Bottle Rock site monitoring station was likely impacted to an extent by localized field development activities, information to prove such is lacking.

Tracer results are still the most useful potential impact evaluation tool that air regulatory agencies can utilize. Results are generally accepted as the best possible information on which to base decisions. Air dispersion models are commonly validated using the results of tracer tests and to validate the use of the model to further extrapolate to other scenarios of concern.

Much discussion has resulted from an MRI Cobb Valley tracer study designed and funded by PG&E, Union, NCPA, DWR and MCRCC, to aid in the permitting of the proposed Cobb Valley development. Results of one tracer test under a "subsidence inversion" condition (Test #5) indicated a very severe impact for H₂S emissions into Pine Grove from the proposed Bottle Rock power plant. In fact, worse case scenario estimated H₂S impacts are great enough to cause alarm over potential health impacts.

Relevant tracer studies to evaluate bleeding wells were also performed in which gaseous tracer was injected directly into the steam of venting wells or released at an elevated point for several meteorological conditions. The results of these tests and tests designed for the power plant are presented in summary form in Table I. Tests of drainage conditions to ascertain impacts of venting wells from the Francisco pad show impacts of the same order as the subsidence Test #5; however, such impacts were closer in and away from population centers and are not believed to be representative of cooling tower plumes.

Review of Tracer Tests Performed

Of the number of tracer tests utilizing SF₆ and CF₃Br performed on or near the DWR proposed site, (MRI-79-DV-1670) Tracer Test #5 has received the most heated discussion. The impacts realized were high but have also been similarly observed during other tracer tests under somewhat dissimilar conditions. The relevance of applying such tests (i.e., 200 ft. releases) may be argued but the caution cannot be ignored. In general, the validity of other tracer tests have not been challenged and are assumed, after limited review, to be valid. In fact, they may very well represent less than worse possible impacts.

Test #5 was performed using a tethered balloon to suspend a ¼ inch hose to a height of approximately 500 feet (variations would be caused by wind changes) and release of CBrF₃ through this hose. Considerable argument has been forwarded by many parties as to the appropriateness or validity of the test for a variety of reasons. Significant modeling and analysis efforts of Test #5 have been performed by Teshi (SAI), Ranzieri (ARB), Goddard (Environmental and Agricultural Consultant for MCRGC), and Sueder (ARB). In addition, the CEC, ARB (Meteorology and Power Plant Siting Sections), MRI, ES&S, DWR and LCAPCD have also reviewed and commented on several occasions on different aspects of the test. However, this is not the only meteorological scenario of concern. The MRI meteorologist (by far the most experienced in KGRA studies) does not agree with speculative high plume rise estimates but has stated that a plume rise of 750 feet is within reason (see Figure I-1). Upon examination, Figure I-1 will disclose the sinking subsidence inversion and the rationale behind correcting to a conservative 750 ft release height but will not completely delete the appropriateness of utilizing the 500 ft release as accomplished. It should be noted that an apparent ground layer inversion or drainage co-existed with the subsidence inversion, especially during late afternoon. The LCAPCD believes the matter

will be subject to continued argument until a great deal more is known about complex terrain air dispersion and steam/cooling tower plumes.

From the above-mentioned efforts, the following can be concluded:

- 1) The analytical measurement techniques utilized during the tests are valid.
- 2) Most opportunities for errors during the performance of tracer tests such as Test #5 will give markedly lower values, not the high values noted. The contractor logs and procedures were reviewed by Dr. Sueder of the ARB who concluded the tests were performed using good professional practices (written communication).
- 3) There are inconsistencies in the reported met data between the tracer summary and data volumes of the MRI reports. This is not true for the chemical/analytical data which is of most concern in evaluating the validity of impacts. Limited met data was erroneously reported during the computer reduction. This error has been acknowledged by ES&S and the analysis was completed without further corrections.
- 4) All parties agree that the proper release height for a power plant can be appropriately and perhaps conservatively assumed to be 750 ft or higher, not the 500 ft utilized. Considerable concern existed and still does as to whether the 500 ft release height used should be corrected for purposes of evaluating stacking emissions. This concern has been alleviated by DWR/MCR incorporating a turbine by-pass into the power plant design which will send those emissions associated with stacking to the power plant abatement and dispersion process via the cooling tower.
- 5) While many investigators concluded that a release height even greater than 750 ft is appropriate for Test #5 (power plant), consideration

Temperature with Elevation Profiles During Test #1
 (Small Flat Extrapolated to DWR site)

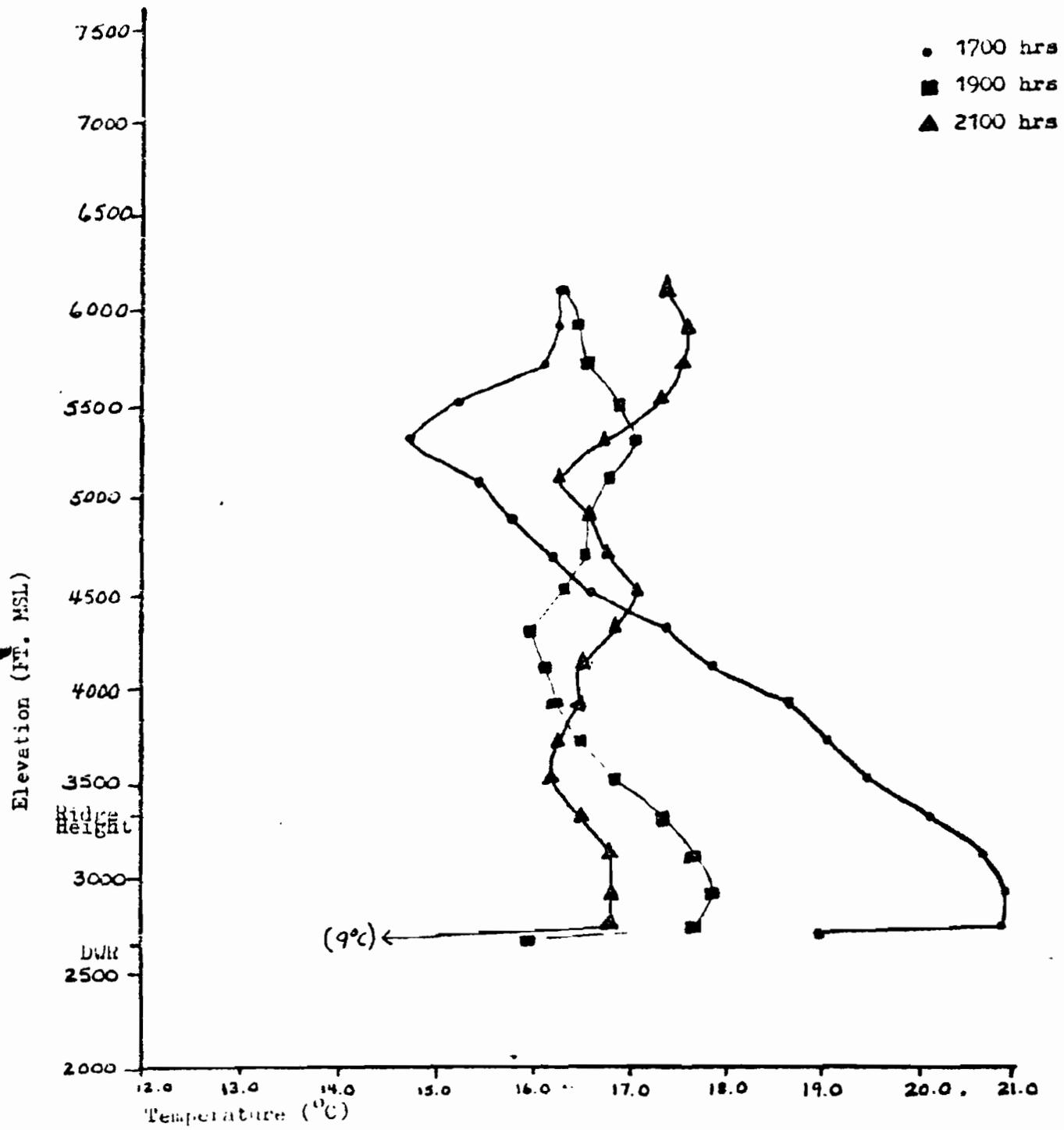


Figure I-1

was not given to stronger subsidence, local or large thermal driven, non-horizontal winds, stronger temperature gradients, etc.

The above discussion leads to the conclusion that a very conservative assumed plume height of approximately 750 ft could be used to correct the referenced test and compared to the impacts expected from a very uniquely re-designed DWR/MCR geothermal energy production facility.

Three approaches as suggested by Teshti, Ranzieri and Goddard were considered as most appropriate by the LCAPCO. Each involves ratio-ing the reported values to a lower impact assuming a higher release height would result in an increased dispersion of emissions. The results of these three suggested approaches are provided in Table II below.

Table II

Correction of Test #5 from 500 ft
to Assumed 750 ft Release*

	<u>Correction Factor</u>	<u>Predicted 5 lb/hr H₂S Emissions Impact</u>
SAI-Hybrid Model	0.297	6.1 ppb
ARB SMOG Model	0.586	12.2 ppb
Goddard & Goddard	0.456	9.5 ppb
		<hr/> mean = 9.3 ppb

* It should be noted that the SAI and ARB models and Goddard & Goddard suggested methodology yield predicted values significantly below those reported if unaltered model outputs are taken or a less conservative plume rise is assumed. In fact, predicted levels are less than 5 ppb total impact.

Notes on Table II

A. Teshti's suggested approach (Relative Impact)

Assumptions: Assumptions used in the SAI model are documented in the attached appendix and include the 750 ft plume rise and that a sinking subsidence (or possibly other momentum effects) as a reason to use elevated grid cell values. The model output is then used in a simple manner to derive a ratio which is applied to the tracer results.

1. Ratio of predicted to actual values for a 500 ft model and tracer test are 0.31 (1 cell away) and 0.34 (2 cells away).
2. Correction factor

$$C_f = \frac{\text{predicted 750 ft impact}}{\text{predicted 500 ft impact}} = \frac{2.075/5}{1.398} = 0.297$$

3. Corrected Test #5 impact - $(4.161)(0.297) = 1.23$ ppb/1.0 lb H₂S.
4. Impact of 5 lb/hr H₂S = 6.1 ppb.

B. ARB's suggested approach (Relative Impact)

The ARB/s smog model was used to attempt to emulate Test #5. Predicted impacts are off by an order of magnitude, but the ratios of predicted impacts can be utilized to derive a relative impact.

1. Ratio of predicted to actual impact under Test #5 conditions are poor.
2. Correction factor derived using worst 500 ft and 750 ft plume rise impacts plus or minus one grid cell from observed peak

$$C_f = \frac{1.7}{2.9} = 0.586$$

3. Corrected Test #5 impact = $(4.161)(0.586)$ ppb/1.0 lb H₂S
= 2.44 ppb/lb H₂S.
4. Impact 5 lb/hr H₂S = 12.2 ppb.

C. Recalculation using approach similar to that suggested by Goddard & Goddard for a 750 ft (229 m) assumed plume rise.

1. Derived equation

Pine Grove = expected ground level concentration equivalence

$$= 7.676 e^{-\frac{1}{2}\left(\frac{H}{137}\right)^2} \text{ ppb H}_2\text{S/lb emitted}$$

$$= 7.676 e^{-\frac{1}{2}\left(\frac{229}{137}\right)^2} \text{ ppb H}_2\text{S/lb emitted}$$

$$= 1.90 \text{ ppb H}_2\text{S/1.0 lb H}_2\text{S emitted.}$$

2. Correction factor: $\frac{1.9}{4.161} = 0.456.$

3. Impact of 5 lbs/hr H₂S = 9.5 ppb.

LCAPCD Selected Worse Case

Evaluation of the discussion of impacts contained in the previous sections leads to the conclusion that while MRI Test #5 produced the highest singular impact value, other scenarios (such as drainage) will likely also produce equally serious impacts. The cross ridge transport mechanism has shown, through aircraft H₂S monitoring and spot sampling, to have potential for heavy impacts of H₂S and contributions to exceeds of the CAAQS. This is vividly illustrated by Knuth in his discussion of Test #5 (and others) in the MRI 79 DV 1670 document. Thus, while Test #5 is considered the "worst singular impact," the other scenarios, when combined with existing background, are also of major concern.

In the final analysis, DWR/Bottle Rock is estimated to contribute less than 5 ppb concurrent to an exceed, although during subsidence inversions the contribution is estimated at slightly less than 10 ppb concurrent with a 15 ppb background. Since the contribution is less than 5 ppb to an exceed, the facility can be permitted under rule 602. Future background H₂S levels, the contribution of DWR/Bottle Rock, and methods of estimation are provided in the sections that follow.

Subsidence Inversions (Limited Vertical Mixing)

Examination of data concerning the worst case subsidence inversion impact for the DWR project revealed ten (10) tracer test days with suspected subsidence inversions (Table I-1). Data for these ten tracer tests are contained in MRI Data Volumes MRI 78 FR 1539 and MRI 79 DV 1670. H₂S data depicted in Table I-1 is contained in the monthly SRI reports for the dates noted. These values are the maximum hourly values recorded within ± 5 hours of tracer release periods.

While days with subsidence inversions occur with regularity in the area of concern, those days listed in Table I-1 are the only days for which upper air data (temperature soundings) exist and are available to the District to quantify characteristics of the scenario in question. The co-existing background (H₂S) level for each monitoring site is reported for each of the tests indicated. It is not so easy to establish that these days are indeed the worse historic days coincident with subsidence inversions.

Because of the above discussion, subsidence (limited vertical mixing) has been chosen as one of the worst case conditions. After an analysis of the thirty-five (35) tracer tests contained in the above-mentioned MRI data volumes, this becomes even more apparent. The level of predicted impact obtained from Test #5 (September 27, 1978) re-emphasizes the validity of this consideration.

While many tests have been designed and accomplished in the area of interest, only three were specifically designed with subsidence in mind (Tests 5, 8, and 9 accomplished in 1978). It is noteworthy, however, that many of the 35 tests accomplished were accompanied by subsidence or suspected subsidence inversions. Of these, only Test #5 (MRI 79 DV 1670) demonstrated a rapid descending motion (see Figure I-1) and produced unexpected high impacts.

The sinking subsidence inversion observed during that test qualified as a weak inversion according to Holzworth, as suggested by Tesche (1979) (see

Table I-1

	Holzworth Classification	Remarks	INV top	Maximum H ₂ S ±5 hrs or day							
				SRI# (w/o Rollback)				SRI# (w/Rollback)			
				3	4	5	7	3	4	5	7
Oct 9-10, 1977 22-04 psi	3	Strong	w/sfc inv 3100 ft	5	5	10	10	3	3	5	5
Oct 11, 1977 21-02 p	4	V Strong	w/sfc inv 3400 ft	10	10	15	5	5	5	8	3
Oct 12-13, 1977 00-05 p	5	V Strong	w/sfc inv 3800 ft	10	10	10	5	5	5	5	3
Nov 1, 1977 00-04 p	8	Moderate Moderate	3800 ft 5200 ft	15	10	0	5	8	5	0	3
Nov 2, 1977 00-05 p	9	Moderate	5200 ft	10	0	0	5	5	0	0	3
Nov 9, 1977 00-05 p	10	Strong	5400 ft	10	0	0	5	5	0	0	3
Dec 9, 1977 00-05 p	14	Strong Moderate	4000 ft 5000-5600	5	5	10	5	3	3	5	3
Sep 27, 1978 13-1800	5	Weak	3700-5300	5	5	15	5	3	3	8	3
Oct 20, 1978 13-1800 p	8	Moderate	5300 ft	10	15	20	10	5	8	10	5
Oct 25, 1978 15-2100 p	9	Moderate	3800-4400	10	30	15	25	5	15	8	13

Table I-2). It is interesting to note that the remainder of the inversions listed in Table I-1 qualify as moderate or stronger under the Holzworth scheme. During these tests the strength of the inversion shows little relation to the value of background H_2S recorded but rather indicates that the inversion height (base and top) must be above the ridge (Mayacmas) level for the higher values of H_2S to be recorded in Lake County. Many of these "subsidence" inversions were also accompanied by "surface based" or "valley" inversions which further indicates the probability of a narrow layering of pollutants and may account for the low or high levels of H_2S recorded. Additionally, such layering when coupled with drainage winds or late afternoon thermally-driven winds may result in a complex transport mechanism to populated areas which makes it impossible to model the resulting dispersion.

The values listed in Table I-1 yield background values as high as 30 ppb and if rollback is applied, these levels will fall to 15 ppb. This combined with a projected emissions level/impact of 5 lbs/hr of approximately 10 ppb (corrected Test #5) will produce a combined impact of 25 ppb.

In summary, it may be said that while subsidence produced the highest singular impact, other regimes such as drainage may be expected to produce results nearly as high. The subsidence and accompanying limited mixing will affect populated areas with significant levels (Test #5 ~ 10 ppb), however, as evidenced by Table I-1, the 1978 existing background levels included a 30 ppb exceed and by 1984, this value should be significantly reduced to approximately 15 ppb. This assumption is based on increased awareness of the developers in applying abatement techniques during drilling, etc., and thus insuring the successful application of rollback.

Table I-2

Holzworth Categories for
Classifying Atmospheric Stability

<u>Class</u>	<u>$\Delta T/\Delta Z$ ($^{\circ}\text{C}/100\text{m}$)</u>	<u>Stability Category</u>
1	< -1.60	Very superadiabatic
2	-1.21 to -1.60	Superadiabatic
3	-0.81 to -1.20	Near dry adiabatic
4	-0.41 to -0.80	Near standard atmosphere
5	0.00 to -0.40	Weak lapse
6	0.00 to 0.47	Weak inversion
7	+0.48 to +1.14	Moderate inversion
8	+1.15 to +2.82	Strong inversion
9	+2.83 to +6.00	Very strong inversion
10	>6.00	Extreme inversion

Drainage

Of the previously mentioned MRI tracer tests (35), seven (7) were designed to test drainage from the DWR site or nearby Francisco wells. Release heights for these tests varied from 30 feet above ground level (AGL) to 800 feet AGL. For the purposes of this discussion only the four (4) tests listed in Table I are considered and these produced the heaviest impacts. Specifically, these are tests 4 and 5 of the 1977 series and tests 3 and 18 of the 1978 series. As Table I shows, the worst impact for the drainage tests (or other tests) was recorded during Test #5 of the 1977 series. This impact was 4.511 ppb per pound H₂S emitted and occurred .75 mile east of the Francisco wells near several residences. For this particular test tracer material was injected into a venting steam well (Francisco) and the release height was conservatively estimated at 100 ft AGL which in all likelihood is low for cooling tower emissions but realistic for a steam stacking scenario. Test 18 was accomplished utilizing dual tracer gases (Sf₆ and CBrF₃) released at 800 ft AGL and 400 ft AGL respectively. Of interest in this test is the fact that the higher release height (800 ft AGL) tabulated impact values (worst) of approximately three (3) times the lower release heights (400 ft AGL) and both heights impacted the same receptor site with highest values. These values were .967 ppb per lb H₂S emitted for the 800 ft release and .326 ppb per lb H₂S emitted for the 400 ft release height and were recorded at the Francisco well site which is only slightly west of the residence listed in the "nearby impacts" section of this determination.

An analysis of the thirty-one (31) hours of violations which occurred during the DWR site monitoring was accomplished to ascertain the relationship between the violations and drainage or subsidence conditions. Parameters included the time of day a violation occurred (i.e., nighttime hours), and whether coinciding winds were favorable to drainage (i.e., downslope and/or light speeds) at that

time. The results are tabulated below.

Drainage	Occurrences by Time	%	Occurrences by Winds	%	Peak H ₂ S ppb
Favorable	19	61.2	22	70.9	79
Borderline	6	19.4	3	9.7	60
Unfavorable	6	19.4	6	19.4	29

Of interest is the high percentage of time that both the time and winds were favorable (61.2 - 70.9%) or potentially favorable (80.6%) to drainage conditions and that the peak H₂S values were recorded under these conditions. In addition, six (6) hours of H₂S values of 25 ppb were recorded and all six were favorable by time of day and four of the six were favorable or borderline for winds. This tends to support the observation that drainage will coincide with higher levels of H₂S and possible H₂S AAQS exceeds.

Conclusion: A high expected incidence (80%) of occurrence of drainage conditions coincident with H₂S AAQS exceeds, and impact levels approaching 5 ppb for 5 lbs/hr H₂S emissions from tracer test #18 leads to the conclusion that drainage may be the worst case condition coincident with AAQS exceeds and as such, the LCAPCD must require Best Available Control Technology.

Impingement or Direct Cross Ridge Transport (SRI 4 Episodal)

This condition (scenario) occurs when emissions from sources in Sonoma County are transported across the top of the Mayacmas Mountain to the north of Cobb Mountain and impact into Pine Ridge and/or the western portion of Boggs Mountain. Mixing can be restricted by multiple inversion layers. Winds for such conditions are usually of lower speed (less than downwash). As such, emissions from the DWR project may become entrapped in these layers and add to the existing pollutants which eventually will impinge upon the ridges to the north and east of Cobb Valley. Four tracer tests were accomplished to ascertain and assist in quantifying impacts from such a scenario. These were MRI tests 4, 6, 9, and 10 contained in MRI 79 DV 1670. Tests 4 and 6 were accomplished from the proposed PG&E Unit #17 and NCPA #1 sites while tests 9 and 10 were from the Unit #17 and DWR sites. All release heights were 500 ft AGL. The two releases from the DWR site produced worst impacts along the ridge of .301 and .311 ppb per lb H₂S emitted and the two releases from the Unit #17 site produced similar impacts (.115 - .200); however, the Unit #17 test #6 produced down ridge impacts on the order of .597 (SRI #3) to .703 ppb per lb H₂S emitted (Pine Grove).

Investigation and examination of the tracer data discloses that tests 6, 9, and 10 were accomplished under conditions favorable to cross ridge transport. Test #6 also appears to have had a fumigation effect into the Cobb Valley, re-emphasizing the complexity of performing such tests.

With an emission of five (5) pounds per hour and using Test #9 results, the expected impact would be 1.5 ppb along the opposite ridge. Airborne sampling indicated a higher value of ~5 ppb might also be probable during Test #9. During Test #10 one grab sample indicated 1.976 ppb/lb (~10 ppb) impact near Adams Springs. Grab samples have not been utilized in the past for permit decisions and will not be used in this case; however, such results obviously

point to the necessity to consider impingement of DWR Bottle Rock a major concern.

Conclusion: Cross ridge transport is and should be of concern. Impacts from DWR as ascertained from tracer tests can be expected to be less than 5 ppb on an hourly basis, however short-term levels may be much higher.

Expected Future Worse Case H₂S Levels as a Result of DWR/Bottle Rocks Operation

To anticipate future levels of H₂S the historic emissions data base for selected worse case days must be established and adjusted for the level of abatement expected to be achieved at that future date when a proposed source will become operative. This is not simple unless a direct relationship is assumed. Also, the affects of new development at the receptor area must be evaluated. This task is also extremely difficult unless simplifying assumptions are made.

Considerable uncertainty of emissions inventories results from: (1) uncertainty of abatement efficiency, especially for PG&E's intermittent power plant abatement program; (2) steam variability from selection of supply and at the well; (3) generating load of the plant and/or mode of operation; and (4) abnormal malfunctions or unrecognized sources.

Provided in the table below are selected worse case days for subsidence and drainage and in Table E-1 baseline and future emissions inventories are estimated. This is used with the tracer results and a simple rollback to establish the future worse case levels. These results are also provided after correction for 1984 emissions in the table below.

Exceeds of the H₂S AAQS at the time DWR/Bottle Rock is to become operative are expected, and DWR/Bottle Rock will contribute to these exceeds. The LCAPCD does not accept the argument that modeling can accurately define impacts but does believe that test #5 results can be corrected as indicated to establish the likely impact under subsidence inversions.

Historic H₂S levels of 79 ppb occurring during drainage conditions even with optimistic assumptions for improved abatement will result in expected levels greater than 30 ppb, and when emissions and impacts of new nearby Units are factored in will result in a worse situation. This analyses ignores the

consideration that PCSE Unit #17 may contribute a disproportionate new burden to the Cobb Valley area.

The two worse cases subsidence and drainage can be summarized as follows:

<u>Worse Cases</u>	<u>SRI #4 1978 max</u>	<u>1984 max with rollback</u>	<u>DWR 1984 Contribution</u>
<u>Subsidence</u>			
Oct. 25, 1978 15-2100	30 ppb	15 ppb	<10 ppb
<u>Drainage</u>			
Aug. 8, 1978 0400	<u>Bottle Rock PP 1979 max</u>	<u>1984 max with rollback</u>	<u>DWR 1984 Contribution</u>
	79 ppb	39 ppb	<5 ppb

Conclusion: During subsidence inversions the proposed 5 pounds H₂S/hour emissions limitation would result in ~10 ppb impacts but such impacts are unlikely to cause or contribute to an exceed of the H₂S AAQS.

During strong drainage conditions the emissions for DWR/Bottle Rock will contribute to the continued violation of the H₂S AAQS but in an amount less than 5 ppb as indicated by tracer test #18. It should also be noted that this conclusion assumes H₂S values and tracer test results noted on the leasehold are representative of nearby populated areas.

Abnormal Emission

With the power plant and steam delivery system proposed, abnormal emissions should, except on extremely rare occasions, be nearly non-existent. This is due to the operation of the air emissions control system during power plant outages. This system will reduce the emissions levels of arsenic, boron, ammonia, etc., in addition to H₂S, and limit the frequency of cold start-ups of the power plant due to pipeline maintenance, long-term outages, and possible simultaneous failure of the abatement system. Infrequently the power plant will have to undergo cold start-up and in the process will of necessity have to bleed condensate lines and operate for a short period unabated. In this instance the venting of concentrated gases (Radon²²², H₂S, etc.) for short durations may occur but will be routed to the cooling tower in every possible instance. The impact of emissions in a highly concentrated form without dilution is not known but is of concern. During unabated stacking all gases and the majority of the particulate emissions will be emitted directly into the air. However, as stated, the vast majority of periods of steam stacking will utilize the turbine by-pass and EIC abatement system singularly or together and emissions will not change significantly from normal operations.

Nearby Impacts

The owner and part-time resident of a single family home shown as residence "A" on Figure A-1 located in close proximity to the Francisco leasehold has filed with LCAPCD complaints which include concern for health and air quality believed degraded by drilling activities on the leasehold. The resident has also made similar statements publicly and does not appear to have excellent health. The owner and part-time resident of residence "B", however, has not filed complaints although acknowledges that odors do occur on occasion. Other residents on High Valley Road, while complaining on occasion, have not asked for special consideration.

The LCAPCD shall condition the AFC permit to ensure that should complaints over odor and health increase at residence A during the operation of the Bottle Rock power plant, a study to establish the certainty of the source of impacts will be coordinated with the LCAPCD, and funding assistance will be provided by the applicant to accomplish such studies and ensure that appropriate mitigation is taken.

Locations off the MCR leasehold but near the project, and several vacation residences located on private property on High Valley Road (a private road) will, under worse case conditions, be impacted by the project emissions in an amount likely to be greater than 5 ppb H₂S simultaneous with likely exceeds of the 0.03 ppm H₂S standard. These residences, with the exception of residence A, are not full-time residences, a place where the public would generally be expected to be, a sensitive receptor, or a population center. As such, the limitations of rule 602 have not been applied at these sites. Residence A, which is considered by the LCAPCD to be a sensitive receptor, has been given special consideration.

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Test #	Date	Release Height	Highest Grab	Location	Highest 1 hr Sample per ppb H ₂ S	Location	Impact of Emissions per Hour							
							60 lbs	15 lbs	5 lbs	2.5 lbs**				
-	10/11/77 (Drainage)	100' AGL*	.979ppb	1 mile N Release	2.335ppb	.75 E Release	140ppb	30.4ppb	11.7ppb	5.0ppb				
					.995 "	Jadiker's Gate	60 "	12.9 "	5.0 "	2.5 "				
					1.725 "	Glenbrook	104 "	22.4 "	6.0 "	4.3 "				
					1.212 "	Adams Ranch	75 "	15.6 "	4.1 "	3.0 "				
					.951 "	Nunnemakers	571 "	12.4 "	4.8 "	2.4 "				
3	10/13/77 (Drainage)	100' AGL*	4.068 ppb	.5 mile E Release	1.982ppb	Jadiker's Gate	119ppb	25.8ppb	9.9ppb	5.0ppb				
					1.695 "	Glenbrook	102 "	22.1 "	6.5 "	4.3 "				
					2.337 "	1 mi. NW Release	140 "	30.4 "	11.7 "	5.0 "				
					4.511 "	.75 mi. E Release	270 "	58.6 "	22.0 "	11.5 "				
					.733 "	Adams Ranch	44 "	9.5 "	3.2 "	1.8 "				
3 42	9/22/78 (Drainage)	200' AGL	.882ppb	Jadiker's Gate	.381ppb	Upper DMK	22.9ppb	5.0ppb	1.9ppb	1.0ppb				
					.194 "	Jadiker's Gate	11.6 "	2.5 "	1.0 "	0.5 "				
					.620 "	Sawmill	37.6 "	8.1 "	3.1 "	1.6 "				
					.217 "	Adams Peak	13.0 "	2. "	1.1 "	0.5 "				
					.148 "	4 mi. N Release	8.9 "	1.9 "	0.7 "	0.4 "				
					.830 "	Nunnemakers	50.3 "	10.9 "	4.2 "	2.1 "				
					.640 "	Lee Creek	31.4 "	6.5 "	3.2 "	1.6 "				
					.194 "	Binkley Ranch	11.6 "	2.5 "	1.0 "	0.5 "				
					.307 "	Windrem Ranch	13.4 "	4.0 "	1.5 "	0.8 "				
					.299 "	Sweetwater Ranch	17.9 "	3.9 "	1.5 "	0.8 "				
					4	9/23/78	500' AGL	N/A	.115ppb	Adams Peak	6.9 "	1.5 "	0.6 "	—
					5	9/27/78 (Subsidence Inversion) (Uncorrected/ Corrected)	500' AGL	N/A	1.907ppb 4.161 "	Sawmill Pine Grove	114.4ppb/ 51.0ppb	24.8ppb/ 11.0ppb	9.5ppb/ 4.3ppb	—
249.7 "/	54.1 "/	20.8 "/	—											
111.6 "	24.2 "	9.3 "	—											

Test	Date	Release Height	Height Grab	Location	Highest 1 hr Sample per vol H ₂ S	Location	Impact of Emissions per Hour				
							60 lbs	17 lbs	5 lbs	2.5 lbs**	
6	9/30/78	500'AGL ¹	—	—	.768ppb	Upper DWR	48.1ppb	10.0ppb	3.0ppb	—	
		500'AGL ²	—	—	.597 "	SRI #3	35.8 "	7.5 "	3.0 "	—	
		(SRI 4 episodal)				1.329 "	Jadiker's Gate	79.7 "	17.3 "	6.7 "	—
		1- PSEE Unit 12 Release				.703 "	Pine Grove	42.2 "	9.1 "	3.5 "	—
		2- NCPA Release				.603 "	Lee Creek	37.8 "	5.2 "	3.2 "	—
9	10/25/78	500'AGL	.909ppb	Airt Sample	.311ppb	Central (SRI4)	15.7ppb	4.0ppb	1.6ppb	—	
				(Subsidence Inv/SRI 4 episodal)							
10	10/27/78	500'AGL	1.976	Adams Springs	.301ppb	Hobergs	18.1ppb	3.9ppb	1.5ppb	—	
				(SRI 4 episodal)							
11	4/1/79	500'AGL	—	—	.967ppb	Francisco Well	58.0ppb	12.0ppb	4.0ppb	2.5ppb	
						Francisco Well	19.6 "	4.2 "	1.0 "	0.5 "	

**Data represents impact only.

Table 1A

DISTRIBUTION OF H₂S HOURLY AVERAGES (30 ppb) 1976

Station		Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Percent
1 Geysert Rock	≥ 30 ^a	8	45	22	24	49	99	57	101	45	9	27	488	7
	Days ^b	5	17	12	13	17	27	18	26	12	4	9	160	49
	Counts ^c	447	714	699	662	708	696	602	683	727	695	691	7125	91
2 Anderson Ridge	≥ 30 ^a	51	82	22	41	79	112	91	68	56	26	10	640	10
	Days ^b	12	19	10	14	16	20	20	19	13	11	5	160	49
	Counts ^c	199	718	691	310	675	715	646	663	729	598	496	6660	83
3 Kalin Ranch	≥ 10 ^a	1	5	0	1	4	7	0	13	7	1	1	40	5
	Days ^b	1	4	0	1	2	3	0	4	2	1	1	19	6
	Counts ^c	474	714	672	644	712	725	715	661	717	599	691	7118	91
4 Pine Summit	≥ 30 ^a	5	4	0	1	2	6	0	7	10	3	1	39	5
	Days ^b	2	4	0	1	2	4	0	4	5	2	1	25	8
	Counts ^c	147	710	707	651	702	713	720	594	721	641	662	7168	89
5 Whispering Pine	≥ 30 ^a	0	0	0	1	0	14	3	4	9	0	2	13	5
	Days ^b	0	0	0	1	0	5	3	1	5	0	2	19	6
	Counts ^c	411	714	676	668	627	633	722	644	715	588	647	7065	88
6 Anderson Springs	≥ 30 ^a	0	0	0	0	2	1	0	0	0	0	0	3	04
	Days ^b	0	0	0	0	2	1	0	0	0	0	0	3	9
	Counts ^c	417	724	705	655	651	697	717	594	700	628	647	7155	89
7 Sawmill Flats	≥ 30 ^a	0	0	1	4	9	8	4	7	0	0	0	13	5
	Days ^b	0	0	1	3	5	3	3	2	0	0	0	17	5
	Counts ^c	594	726	690	667	492	676	710	642	730	579	102	6608	82
8 Amlin Ranch	≥ 30 ^a	25	0	0	3	5	1	12	2	17	37	84	186	3
	Days ^b	8	0	0	2	2	1	2	2	4	8	17	46	14
	Counts ^c	295	171	699	648	688	624	714	678	622	536	658	6313	79
Monthly totals	≥ 30	92	136	45	75	150	248	167	204	144	76	125	(All stations)	
	≥ 30	31	9	1	10	22	37	19	33	43	41	88	(Stations 3-8)	

a. ≥ 30 ppb = number of H₂S hourly averages at or above 30 ppb.

b. Days = number of days with at least one hour reading at or above 30 ppb.

c. Counts = number of valid hourly averages (percent counts correspond to valid data capture for 1 February through 31 December)

Table 1

DISTRIBUTION OF H₂S HOURLY AVERAGES (10 ppb) 1977

Station		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Percent
1 Geysert Rock	≥ 30 ^a	11	17	10	12	8	22	19	33	28	45	10	10	245	3
	Days ^b	5	7	3	6	4	11	16	14	13	17	5	5	106	29
	Counts ^c	673	587	713	685	737	719	713	705	694	718	679	648	8271	94
2 Anderson Ridge	≥ 30 ^a	11	31	2	11	25	65	80	70	10	51	17	20	396	5
	Days ^b	4	11	4	9	8	20	17	15	5	8	3	7	111	30
	Counts ^c	696	617	706	708	721	718	712	721	693	747	665	668	8372	96
3 Kahm Ranch	≥ 30 ^a	0	0	0	1	0	1	0	0	2	0	0	0	4	05
	Days ^b	0	0	0	1	0	1	0	0	1	0	0	0	3	8
	Counts ^c	700	583	713	697	740	718	712	716	660	709	677	672	8297	95
4 Pine Summit	≥ 30 ^a	0	0	1	2	1	12	13	17	4	5	5	4	64	7
	Days ^b	0	0	1	2	1	6	5	6	1	3	3	2	30	8
	Counts ^c	664	654	672	685	718	717	666	731	705	731	690	700	8153	95
5 Whispering Pine	≥ 30 ^a	0	0	0	4	0	0	0	0	10	2	1	0	17	2
	Days ^b	0	0	0	3	0	0	0	0	6	2	1	0	12	3
	Counts ^c	700	633	698	713	681	715	705	703	662	721	656	782	7869	90
6 Anderson Springs	≥ 30 ^a	0	0	0	0	2	6	1	8	0	8	0	0	25	3
	Days ^b	0	0	0	0	1	2	1	4	0	2	0	0	10	3
	Counts ^c	664	633	670	679	622	717	703	708	703	714	689	679	8201	94
7 Sawmill Flat	≥ 30 ^a	0	1	0	2	1	3	8	4	1	1	0	0	21	3
	Days ^b	0	1	0	1	1	3	7	3	1	1	0	0	18	5
	Counts ^c	671	636	662	694	712	713	715	711	698	754	677	677	8300	95
8 Ardin Ranch	≥ 30 ^a	15	2	3	0	12	12	5	12	26	122	56	19	284	4
	Days ^b	9	2	2	0	3	6	3	4	7	23	20	8	87	24
	Counts ^c	478	601	682	513	688	689	518	678	660	708	585	542	7342	84
Monthly totals	≥ 30	37	51	19	32	49	121	146	144	81	234	89	53	(All stations)	
	≥ 30	15	3	4	9	16	14	27	41	43	138	62	23	(Stations 3-8)	

a ≥ 30 ppb = number of H₂S hourly averages at or above 30 ppb (The actual measurement per hour must have averaged 29.5 or more.)

b Days = number of days with at least one hour reading at or above 30 ppb

c Counts = number of valid hourly averages (percent counts correspond to valid data capture for 1 January through 31 December)

Table 1

DISTRIBUTION OF H₂S HOURLY AVERAGES (30 ppb) 1978

Station		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Percent
1 Geyser Rock	≥ 30 ^a	5	2	1	14	1	23	56	28	7	23	12	16	188	2
	Days ^b	1	2	1	7	1	9	18	11	5	9	7	8	79	22
	Counts ^c	597	602	719	675	691	590	723	687	612	724	558	657	7835	89
2 Anderson Ridge	≥ 30 ^a	1	1	2	1	13	84	62	22	33	23	10	46	300	4
	Days ^b	2	1	2	1	6	18	14	7	14	13	6	16	100	27
	Counts ^c	600	539	712	679	676	575	591	481	497	596	659	711	7316	84
3 Kahn Ranch	≥ 30 ^a	0	0	0	0	0	0	0	1	0	1	0	0	2	0.03
	Days ^b	0	0	0	0	0	0	0	1	0	1	0	0	2	0.5
	Counts ^c	470	605	727	673	694	645	719	710	700	682	372	578	7575	86
4 Pine Summit	≥ 30 ^a	0	0	0	0	0	3	18	18	10	14	0	0	63	0.9
	Days ^b	0	0	0	0	0	1	7	8	6	5	0	0	27	8
	Counts ^c	607	595	611	692	335	646	714	728	712	547	242	553	6982	80
5 Whispering Pine	≥ 30 ^a	0	1	7	2	0	0	3	0	3	6	3	0	25	0.3
	Days ^b	0	1	5	1	0	0	2	0	2	4	3	0	18	5
	Counts ^c	562	571	687	683	698	634	723	716	666	648	537	420	7545	86
6 Anderson Springs	≥ 30 ^a	0	0	0	0	0	2	0	2	0	0	0	0	4	0.05
	Days ^b	0	0	0	0	0	1	0	2	0	0	0	0	3	0.8
	Counts ^c	587	601	609	689	705	645	726	719	690	687	697	742	8097	92
7 Grand Flats	≥ 30 ^a	0	0	0	0	0	1	3	0	0	4	0	0	8	0.1
	Days ^b	0	0	0	0	0	1	2	0	0	2	0	0	5	1.4
	Counts ^c	605	613	734	655	696	646	725	719	710	331	380	725	7539	86
8 Aidin Ranch	≥ 30 ^a	12	9	0	0	0	0	66	41	7	94	62	9	300	6
	Days ^b	9	6	0	0	0	0	16	10	3	17	10	6	77	21
	Counts ^c	552	458	0	0	0	0	673	689	677	592	501	716	4758	54
Monthly totals	≥ 30	20	13	10	17	14	113	208	112	60	165	87	71	890	
	≥ 30	12	10	8	9	7	30	59	39	30	51	26	30	311	

^a ≥ 30 ppb = number of H₂S hourly averages at or above 30 ppb (the actual measurement per hour must have averaged 29.5 or more)

^b Days = number of days with at least one hour reading at or above 30 ppb

^c Counts = number of valid hourly averages (percent counts correspond to valid data capture for 1 January through 31 December)

TABLE E-I

ESTIMATED GEYSERS POWER PLANT H₂S EMISSIONS
1977, ARB/NSCAPCD STRATEGY 1984, VARIANCE 1984

<u>Unit</u>	<u>1984 Gr/GMW</u>	<u>1977 Emissions^a No Abate Day Assumed</u>	<u>ARB & NSCAPCD Strategy 1984 (No Variance Assumed)</u>	<u>PG&E/NSCAPCD Variance 1984</u>
PG&E #1	200	32.5 lbs/hr	5.5 lbs/hr	5.5 lbs/hr
PG&E #2	200	39.1 ^b	6.1	6.1
PG&E #3	200	115.7 ^b	11.1	11.1
PG&E #4	200	87.4 ^b	11.1	11.1
PG&E #5	200	213.3 ^b	24.2	11.1
PG&E #6	200	274.6 ^b	24.2	11.1
PG&E #7 ^c	200	178.1	24.2	225
PG&E #8	200	111.0	24.2	111
PG&E #9	200	51.9	24.2	51.9
PG&E #10	200	70.1	24.2	70.1
PG&E #11	200	193.3	48.4	48.4
PG&E #12	200		48.4	48.4
		<u>Total</u> 1367.0 lbs/hr	<u>Subtotal</u> 276.0 ^d lbs/hr	<u>Subtotal</u> 568.0 lbs/hr ^d
PG&E #13			11.3	11.3
PG&E #14	100		24.2	24.2
PG&E #15	100		12.5	12.5
PG&E #17			26.4	26.4
PG&E #18			11.6	11.6
MUD #1			8	8
REE Unit #16			5	5
CPA #2			24.2	24.2
			<u>Total</u> 300.0	<u>Total</u> 691.0

^a Source SAI, 1979. Assumed 80% operation of plant.

^b Assumed no abate day

^c To illustrate the uncertainty of emissions; Unit #7 displayed a predicted emissions rate of from 175 to 325 lbs/hr during EIC pilot tests.

^d To allotment for 20% downtime. Assumed other sources would contribute similarly.

APPENDIX B

Legal Briefs and General Counsel's
Opinion on Lake County's Proposed
Condition to Impose Payment
Requirement on Applicant in Lieu
of ad valorem taxes.



1 CHARLES D. HAUGHTON
County Counsel
2 255 N. Forbes Street
Lakeport, California 95453
3 Telephone 707-263-2321

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4 County of Lake
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8 STATE OF CALIFORNIA
STATE ENERGY RESOURCES
9 CONSERVATION AND DEVELOPMENT COMMISSION
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11 In the matter of:) 79-AFC-4
)
12 Application for Certification) BRIEF IN SUPPORT OF LAKE
of Department of Water Resources) COUNTY'S PROPOSED FINDINGS
13 re: Bottlerock Geothermal Power) AND CONCLUSIONS.
Plant.)
14 _____)

15 Background

16 The Department of Water Resources, hereinafter "DWR",
17 applied to this Commission for certification to build a geothermal
18 power plant in Lake County designated as Bottlerock Geothermal
19 Power Plant hereinafter "Plant." DWR is an administrative
20 agency of the State of California created and existing pursuant
21 to the provisions of Article 1 of Chapter 2 of Division 1 of the
22 Water Code commencing with section 120.

23 The County of Lake petitioned the Commission for leave to
24 intervene, which said petition was granted. The County's primary
25 concern as expressed in its petition was the socio-economic
26 impact of siting this Plant in Lake County. One such impact is
27 the non-realization of revenues if DWR constructs the Plant in
28 Lake County.

1 This result appertains as a direct consequence of the
2 following indisputable facts:

3 1. The geothermal resource in the Geysers Known Geothermal
4 Resource Area capable of development to commercially produce
5 electrical energy is finite.

6 2. The production of electrical energy by taxable entities
7 from the finite resource underlying lands in Lake County will
8 generate finite ad valorem revenues to local agencies as deter-
9 mined by Revenue and Taxation Code sections 2201 et. seq., inclu-
10 ding the County of Lake.

11 3. The production of electrical energy by the Department
12 of Water Resources from the finite resource underlying lands in
13 Lake County will use a portion of such finite resource which then
14 will be unavailable for production by taxable entities.

15 4. The Department of Water Resources is exempt from the
16 payment of ad valorem property taxes pursuant to the provisions
17 of Article XIII, Section 1 of the Constitution of the State of
18 California.

19 5. Such exemption and production will result in Lake
20 County local agencies receiving less than the finite ad valorem
21 revenues they would otherwise receive if all production was by
22 taxable entities.

23 To mitigate this impact, the County of Lake has proposed
24 that the Commission, as a condition of granting the application
25 for certification, require DWR to "annually on or before December
26 10, pay to the County of Lake a sum equal to the total amount of
27 ad valorem property taxes it would have paid but for the exemptio

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1 of Article XIII, Section 1 of the Constitution of the State of
2 California to be distributed by the County of Lake to those local
3 agencies who would otherwise be entitled to them pursuant to the
4 provisions of Revenue and Taxation code sections 2201 et. seq.

5 DWR disputes the Commission's authority to impose the afore
6 specified condition.

7 Points and Authorities

8 I. The Legislature could require the payment of DWR.

9 Article IV, Section 1 of the California Constitution
10 vests in the Legislature the whole of the legislative power of
11 the state. The Legislature may deal with any subject within the
12 scope of civil government, except so far as restrained by the
13 Constitution. Melvin v. State (1898) 121 C 16; People v. San
14 Joaquin etc. (1907) 151 C 797. Powers incident to sovereignty
15 that are not mentioned in or limited by the Constitution inhere
16 in the government. The express enumeration of legislative
17 powers in the Constitution is not exhaustive of others not named
18 unless accompanied by negative terms. Jensen v. McCullough (1928)
19 94 CA 382, MacMillan Co. v. Clarke (1920) 184 C 491. If presented
20 with the facts, as set forth in the proposed findings of Lake
21 County, the Legislature could authorize the payment as proposed
22 in the conclusion.

23 Only two Constitutional provisions can be cited as possible
24 limitations on the Legislature's power to authorize the payments
25 proposed by Lake County. Article XIII, Section 1 exempts the
26 property of the state from taxation. As commonly used, a "tax"

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1 is defined as a charge, a compulsory exaction, or an enforced
2 proportional contribution. Perry v. Washburn (1862) 20 C 318;
3 People v. Naglee (1850) 1 C 232; McHenry v. Downer (1897) 116
4 C 20. However, a voluntary payment of money as proposed, is not
5 a tax and would not be prohibited by the Constitution.

6 Article XIII, Section 25 of the Constitution prohibits the
7 Legislature from making a gift of public funds. The most notable
8 exception carved out by the courts to this prohibition is the
9 public purposes exception. Alameda County v. Carleson (1971) 5
10 C3d 730; Santa Barbara etc. v. All Persons (1957) 47 C2d 699.

11 "It is generally held that in determining whether an appro-
12 priation of public funds is to be considered a gift, the primary
13 question is whether the funds are to be used for a 'public' or
14 'private' purpose; the benefit to the state from an expenditure
15 for a public purpose is in the nature of consideration and the
16 funds expended are therefore not a gift..." County of Alameda
17 v. Carleson, Id. at pp. 745-746.

18 The "funds", if authorized by the Legislature as proposed
19 by Lake County, would be used and are restricted to uses as
20 authorized by the Legislature and by the Constitution. The
21 time honored presumption that public officials will do their
22 duty, in this case expend the funds lawfully only for public
23 purposes, is sufficient to conclude that such an appropriation would
24 not be a gift of public funds. Evidence Code section 664. As
25 expressed by the Carleson (supra) Court each expenditure for a
26 public purpose by Lake County entities would constitute considera-
27 tion and again the appropriation would not be a gift of public
28 funds.

1 II. The Legislature could delegate to the Commission the
2 authority to ascertain the facts and impose the condition.

3 While it is a well-recognized maxim of constitutional law
4 that the legislature cannot delegate to any other department or
5 body its authority to make laws, it is an equally well-recognized
6 principle that the legislature, notwithstanding it may do things
7 itself, may nevertheless authorize them to be done by ministerial
8 officers or boards when it believes that they can do them more
9 conveniently and effectively than it can itself. Ex parte McManus
10 (1907) 151 C 331, 335. This general concept has been examined on
11 numerous occasions by the supreme court. The most authoritative
12 treatment was done by Justice Tobriner in Kugler v. Yocum (1968)
13 69 C2d 371. The relevant and pertinent portions of the Kugler
14 (id.) case are set forth commencing at page 375 as follows:

15 "At the outset, we note that the doctrine prohibiting
16 delegation of legislative power,...is well established in
17 California."

18 "Several equally well established principles, however, serve
19 to limit the scope of the doctrine proscribing delegations of the
20 legislative power."

21 "'The essentials of the legislative function are the deter-
22 mination and formulation of the legislative policy. Generally
23 speaking, attainment of the ends, including how and by what means
24 they are to be achieved, may constitutionally be left in the hands
25 of others. The Legislature may, after declaring a policy and
26 fixing a primary standard, confer upon executive or administrative
27 officers the 'power to fill up the details' by prescribing adminis-

28 //

1 trative rules and regulations to promote the purposes of the
2 legislation and to carry it into effect...'"

3 "It is well settled that the legislature may commit to an
4 administrative officer the power to determine whether the facts
5 of a particular case bring it within the rule or standard previously
6 established by the legislature..."

7 "...while the legislative body cannot delegate its power
8 to make a law, it can make a law to delegate a power to determine
9 some fact or state of things upon which the law makes or intends
10 to make its own action depend." (Emphasis added)

11 As to the need for "standards" by which an administrative
12 agency is to guide its action when legislative authority is
13 delegated the Kugler (supra) court at pages 381-382 citing an
14 Oregon Supreme Court case says:

15 "It is now apparant that the requirement of expressed
16 standards has, in most instances, been little more than a judicial
17 fetish for legislative language, the recitation of which provides no
18 additional safeguards to persons affected by the exercise of
19 the delegated authority. ...[T]he important consideration is
20 not whether the statute delegating the power expresses standards,
21 but whether the procedure established for the exercise of the power
22 furnishes adequate safeguards to those who are affected by the
23 administrative action."

24 From the foregoing it is apparent that the Legislature may
25 delegate any of its powers except that of policy making; it
26 may establish policy and permit administrative agencies to attain
27 the results desired; and it may establish policy and delegate the
28 power to determine the facts to which that policy applies.

1 III. The Legislature has constitutionally delegated the authority
2 to the Commission to impose the condition.

3 The Legislature has declared that economic impacts of power
4 plants permitted by state agencies be mitigated. This policy
5 declaration is contained in Division 13 of the Public Resources
6 Code (P.R.C.) commencing with section 21000, commonly known as
7 the Environmental Quality Act of 1970 (CEQA) and Division 15 of
8 the P.R.C. commencing with section 25000, commonly known as the
9 Warren-Alquist Act.

10 CEQA establishes a comprehensive scheme for addressing the
11 impacts of projects approved by every public agency. An environ-
12 mental impact report is an informational document which shall be
13 considered by every public agency prior to its approval or
14 disapproval of a project. The purpose of the report as well as
15 CEQA is to insure that public agencies are provided with detailed
16 information about the effect which a proposed project is likely
17 to have on the environment. P.R.C. § 21061 Economic considera-
18 tions must be considered by the public agency. The Legislature
19 declares this policy specifically in section 21001 P.R.C. subsec-
20 tion (g) as follows to: "Require governmental agencies at all
21 levels to consider qualitative factors as well as economic and
22 technical factors..." This declaration has been interpreted by
23 the Director of the Resources Agency, of which DWR is a part, in
24 section 15012 of Title 14 of the Administrative Code as follows:

25 "While CEQA requires that major considerations be given to
26 preventing environmental damage, it is recognized that public

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1 agencies have obligations to balance other public objectives,
2 including economic and social factors in determining whether
3 and how a project should be approved."

4 CEQA is a comprehensive statutory scheme establishing a
5 public policy that impacts be identified and where feasible
6 mitigated. It contains a detailed procedure for identifying and
7 addressing impacts with numerous safeguards for protecting appli-
8 cants from abuse of discretion delegated.

9 The Warran-Alquist Act, like CEQA, is an equally comprehensive
10 statutory scheme establishing public policy and providing adequate
11 safeguards. The legislature has determined that the Commission
12 can deal with all aspects of powerplant development more effec-
13 tively than having it fragmented between itself, the PUC and
14 numerous state and local agencies. Section 25005 P.R.C. declare
15 "The Legislature further finds and declares that prevention of
16 delays and interruptions in the orderly provision of electrical
17 energy, protection of environmental values, ...require expanded
18 authority and technical capability within state government."
19 Section 25006 P.R.C. declares: "It is the policy of the state
20 and the intent of the Legislature to establish and consolidate the
21 state's responsibility for energy resources..."

22 When considered in light of the foregoing "intent" sections
23 and the "liberal construction" language provisions of Section
24 25218.5 P.R.C., it is clear that the substantive provisions of
25 the enabling sections of the Commission confer authority to
26 impose the condition contained in the conclusion.

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1 Section 25500 P.R.C. consolidates all authority in the
2 Commission to permit powerplants and provides that the issuance
3 of a certificate by the commission shall be in lieu of any
4 permit etc. and "shall supercede any applicable statute,... of
5 any state..." The economic impact on local agencies is a proper
6 subject for commission consideration and is specifically authorized
7 by Section 25509.5 P.R.C. which provides that at a public informa-
8 tional hearing the commission shall "obtain the views and comments
9 of...concerned governmental agencies on the environment, public
10 health and safety, economic, social and land use impacts of the
11 facility at the proposed site." The Commission then may carry
12 these concerns through the process of the summary and hearing
13 order (§ 25512 P.R.C.), the final report (§ 25514 P.R.C.), the
14 decision on the notice of intent (§ 25516 P.R.C.), the application
15 for certification process (§ 25519 P.R.C.) and the decision on
16 the application for certification (§ 25523 P.R.C.).

17 It is clear that CEQA and the Warren-Alquist Act are a clear
18 declaration by the Legislature that the economic impact should and
19 can be mitigated. It has delegated the authority to the commission
20 to ascertain the facts and to attain the goals and ends specified
21 in the Acts.

22 Conclusions

23 1. The Legislature, presented with the facts of this case,
24 could authorize the payments proposed by Lake County;

25 2. The Legislature could delegate to the Commission the
26 authority to ascertain the facts and to accomplish the goals of
27 the Legislature.

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STATE OF CALIFORNIA

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ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

SEP 12 1980

In the Matter of:)	
	)	Docket No. 79-AFC-4
Application for Certification of)	
the State Department of Water	)	OPINION OF THE GENERAL
Resources' Bottle Rock Geothermal	)	COUNSEL IN RESPONSE TO
Power Plant.	)	PARAGRAPH 2 OF FIRST
	)	<u>COMMITTEE HEARING ORDER</u>

The First Committee Hearing Order requests a formal opinion on the question of Commission authority to condition certification of the DWR Bottle Rock project upon annual payment by DWR to the county of an amount equivalent to the property taxes which DWR would have paid but for the exemption of Article XIII, section 1 of the California Constitution.

CONCLUSION

While the Commission's ability to adopt conditions to certification of facilities is very broad, the Legislature has not granted the Commission authority to impose, as a condition of facility certification, a requirement that a state agency make an annual payment to compensate local government for lost property tax revenues resulting from state ownership of the facility.

ANALYSIS

In this proceeding, Lake County has imaginatively addressed a problem which is generic to local government

whenever a state or federal agency develops land within the geographic boundaries of the local government--the loss of tax revenues that would have accrued if the development had been undertaken by a private party. Lake County suggests that while the California Constitution (Art. XIII, §1) exempts all state property from local taxation, the State Legislature may legally authorize payment of an equivalent sum and may delegate that authority to the Commission. The County also argues this would not be a gift of public funds, prohibited by Article XIII, section 25 of the State Constitution because a public purpose would be served by the payment. Finally, the County concludes that because the Legislature has given the Commission consolidated authority for resolving problems associated with the construction and operation of major generation facilities (over 50 mw), the Legislature has granted the Commission authority to meet this local concern.

The county would appear to be correct in its contention that the Legislature could make such a payment and that it would not be invalid as a gift of public funds. Such a payment would certainly be no more improper than the Legislature's payments to local government in the wake of Proposition 13 on the June 1978 ballot. (See Gov. Code §§ 16250, et seq.; cf. Sonoma County Organization of Public Employees v. Sonoma County (1979) 23 Cal.3d 296, 319-20 (invalid provision limiting local cost of living increases found severable from whole local government relief scheme, thereby implying that the remaining portions of the law were valid.) But the county's theory runs into difficulty with

its assumption that the Legislature intended for the Commission to have the power to order another state agency to make such payments as a condition to a license to proceed with construction. In my opinion there is insufficient indication in the Warren-Alquist Act, even given the need to give it a "liberal construction" (Pub. Res. Code § 25218.5), of any legislative intent to delegate to the Commission the power to require another state agency to pay local government a fee in lieu of the taxes which the state agency is constitutionally exempt from paying.

The Energy Commission does have very substantial authority to impose conditions on certification of facilities, in order to mitigate adverse environmental and economic impacts of the facility and in order to carry out critical energy policies established by the Commission in its planning function pursuant to Public Resources Code sections 25300, et seq. (See Pub. Res. Code §§ 25514(d), 25523.) Where the clear purpose of a condition is to insure (1) that provision of needed electricity will not unduly harm environmental quality, (2) that California will have a reliable supply of electricity at a reasonable cost, or (3) that limited carrying capacities will be stretched as far as possible, there is a strong basis for finding legislative intent in the opening sections of the Act (Pub. Res. Code §§ 25000-25507) to provide Commission authority to impose the condition.

Where, as in this case, the purpose of a condition is to address some more general societal concern, not directly

addressed in the Warren-Alquist Act, the Commission's authority is subject to question. Here the goals of environmental protection and reliability of electricity supply could, at most, be incidentally benefited by county expenditure of the in lieu payments, but the main goal is clearly to aid a local government with its fiscal problems. Nothing in the purposes or provisions of the Warren-Alquist Act suggests that the Legislature intended to have the Commission address this problem in carrying out its facility certification function.

This is not to say that all of the conditioning power of the Commission need be found in express provisions in the Warren-Alquist Act. Some powers can be inferred from the fact that the Legislature consolidated at the Energy Commission the responsibility for exercising many powers previously held by other state and local agencies. For example, the failure of the Act to specifically state that the Commission may impose any condition a county could impose in granting a use permit does not prevent the clear implication of legislative intent to grant the Commission such authority since the Commission's certification procedure takes the place of the use permit (Pub. Res. Code § 25500) and there is no indication that the Legislature intended any contraction of previous substantive regulatory authority over construction and operation of facilities. But in this case there was no agency which exercised the authority to address the county's economic concern by imposing conditions to a permit for a power plant before the Warren-Alquist Act was enacted. Thus the Act's

consolidation of previous regulatory functions in the Commission does not imply any transfer of such authority from a prior source.

The county points out that the geothermal resources of the county are limited and therefore state development of such resources reduces the county's ability to maximize its property tax revenues from geothermal production. However unfortunate this result may be though, it is no different from the problem a county has when the state or the federal government develops some of the finite land located in the county. The exemption from property taxation which state agencies enjoy is widely understood in many contexts. We must assume therefore, that the Legislature is aware of the exemption and if it intended to make a special exemption to this general rule, it would clearly state such intent. Moreover, if it intended to take the more unusual step of expressing that intent by allowing a state agency, such as the Commission, to make judgments on the propriety of compensating the county under these circumstances rather than directly making such judgments itself, we could expect a very express statement delegating such authority to the Commission. Instead, given the terms of the Warren-Alquist Act, in this case we would have to imply such authority from very general powers of and directions to the Commission. (E.g. The Commission must consider the comments of local agencies. Pub. Res. Code §§ 25506, 25519(f).) This is not a sufficient basis for assuming willingness to have the Commission order an exception to a constitutional exemption.

I must emphasize that this conclusion is in no way affected by the amount of money required to satisfy the proposed condition. The Commission may order an applicant for certification of a facility to add pollution control equipment or make other expenditures which may double or triple the capital cost of a project upon a reasonable showing that requiring such expenditures is necessary to properly carry out the Commission's principal functions and policies, but the Commission may not, without clearer legislative authority, undertake an equitable redistribution of state and local funds even if a relatively small amount is involved. This conclusion does not, however, leave the county without a remedy. The county may still raise its concern in the Legislature which does have the power to cure any unusual inequities resulting from application of Article XIII, section 1 of the Constitution in the context of geothermal development by the Department of Water Resources.

Dated: September 12, 1980.

Respectfully submitted,

William M. Chamberlain

WILLIAM M. CHAMBERLAIN
General Counsel
California Energy Commission

STATE OF CALIFORNIA
ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

79-AFC-4

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In the Matter of:

Application for Certification
of the STATE DEPARTMENT OF
WATER RESOURCES' Bottle Rock
Geothermal Project

Docket No. 79-AFC-4

~~APPLICANT'S BRIEF ON~~
~~AUTHORITY OF COMMISSION~~
TO REQUIRE PAYMENT BY
APPLICANT OF "IN-LIEU"
PROPERTY TAXES TO LAKE
COUNTY

This brief is filed pursuant to the September 4, 1980,

First Committee Order, item 3.

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1 I.

2 INTRODUCTION

3 Intervener, County of Lake (County), has proposed
4 that the California Energy Commission (Commission) condition
5 the granting of the Applicant, State Department of Water
6 Resources' Application for Certification on the payment of
7 taxes in lieu of ad valorem property taxes. The Applicant
8 (Department) is proposing to construct a nominally rated
9 55 megawatt powerplant and related facilities in Lake County
10 on the Francisco leasehold. The land itself, upon which the
11 powerplant and related facilities will be located, is not
12 owned by the State and is subject to ad valorem taxation by
13 the County. The value of the powerplant and related facilities
14 will not be included in the County's tax base.

15 II.

16
17 PROPERTY OF APPLICANT, DEPARTMENT OF WATER
18 RESOURCES, IS NOT SUBJECT TO AD VALOREM PROPERTY
19 TAXATION BY INTERVENER LAKE COUNTY.

20 The Department of Water Resources is a Department of
21 the Government of the State of California. California Water
22 Code Section 120 et seq.; California Government Code Section
23 21150 et seq. As such its property is exempt from property
24 taxation. California Constitution Article XIII, Section 3(a),¹

25 ¹ California Constitution Article XIII, Section 3 provides
26 in part:

27 The following are exempt from property taxation:
28 a. Property owned by the State

1 Article XIII, Section 3(b) exempts from property
2 tax "Property owned by a local government, except as otherwise
3 provided in Section 11(a)." Article XIII, Section 11(a) provides
4 that "Lands owned by a local government that are outside its
5 boundaries ... are taxable if ... they were taxable when
6 acquired by the local government". While the Department's
7 property does not fall within the purview of this provision,
8 (there are no exceptions to the property tax exemption afforded
9 State property), judicial interpretation of the provision is
10 instructive in this case. In fact, it demonstrates that even
11 if the Department was a local government (which it is not), it
12 would not be required to pay the County ad valorem property
13 taxes under Article XIII, Section 11(a).

14 In County of Tuolumne v. State Board of Equalization,
15 206 C.A.2d 352 (1962), Tuolumne County made the same claim
16 as Lake County makes in this case, though it based its claim
17 on the constitutional exception. In the lawsuit, Tuolumne
18 County sought certain tax revenues from the City and County of
19 San Francisco for appropriative water rights in Tuolumne County
20 owned by San Francisco. Tuolumne County asserted in its brief
21 before the Court: "If the water rights had not been taken up
22 by the City [San Francisco] or some other public corporation,
23 they certainly would have been taken and used by private
24 concerns or individuals and would have contributed immeasurably
25 to the tax base of Tuolumne County." (206 C.A.2d at 358).
26 This is the same argument asserted by Lake County. The Court
27 rejected Tuolumne County's claim.

1 The Court found that the constitutional exception,
2 allowing taxation of land (which includes water rights) owned
3 by another county, was intended to "safeguard the tax revenues
4 of smaller counties wherein large municipal corporations had
5 purchased, or would acquire, extensive holdings and which
6 would, except for the amendment [exception], be exempt from
7 local taxation", 206 C.A.2d at 364-5, quoting from City and
8 County of San Francisco v. County of Alameda, 5 Cal.2d 243,
9 at 245-6.

10 Nonetheless, the Court held that Twolumne could not
11 assess San Francisco's water rights because the water rights
12 were not taxable at or prior to the time San Francisco acquired
13 them. The Court stated that "it is the taxability of the pro-
14 perty as it stood at the time of acquisition, and immediately
15 before transfer, that is determinative". The mere fact that if
16 a taxable entity had purchased the property, and additional
17 revenues thus could have been available to the county, was not
18 relevant to the Court's determination. The Court determined
19 that the constitutional exception was intended "to prevent the
20 removal of private property from the tax rolls upon purchase
21 by an outside county", 206 C.A.2d at 365. (Emphasis added).
22 Property that was not taxable at the time it was acquired by
23 the outside county, i.e., on the county's tax rolls, (never
24 rights appropriations in that case) was not then taxable in
25 the hands of the outside county as no private property was
26 taken off the tax rolls.

27 The Court thus determined that the county had no
28 right to remove the revenues from a non-taxable

1 found within its boundaries. (Accord, see County of Amador v.
2 State Board of Equalization, 240 C.A.2d 205, at 213 (1956)).
3 Similarly, even if the Constitutional exception applied to the
4 State, the Department's property could not be taxed because it
5 will not have taken any private property off the tax rolls.
6 In short, there was no taxable property in existence prior to
7 the Department's activities.

8 Furthermore, and following the same analogy with the
9 Constitutional exception for local governments, the Department's
10 powerplant could not be taxed because it is an improvement.
11 Article XIII, Section 11(a) specifically limits the taxation
12 of improvements owned by a local government that are outside
13 its boundaries to those improvements that "were taxable when
14 acquired or were constructed by the local government to
15 replace improvements which were taxable when acquired". In no
16 event would new improvements, in this case, a powerplant, be
17 taxable. As explained in Section I, the land itself is subject
18 to taxation.

19 Thus, even when the Legislature and the people enacted
20 a specific constitutional provision to safeguard county revenues,
21 they did not go as far as Lake County would like to go in this
22 case, without any legislative or constitutional authority.
23 The County is clearly seeking for something which the law does
24 not allow.
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11/11/77

1 IV.

2 THE ENERGY COMMISSION HAS NO AUTHORITY TO
3 REQUIRE AS A CONDITION OF THE DEPARTMENT'S
4 CERTIFICATION FOR BOTTLE ROCK POWERPLANT
5 PAYMENT OF "IN-LIEU" TAXES TO THE COUNTY.

6 Assuming for the purposes of argument that the
7 property of the State could be subject to "in-lieu" taxation,
8 still, the Energy Commission could not order payment of such
9 taxes.

10 A. Only the Legislature may impose a tax.
11 It may not delegate this authority.

12 It is fundamental to our system of government that
13 the power to tax "is vested exclusively in the Legislature".
14 Emery v. San Francisco Gas Co., 26 Cal. 345 at 355 (1865).
15 The Legislature must originate a tax and prescribe the rules
16 under which it is to be levied. See generally 13 California
17 Jurisprudence Third, Constitutional Law, Sections 104 and 164.
18 California courts have viewed taxation as having two elements;
19 first, the imposition of the tax and second, the assessment and
20 collection of the tax". The former is a legislative function;
21 the latter is mere machinery, and is delegable...." Gadd v.
22 McGuire, 69 Cal.App. 347, 36--5 (1924).

23 The Legislature may not delegate to an administrative
24 agency its power to impose a tax. The Constitution prohibits
25 the delegation of legislative functions to administrative
26 agencies. Harter Comm'rs. v. Redwood Co., 83 Cal. 491 (1891).

27 It is clearly appropriate for the Legislature to
28 delegate certain quasi-legislative powers to administrative
29 agencies. The Ex Parte Watts, power to adopt rules

1 regulating the admission of persons to practice the profession
2 of architecture; In re Halck, 215 Cal. 500 (1932), power to
3 administer legislation regulating personal property brokers;
4 Fillmore Union High School Dist. v. Cobb, 5 Cal.2d 26 (1935),
5 power to adopt conditions upon which students who reside in
6 one county may be permitted to attend a high school in another
7 county; Holloway v. Purcell, 35 Cal.2d 220 (1950), power to
8 determine when and where freeways will be constructed; and
9 Ray v. Parker, 15 Cal.2d 275 (1940), power to implement the
10 Milk Stabilization Act including power to designate marketing
11 areas, formulate plans, and prescribe contents of plans.)

12 The Constitution, however, prohibits the delegation
13 to administrative agencies of the power to tax. Acts attempting
14 to delegate the power to tax have been specifically overturned
15 by the California Supreme Court. Houghton v. Austin, 47 Cal.
16 646 (1874). The Supreme Court in S.F. & N.P.R.R. Co. v. State
17 Board, 60 Cal. 12 (1882), upheld a delegation of certain powers
18 (including the power to assess the value of railroad property
19 operated in more than one county) to the State Board of
20 Equalization by finding specifically that the Act in question
21 did not confer upon the Board the power of levying a tax.
22 (60 Cal. at 34). Simply, the courts have struck down, as
23 unconstitutional, attempted delegations of power to tax.

24 Judicial evaluation of legislative delegations has
25 turned on the simple criteria that a non-delegable legislative
26 function is the determination and formulation of legislative
27 policy. First Industrial Loan Co. v. Daugherty, 26 Cal.2d 545
28 (1956). Held that a regulation of the Commissioner of

1 Corporations concerning use of surplus monies to affect debts
2 and losses was an unconstitutional delegation of the taxing
3 power). Absent a policy determination by the Legislature
4 that the Commission should impose a tax on the State, the
5 Commission has no authority to impose such a tax on its own.
6 That determination is constitutionally non-delegable.

7
8 B. The Legislature has not authorized the
9 Energy Commission to impose "in-lieu" Taxes
10 as a condition of granting the Department's
11 Application for Certification.

12 The Energy Commission may not, on its own, impose a
13 tax on the Department. We have demonstrated that the power to
14 tax is a non-delegable legislative function. The question,
15 then, assuming that State property could be the subject of "in-
16 lieu" taxes, is whether the Legislature has established a policy
17 authorizing the Energy Commission to impose a tax. Clearly,
18 as we will show, the Legislature has not.

19 There has been no demonstrated legislative policy
20 determination that the Department should be required to pay
21 "in-lieu" property taxes. The broad legislative intent
22 provisions in the Warren-Alquist Act (Public Resources Code
23 Section 25000 et seq.), provide no justification for the
24 conclusion that the Legislature intended to impose "in-lieu"
25 property taxes on State property. Even in light of the "liberal
26 construction" language of Public Resources Code Section 25216.5,
27 these "intent" sections manifest no legislative policy with
28 regard to taxation. A policy determination of authority to
29

1 legislative intent sections.

2 Similarly, while Public Resources Code Section 25000
3 et seq. confers broad authority on the Commission in the siting
4 of powerplants, those provisions contain no legislative
5 determination regarding "in-lieu" property taxation of State
6 property. Certainly, the Legislature would not have left to
7 inference such a determination as is suggested by the County.

8 The earliest printed versions of the legislation
9 which was to become the Warren-Alquist Act (Assembly Bill 1575,
10 1973-4 legislative session) contained a provision very similar
11 to the constitutional exception discussed in Section III. That
12 provision would have required the Commission to condition
13 certification of a powerplant proposed by a local government
14 to be sited outside of its boundaries upon payment of "in-lieu"
15 property taxes.^{3/}

16 The Legislature deleted this provision from the
17 January 9, 1974 version of Assembly Bill 1575 and did not
18 include it in any subsequent version. While that provision
19 would not have applied to the Department, the fact that the
20 Legislature considered that provision and rejected it

21
22 5. For May 29, 1973 and August 6, 1973 versions of Assembly
23 Bill 1575 contained the following provision:

24 "The Commission shall require as a condition of
25 certification of any facility contained in the application,
26 that any city, city and county, or county, proposing to
27 site a facility in any other city, city and county, or
28 county, or any district or other agency proposing to
29 site a facility outside its district or boundaries
30 of the jurisdiction, shall provide for an annual payment in
31 lieu of property taxes on such site to such city, city and
32 county, or district. The amount of such payment shall be
33 determined by the Board of Supervisors."

1 demonstrates that the Legislature did not intend to give the
2 Commission the power to impose "in-lieu" property taxes.

3
4 V.

5 THE PAYMENT OF IN-LIEU TAXES BY THE DEPARTMENT
6 WOULD BE AN UNCONSTITUTIONAL GIFT OF PUBLIC
7 FUNDS.

8 Article XVI, Section 6 of the California Constitution
9 provides in relevant part as follows:

10 "...nor shall [the Legislature] have power to
11 make any gift or authorize the making of any gift, of
12 any public money or thing of value to any individual,
13 municipal or other corporation whatever;..."

14 This constitutional provision prohibits the Legislature from
15 making a gift of public funds. Had the Legislature attempted
16 to require payment of "in-lieu" property taxes by the Department
17 (which it has not, see discussion in Section III B) such an
18 attempt would be void because of this prohibition.

19 The one judicially recognized exception to this
20 prohibition is when there is a "public purpose" served by the
21 gift. In order to fall within this exception the gift must
22 serve a public purpose of the donor agency (Department), not
23 the donee agency (County). Santa Barbara Etc. Agency v. All
24 Persons, 47 Cal.2d 699 (1957), reversed on other grounds,
25 357 U.S. 275 (1958). The fact that the County may use revenue
26 generated by this proposed tax for public purposes is irrelevant.
27 The donor agency public purpose served provides the "adequate
28 consideration" necessary to uphold a gift of public funds in
29 the face of the constitutional prohibition. (California Sen.
30 Bill No. 1000, 1958-59 Session, Chapter 1000, Section 1000, 1958
31 (1958)).

1 The only Departmental purpose that could conceivably
2 be served is avoiding delay of the proceedings. This purpose
3 is not the kind of purpose which courts have determined provide
4 adequate consideration for a gift of public funds. This
5 possible purpose of avoiding delay we submit is not adequate
6 consideration.

7 In addition, regardless of the Commission's decision
8 on this matter, and regardless of any subsequently initiated
9 litigation or legislation, this proceeding need not be delayed
10 even one day. At issue is simply a question of the payment of
11 money. The Commission (and any court) would have no justifica-
12 tion for delaying the project when the remedy is simply the
13 payment of money. No irreparable injury would occur to any
14 party if the project proceeds while the issue of payment of
15 money is determined.

16
17 4. Courts have ruled that the following public purposes pro-
18 vided adequate consideration for gifts of public funds:

19 Employment incentives with goal of self-sufficiency and
20 removing people off of welfare rolls, County of Alameda v.
21 Jarvison, 9 Cal.3d 730 (1971); education of the young,
22 Miller v. Compton Junior College Dist., 77 Cal.2d 719 (1971);
23 promotion of agriculture, United Agricultural Assn. v. State,
24 192 Cal. 431 (1923); conservation and beneficial use of
25 domestic waters of the State, Santa Barbara, supra; pro-
26 viding aid to needy aged, County of Los Angeles v. La Fuente,
27 20 Cal.2d 610 (1942); release of liens on property owned by
28 indigent welfare recipients, County of Alameda v. Janssen,
29 10 Cal.2d 276 (1940); providing aid to indigent sick and poor
30 persons, San Francisco v. Collins, 216 Cal. 127 (1912); pro-
31 viding tax refund to certain charitable institutions, Doctors
32 General Hospital v. County of Santa Clara, 110 Cal.2d 611
33 (1962); and providing hospital care to indigent and others
34 unable to afford private care, Castell v. White, 11 Cal.2d
35 610 (1956). The appropriation of state funds based on a
36 total collection has been ruled an unconstitutional gift,
37 California v. United Fruit Co., 119 Cal. 139 (1922).

VI.

THE ENERGY COMMISSION SHOULD NOT CONDITION THE DEPARTMENT'S APPLICATION FOR CERTIFICATION ON THE PAYMENT OF IN-LIEU TAXES AS REQUESTED IN THE COUNTY'S PROPOSED FINDINGS AND CONCLUSION.

Even if the Commission had authority to require the Department to pay "in-lieu" taxes, it should not require the payment of "in-lieu" taxes by the Department.

The Department has been negotiating with the County since it originally intervened in the Notice of Intention proceeding. The County publicly stated at that time that its major socio-economic concern was the effect of increased use of Bottle Rock Road. The Department in good faith negotiated an agreement with the County (Agreement R-50284, dated January 29, 1980), for the improvement of the road. Under the agreement the Department will pay all costs which include costs of "right of way acquisition, design, relocation, realignment and modification". The agreement provides for obtaining payment from other developers who subsequently use Bottle Rock Road, as the Department is upgrading the road to a level which will accommodate future development, which may not occur. Under the agreement, the Department will reimburse the County for its costs of processing an encroachment permit, up to \$25,000, and for any other costs, including costs of reviewing plans, up to \$15,000. The cost of reconstructing Bottle Rock Road under the agreement is estimated to be \$1,125,000.

The Department is currently negotiating a memorandum of understanding with the County. While it has yet to be

1 executed due to minor disagreements in one area, the Department
2 has committed to, among other things, submit his plans and
3 specifications to the County for review prior to advertising
4 of construction contracts, work cooperatively with the County
5 in the operation of the plant, retrofit the powerplant under
6 certain circumstances to improve the quality of the plants air
7 emissions, provide an air monitoring network or study, provide
8 an extensive stream flow measurement program, provide a surface
9 water quality monitoring program, construct a dam and
10 implement a creekbed enhancement program on Kelsey Creek, and
11 reimburse the County for specified administrative costs incurred
12 up to \$25,000 per year.

13 The Department proposes to adequately mitigate any
14 demonstrated adverse socio-economic impacts caused by its
15 construction of Bottle Rock Powerplant. It has agreed to
16 reconstruct Bottle Rock Road to meet the County's needs. It
17 has worked with the County to develop a Memorandum of
18 Understanding which provides a format for future cooperation
19 (though unsigned, the Department has complied with its provision
20 regarding submital of plans and specifications). In short,
21 we feel that the Department proposes to mitigate, to an
22 acceptable level, the possible adverse socio-economic impacts
23 to the fullest extent authorized by the laws which govern its
24 actions. The Commission not only may not but should not
25 withhold the granting of the Department's Application as
26 requested by the County.

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VII.

CONCLUSION

The Energy Commission, as a matter of law, cannot require the Department to pay "in-lieu" taxes as proposed by the County. Under the circumstances, neither should it.

DATED: September 11, 1960

Respectfully submitted,

State of California
Department of Water Resources


MARCIA J. STEINBERG
Attorney



SEP 12 1980

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

In the Matter of:)

Application for Certification of)
the STATE OF CALIFORNIA DEPARTMENT)
OF WATER RESOURCES' Bottle Rock)
Geothermal Project)

) Docket No. 79-AFC-4

) STAFF BRIEF IN OPPOSITION
) TO LAKE COUNTY'S MOTION
) TO IMPOSE CONDITION ON
) CERTIFICATION
)

Respectfully submitted,

Dated: September 12, 1980.

Lisa S. Trankley

LISA S. TRANKLEY

Attorneys for the Staff of the
California Energy Commission

1111 Howe Avenue
Sacramento, CA 95825
(916) 920-6257

Proof of Service (Revised *CA*)
Original mailed from Sacramento
on *Sept 12, 1980*

STATE OF CALIFORNIA
STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

In the Matter of:)
Application for Certification of)
the STATE OF CALIFORNIA DEPARTMENT)
OF WATER RESOURCES' Bottle Rock)
Geothermal Project.)

Docket No., 79-AFC-4
STAFF BRIEF IN OPPOSITION
TO LAKE COUNTY'S MOTION
TO IMPOSE CONDITION ON
CERTIFICATION

Intervenor County of Lake has moved the Energy Commission to impose as a condition of certification for the Bottle Rock facility that the Applicant Department of Water Resources (DWR) annually pay to the County of Lake a sum equal to the amount of property taxes which DWR would pay but for its tax-exempt status. (Proposed Findings and Conclusions of Lake County, August 4, 1980.) The Commission Staff opposes this motion. Staff submits that the Commission would exceed its authority in granting the motion. Even if the Commission has the power to impose the proposed condition on the certification, there is no reasonable connection between its regulatory functions and the proposed condition.

I

THE COMMISSION HAS NO AUTHORITY TO MODIFY
DWR'S EXEMPTION FROM LOCAL PROPERTY TAXES.

Lake County concedes that, by provision of the California Constitution, DWR is not a taxable entity for purposes of Lake County's ad valorem property taxes. (Proposed Findings and Conclusions of Lake County, Finding 4.) In proposing

that DWR nevertheless be required to pay an amount exactly equal to the taxes it would otherwise have paid, Lake County effectively asks the Commission to abolish this constitutional exemption with respect to the Bottle Rock power plant. Nothing in the Warren-Alquist Act authorizes the Commission to take such an action.

The Commission certainly has broad powers with respect to energy conservation, development, and facility siting. It has, through its NOI and AFC proceedings, extensive supervision over power facility and site certification in the state. (Pub. Res. Code §§ 25500-25542.) It is authorized to compile land use, public safety, environmental, and other standards to be met in designing, siting, and operating facilities. (Pub. Res. Code § 25216.3(a).) It can adopt standards "to be met in designing or operating facilities to safeguard public health and safety, which may be different from or more stringent than those adopted by local, regional, or other state agencies. . . ." (Id.) It also has the power to specify conditions under which approval and continuing operation of a facility will be permitted. (Pub. Res. Code § 25216.5.) None of these sections, however, allows the Commission to fundamentally adjust the constitutionally established fiscal relations between state and local governmental entities.

The Legislature, in establishing the Energy Commission, was aware that local entities might incur financial burdens under the Warren-Alquist Act and mitigated certain aspects of that financial burden. For example, the Legislature provided for reimbursement of local entities' costs of reviewing applications upon request of the Commission. (Pub. Res. Code § 25538.)

While the Legislature clearly contemplated that state agencies might build power plants (Id., §§ 25116, 25101) it did not, in passing the Warren-Alquist Act, authorize the Commission to provide for the type of financial relief requested in this instance. Yet Lake County's argument assumes that the Legislature allowed the Commission to waive the state's tax exemption embodied in the California Constitution. This assumption should not be indulged.

II

A CONDITION MODIFYING DWR'S EXEMPTION FROM LOCAL PROPERTY TAXES BEARS NO RELATION TO THE COMMISSION'S REGULATORY FUNCTIONS

Even if the Commission may order the type of fiscal arrangement proposed by Lake County, it does not follow that the Commission could set such a condition in this instance.

A standard of reasonableness applies to conditions imposed by a regulatory agency. (Scrutton v. County of Sacramento (1969) 275 Cal.App.2d 412, 79 Cal.Rptr. 872, 879.) The reasonableness of a condition depends on whether the condition is related to the impacts of a proposed facility or furthers the policies of the statute or the agency conducting the proceeding. (Gong v. City of Fremont (1967) 250 Cal.App.2d 568, 58 Cal.Rptr. 664, 670.)

The proposed condition does not relate to any clear concerns of the Commission, such as the need for the facility, the efficient use of energy and resources, the maintenance of environmental quality, or the Applicant's ability to operate the facility safely and reliably. (See Pub. Res. Code §§ 25514.5, 25509.5,

25511.) Lake County's objection runs, not to the facility or to the Applicant, but to the Applicant's status as an entity of state government.

Lake County's Proposed Findings and Conclusions intimate that the proposed condition emanates from the finite nature of the geothermal resource in Lake County. Even assuming that the area has a limited capacity for commercial production of electricity, the proposed condition does not relate to mitigation of this effect. The Commission undoubtedly can impose conservation conditions on an Applicant, as in the Sundesert NOI. (Sundesert Final Report, Nov. 1977, pp. ii, 24-25; Decision, Feb. 15, 1978, App. A, Condition 1; Tr. II-12254.) But Lake County apparently proposes to use the money it would receive from DWR exactly like any other property tax revenues, not to mitigate any alleged impacts. (See Conclusion of Lake County's Proposed Findings and Conclusions.) Thus, Lake County has completely failed to establish any reasonable relationship between the proposed condition and the Bottle Rock plant. Without such a relationship the Commission cannot impose the proposed condition.

CONCLUSION

The Commission does not have authority to require payments by DWR in lieu of property taxes. Even if the Commission had such authority, Lake County has failed to demonstrate that such authority should be exercised in the circumstances of this case.



APPENDIX C

Applicant's Supplemental Filing
and General Counsel's Opinion
Regarding Confidential Treatment
of Proprietary Information.



STATE OF CALIFORNIA
ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

In the Matter of:

Application for Certification
of the State of California
Department of Water Resources'
Bottle Rock Geothermal Project.

DOCKET NO. 79-AFC-4

SUPPLEMENTAL FILING ON AIR
QUALITY FINDINGS AND
CONCLUSIONS

Applicant, Department of Water Resources, and Staff of the Energy Commission left open the issue of confidential treatment of proprietary information in their joint Prehearing Conference Statement on Air Quality, Condition 1(a), EIC System, page 13.

The General Counsel issued an opinion in response to Paragraph 1 of the First Committee Hearing Order, concluding that Applicant's proprietary information could be dealt with under the applicable Commission regulations and that Applicant's information would thereby be protected. Applicant agrees with the General Counsel's conclusion. The following language for Condition 1(a) has been discussed with the Staff and is submitted to resolve the issue left open in the Joint Statement.

1. The Applicant shall provide the CEC Staff, for its review, design information on the following
(Any such information which Applicant deems proprietary shall be submitted to the Executive Director pursuant to 20 Cal. Admin. Code Section 2505(d).

Any information which is determined to be confidential

shall be kept confidential as provided for in
20 Cal. Admin. Code Section 2501 et seq.):

a. EIC Systems.

DATED: October 8, 1980

Respectfully submitted,

Marcia J. Steinberg
MARCIA J. STEINBERG
Staff Counsel

STATE OF CALIFORNIA

ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

ENERGY COMMISSION RECEIVED

SEP 5 1980

In the Matter of:)	
	)	Docket No. 79-AFC-4
Application for Certification)	
of the State of California	)	GENERAL COUNSEL'S OPINION
Department of Water Resources'	)	IN RESPONSE TO PARAGRAPH
Bottle Rock Geothermal Project.	)	1. OF FIRST COMMITTEE
	)	<u>HEARING ORDER</u>
)	

QUESTION

The Committee has requested an opinion whether the Commission's regulations implementing the Public Records Act (Cal. Admin. Code, tit. 20, §§ 2501-2511) allow a public agency applicant in a siting case to have the same confidentiality treatment of its records as a private party applicant.

CONCLUSION

The regulations allow equal treatment of records of agencies and private parties so long as there is good cause for confidential treatment. The only difference between the two kinds of applicants is in the procedures to be followed in determining that confidential treatment will be allowed.

ANALYSIS

This problem apparently arose because the definition of "applicant" in section 2503(b)(5) refers to "a private third party" which in turn is defined in section 2503(b)(3) as not including state agencies. This led to the fear that

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on 9/5/80

state agencies were not to be granted the same protection for confidential documents as private third parties. In fact, however, the regulations clearly contemplate that records which other agencies keep confidential shall be obtainable by the Commission upon our agreement to give such records similar treatment. Section 2505(d) provides:

"The Executive Director may, after consulting with the General Counsel, determine that a record not submitted by a private third party should be kept confidential. The determination shall be in writing and may be appealed to the Commission within 30 days."

Additionally, section 2507(c) allows the Executive Director to disclose confidential records to other agencies who agree to keep them confidential. Section 2507(c) also repeats the point that:

"On behalf of the Commission the Executive Director may request and agree to maintain the confidentiality of other agencies' confidential records."

Thus the exclusion of state agencies from the definition of "applicant" was intended only to avoid requiring of other agencies the more formal application and determination procedures required for private parties in section 2505(a)-(c). Since such agencies are also subject to the Public Records Act and must, under that law, have already determined that their own confidential records are allowed confidential treatment, there is no need for the more formal procedure here at the Commission with respect to such records, and confidentiality can be insured by the less formal mechanism of an Executive Director's determination and agreement to

keep the records confidential, pursuant to sections 2505(d)
and 2507(c).

Dated: September 5, 1980.

Respectfully submitted,

William M. Chamberlain

WILLIAM M. CHAMBERLAIN
General Counsel
California Energy Commission



APPENDIX D

Lake County Use Permit.



25
DOCKET

79-AFC-4

DATE: _____

RECD: AUG 18 1980

COUNTY OF LAKE

USE PERMIT

McCULLOCH BOTTLEROCK STEAMFIELD GEOTHERMAL PROJECT

Pursuant to the approval of the Lake County Board of Supervisors on February 19, 1980, there is hereby granted to McCulloch Geothermal Inc., 10880 Wilshire Boulevard, Los Angeles, CA., a Use Permit for the Cobb Valley area, for a maximum of ten additional wells to be drilled on three pads, the existing Francisco, existing Coleman and proposed Pad #3 as identified in the Final E.I.R., and for accessory access roads and pipelines, including three injection wells to be located in Sections 5 and 6 T11n., R8W, MDB&M, in accordance with the Lake County Ordinance Code.

The Board of Supervisors finds that the establishment, maintenance or operation of the use for which application is made will not under the circumstances of this particular case be detrimental to the health, safety, peace, morals, comfort and general welfare of persons residing or working in the neighborhood of such use, or be detrimental to the general welfare of the County and that the proposed use is not a trival action with no significant impact on the environment.

The Planning Commission has caused to be prepared an Environmental Impact Report on the subject of this application and has held public hearings thereon and has carefully considered this matter pursuant to the California Environmental Quality Act and the State E.I.R. Guidelines pertaining thereto, and pursuant to the Environmental Protection Guidelines of the County of Lake.

1. Approval is subject to the following terms and conditions:

1. The Use Permit shall be valid for a period of three (3) years from the date of approval; however, if the Use Permit is not used prior to February 19, 1983, it will become null and void, and the use may not proceed without the application for and approval of a new Use Permit. The Planning Commission may in its discretion approve time extensions.

2. The County reserves the right to inspect this project at any time after first attempting to notify the operator.

3. The Use Permit shall be reviewed by the Planning Commission at the end of eighteen (18) months and shall be subject to the following conditions:

A. TO PROTECT PLANT ASSOCIATIONS:

1. Specified pad, road, and borrow sites shall be evaluated by a qualified landscape architect, registered forester, plant ecologist or qualified person acceptable to the Planning Department and applicant, to determine which native plants should be replanted, which annual grasses shall be seeded and which non-native plants can be tolerantly sustained.

2. Top soil shall be stockpiled for later respreading over the disturbed areas prior to re-seeding.

3. When construction/drilling has been completed, revegetation shall be programmed and shall commence in the fall following the construction. The revegetation program shall be directed by the landscape architect, registered forester, plant ecologist or other qualified person acceptable to the Planning Department and applicant.

4. The entire revegetation program shall be re-evaluated during the spring following initial

planting and, if deemed by the Planning Department to be unsuccessful, additional revegetation will be required in the immediately succeeding fall season.

5. Except for large stumps, vegetation removed during construction shall be chipped and respread when beneficial as determined by person in Section A-1, or burned under the permits required by the Lake County Air Pollution Control District. Stumps may be buried outside of engineered fill and embankments.
 6. In order to protect riparian and fen areas, as well as other vegetation on the leasehold, access to the drill-sites shall be restricted to existing roads and proposed roads as defined in the application.
 7. Vegetation beyond the construction perimeter shall not be disturbed. The clearing limits for the pad shall be specified in the plans and specifications to be submitted for approval to the Planning Department.
- B. TO PROTECT AGAINST EXCESSIVE SOIL EROSION, INDUCED LANDSLIDES AND SURFACE GEOLOGIC HAZARDS:
1. Plans for drill pads, steam transmission pipelines, sumps and access roads shall be prepared by a registered civil engineer with assistance from a registered engineering geologist. Topographic mapping by photogrammetric methods shall be used for design and be supplemented as necessary with ground surveys. Road, pipeline, and pad locations shall be staked on the ground and adjusted as necessary before completion of final plans. Plans shall include a separate drainage plan using five foot contour intervals and supporting calculations for culvert sizes using acceptable engineering methods. Plans shall show specific provisions for erosion protection along pipeline routes, at culverts and on cut and fill slopes. Detailed specifications for construction should be prepared in a manner similar to applicable portions of "Forest Service General Provisions and Standard Specifications for Construction of Roads and Bridges-1977" and "Regional Standard Specifications", a U.S.D.A. Forest Service. Plans, specifications and ground locations shall be approved by the Planning Department or their authorized representatives before starting construction, and shall also be approved by the Regional Water Quality Control Board prior to construction.
 2. Drill pad and road fills shall be compacted to a minimum 90% relative compaction to minimize erosion. If significant erosion occurs as a result of any part of this project, applicant shall take prompt remedial action.
 3. Filled slope banks shall not exceed a gradient of 2:1. Toes of all fills shall be stabilized with rock and gravel or keyed into stable soil and placed to reduce erosion potential to an absolute minimum on all fill slope banks. Revegetation of slopes shall be carried out as specified in Condition A. Unless approved by an engineering Geologist and Planning Department, cut slopes shall not exceed a gradient of 1½:1.
 4. Subdrains shall be provided under all fills where natural drainage courses and seepage are evident.
 5. No drill pad construction or access road shall be allowed on potentially active landslides, unless properly mitigated, subject to approval by the Planning Department.

6. Buffer zones of undisturbed vegetation shall be maintained 500 feet on either side of streams. No geothermal related construction shall take place within this buffer zone without specific approval from the Lake County Planning Commission. Roads crossing riparian areas shall be minimum safe widths.
7. A retaining levee of not less than eighteen (18) inches in height and three (3) feet in base thickness shall be placed on the perimeter of all fill areas including access road fills, pad site and reserve pit sites, to prevent storm runoff accumulation from random discharge.
8. Drainage plan to be submitted will distribute storm water runoff and channel it to existing natural waterways only to the extent that it will not increase water head to the point of unnatural channel abrasion. Energy dissipators and collection devices to reduce the erosion force of unnatural runoff will be required where determined by County or State Agency Representatives.
9. All grading activity shall be completed and all drainage structures shall be in place and operational prior to October 10 of any year. Grading and excavation activity may not be permitted during the consecutive period from October 10 to April 10. (It is understood that this is a general time frame. Extension beyond October 10 may be allowed by the Lake County Planning Director upon establishment of a suitable soil moisture specification for any stated activity).
10. Applicant shall agree to contract with the County of Lake for engineering and inspection services, as required, to a completion date agreed upon by the applicant and the County, to insure compliance with the above stated conditions. Such services shall be billed to the applicant and repayment by the applicant shall be deposited in the Lake County Geothermal Trust Fund.
11. In areas requiring removal of vegetation but no grading, root crowns shall be left intact so as to retard soil erosion.

C. ENVIRONMENTAL AND SAFETY PROTECTIONS:

1. The sump shall be designed by a registered civil engineer with assistance from a registered engineering geologist. Design of the sump fill shall be to a specification to withstand both static loads and dynamic loads (imposed by credible seismic events) with safety factors of 1.5 and 1.2 respectively. The sump shall be constructed of material compacted to minimum 95% relative compaction unless the Lake County Planning Director determines, based upon conclusive soil testing data, that a lesser compaction is adequate. The sump shall be lined with at least two feet of clay having a permeability not to exceed 1×10^{-6} cm./sec., or an equivalent impermeable membrane. Volume of the sump shall be sufficient to accommodate both the drilling mud and any reasonable amount of precipitation which could enter the sump.
2. The sump shall be operated in such a manner as to preclude overtopping of the sump. Three feet of free board shall be maintained at all times.
3. Applicant shall prepare a viable contingency plan for spills and emergency pumping of the sump in the event of a heavy, unexpected rainfall or if excessive geothermal fluids are encountered. The plan shall show who is responsible and what equipment and manpower is available to respond to such an emergency. The plan shall be submitted to the Lake County Planning Department prior to commencement of construction.

4. Applicant shall prepare a viable contingency plan for emergencies due to breaks or unexpected deformation of the pipeline or its supports. The plan shall show who is responsible and what equipment and manpower is available to respond to such an emergency. The plan shall be submitted to the Lake County Planning Department prior to commencement of testing or operations, and annually updated on anniversary of permits.
5. Prior to the removal of drilling equipment, sump fluids (both mud and supernatant liquids) shall be chemically analyzed, upon request from the Planning Department, for type and quantity of biologically sensitive materials, especially hazardous materials, heavy metals and acids. The chemical analysis shall be sent to the California Regional Water Quality Control Board and Lake County Planning Department for review. If said analysis does not indicate quantities in excess of allowable limits for either human or other important biological elements, especially those of the aquatic ecosystem, then sump materials shall be solidified, dried, mixed with native soil and buried. If hazardous or biologically sensitive materials are found, such materials shall be removed to a Class 2-1 or Class 1 disposal dump site as directed by the County or appropriate State Agency.
6. No hydrocarbon base cleaning agent, no waste oils or greases, and no liquid fuel shall intentionally be released directly onto the surface of a drill pad. All such liquids shall be contained and removed from the site. Any accidental discharge of the materials mentioned above shall be removed and properly disposed of by the applicant.
7. All unattended drilling equipment, well heads, sumps and ponds shall be protected from access by unauthorized persons by minimum 6 ft., locked, chain-link fencing.
8. Pipeline components which are exposed to ambient conditions at a temperature of 140 degrees Fahrenheit or higher, where accessible to human reach, shall be designed to mitigate against inadvertent human burn injury.
9. Sanitary and hand washing facilities shall be provided at the drill site and as specified by the Lake County Health Department.
10. In the event of casing blowout or other uncontrolled venting, the applicant shall move immediately to control the vent. No more than two (2) days shall elapse from the date of the uncontrolled vent to the date of equipment relocation to secure it.
11. Well discharge shall be directed away from adjacent woody vegetation and populated areas and appropriate energy dissipators shall be used as required by the Planning Department.
12. All solid waste material shall be removed from the site. Upon completion of drilling operations, unless otherwise approved by Planning Department, all equipment and materials unnecessary to the operation of the completed well shall be removed within sixty (60) days of completion of the well.
13. Applicant shall comply with the requirements of the fire prevention practices and measures as may be prescribed by the California Division of Forestry and/or County of Lake.
14. Provision shall be made for adequate access by fire-fighting equipment to the site, and fire access maps shall be provided to the appropriate Fire District (s).

15. Lights in the drilling rig shall be shielded so as to minimize visual impact at night to the portion of Bottlerock Road from which the drilling mast is visible.
16. Applicant shall provide the Planning Department with a plan which details the equipment and procedures which will be employed during powerplant outages (stacking periods) and during maintenance venting. This plan shall include proposed hours during which planned maintenance venting will occur as well as projected time which will elapse between unscheduled power plant outages and the throttling back of wells to minimum bleed. The plan shall include personnel available for unscheduled outages and projected response time of those personnel.
17. Applicant shall submit for the Planning Commission's approval a traffic control and road maintenance plan for High Valley Road. This plan shall take into account the great increase in heavy truck traffic which will accompany full field development of the Bottlerock site. The plan shall suggest mitigations which will prevent or alleviate the concomitant increase in danger due to traffic accidents and damage to the road which may occur following development.
18. Pipeline routes and design must be approved by the Planning Department prior to construction.
19. Prior to any construction activities, the applicant shall provide to the Planning Department for its approval a complete plan of development, showing locations of wells, pads, sanitary facilities, temporary and permanent storage and construction areas and buildings and the means by which these areas will be protected from unauthorized entry.

D. TO PROTECT AGAINST SURFACE WATER DEGRADATION:

1. In order to preserve the hydrologic integrity of this leasehold area applicant shall obtain by right or purchase all water used in drilling process or dust control.
2. The equipment service and fuel transfer areas and the area occupied by the drilling rig shall drain into the sump.
3. All fluids produced during testing after the sump has been filled shall be containerized and removed to a Class 1 or Class 2-1 disposal site, if required by the Planning Department or State Agencies.
4. The applicant shall continue to monitor the surface water quality of Kelsey and High Valley Creeks as required by the McCulloch Francisco Use Permit, and shall coordinate this water quality monitoring program with the ongoing California Department of Water Resources Water Quality Monitoring Program, said coordination being subject to approval by the Planning Department. Yearly microfaunal studies shall be initiated at times and locations specified in the McCulloch Department of Water Resources Bottlerock Steam Field EIR. Sampling procedures and parameters shall conform to those procedures and parameters outlined in the section entitled "monitoring", on pages 123 and 124 of that EIR.
5. If the applicant elects to conduct or participate in a larger and more comprehensive water quality program, it can be substituted for the requirements of D4. Such a proposal must be submitted to and accepted by the Planning Department and begun prior to the commencement of construction activities.

E. TO PROTECT AIR QUALITY:

1. Applicant shall meet all regulations and standards set

by the Lake County Air Pollution Control District and utilize on a continuous basis the state of the art of H₂S technology. This Use Permit does not supersede the authority of said District in any way.

2. After completion of geothermal wells, the H₂S emissions during standby venting of steam shall be either abated to acceptable level per Air Pollution Control District rules and regulations or standby venting shall be curtailed to that level necessary to attain emission limitations. Curtailment methods to be utilized shall include the shutting in of geothermal wells as publicly agreed to by the applicant.
3. Applicant shall minimize vehicular dust on unpaved roads by the use of water or other acceptable dust retardant.
4. Applicant shall provide accurate chemical analysis of the geothermal resource if it is encountered, when required by the Air Pollution Control District.
5. The analysis shall include accurate "wet chemistry" and gas chromatograph determinations. Heavy metals such as lead, chromium, arsenic, antimony, mercury and cadmium should be determined as well as substances such as radon, hydrogen sulfide, boron, manganese, methane, fluoride, ammonia and carbon dioxide. The analysis should also include pH. The chemical analysis will be used in future use permit consideration for geothermal development on the project leasehold. The analysis shall be sent to the Planning Department within 45 days of completion of the well.
6. Applicant shall enter into agreements with Department of Water Resources or other parties as necessary and provide a written commitment and preliminary design of abatement systems as described in a letter dated February 15, 1980 from Ronald Robie, Director Department of Water Resources, to Lake County Air Pollution Control District which is acceptable to the Lake County Air Pollution Control District prior to all construction.

F. TO PROTECT AGAINST NOISE EXPOSURE:

1. Applicant shall meet a noise standard of Ldn 55 db (A) with a 10 db penalty between the hours of 10 P.M. and 7 A.M. of the following day at residences.
2. If measurements by the Planning Department indicate a possible violation of F.1, a measurement of the source noise in an appropriate location in the immediate vicinity of the source shall be made to determine if the source noise is sufficient to cause the level measured at F.1 to exceed 55 Ldn using the inverse square law. This source measurement shall be an equivalent sound level (Leq) averaged over a 24 hour period.
3. These regulations shall be adopted until a noise control ordinance is approved by the Board of Supervisors. Applicant agrees that the Planning Commission shall have the right to substitute the conditions of a General Noise Control Ordinance for the conditions of this section when adopted by the Board of Supervisors. It is understood by the Planning Commission and applicant that mufflers of advance design will be required for almost all geothermal operations in order to meet these standards and that extraordinary mitigative techniques such as lead/vinyl barriers and the wrapping of the drill rigs may be necessary to meet the noise standards of Section F-1 and F-2.

4. It is stipulated that the Lake County Planning Department will be spot monitoring noise levels in the vicinity of the proposed land use and that findings resulting from said monitoring may require the applicant, his contractors or agents to provide continuous noise level monitorings and readings as may be directed by the Planning Department.
5. It is also stipulated that the Planning Department has jurisdiction over noise investigation procedures and enforcement.
6. If the Planning Department receives noise complaints, the hours of heavy truck traffic to and from the site may be restricted to the hours between daylight and sunset only; except in cases of emergency.
7. Drill pipes shall not be laid in bins between the hours of 8 P.M. and 7 A.M. the following day.

G. TO PROTECT ARCHAEOLOGICAL RESOURCES:

1. Archaeological sites identified on pages 125-127 of the McCulloch Department of Water Resources Bottlerock Steamfield EIR shall be preserved in their existing state. No excavation or disturbance by the applicant or his contractors shall be permitted at these archaeological sites unless mitigated, subject to approval by the Planning Department and Sonoma State University's Resources Facility.

H. TO CONTROL VISUAL IMPACTS:

1. The revegetation program shall be formulated to include consideration of the visual impacts created by geothermal development.
2. Pipelines shall be colored in such a manner as to provide maximum color compatibility with the vegetation type through which it is routed. The choice of the color of the pipeline shall be made by the revegetation program contractor. Changes in color shall be made along the pipeline if necessary to blend with the background.
3. On visual edges such as ridgelines, low profile design approaches shall be employed.
4. All pad/road/pipeline sites shall be placed in areas, other environmental and engineering conditions being met, in such a manner that existing vegetation and topography will provide maximum screening.

I. UPON WELL ABANDONMENT:

1. The applicant shall abandon any well in accord with the Division of Oil and Gas Regulations.
2. Applicant shall refill sump and grade pad to reasonably restore a natural ground contour.
3. Applicant shall remove all pipelines and supports not necessary for field operation.
4. Applicant shall revegetate the pad and sump areas with woody vegetation that can be tolerantly sustained in accord with recommendations of the revegetation consultant or the procedure given in Condition A-1.

J. RE-ENTRY OF PRODUCTION OR SUSPENDED WELL BORES:

1. Applicant may re-drill or otherwise re-enter the same well bore of any well authorized under this

K. SEVERABILITY:

If any section, subsection, sentence, clause or phrase of this permit is for any reason held by a court of competent jurisdiction to be invalid, such decision shall not affect the validity of the remaining portions of the use permit. The Board of Supervisors hereby declares that it would have passed this use permit and each section, subsection, sentence, clause and phrase hereof irrespective of the fact that any one or more sections, subsections, clauses or phrases are declared invalid.

11. IN GRANTING THIS USE PERMIT, THE LAKE COUNTY BOARD OF SUPERVISORS MAKES THE FOLLOWING FINDINGS:

- A. That this Use Permit does not abridge or supersede the regulatory powers or permit requirements of any State or Federal Agency or any Special District or other Lake County Department or Division which may retain an advisory or regulatory function as specified by statute or ordinance, nor does this Use Permit grant any title or other real property solely to this applicant or his assigns.
- B. That the granting of this Use Permit is in the general public interest and that environmental and performance parameters conditioning the proposed activity as specified in this Use Permit and as contained in that document entitled "Conditions, Procedures and Performance for Geothermal Regulations, County of Lake" now referenced and made a part hereof, will allow the proposed activity with adequate safeguards to the welfare of the people of Lake County at large and to the people residing in the vicinity of said activity.
- C. That this Use Permit shall be subject to revocation or modification by the Board of Supervisors of Lake County if:
 1. The Board finds that there has been non-compliance with any of the foregoing conditions or:
 2. The Board finds that the use for which this Use Permit is granted is so exercised as to be substantially detrimental to the general public or to property in the vicinity of the use.

Any such revocation shall be taken pursuant to Section 21-84 of the Ordinance Code of the County of Lake.

- D. Noise levels from drilling operations will be muffled and times of other operations limited so as not to constitute a public nuisance.

III. THE BOARD OF SUPERVISORS FURTHER DECLARES THAT:

- A. This Use Permit may be modified or revoked if the Lake County Board of Supervisors finds that the use to which this permit is put is detrimental to the health, safety, morals, comfort and general welfare of the persons residing or working in the neighborhood of such use, or

If it is injurious or detrimental to property and improvements in the neighborhood or the general welfare of the County, or is a nuisance.

Date of Issuance:

GEORGE R. VOLKER
Planning Director

By: _____
Irene L. Brown, Secretary

ACCEPTANCE

I have read and understand the foregoing Use Permit and agree to each and every term and condition thereof.

Date: _____
Owner or Authorized Agent

DP;lds



APPENDIX E

CEC Staff Compliance
Monitoring Report.



ENGINEERING AND ENVIRONMENTAL DIVISION
COMPLIANCE MONITORING REPORT
DWR BOTTLE ROCK

A. INTRODUCTION

This report has been prepared to partially fulfill the requirements of Public Resources Code Section 25532. The requirements set forth in this report are based entirely upon the Terms and Conditions of the CEC Certificate. The information basis for the administrative procedures in this report include prehearing conference statements, workshop discussions, hearing proceedings, findings and conclusions, testimony and other materials considered part of the power plant case record, and CEC adopted policy and procedures for compliance monitoring.

The report is divided into technical areas, and the applicable laws, ordinances, regulations, standards and agreements are listed for each. Requirements for compliance monitoring are divided into five phases: preconstruction, construction, preoperation, operation, and postoperation. For each requirement there is a discussion regarding the method of verification, procedures of enforcement, and filing or notification methods. All compliance verifications will be part of the public record and will be maintained by the California Energy Commission Docket Unit.

During the Application for Certification (AFC) AFC proceeding, a determination was made in each technical discipline regarding the necessity for postcertification activities. Some technical areas are not contained since no postcertification activities were identified by any party to the proceeding. This report contains those activities determined by the proceeding to be necessary to assure compliance with the applicable laws, ordinances, regulations, and standards.

The Compliance Monitoring Program for each power plant is managed by a Compliance Audit Manager who works within the CEC's Engineering and Environmental Division. The manager will be responsible for implementing the approved program after certification, maintaining compliance monitoring legal records for the program, ensuring that all aspects of the program are done in a timely manner, and will bring to the attention of the Commission any need for issue resolution. In cases of dispute, the Commission has final authority to resolve the dispute.

3. GENERAL NOTES

1. The California Energy Commission (CEC) shall be the responsible agency for compliance monitoring and enforcement. The CEC may delegate authority for review, approval, and enforcement of compliance monitoring submittals to other public agencies to the limit of those agencies' legal authority in lieu of the CEC's exclusive power to certify sites and related facilities. However, for purposes of exhaustion of administrative remedies, the Commission's procedures will constitute final administrative relief.
2. This document includes the laws, ordinances, standards, and conditions for designing, constructing, and operating the power plant and related facilities. This document additionally specifies actions, verifications, submittals, and approvals required by the Commission to assure that the facilities are designed, constructed, and operated in compliance with air and water quality, public health and safety, and such other laws, ordinances, and standards specified by the Commission in its written decision on the application.
3. This document applies to the "Project Area" which is defined herein as the plant site area and the transmission line right of way.
4. In the event that the utility and any person with delegated compliance authority determines, after reasonable effort on the part of both parties, that a conflict cannot be resolved, either party may petition the CEC to consider the conflict.

The petition shall be filed with the Compliance Audit Manager (CAM). The CAM will review the petition and may:
 - (a) Convene a workshop to review the conflict and facilitate a resolution between all parties; or
 - (b) Refer the conflict to the Executive Director with a written recommendation.
5. Any matter of noncompliance with terms of the certificate that comes to the attention of the CEC, is subject to review and can result in proceedings pursuant to CAC Title 20, Article 4, Sections 1230, et seq.
6. Any person may file a complaint with the Executive Director alleging a violation of statute, regulation, order or decision adopted, administered, or enforced by the CEC according to the requirements and procedures set forth in CAC Title 20 Article 4, Complaints and Investigations, Section 1230, et seq.
7. CEC's mailing address for all Compliance and Monitoring matters is:

Compliance Audit Manager, File No. 79-AFC-4C
California Energy Commission MS-2000
1111 Howe Avenue
Sacramento, California 95825

Note: The Compliance File Number is the AFC docket number with the letter "C" added to the end.

8. All compliance correspondence and materials to be delivered to CEC staff should be addressed to the staff via the Compliance Audit Manager (CAM) at the above address.
9. The utility and county Chief Building Official, if applicable, will maintain for the life of the project, files of all "As-Built" documents referenced in this report for the life of the project. CEC staff, upon reasonable notification, will have access to these files.
10. CEC will maintain as a public record:
 - o All attestments pertaining to the fulfillment of legal requirements.
 - o All documents relative to complaints filed with the CEC pursuant to Title 20 CAC, §1230, et seq.
 - o All documents relative to postcertification compliance monitoring proceedings brought before the Commissioners.
11. Any information which Applicant deems proprietary shall be submitted to the Executive Director pursuant to 20 Cal. Admin. Code Section 2505(d). Any information which is determined to be confidential shall be kept confidential as provided for in 20 Cal. Admin. Code Section 2501 et seq.

C. COMPLIANCE REQUIREMENTS

I. Air Quality/System Engineering

Will the construction and operation of the proposed DWR Bottle Rock Geothermal Project result in any adverse impacts to air quality?

A. Law

During normal plant operations, H₂S and total suspended particulates (TSP) emissions from a geothermal power plant are governed by the California ambient air quality standards for H₂S and TSP as well as LCAPCD New Source Review regulations and specific emissions limits for H₂S and TSP.

Use Sections 502, 604, and 605

In general, District New Source Review regulations limit TSP and H₂S emissions from a single plant to a level that will not cause a violation of the ambient air quality standards from the plant alone or lead to a standard violation when plant impacts are added to likely background values of TSP or H₂S.

Based upon the LCAPCD's air quality analysis, emission limitations for H₂S will be 5 lbs/hr and this limitation has been made part of the CEC AFC Decision of the Bottle Rock Facility. This emission limitation shall be the criteria for examination of compliance of the facility for H₂S emissions.

Rule 421.2-A

Specific emission limitation limit H₂S emissions to 100 grams per gross megawatt from (gr/GMWhr) effective January 1, 1980. Subject to public hearings in 1987, this level could be reduced to 50 gr/GMWhr on January 1, 1990.

Rule 411

TSP emission values are limited to .2 grains/SCF or 40 lbs/hr maximum. In addition, rules identified on DOC pages 14 and 15 shall also apply.

Although the applicant is to be licensed upon the use of BACT as described in DOC Condition #2, DWR may use other means to comply provided the LCAPCD, ARB, and CEC are provided performance data indicating the other means are capable of achieving the same emissions limitations and reliability as those defined in Condition #2. Any such changes shall be decided at a properly noticed public hearing to be convened jointly by the LCAPCD and CEC, no later than 2 years prior to anticipated power plant operation at which the ARB and all intervenors shall be invited to participate. The LCAPCD concurrence upon any changes must be given.

The delegate agency is LCAPCD. DWR is charged with the responsibility of maintaining files for all reports or informational requirements outlined in the following monitoring programs. DWR shall inform LCAPCD, CEC, and the CAM of the location of the Central Repository for this information. DWR shall make these files available to LCAPCD, ARB, and CEC staff upon request.

1. Preconstruction Requirements

The following definitions will apply to the DWR Bottle Rock facility only:

Review--Review shall mean a 30 day period during which the control agency(s) shall assess and inform DWR of any apparent design deficiencies. LCAPCD shall notify DWR and CAM of any unacceptable items 30 days after receipt of information. The CAM shall notify the LCAPCD of any discrepancies the CEC staff has found. If no notification is given, DWR shall proceed on its project schedule. If notified of an apparent deficiency, DWR shall inform the agency(s) of its intention to provide additional information or modifications to correct the deficiency within 30 days. A projected schedule for this information shall also be provided.

Design Information--This information shall contain the equivalent level of detail as the Stretford system flow diagram (AFC figure 4.3-15, attached) submitted by PGandE in Geysers unit 18 AFC or as otherwise deemed appropriate by LCAPCD. This information shall also consist of a tabulation of associated equipment (e.g., pumps, blowers, tanks, etc.) and emission points and a list indicating numbers of components, capacities and redundancies. This information may be based upon final bid specifications.

Forty-five (45) days before procurement--This shall mean 45 days before specific equipment hardware is purchased. If design information is not provided 45 days in advance of procurement DWR shall have proceeded at its own risk.

1.1 DWR shall provide CAM, ARB, and LCAPCD, for their review, design information on the following:

- a. TIC systems,
- b. Stretford system,
- c. Turbine by-pass,
- d. Condensate Treatment (Hydrogen peroxide), and
- e. Any performance information which is not proprietary on the condenser/sparger system acquired during shop testing and preoperation compliance and monitoring activities.

when this becomes available, but no later than 45 days before procurement of equipment.

1.2 DWR shall submit verification to the CAM, ARB, and LCAPCD that the initial EIC operators have been trained in accordance with EIC manufacturer recommendations.

1.3 DWR shall provide the results of vendor testing of EIC demister systems to the CAM, ARB, and LCAPCD for their review when they become available, but no later than 45 days before procurement of the demister equipment.

1.4 DWR shall provide the results of LCAPCD steam testing to the CAM and ARB when they become available, but in no case later than 45 days before procurement of H₂S abatement equipment.

1.5 DWR shall provide to the CAM and LCAPCD a summary description of the contractual relationship among DWR, the steam supplier and EIC Corporation.

1.6 DWR shall provide the CAM, ARB, and LCAPCD a summary of results of the Bechtel tests described in Finding 23 as soon as they become available, but in no case later than 45 days before procurement of equipment.

1.7 DWR shall provide the CAM, ARB, and LCAPCD a verification that it has received a performance (control efficiency) guarantee of 90 percent or better obtained from EIC laboratories for the EIC system.

- a. Verification--DWR shall submit the information identified above to the appropriate agencies. LCAPCD shall review the information for adequacy.
- b. Enforcement--LCAPCD shall notify the CAM and DWR in writing as soon as possible but no not less than 30 days after receipt of the data, of any unacceptable item or apparent deficiency. LCAPCD shall also identify, to DWR and the CAM, LCAPCDs recommendation to resolve the deficiency. The CAM shall notify the LCAPCD of any discrepancies the CEC staff has found.
- c. Filings and Notifications--see Verification and Enforcement above.

2. Construction Requirements--None

3. Preoperational Requirements

DWR will submit a monitoring program at least 60 days prior to startup of the Bottle Rock Facility to LCAPCD, CAM, and ARB. H₂S emissions shall be monitored continuously by measuring total volume flow rates and H₂S concentrations.

In the event that acceptable continuous monitors are not available, DWR shall conduct testing no less than once every thirty (30) days to ensure the efficiencies of the H₂S abatement systems are being maintained. The testing procedure used to determine compliance must be approved by the LCAPCD. A log of such testing shall be maintained and be available to LCAPCD staff upon request.

Safe sampling access and ports to enable the LCAPCD to gather samples from the freshly treated condensate, cooling tower stack, treated gas from the Stretford system, and treated steam from the EIC system shall be provided.

3.1 The incoming steam (both upstream and downstream of EIC) to the power plant shall be analyzed quarterly and reported to the CAM and LCAPCD for hydrogen sulfide, radon-222 and its daughters, mercury, arsenic, silica, boron, benzene, ammonia, and total suspended solids for the first two years of operation. The results of these tests shall be reviewed by the LCAPCD to determine if thereafter annual testing will suffice. DWR may join with the steam supplier in performing such tests. Results of any tests performed upon the cooling tower sludge shall also be forwarded to the LCAPCD.

3.2 DWR shall develop a program to measure H₂S in the non-condensable gas flow upstream of the Stretford unit and in the off-gas vents of the Stretford unit to the atmosphere and to the cooling tower.

3.3 DWR shall develop a program to measure H₂S concentrations and liquid flow rate of the condensate upstream of the secondary abatement system and H₂S concentration downstream of the secondary abatement system prior to its release to cooling tower circulating water.

3.4 DWR and LCAPCD shall develop a program to monitor ambient H₂S and TSP concentrations and/or other pollutants (as identified in the DOC, Condition 23,) prior to and during operation of the Bottle Rock facility at locations to be mutually agreed upon. DWR shall submit the monitoring plant to ARB and CEC for approval at least 6 months prior to start up of the program.

3.5 A log of monitoring shall be maintained and be made available to LCAPCD staff upon request. The devices must have accuracies of +1 ppm, provide measurements at least every 15 minutes, and be accessible to LCAPCD staff. Flow rate measuring devices must have accuracies of +5 percent at 40 percent to 100 percent of the total flow rate and calibrations must be performed at least quarterly. Calibration records must be made available to LCAPCD staff upon request.

- a. Verification--DWR shall submit the monitoring program plans to LCAPCD, CAM and ARB. LCAPCD shall review the plans for adequacy.
- b. Enforcement--LCAPCD shall notify the CAM and DWR in writing, 30 days after submittal of the programs, of any unacceptable items. LCAPCD shall also identify to DWR and the CAM, LCAPCD recommendation to resolve the unacceptable items. The CAM shall notify the LCAPCD of any discrepancies the CEC staff has found.
- c. Filings and Notifications--see Verification and Enforcement above.

4. Operational Requirements

4.1 Initial Compliance Determination

DWR shall submit for approval a detailed performance test plan and schedule to LCAPCD and the CAM for an emission limitation compliance test at least 60 days prior to test. In the event of plant disapproval, the LCAPCD will notify DWR and the CAM in writing within 30 days of receipt of plans and include recommendations on how to achieve approval. Results of monitoring program shall be submitted to LCAPCD, ARB, and the CAM as follows:

4.1.1 DWR shall provide a compliance report on the results of the monitoring program within 100 days after the facility has been declared operational. The report shall contain data obtained during the 75 day. The monitoring activity is to cover a minimum period of 75 days after the time the facility has been declared operational monitoring period. A minimum of 30 days of data (not necessarily consecutive days) at 90 - 100 percent rate power generation shall be required. The report shall contain as a minimum H₂S concentrations in the off-gas and freshly-treated condensate, power generation rates, a description of the abatement system's failures, if any, and data obtained in Items 3.1 thru 3.4 above.

4.1.2 If, during the first 75 days of monitoring described in Item a, 90 - 110 percent rated power has not been achieved for a minimum total equal to 30 days, monitoring shall continue and a second report is to be submitted within 15 days of obtaining 30 total days at 90 - 110 percent rated power. The second report shall include a summary statement of why 90 percent rated power was not being achieved, and a description of any corrective action taken.

4.1.3 Upon review of the information in Item(s) 4.1.1 and 4.1.2 the Air Pollution Control Officer of the LCAPCD shall present to DWR, the CAM, and ARB findings on conformity of air quality standard(s).

4.1.4 If the APCO finds that the facility has not met applicable emissions limitations, DWR shall prepare and submit its response to the Commission, ARB and LCAPCD. The response shall be submitted within 30 days after the submittal of the report(s) showing noncompliance. The response shall include a description of the mitigation measures or additional control(s) to be applied to the facility or other actions taken to meet the emission limitations. The report will also describe a schedule for implementation of these measures.

4.1.5 Upon review of the information in Item 4.1.4 the Commission, ARB, and LCAPCD shall jointly determine what actions DWR shall take to comply with emission limitations.

4.1.6 After the implementation of the approved mitigation measures, DWR shall conduct monitoring programs, described in Items 4.1.1 and 4.1.2. The LCAPCD shall perform the actions described in Item 4.1.3.

4.2 Continued Monitoring for Compliance

4.2.1 The LCAPCD shall be notified within one hour following any power plant outage or malfunction resulting in emissions in excess of five (5) pounds per hour H₂S at (707) 263-2391, or a number to be provided by the LCAPCD.² DWR shall maintain a log of power plant outages along with explanations for the outages and malfunctions. In the event that power plant outages recur because of equipment malfunctions that are not indicated by alarms, DWR shall retrofit alarms on the malfunctioning equipment as possible. The log shall be available for inspection upon the request of the staffs of the LCAPCD, ARB, CEC, and EPA.

4.2.2 The power plant abatement system shall have an operator on site at all times. The operator must be able to immediately take necessary corrective action in the event of power plant outage or equipment malfunction in order to meet the conditions of this Determination of Compliance. DWR shall provide a telephone number at which the Bottle Rock operator or a representative can be reached to ensure LCAPCD entry for inspection purposes within one (1) hour of notification.

If for considerations of safety, DWR can not comply with such a specific request, DWR shall forward in writing within one week a letter explaining the reasons entry could not be provided to LCAPCD staff, within one hour.

4.2.3 After obtaining a finding of conformance described in Item 4.1.3, DWR shall continue to monitor the H₂S emissions from the power plant and report on the status of compliance as required by LCAPCD, but not less than on a quarterly basis. In case of noncompliance, actions identified in Items 4.1.4, 4.1.5, and 4.1.6 will be required to return to a condition of compliance.

4.2.4 DWR shall, at the request of the LCAPCD, install, operate and maintain an on-site meteorological station capable of determining wind direction, wind speed, standard deviation of the direction, and temperature. Such data shall be furnished to the LCAPCD on a monthly basis in an hourly/day format and quarterly in a summary format acceptable to the LCAPCD.

4.2.5 DWR shall promptly fund reasonable studies or tests as required by the LCAPCD to ascertain the impact of DWR/Bottle Rock when operating, specifically at the residence located approximately 1,900 ft. east of the Francisco pad, should the resident in good faith file complaints with the LCAPCD indicating the air quality is worsening or becoming a nuisance or unhealthful as a result of Bottle Rock's operation. These studies shall include, but not be limited to, monitoring at the residence to determine H₂S levels and particulate or other components which are believed or known to be in geothermal steam, tracer tests or source tests. Such studies shall be approved by the LCAPCD prior to initiation. Reasonable mitigation steps shall be applied upon request of the LCAPCD to attempt to remedy any unlawful impacts caused by the DWR Bottle Rock power plant upon the residence.

4.2.6 Reports shall be issued quarterly to the LCAPCD detailing: hours of operation; any periods for which abatement equipment malfunctioned and the action taken; chemicals utilized for treatment of condensate; periods of scheduled and unscheduled outages and the reasons for such outages; and summary of the output of continuous emissions monitors with explanations of any irregularities.

- a. Verification--DWR shall submit the monitoring program plans to LCAPCD, CAM and ARB. LCAPCD shall review the plans for adequacy.
- b. Enforcement--LCAPCD shall notify the CAM and DWR in writing, 30 days after submittal of the programs, of any unacceptable items. LCAPCD shall also identify to DWR and the CAM, LCAPCDs recommendation to resolve the unacceptable items. The CAM shall notify the LCAPCD of any discrepancies the CEC staff has found.
- c. Filings and Notifications--see Verification and Enforcement above.

5. Postoperational Requirements--None.

II. HEALTH

will the operation of the power plant result in adverse public or occupational health impacts? (See sections on Safety/Worker Safety, and Air Quality Monitoring Compliance for additional requirements related to health.)

A. Law--Radon-222: The laws pertaining to this radiological health issue are California Administrative Code Title 17, Section 30355 (concentration limits for radioactive effluents released to uncontrolled areas) and California Health and Safety Code Section 25607 (requirement for radiological monitoring): The California Department of Health Services Radiologic Health Section (DHS/RHS) is the agency delegated responsibility for determining compliance with requirements.

1. Preconstruction Requirements--None.
2. Preoperation Requirements--None.
3. Construction Requirements--None.
4. Operating Requirements--DWR shall conduct quarterly sampling and analysis of radon-222 (^{222}Rn) concentrations in noncondensable gases entering the power plant. An outline of the current DHS/RHS minimal requirements for monitoring and reporting on ^{222}Rn follows:
 - o The facility must be sampled at least quarterly.
 - o The sampling and analysis methods must be shown to be accurate by comparison to known standards supplied by an acceptable source (e.g., EPA). This "standard comparison" or "calibration" shall be run with each set of samples counted unless it is shown that the counting system is sufficiently stable. If calibration is unnecessary for each run, then calibration shall be required at least once per year.
 - o Each power production unit must be sampled such that the instantaneous ^{222}Rn emission rate (Ci/sec) to the environment is accurately determined.

This ^{222}Rn monitoring program will be conducted for at least the first three years of commercial operation. If monitoring results indicate that the ^{222}Rn release for the Bottle Rock facility is well within applicable standards, the program may be modified, reduced in scope, or eliminated provided the approval of RHS is obtained by DWR. DWR shall send a copy of the RHS approval to the CAM. As new information and techniques become available, with concurrence of DWR and RHS, changes may be made to the program or the methods employed in monitoring ^{222}Rn .

- a. Verification--Approximately 10 percent of samples will be taken in duplicate with the duplicate sample sent to the DOHS Sanitation and Radiation Laboratory in Berkeley for cross-check analysis as a quality control on the DWR's laboratory analyses.

An annual report shall be prepared discussing each point above. All results shall include the standard deviation associated with the counting error. Sources of error in the sampling procedure and emission calculation shall be discussed.

The report shall also indicate the maximum dose due to emissions, calculated at the site boundary, and to the resident nearest the location of maximum ^{222}Rn concentration, and the resultant expected population dose. (These dose calculations may follow a simplified methodology established by RHS).

- b. Enforcement--DOHS/RHS is responsible for enforcing ^{222}Rn emission standards, if the ^{222}Rn emission standard is violated, DWR must inform the DOHS/RHS and CEC staff with special advisory reports. DWR will provide a written report to DOHS/RHS and CEC staff within 30 days of confirmation of an exceedance of 3.0 picoCurie per liter (pCi/l) ^{222}Rn in the cooling tower exhaust. If the ^{222}Rn concentrations exceed 6.0 pCi/l in the cooling tower exhaust, DWR will notify DOHS/RHS and CEC staff by telegram or telephone within 24 hours of the confirmation of the sample result. Confirmation includes the reanalysis of the sample by DWR or another qualified laboratory. Confirmation of sample results must be accomplished in the most expedient manner possible. The procedures used shall be the same as the normal analysis, but may include sending samples to DOHS/RHS and/or outside qualified laboratories for analysis. The confirmation of a sample should take less than five calendar days. DWR shall notify the CAM of corrective actions taken.
- c. Filings and Notifications--DWR will provide the annual reports in a. above to DOHS/RHS and notify DOHS/RHS if specified advisory limits are exceeded (per b. above). Annual reports shall be maintained by DOHS/RHS and be available to the CEC staff and the public on request. DOHS/RHS shall report annually the results of ^{222}Rn monitoring program to the CAM. This report shall include at a minimum data concerning average and high values of ^{222}Rn emissions, and incidences of the 3.0 pCi/l and 6.0 pCi/l level exceedances.

5. Postoperation Requirements--None.

- B. Law--Occupational Health and Safety: California Administrative Code, Title 8. (See sections on Worker Safety, and Handling and Storage of Hazardous, Toxic, and Flammable Materials.)
- C. Air Quality Laws, Ordinances and Standards--(See section on Air Quality for regulated pollutants, particularly for H₂S).
- D. Law--Monitoring Requirements: California Public Resources Code Section 25532. The following requirements are based on the Commission's responsibility to establish monitoring systems in order to assure that any facility certified by the Commission is constructed and is operating in compliance with air and water quality, public health and safety, and other applicable regulations, guidelines, and conditions adopted or established by the Commission or specified in the written decision on the application.
 1. Preconstruction Requirements--None.
 2. Construction Requirements--None.
 3. Preoperation Requirements--The need for an ambient air monitoring program is based upon the following:
 - o There remains a lack of adequate baseline air quality data for use in determining public health impacts from geothermal development.
 - o Ongoing and future development is expected to increase pollutant emissions; therefore, an analysis of existing ambient concentrations of pollutants should be made prior to the start of commercial operation of each power plant.

DWR shall obtain baseline ambient air measurements for benzene, silica, mercury, arsenic, ammonia, and vanadium in accordance with the following requirements. These requirements may be accommodated as a part of any established regional data gathering program acceptable to LCAPCD and CEC staff.

- o Measurements shall be made in the populated areas in Cobb Valley downwind of the power plant, to be determined by LCAPCD, CEC staff, and DWR.
- o Sampling will be performed for at least one year prior to commercial operation.
- o Mercury will be measured in the particulate and vapor state.
- o Benzene will be measured in the vapor state.
- o Particulate measurements for silica, arsenic, mercury and vanadium will be made using a sampler for inhalable particulates. Elemental analyses may be performed using

particulate induced X-ray emission (PIXE) techniques, atomic absorption or neutron activation techniques. Particulate samples will be collected every sixth day on the same schedule as the California Air Resources Board (CARB) statewide hi-vol particulate monitoring.

- o Mercury vapor measurements will be made by trapping the vapor and subsequent laboratory analysis. The schedule for mercury vapor sampling may differ from the particulate sampling depending on the exact method used.
- o Ammonia will be measured in the gaseous state concurrently with hydrogen sulfide. If a uniform ratio exists between ammonia and hydrogen sulfide, ambient hydrogen sulfide data can be used to estimate ammonia concentrations.
- o Ammonia measurements will be performed using a continuous No-NO₂ analyzer retrofitted with a high temperature converter designed for ammonia determination.
- o Measurement methods other than those specified above may be proposed and used by DWR as approved by CEC staff.

DWR and CEC staff, in consultation with CARB and DOHS, will agree upon significant levels of regulated and nonregulated pollutants applicable in the operational monitoring program. (Significant levels for regulated pollutants will be revised only if there is a change in federal or state Air Quality Standards.) A report prepared by CEC staff on the agreed upon levels for pollutants will be filed with the CAM.

- a. Verification--A sampling plan consistent with the above sampling requirements will be prepared by DWR for approval by CEC staff, in consultation with the CARB, and DOHS/RHS before monitoring begins.
- b. Enforcement--See General Section.
- c. Filings and Notifications - Same as air quality (3.4).

4. Operational Requirements

There are four requirements related to public health protection in this section:

- o Initial Steam Sampling Program - Same as air quality (I.A.3.1). Continuation of the initial steam sampling program will depend upon:
 - The variation of the steam concentration of each pollutant;
 - The rate of emission of each pollutant; and

The development or status of ambient air quality standards or emission regulations for each pollutant.

If pollutant concentrations do not vary more than 20 percent, and rates of emissions are low (as compared to agreed-upon significant levels), monitoring will be terminated for specific pollutants unless new regulations have been adopted that require monitoring.

- o Mass Balance Measurements--In the second year of commercial operation, DWR shall perform a mass balance measurement for mercury and arsenic. DWR will prepare a report on the mass balance measurements and calculations.
- o Ambient Monitoring--DWR will initiate an ambient monitoring program for any pollutant sampled if plant emissions are great enough to cause significant ambient concentrations at populated areas as determined by LCAPCD, DOHS, and CEC staff. Significant ambient concentrations resulting from power plant operation will be 33 percent of any standard or agreed-upon significant level when the plant contribution is added to baseline ambient concentrations in existence before the power plant began operation.
- o New Well Steam Analysis--This analysis will be required when new steam supply wells are added to guarantee that combined power plant emission (the sum of baseline, power plant contributions, and new well contributions) do not change significantly (+20 percent). Methodology for this analysis will be the same as in the Initial Steam Sampling Program.
 - a. Verification
 - o Initial Steam Sampling Program--Within 45 days after commencement of commercial operation, DWR shall perform the first quarterly steam analysis. DWR shall send the first and consecutive quarterly steam analyses and reports to DOHS and the CEC staff within 30 days after sampling. The quarterly steam sampling program will be conducted for one year. The results will be reviewed by the CEC staff to determine continuation of monitoring requirements, if any.
 - o Mass Balance Measurements--DWR shall send a report on the Mass Balance Measurements and calculations to DOHS and CEC staff within 30 days after completing the measurements. The program results will be evaluated by CEC and DOHS to determine requirements, if any, for continuation of a mass balance measurement program.

III. CULTURAL RESOURCES

Does the proposed project impact cultural resources?

A. Law--(Federal)--National Historic Preservation Act of 1966, 16 U.S.C. 470 et seq., 36 CFR 800. In the absence of the CEC exclusive siting authority, the responsible agency is the State Historic Preservation Office.

1. Preconstruction Requirements

CA-LAK-605, 607, 608

The above-mentioned sites will be flagged, and construction personnel will be informed to avoid these sites.

CA-LAK-609

The existing fence around CA-LAK-609 will be maintained to prevent construction impacts.

CA-LAK-610

DWR will develop and carry out a systematic archaeological recovery program in consultation with CEC staff prior to any construction activity. Such a program will include at least the development of an archaeological research design, site mapping, and site transect for sampling. Further, the analysis and curation of artifacts recovered will be undertaken.

a. Verification--N.A.

b. Enforcement--N.A.

c. Notification--N.A.

2. Construction Requirements

DWR will arrange for the presence of a qualified archaeologist, during stripping of vegetation and top soil from the plan site and related facilities to advise DWR's Construction Department of the significance of any cultural resource which may be discovered. The archaeologist will conform to on-site safety procedures, as directed by the Resident Engineer. Further, all construction personnel will be instructed to avoid all contact with flagged or fenced sites and to not disturb any other historic or archaeological material.

a. Verification--If cultural resources are discovered during such land alteration activities, the operation in the potentially impacted area will cease until the archaeologist evaluates the significance of the resource.

IV. BIOLOGICAL RESOURCES

A. Law

- o Public Resources Code, Section 25003 specifies, "...in planning for future electrical generation...environmental protection... should be considered."
- o Endangered Species Act of 1973 and implementing regulations.
- o California Species Preservation Act of 1970, Fish and Game Code, Sections 900 - 903.
- o Native Plant Protection Fish and Game Code, Sections 1900 - 1904 and 1911.
- o Endangered Species Act of 1970, Fish and Game Code Sections 2050 - 2055.
- o Fully Protected Species, Fish and Game Code Sections 3511 (a, g) 4700 (e).
- o California Environmental Quality Act, Public Resources Code, Section 21000 et seq., states that "All agencies of the state government which regulate activities of private individuals, corporations and public agencies which are found to affect the quality of the environment, shall regulate such activities so that major consideration is given to preventing environmental damage."

The delegated agency for legally protected species and fish and wildlife is the CDFG. CDFG also provides comments on species of special concern.

1. Preconstruction Requirements

- (a) DWR will have a qualified botanist identify and mark populations of Lomatium repostum in the vicinity of the power plant, transmission lines, and access roads. Construction crews will be alerted to avoid the marked populations.
 - a. Verification--DWR's botanist will prepare a statement summarizing the results of the survey and indicating completion of the marking.
 - b. Enforcement--The statement will be reviewed by staff of the CEC and CDFG. CEC and CDFG staffs will be allowed to make on-site inspections as necessary upon reasonable notice.
 - c. Filings and Notifications--DWR will file the statement with CEC staff 30 days prior to initiation of construction activities in the vicinity of these communities.

2. Construction Requirements--None.
3. Preoperation Requirements--None.
4. Operation Requirements--None.
5. Postoperation Requirements--None.

B. Law

- o Fish and Game Code Sections 900 - 903, California species Preservation Act of 1970.
 - o Public Resources Code Section 25003 states "...in planning for future electrical generation...environmental protection...should be considered."
 - o California Environmental Quality Act, Public Resources Code Section 21000 et seq., states that "All agencies of the state government which regulate activities of private individuals, corporations and public agencies which are found to affect the quality of the environment, shall regulate such activities so that major consideration is given to preventing environmental damage."
 - o Warren-Alquist Act, Public Resources Code Section 25527 states the Commission shall give greatest consideration to the protection of areas of critical environmental concern including, but not limited to, "unique and irreplaceable scientific, scenic and educational wildlife habitats...and areas under consideration by the state or the United States for wilderness or wildlife and game reserves."
1. Preconstruction Requirements--DWR shall comply with the following:
 - (a) DWR will prepare a detailed biological resources mitigation plan which includes a field implementation plan and submit it to the CEC staff for review and approval. This plan will include the mitigation measures set forth in the AFC (pages V-108 to V-115), excluding brush piles, (V-102) and in the NOI (pages V-16 and 17 and VII-14 and 15).
 - (b) DWR will have erosion controls for all disturbed areas in place prior to the first rain season following construction activities.
 - (c) DWR will commence monitoring streams (four locations, see AFC, Page V-97) in order to establish baseline data prior to construction activities. (This requirement will be satisfied if the cooperative Geysers KGRA aquatic study has commenced by this time.)

(d) DWR will submit erosion control measures for earthmoving activities which are proposed for December, January, February and March. CEC staff will review the plan for adequacy and provide a determination within 15 days of receipt. The plan must be approved prior to allowing earthmoving activities during these months. If earthmoving activities are planned from November to April, temporary measures will be implemented to control erosion as set forth in the AFC (pages V-10 to V-104).

a. Verification--DWR will submit a statement to CEC staff indicating that it has complied with the above requirements. CEC staff will review this statement. Upon reasonable notice, CEC staff and CDFG staff will be allowed to make on-site inspections.

b. Enforcement--DWR will not begin construction activities until it has complied with these requirements. If the required submissions are found unacceptable, the staff of CEC, CDFG and DWR will meet to resolve the differences. If differences cannot be resolved by staff, they will be submitted to the Commissioners for resolution.

c. Filings and Notifications--DWR will submit the following to CEC staff:

(1) DWR will submit a detailed biological resources mitigation plan [see B.1.(a)]. This plan will be submitted to CEC staff for review by January 16, 1981. CEC staff will inform the Applicant by February 2, 1981, of the adequacy of the proposed plan.

(2) DWR will submit a statement to CEC staff prior to the rainy season following major earthmoving activities indicating that requirement B.1.(b) has been satisfied.

(3) DWR will submit a statement to CEC staff indicating that requirement B.1.(c) has been satisfied.

(4) DWR will submit an erosion control plan required in B.1.(d).

2. Construction Requirements...

(a) DWR will continue monitoring the streams [see Preconstruction Requirement B.1.(c)].

(b) DWR will implement applicable measures of the approved detailed biological resources mitigation plan [see Preconstruction Requirements B.1.(a)].

(c) DWR will inspect, cut, and fill slopes and other disturbed areas for impacts from gully erosion and will take corrective action whenever necessary until permanent vegetation is established.

a. Verification

(1) DWR will submit an annual stream monitoring report to CEC staff for review (see 1.c.).

(2) DWR will submit annually a statement indicating compliance with the applicable requirements of the detailed biological resources mitigation plan.

(3) Upon reasonable notice, CEC staff and CDFG staff will be allowed access to the leasehold as necessary or appropriate.

b. Enforcement--If the requirements are not fulfilled, the Applicant and CEC staff will attempt to resolve any problems or differences. If differences cannot be resolved by staff, they will be taken before the Commission for resolution.

c. Filings and Notifications

(1) DWR will submit annual reports documenting the results of the stream monitoring to CEC staff for review [see B.1.(c)]. If significant sedimentation impacts are occurring, the staff of DWR, CEC and CDFG will meet to decide what further measures should be taken to correct or reverse these adverse impacts.

(2) DWR will submit a statement (including photographs when applicable) to CEC staff indicating which measures of the detailed biological resources mitigation plan have been implemented.

3. Preoperation Requirements

(a) DWR will begin visual observations and infrared aerial photography prior to power plant operation in order to establish a baseline against which cooling tower drift impacts will be evaluated.

(b) DWR will implement applicable measures of the approved detailed biological resources mitigation plan (see Preconstruction Requirements).

(c) DWR will continue monitoring for gully erosion and revegetation success [see B.2.(c)].

(d) DWR will continue stream monitoring [see B.1.(c)].

a. Verification

- (1) DWR will submit a statement to CEC staff indicating that baseline observations for cooling tower drift have been made. CEC staff will review this statement.
- (2) DWR will submit a statement indicating compliance with the applicable requirements of the detailed biological resources mitigation plan.
- (3) DWR will submit an annual stream monitoring report [see B.1.(c)].
- (4) DWR will submit an annual gully erosion and revegetation success monitoring report.
- (5) CEC staff or CDFG staff will be allowed access to the leasehold as necessary or appropriate to verify compliance.

b. Enforcement--If the above requirements are not fulfilled, the DWR and CEC staff will attempt to resolve any problems or differences. If differences cannot be resolved by staff, they will be taken before the Commission for resolution.

c. Filings and Notifications

- (1) DWR will submit the statement to CEC staff indicating that requirement B.3.(a) has been satisfied. The statement will identify where, when, and how the visual observations have been made and the results. The statement will also identify the area, date, time, and altitude coverage (scale) by the aerial photography.
- (2) DWR will submit a statement (including photographs when applicable) to CEC staff indicating which mitigation measures and monitoring studies included in the detailed biological resources mitigation plan have been implemented.
- (3) DWR will submit a statement indicating that requirement B.3.(c) has been satisfied.
- (4) DWR will submit an annual stream monitoring report [see B.1.(c)].

4. Operation Requirements

- (a) DWR will continue monitoring the potential drift impact area. Monitoring is required for at least the first three years of plant operation at which time DWR, CDFG, and CEC staff will meet to determine if further monitoring is necessary. If significant damage or changes

are observed, DWR, CDFG, and CEC staff will decide on further studies and/or necessary mitigation measures.

- (b) If the CEC staff receives any submittals, complaints or other information from DWR, other agencies or the public that indicates one or more significant impacts are occurring on the leasehold, the Applicant and CEC staff will meet to determine what further measures shall be taken to correct or reverse these impacts.
 - (c) DWR will implement applicable measures of the approved detailed biological resources mitigation plan (see Preconstruction Requirements).
 - (d) DWR will continue stream monitoring for benthic organisms and water quality [see E.1.(c)].
 - (e) DWR will continue monitoring of gulley erosion and revegetation success on cut and fill slopes. These reports are required until mitigation has been permanently established on the cut and fill slopes. At that time DWR shall contact the CEC staff to consider termination of this aspect of the monitoring program.
 - (f) DWR shall submit to CEC staff one year prior to termination of power plant operation a detailed biological resources mitigation element as part of their power plant decommissioning plan.
- a. Verification
- (1) DWR will submit an annual drift monitoring report to the CEC staff for review.
 - (2) DWR will submit a statement indicating compliance with the applicable requirements of the detailed biological resources mitigation plan.
 - (3) DWR will submit an annual stream monitoring report (see 1.c.)
 - (4) DWR will submit an annual gully erosion and revegetation success monitoring report.
 - (5) CEC staff or CDFG staff will be allowed access to the leasehold as necessary or appropriate to verify compliance.
- b. Enforcement--If the above requirements are not fulfilled, the Applicant and CEC staff will attempt to resolve any problems or differences. If differences cannot be resolved by staff, they will be taken before the Commission for resolution.

c. Filings and Notifications

- (1) DWR will submit an annual report by January 1st of each year documenting the results of the previous year's observations and photography including an identification of any areas of stress or damage or changes in these areas. These photographs will be made available to the staff of CEC or CDFG upon request.
- (2) DWR will submit a statement (including photographs when applicable) to CEC staff indicating requirement B.4.(c) has been satisfied.
- (3) DWR will submit an annual stream monitoring report. these reports shall be required for the life of the project [see B.1.(c)].
- (4) DWR will submit an annual gully erosion and revegetation success monitoring report.
- (5) DWR will submit a detailed biological resources decommissioning plan to CEC staff for review and approval one year prior to termination of power plant operation.

5. Postoperation Requirements--DWR will implement the approved decommissioning plan.

- a. Verification--DWR will submit a statement of compliance to CEC staff indicating they have complied with the approved decommissioning plan. Staff of CEC of CDFG will be allowed access to the leasehold as necessary or appropriate to verify compliance.
- b. Enforcement--If compliance is not carried out, DWR, CDFG, and CEC staff will attempt to resolve any problems or differences. If differences cannot be resolved by staff they will be taken before the Commission for resolution.
- c. Filings and Notifications--DWR will submit all information designated by the CEC staff in its approval of the decommissioning plan.

V. WATER QUALITY

Will the construction and operation of the facility result in adverse impacts on water quality of the area?

- A. Law--California Administrative Code, Title 23, Subchapter 15--implementing Porter-Cologne Act with respect to waste disposal to land (see Section X WASTE MANAGEMENT).

Law--California Health and Safety Code, Division 20, Chapter 6.5; California Administrative Code, Title 22, Division 4, Section 66028, et seq.--in the absence of CEC exclusive siting authority, the responsible agency is the Department of Health Services (DOHS). (See Section X WASTE MANAGEMENT.)

Law--Porter Cologne Water Quality Control Act. California Administrative Code, Title 23, Section 13260--requiring any person discharging waste which could affect waters of the state to file a report of waste discharge, Section 13269--providing a conditional waiver to Section 13260.

Plan--Spill Contingency and Containment Plan, filed with Central Valley Regional Water Quality Control Board (CVRWQCB) by DWR pursuant to CAC, Title 23, Section 13269.

1. Preconstruction Requirements--None.
2. Construction Requirements--None.
3. Preoperation Requirements--None.
4. Operating Requirements--In the event of an accidental spill of condensate to a surface stream, DWR or steam field operator, pursuant to the above Order, will implement the monitoring program described in the "Spill Contingency and Containment Plan."
 - a. Verification--DWR or the steam field operator will report a spill by telephone to the CVRWQCB as soon as possible and submit to the CVRWQCB a detailed written report within two weeks after the spill has occurred. This information and the monitoring reports will be available to CEC staff upon request.
 - b. Enforcement--The CVRWQCB is responsible for enforcing the waste discharge requirements, Order No. 76-202, and the requirements of the spill contingency and containment plan.
 - c. Filings and Notifications--Reports of spills are to be filed with the CVRWQCB by the utility or the steam field operator. These files are open to the public. The CVRWQCB shall notify the CAM of any potential enforcement actions.

5. Postoperation Requirements--None.
3. Law--California Porter-Cologne Water Quality Control Act--In lieu of filing a Report of Waste Discharge with the Central Valley Regional Water Quality Control Board, as required by Section 13260 of the Act, the utility may propose a spill containment system that will preclude discharges of condensate and other wastes off the plant site, a provision of Section 13269.

Plan--CVRWQCB Approved Spill Contingency Plan for Accidental Spills and Discharges. A contingency plan for cleanup and abatement of accidental spills by persons who discharge, store, or otherwise manage wastes or hazardous materials.

1. Preconstruction Requirements--None.
2. Construction Requirements--DWR will construct and maintain an impermeable retention-containment system to contain condensate and other on-site spills.
 - a. Verification--DWR will maintain "as-built" drawings signed by a registered civil engineer for the spill containment system. Additionally, DWR shall provide documentation that the spill containment system liner is a material having a permeability of 1×10^{-5} cm/sec or less.
 - b. Enforcement--See General Requirements.
 - c. Filings and Notifications--DWR will maintain "as-built" drawings upon completion of construction activities. DWR will maintain these files for the life of the project. CEC staff will have access to DWR "as-built" files.
 - (1) DWR shall notify the CAM of completion of items as required in Item A.
3. Preoperation Requirements--None.
4. Operating Requirements
 - a. Verification--DWR shall submit a statement annually to the CVRWQCB which describes the condition of the spill containment basin, barrier, and pump-back system.
 - b. Enforcement--See General Notes.
 - c. Filings and Notifications--The statement shall be filed with the CVRWQCB by July 1.
5. Postoperation Requirements--None.
- C. Standard--water Quality Control Plan for the Sacramento River Basin, 5A, adopted by the CVRWQCB.

1. Preconstruction Requirements
 - a. Verification--DWR shall file a notice with the CVRWQCB concerning the Transmission Line construction phase of the project.
 - b. Enforcement--See General Notes.
 - c. Filings and Notifications--DWR or its Transmission Line contractor shall provide the CVRWQCB with a Transmission Line route map (showing pads, towers, roads, etc.), and a construction phase schedule.
2. Construction Requirements--Vegetation removal and erosion/siltation contributing construction shall be minimized whenever possible, and DWR and its contractors shall comply with any waste discharge requirements, conditions, or monitoring the RWQCB may require.
 - a. Verification--RWQCB routine inspections or response to complaints.
 - b. Enforcement--See General Notes.
 - c. Filings and Notifications--None.
3. Preoperation Requirements
 - a. Verification--DWR shall prepare "as-built" drawings verifying compliance with the CVRWQCB accepted domestic waste disposal system for carrying the domestic wastes to the steam supplier's reinjection line.
 - b. Enforcement--Changes to the CVRWQCB accepted domestic waste disposal system may require CVRWQCB approval.
 - c. Filings and Notifications--DWR will: (1) file a copy of the "as-built" drawings with the CVRWQCB and (2) maintain a copy for the life of the project.
4. Operating Requirements--None.
5. Postoperation Requirements--None established.

VI. GEOTECHNICAL AND CIVIL ENGINEERING

Issue i

Will DWR's grading plans assure adequate site safety and comply with applicable excavation and grading terms and conditions of the certificate and Joint Prehearing Conference Statement of the Commission staff and applicant?

A. Ordinances

Uniform Building Code (1979), especially Chapters 3, 29, and 70 as adopted by Lake County Ordinance 970 and reviewed and applied by the CEC staff.

- o Chapter 3 sets forth requirements for permits and fees.
- o Chapter 29 sets forth requirements for excavation, fills, foundations, and retaining walls.
- o Chapter 70 sets forth requirements for site excavation and grading to safeguard life, limb, property, and public welfare.

The California Business and Professions Code, Section 7835, requires that engineering geologic reports be prepared and signed (or sealed) by a registered geologist or certified engineering geologist.

1. Preconstruction Requirements--DWR shall prepare and submit proposed grading plans for review by CEC staff and the Lake County Chief Building Official (CBO).

a. Verification

DWR's responsible registered civil engineer(s) and certified engineering geologist(s) shall verify and sign, that the proposed grading plans (including the accompanying reports) comply with the requirements set forth in the standards and documents referenced herein.

The CBO shall review and comment on compliance of the proposed plans and specifications with requirements (primarily USC76) of County Ordinances. CEC staff or its agent shall review DWR's proposed plans to determine compliance with any other requirements (including, but not limited to, those to mitigate adverse geologic conditions, soil erosion, and public health and safety).

Upon submittal by DWR to the CAM of adequate quality assurance/quality control procedures for review and checking of grading plans, CEC staff may delegate to DWR responsibility for determination that proposed grading plans conform with USC79 or other requirements of the certificate.

b. Enforcement

The CEC staff shall not accept DWR's proposed grading plans unless they are in substantial compliance with the criteria referenced herein.

If the proposed grading plan is not accepted by the CEC staff, it shall be modified by DWR for modification until substantial compliance is attained.

DWR shall not begin any excavation, grading, or other earthwork (other than that required for site exploration) until the proposed grading plans are accepted by CEC staff.

c. Filings and Notifications

At least 30 days prior to submittal of proposed grading plans, DWR shall notify the CAM that the plans will be filed on or about a certain date. At least 60 days prior to intended start of site excavation and grading, DWR will simultaneously submit proposed grading plans to the CAM and the CBO for review.

The CBO will, within 25 days of grading plan submitted, file concurrently with DWR and the CAM, a compliance letter containing the County's review comments.

The CAM will, within 50 days of receipt by CEC of DWR's proposed grading plans, file a compliance letter to notify DWR if the plans are acceptable to CEC staff, or, if not, of the CEC staff recommendations. Should the CAM fail to file the compliance letter within 50 days, DWR may deem its proposed grading plans acceptable to CEC staff.

2. Construction Requirements--Site excavation and grading shall comply with accepted grading plans and change orders.

a. Verification

(1) Substantial Changes. Should adverse site conditions warranting substantial changes* in facility design or other mitigation measures be discovered during site excavation and grading, DWR's evaluation of these conditions shall be signed and stamped by a certified engineering geologist, and any plans setting forth the substantial changes (change orders) shall be signed and stamped by the responsible registered civil engineer, who shall also verify that the change orders conform with the terms and conditions of the certificate.

*"Substantial changes" are those changes requiring an alteration in design concept and preparation of new design calculations. For example, thickening the cooling tower basin foundation by one foot would be considered a minor change. However, deepening of the foundation by two or three feet or redesign of the foundation as a network of pier foundations will be considered a substantial change.

CEC staff will review the proposed change orders and the geotechnical information on which they are based to determine that they conform with the terms and conditions of the certificate.

(2) Inspections. DWR will assign to the project one or more qualified geotechnical engineers to monitor compliance with design intent in geotechnical matters, to provide consultation during design and construction of the project, to make professional geotechnical judgements concerning actual site conditions and to recommend field changes to the responsible civil engineer. The responsibilities of the geotechnical engineer will include:

- o Review of earthwork quality control tests (including compaction tests);
- o Reporting to the responsible civil engineer any geologic conditions which differ from those predicted on the basis of the engineering and geology and soils engineering reports and any site earthwork which does not comply with the approved grading plans and change orders;
- o Preparation, in accordance with USC 7015, of a soils grading report with his approval that the site is adequate for the intended use; and
- o Other duties (such as monitoring on-site or near-site groundwater levels) as appropriate.

If the geotechnical engineer is a certified engineering geologist, he may also be given the responsibilities listed in the following paragraph.

DWR will assign to the project a qualified certified engineering geologist who will be present as needed during all phases of site excavation and grading to evaluate site geologic conditions and geologic safety. Responsibilities of the engineering geologist will include:

- o Collection during site excavation and grading of information relative to site geology and geologic safety, including inspection and monitoring of drill logs and drill cores;
- o Preparation of a detailed permanent geologic map or log of all final excavated surfaces (including walls and floors of the foundations of the turbine generator building, cooling tower, and other permanent structures);

- o Reporting to the responsible civil or geotechnical engineer any geologic conditions which differ from those predicted in the Engineering Geology Report; and
- o Preparation, in accordance with requirements of UBC Section 7015, of a geologic grading report, with approval that the site is adequate for the intended use as affected by geologic conditions.

The CEC staff or its agents, may, upon reasonable notice to DWR, inspect the site at any time to verify conformance of site earthwork with approved plans and change orders and/or to evaluate newly discovered adverse site conditions.

Upon submittal by DWR to the CAM of adequate quality assurance/quality control procedures for inspectors of earthwork and grading, CEC staff may delegate to DWR responsibility for determining that such work conforms with UBC79 or other requirements of the certificate.

Should CEC staff delegate earthwork inspections to DWR, DWR will certify that any designated inspectors have the authority to: (a) stop excavation or grading in areas where adverse site conditions are discovered or where earthwork does not conform with the approved grading plans or change orders; and (b) require that changes or remedial work be performed to reestablish conformance or to achieve the design intent.

- (3) Attestments of Compliance. DWR's responsible civil engineer shall certify on the As-graded plan that site earthwork was done in accordance with the final approved grading plan (including change orders) and satisfies the design intent.

The CEC staff may review the As-graded plans and accompanying soils grading report and geologic grading report and may conduct a final inspection of site earthwork to verify that site earthwork complies with the accepted final grading plan.

b. Enforcement

- (1) Substantial Changes. DWR shall not proceed with any earthwork in the affected area (except that necessary to protect persons, property, and the environment) based on proposed change orders until the change orders are accepted by CEC staff.
- (2) Inspections. If, upon inspection of site earthwork, DWR's quality control engineers or designated inspectors, or CEC staff or its agents discover nonconformance with approved

grading plans and change orders, they may require whatever changes or remedial work are necessary to reestablish conformance. Upon site evaluation of newly discovered adverse site conditions, they may recommend changes to ensure compliance with design intent.

If the CEC staff delegates inspection to DWR:

- o DWR's responsible inspector or geotechnical engineer shall halt any earthwork which does not conform with the approved grading plans and change orders, and shall notify the responsible civil engineer,
- o Changes or remedial work to reestablish compliance shall be performed as directed by the geotechnical engineer or the civil engineer, and
- o DWR's responsible engineering geologist shall halt site earthwork as necessary to adequately evaluate any adverse geologic conditions or hazards discovered during site excavation or grading.

DWR will not begin construction of any structure or foundation until notified by the CAM that site earthwork is acceptable to CEC staff.

c. Filings and Notifications

- (1) Substantial Changes. Discovery of adverse site conditions which will warrant only minor changes in facility design or other mitigation measures need not be reported by DWR to the CAM. Such new geotechnical information will be reflected in the As-graded and As-built plans. DWR will maintain the As-built and As-graded files for the life of the project. CEC staff will have access to these files.

As soon as possible after DWR confirms the presence of any adverse site conditions which may require substantial changes, DWR's civil engineer or geotechnical engineer shall notify the CAM and shall submit to the CAM the new geotechnical information upon which the necessary change orders will be based.

As soon as possible after DWR has developed change orders for such hazardous or adverse geologic conditions, DWR will submit two copies of such change orders to the CAM for determination of their acceptability.

Unless DWR is notified otherwise within 30 days of receipt by CAM of any change order, DWR's proposed change orders will be deemed acceptable to CEC staff.

- (2) Inspections. CEC staff, or its agents, shall give DWR reasonable notice (at least 24 hours) prior to unscheduled

inspections of site earthwork, unless an imminent hazard requires more immediate inspection.

DWR will notify the CAM when site earthwork is ready for final inspection and, upon completion of the rough grading work and at the final completion of the work, will file with the CAM, two copies of the As-graded plan, soils engineering report, and geologic grading report.

- (3) Progress Reports and As-graded Plans. DWR will submit to the CAM a monthly summary of construction progress. Upon completion of site earthwork, DWR will prepare and maintain as a public record for the life of the project the As-graded plans. CEC staff and its agents shall have access to these filed documents.
- (4) Attestments of Compliance. If the CAM does not notify the CBO otherwise within 10 days of submittal of the final As-graded plan and supplementary reports, the CBO may deem these documents and site earthwork acceptable to CEC staff.

3. Preoperation Requirements--None.

4. Operating Requirements--None.

5. Postoperation Requirements--DWR will prepare and submit a reclamation plan to the CEC staff to restore the site to its original condition as nearly as practicable at least six months prior to decommissioning of the facility.

Issue II

How can potentially adverse conditions predicted in shear zone materials in the cooling tower foundation be adequately evaluated and mitigated?

Ordinances

There are no directly applicable legal requirements; those cited for Geotechnical Issue I are made applicable by agreement with DWR [see Findings 1, Joint Prehearing Conference Statement of the Commission staff and the Applicant (JPCSCSA) dated August 22 and 27, 1980]. The requirements which the CEC staff and DWR have agreed upon to alleviate the concern expressed in Issue II are stated in the remainder of the JPCSCSA.

VII. SOILS EROSION PROTECTION

Has the DWR complied with standards controlling soil erosion and consequent sediment yield?

Standard--The Central Valley Basin Plan (based on requirements set forth in the Porter-Cologne Water Quality Control Act) of the Central Valley Regional Water Quality Control Board (CVRWQCB). The delegated agency is the CVRWQCB.

1. Preconstruction Requirements--None.
2. Construction Requirements--DWR will adhere to the requirements set forth in the Central Valley Basin Plan concerning maximum allowable cut and fill slopes and revegetation of disturbed areas.
 - a. Verification--Site inspection may be performed by CVRWQCB prior to the operating phase. A statement verifying compliance with the standard will be prepared by DWR.
 - b. Enforcement--Any CVRWQCB determination of noncompliance substantial enough to require corrective action will be reported to DWR with a copy sent to the CAM in writing. In the notification, CVRWQCB will recommend any actions they deem necessary to correct the noncompliance.
 - c. Filings and Notifications--DWR will file a statement of compliance with CVRWQCB and the CAM prior to the operating phase.
3. Preoperation Requirements--None.
4. Operating Requirements--None.
5. Postoperation Requirements--None.

Agreement--DWR will construct and maintain a sediment containment system of terraced slopes and straw bail barriers until revegetation of cut and fill slopes is effective. DWR will annually quantify the sediments accumulated in the sedimentation containment system.

1. Preconstruction Requirements--None.
2. Construction Requirements--None.
3. Preoperation Requirements--None.
4. Operating Requirements--Annual quantification of sediments accumulated in the sedimentation containment system for the first three years after completion of the site preparation; after three years DWR may request CEC staff to review the need for additional reports.
 - a. Verification--DWR shall annually monitor the sedimentation yield through measuring the amounts of sediments accumulated in the sedimentation containment system.

- b. Enforcement--CVRWQCB determination of excess sedimentation may result in a cease and desist order to DWR.
 - c. Filings and Notifications--DWR will annually submit a report of sediment accumulated in the sediment containment system to CVRWQCB and CAM. CVRWQCB will notify the DWR in writing of any unacceptable sedimentation rates including any recommendations for corrective measures. A copy of any such notification will be sent to the CAM.
5. Postoperation Requirements--DWR will prepare and submit to CEC staff for review and approval, site restoration plans at least six months prior to decommissioning of the power plant.

VIII. STRUCTURAL ENGINEERING

Will the proposed power plant and related facilities be designed and constructed to ensure adequate safety and reliability and to comply with applicable laws, ordinances, standards, and other applicable criteria?

A. Laws, Ordinances, Standards, and Other Criteria

Laws

- 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 current edition of Uniform Building Code (UBC) as minimum legal building standards. UBC 79 is currently scheduled for adoption.
- 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 Lake County Ordinance 970 adopting (with appropriate additions or deletions) UBC 76 or equivalent building standard as deemed applicable by the Commission.

Standards

- o Uniform Building Code, 1979 Edition (UBC 79)
- o American Society of Mechanical Engineers' Boiler and Pressure Vessel Code.
- o American National Standards Institute, "B 31.1 Power Piping Code."
- o American Concrete Institute (ACI), "Building Code Requirements for Reinforced Concrete" (ACI 318-77).
- 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).
- o American Institute of Steel Construction (AISC), "Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings" (AISC SPEC 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 Joists Using ASTM A325 or A490 Bolts," April 1978 (AISC SST 78).
- o American Welding Society, "Structural Welding Code AWS D1.1-179" (AWS D1-79).
- o American Welding Society AWS D12.1-75, "Reinforcing Steel Welding Code."
- o "National Design Specification for Stress-Grade Lumber and Fastenings, 1977" (NDS 77).
- o "Timber Construction Standards," AITC-100, American Institute of Timber Construction, 1972.
- o American Iron and Steel Institute (AISI), "Specifications for the Design of Light Gauge Cold-Formed Steel Structural Members" (AISI SDLCFSS).
- o Steel Joist Institute, "Standard Specifications and Load Tables" (SJI SSLT).
- 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 Tower with Douglas Fir Lumber," October 1974 (CTI).
- o Structural Engineers Association of California (SEAOC), "Recommended Lateral Force Requirements," 1975, Recommendations and Commentary (SEAOC Recommendations and Commentary).
- o Departments of the Army (TM 5-009-10), the Navy, and the Air Force, "Seismic Design for Buildings," Section 9 excepting subsection 9-061, April 1973.

Other Criteria

- o DWR will design and construct the power plant and its related facilities in accordance with:
 - a. DWR Bottle Rock AFC, Section IV.D. (entitled, "Seismic Performance Criteria," revised May 22, 1980), Appendix A (Part III, entitled, "Structural Design and Construction Policy," revised May 22, 1980, and Appendix B (entitled, "A Report on Geysers Power Plants," by Dr. Haresh C. Shah, dated May 1980).

- b. Applicant's responses (dated November 5, 1979) to Staff Interrogatories.
- c. Record of telephone conversation, Gaylon Lee (CEC) and Dale Martfeld (DWR), July 21, 1980.
- d. Applicable Findings and Conclusions regarding Structural Engineering of the Joint Prehearing Conference Statement of the Commission Staff and the Applicant dated August 29, 1980.
- d. Applicable Terms and Conditions of the Certificate.
- o DWR will use the Applied Technology Council "Tentative Provisions for the Development of Seismic Regulation for Buildings" (NBS-SP-510) as a guide in the design of the power plant and related facilities.

In the event that UBC 79 is not adopted by the state (under Title 24 CAC) prior to construction, the Applicant will demonstrate that facility design conforms with the requirements of UBC 1976.

- o In the case of discrepancies between criteria set forth in any of the laws, ordinances, standards, or criteria referenced herein, the utility will use the highest criteria in the final design and construction of the power plant and related facilities.
- 1. Preconstruction Requirements--DWR shall prepare and submit proposed final design documents (plans and specifications) for review by CEC staff and by Lake County CBO.

a. Verification

DWR's design engineer(s) shall sign and/or stamp all proposed final plans* and specifications, and shall certify in writing that to his personal knowledge:

- o The proposed final plans and specifications are consistent with the applicable referenced criteria and with any other applicable terms and conditions of the certificate, and were developed using design criteria and methods accepted by CEC staff, and
- o The utility's procurement specifications for components purchased from a vendor, comply with the referenced criteria and with any other applicable terms and conditions of the certificate.

*final plans are defined as the plans upon which construction will be based (e.g., used for bid purposes).

For the Turbine/Generator Building, Turbine/Generator Pedestal, Cooling Tower, and Stretford Absorber Columns, DWR will clearly demonstrate through design calculations and drawings that the proposed final plans and specifications are based on and conform with design criteria and methods required by the certificate or that any nonconformance is justified.

The Lake County CBO shall review and comment on compliance of proposed plans and specifications with requirements (primarily USC 76) of County Ordinance 970. The CEC staff or its agent shall review DWR's proposed design criteria and methods, preliminary and final plans and specifications, and upon request, may review proposed procurement specifications to determine that the proposed design or design approach conforms with terms and conditions of the certificate (other than County requirement) or, of not, that any nonconformance is justified.

Upon submittal by DWR to the CAM of adequate quality assurance/quality control procedures for review and checking of final design plans and specifications for the proposed structure and equipment, CEC staff may delegate to DWR responsibility for determining that the proposed final plans and specifications comply with USC 79 or other requirements of the certificate.

b. Enforcement

If the utility's proposed design criteria or methods, final plans and specifications, and procurement specifications are not acceptable to the CEC staff, the design documents shall be modified by DWR until substantial compliance is attained.

The utility shall not begin construction of any structure or foundation for which final plans and specification have not been accepted by CEC.

c. Filings and Notifications

At least 30 days prior to submittal of any design documents, DWR will notify the CBO and CAM of the intended submittal date.

DWR will furnish two sets of preliminary plans and specifications to both the CEC and to the Lake County Chief Building Official (CBO) for review and comment concurrently with the Applicant's staff review process.

DWR will simultaneously submit two complete sets of final structural designs plans and specifications for each structure and structure foundation to the CAM and CBO at least 75 days prior to the intended date of bid opening.

The final plans and specifications will reflect the inclusions of approved criteria, assumptions, and methods used to develop the design, and for the Turbine-Generator Building, Cooling Tower, and Stretford Absorber Column, shall include design calculations.

The CEO will within 50 days of submittal of both preliminary and final plans and specifications by DWR, file concurrently with DWR and the CAM, a compliance letter containing the county's review comments.

The CAM will, within 70 days of receipt by CEC of DWR's proposed final plans and specification, file a compliance letter to notify DWR if the proposed plans and specifications are acceptable to CEC staff or, if not, what changes are recommended by CEC staff. Should the CAM fail to file a compliance letter within 70 days, DWR may deem its proposed final plans and specifications acceptable to CEC staff.

2. Construction Requirements--The power plant and related facilities will be constructed in accordance with accepted final plans, specifications, and change orders for substantial changes.

- a. Verification

Should DWR propose substantial changes (as defined under Geotechnical and Civil Engineering) in facility design, the proposed substantially changed plans and specifications (change orders) shall be signed and/or stamped by the responsible design engineer who shall also certify that the proposed change orders conform with the requirements set forth or referenced herein and with any other terms and conditions of the certificate. Any nonconformance shall be justified by the utility.

The CEC staff or its agent will review the proposed change orders to determine that they conform with the requirements; or, if not, that any nonconformance is justified.

DWR will provide, through its Construction Office, a staff of field engineers and inspectors to monitor conformance with the accepted final plans, specifications, and change orders. These field engineers and/or inspectors will be present on site at all time to monitor construction activities.

Upon submittal by DWR to the CAM of adequate quality assurance, quality control procedures for inspection of construction work, CEC staff may delegate to DWR responsibility for determining that construction work conforms with USC 79 or other requirements of the certificate.

Should the CEC delegate responsibility for inspections to DWR, DWR shall certify that the designated inspectors have the authority to:

- o Stop construction work which does not conform with approved plans, specifications, and change orders;
- o Require changes or remedial work to reestablish conformance; and
- o Report substantial nonconformance to the CAM and CBO as soon as discovered.

CEC staff, or its agent, may upon reasonable notice, inspect the construction at any time to ensure that construction conforms to the accepted final plans, specifications, and substantial change orders.

Should DWR proposed substantial corrective measures for any nonconforming construction work, DWR's responsible civil engineer shall sign and/or stamp the proposed corrective plan and specifications shall certify that they conform with the applicable criteria. Any nonconformance shall be justified by DWR.

Any proposed substantial corrective measures shall be reviewed by the CBO and CEC staff or its agent to determine that they conform with the applicable criteria or with the design intent.

Upon request by DWR's responsible engineer, select fabricated materials shall be inspected for compliance with contract specifications, either in the suppliers' shops or on-site, by the utility's Engineering Quality Control Inspection Group. The test requirements shall be described in DWR's contract specifications or referenced standards.

The utility's responsibility civil engineer shall certify in writing to the CAM that the finished work for each major structure or component is accurately depicted in the As-built plans and that it conforms with accepted final plans, specifications, and change orders.

b. Enforcement

The utility shall not begin any construction based on proposed change orders or corrective measures unless these design documents have been accepted by CEC staff.

If, upon inspection of construction work the utility's quality control engineers, designated inspectors, CEC staff, or its agent discover that the work is in substantial nonconformance with the approved plans, specifications, and

change orders; the discoverer will immediately request that the construction work be stopped and notify the CAM.

If, upon inspection of construction work any of the utility's quality control engineers or inspectors discover minor nonconformance with the approved plans, specifications, and change orders; he shall halt construction work and require whatever changes or remedial work is required to reestablish conformance. The CAM need not be notified of or approve these changes; the corrective work shall be reflected in the As-built plans and specifications.

Upon notification by DWR of completed construction for each major structure or component, CEC staff or its agent may perform final site inspection to determine that the finished work is accurately represented by the As-built plans and specifications and conforms with the approved final plans, specifications, and change orders.

c. Filings and Notifications

At least 15 days prior to submitting a proposed change order which substantially revises approved final plans and specifications, DWR shall notify the CAM of its intent to submit such change orders.

If substantial nonconforming work is discovered by any of DWR's quality control engineers or inspectors, designated inspectors, or by CEC staff or its agent; the discoverer will immediately notify the CAM of the nonconformance.

At least 30 days prior to intended start of construction based on a proposed change order or corrective measure, the utility will submit at least 2 copies of such change order or corrective measure to the CAM for review.

The utility's proposed change order or corrective measure will be deemed approved unless the CAM notifies the utility otherwise within 30 days of receipt by CEC.

A monthly summary of construction progress will be submitted to the CAM of construction by DWR.

DWR will notify the CAM upon completion of each major structure or component.

The following will be established and maintained as public records on file at DWR:

- o A summary of concrete strength tests;
- o Copies of concrete pour sign-off sheets;
- o Bolt torque inspection reports;

- o Weld (yield) inspection sheets; and
- o As-built drawings for the construction of civil and architectural work (changes approved by the CAM shall be identified on the As-built drawings).

CEC staff and its agents shall have access to these filed documents.

3. Preoperation Requirements--None.
4. Operating Requirements--Modifications to the facility after operation has commenced which would violate the laws and standards in Section A above is considered a major change and requires CEC approval before the change is made.

- a. Verification

The utility will file engineering descriptions of intended major changes with the CAM. Verification as in Construction above.

- b. Enforcement

Same as Construction above. Inspections can be delegated to the utility as provided in Section 305, Chapter 3 of the UBC.

- c. Filings and Notifications

Same as Construction above.

5. Postoperation Requirements--None determined.

IX. WASTE MANAGEMENT

Will DWR comply with requirements for handling and disposing of construction wastes and wastes generated by the cooling towers, air pollution abatement equipment and other sources? Will DWR comply with requirements for recovering feasibly recoverable wastes?

- A. Law--California Health and Safety Code, Division 20, Chapter 6.5, "Hazardous wastes."

Regulations--California Administrative Code, Title 22, Division 4, Chapter 0, "Minimum Standards for Management of Hazardous and extremely Hazardous Wastes."

In the absence of CEC exclusive siting authority, the responsible agency is the California State Department of Health Services (DOHS).

Law--Porter Cologne water Quality Control Act. California Administrative Code, Title 23, Section 13260 (requiring any person discharging waste which could affect waters of the state to file a report of waste discharge).

Regulations--California Administrative Code, Title 24, Subchapter 15 (implementing Porter-Cologne Act with respect to waste disposal to land). In the absence of CEC exclusive siting authority, the responsible agency is the Central Valley Regional Water Quality Control Board.

1. Preconstruction Requirements--None.
2. Construction Requirements--DWR shall inform the CAM and Solid Waste Management Board (SWMB) of the disposal option selected for construction wastes generated.
3. Preoperation Requirements--Ensure availability of Class II-1 solid waste disposal sites approved for geothermal wastes.
 - a. Verification--Completed Waste Discharge Requirements for Geothermal, Inc. (Middletown site) and I.T. Corporation (Kelseyville site) were adopted by the Central Valley Regional Water Quality Control Board on August 27, 1976, and September 22, 1978, respectively. These sites are approved for disposal of drilling mud, petroleum fractions, geothermal condensates or brines, and geothermal power plant wastes from hydrogen sulfide removal equipment.
 - b. Enforcement--DOHS, Hazardous Materials Management Section can inspect hazardous waste disposal facilities, and will enforce the law and regulations applicable to hazardous waste facilities.
 - c. Filings and Notifications--None.

4. Operating Requirements--Hazardous waste haulers' manifests will be submitted monthly by the hazardous waste producer to the State Department of Health Services (DOHS), Hazardous Materials Management Section, whenever hazardous wastes (cooling tower sludge, sulfur, etc.) are hauled from the plant and disposed of at a Class II-1 or other solid waste disposal site.
 - a. Verification--Data from the manifests will be put into a DOHS computer and can be cross-checked if necessary. This data will be available to CEC staff upon request.
 - b. Enforcement--Illegal dumping of wastes from the plant site will be determined by the DOHS or the Central Valley Regional Water Quality Control Board (CVRWQCB) or appropriate board. DOHS will continue to have authority over the waste hauler, and DOHS and the CVRWQCB will have authority over the disposal site operator. Any DOHS or CVRWQCB proceeding or action that could affect disposal of waste generated by Bottle Rock will be reported to the CEC staff by DOHS or the CVRWQCB.
 - c. Filings and Notifications--Hazardous waste haulers' manifests are to be submitted by the waste producer, and disposal site operator, monthly, to the DOHS. Monitoring programs are submitted by the disposal site operator to the CVRWQCB or appropriate board.
8. Law--California Health and Safety Code, Division 20, Chapter 6.5; Regulations. California Administrative Code, Title 22, Division 4 Requirements for Storage, Handling, and Disposal of Hazardous Wastes. The responsible agency is the Department of Health Services (DOHS).
 1. Preconstruction Requirements--None
 2. Construction Requirements--None.
 3. Preoperation Requirements--If DWR will operate a hazardous waste facility (i.e., storage over 60 days or disposal of hazardous wastes, including Stretford sulfur effluent) they must obtain a DOHS determination that the requirements of a Hazardous Waste Facility Permit are met.
 - a. Verification--The DOHS will review any permit application to assure that DWR has satisfactorily complied with DOHS requirements.
 - b. Enforcement--If DWR does not comply with DOHS requirements, DOHS will notify the CAM.
 - c. Filings and Notifications--The in-lieu application will be filed with the DOHS. DOHS will notify the CAM when all requirements have been met.

4. Operating Requirements--Monitoring requirements for a hazardous waste facility depend on the conditions of the DOHS determination issued.
5. Postoperation Requirements--Same as Operating Requirements.

X. SAFETY/WORKER SAFETY

Has DWR adequately provided measures and procedures to ensure the safety and health of the construction workers and plant personnel?

A. Law--California Administrative Code, Title 8, Industrial Relations, Chapter 4. Requirement for accident prevention program.

1. Preconstruction Requirements--None.
2. Construction Requirements--
 - a. Verification--DOSH will conduct inspections upon receipt of a complaint.
 - b. Enforcement--DOSH will investigate complaints and will determine and take action on what penalties shall be imposed and what corrective actions will be taken.
 - c. Filings and Notifications--DOSH will notify the CAM in the event of a violation that could involve DOSH action that would affect the construction schedule.
3. Preoperation Requirements--DWR shall request the state CAL/OSHA Consultation Service to review sections of the power plant accident prevention program for conformance with the requirement of Title 8 CAC, Section 3203. These sections refer to chemical handling and storage, and include provisions for hazardous materials and airborne contaminant exposure based on Section 5155 of Title 8 CAC. In addition, all other sections of the accident prevention program shall be reviewed by CAL/OSHA Consultation Service or CAL/DOSH to verify compliance with the requirements of Title 8 CAC, Section 3203.
 - a. Verification--DOSH will verify conformance with Title 8, CAC through on-site inspection.
 - b. Enforcement--DOSH will issue corrective orders if abnormalities are found during site inspections.
 - c. Filings and Notifications--DWR shall submit to the CAM, not later than 150 days prior to commencement of operation of Bottle Rock, a letter from the CAL/OSHA Consultation Service verifying the review specified above, and a letter from CAL/OSHA Consultation Service or CAL/OSHA verifying compliance with the requirements of Section 3203 of Title 8, CAC. DOSH shall notify the CAM in writing if a violation occurs that could result in delay in facility operation.
4. Operating Requirements--DWR will ensure compliance with provisions of the "Accident Prevention Program." (See 3.a. Verification above.)

- a. Verification--The California Division of Occupational Safety and Health (DOSH) will enforce compliance with state occupational safety and health standards. DOSH may conduct random inspections and must inspect the plant if there is a complaint from an employee.
 - b. Enforcement--Following investigation DOSH will determine what penalties shall be imposed and what corrective actions must be taken.
 - c. Filings and Notifications--DOSH will notify the CAM whenever a violation has occurred that could involve DOSH action that would affect plant operation.
5. Postoperation Requirements--None.

XI. SAFETY/FIRE SAFETY

Has the DWR considered measures and procedures to ensure reasonable safety of the plant personnel?

- A. Law--California Administrative Code, Title 8, Chapter 4.7, Groups 20 and 27; Uniform Building Code (1976 Edition) Chapter 5, 20, 32, 33; National Fire Protection Association Standards 10, 12, 13, 13A, 15, 19B, 194, 196, 198, 20; 24, 26, 30, 70, 214, 198, 26, 27, 231A, 43A, 50A, 58, 72E, 80, 90A, 99.

Public Resources Code, Section 4291. (CDF requirement to clear brush and grass within 100 feet of buildings.)

Title 19, CAC, General Fire Safety Standards applicable to all buildings owned or occupied by the State of California.

1. Preconstruction Requirements--None.
2. Construction Requirements--None.
3. Preoperation Requirements--DWR will arrange for a review by a registered fire protection engineer or the DWR's fire insurance company to assure that Bottle Rock is designed or has been constructed in reasonable conformance with applicable fire safety codes and standards as set forth above.
 - a. Verification--DWR will prepare or have prepared a certificate of compliance signed by a registered fire protection engineer or DWR's fire insurance company.
 - b. Enforcement--If DWR fails to submit to the the indicated documentation prior to commercial operation of the facility, the CEC can order the utility to delay operation of the facility or take other appropriate action consistent with the certificate and applicable laws.
 - c. Filings and Notifications--Prior to commencement of commercial operation of the power plant, DWR shall file with the CAM the signed certificate of compliance.
4. Operation Requirements--None.
5. Postoperation Requirements--None.

XII. SAFETY/HANDLING AND STORAGE OF HAZARDOUS, TOXIC, AND FLAMMABLE MATERIALS

A. Law--Title 8, CAC, Chapter 4.

1. Preconstruction Requirements--None.
2. Construction Requirements--None.
3. Preoperation Requirements--DWR will arrange for a review by a registered civil, mechanical, or industrial engineer of the following:
 - o Stretford system and EIC system pressure vessels and liquid petroleum gas tanks have been designed, constructed and installed in accordance with Title 8, California Administrative Code (CAC) and the Tri-Services Manual, and anchored in resist a force of an ELF - of 0.5 W.
 - o EIC system and Stretford system tanks have been designed, constructed, and installed in accordance with American Petroleum Institute (API) Standard 650 and the Tri-Services Manual, and anchored to resist a force of an ELF of 0.5 W.
 - o Lube oil storage tanks are designed and constructed according to Article 145, Title 8, CAC and anchored to resist a force of an ELF of 0.5 W.
 - o All storage bins and cylinder anchorages for flammable and hazardous substances are designed and constructed to resist a force of an ELF of 0.5 W.
 - o Hydrogen and oxygen systems are installed according to articles 138 and 139, Title 8, CAC.
 - o Ammonia and CO₂ gas are stored according to Articles 107 and 76, Title 8, CAC.

DWR will acquire certified code papers for pressure vessels or storage tanks required to be designed to the ASME Boiler and Pressure Vessel Code.

- a. Verification--DWR will prepare a certificate of compliance stamped by a registered civil, mechanical, or industrial engineer.
- b. Enforcement--If DWR fails to submit the documentation, the CEC may order DWR to delay facility operation or take other appropriate action consistent with the certificate and applicable laws and standards.
- c. Filings and Notifications--Prior to commercial operation of the power plant, DWR shall file with the CAM the following documents:

- (1) Certificate of Compliance with the requirements under 3. above, stamped by a registered civil, mechanical, or industrial engineer.
- (2) Copies of Certified Code Papers for Pressure Vessels.

XIII. TRANSMISSION LINE ENGINEERING/SAFETY AND NUISANCE

Issue I

Will the transmission line be constructed and operated in compliance with California Public Utility Commission (CPUC) General Order 95 (GO-95) and as certified by the CEC?

The delegate agency for GO-95 is the CPUC. The CEC is the responsible agency for design intent.

A. Order--CPUC GO-95 and Design Intent.

1. Preconstruction Requirements--The transmission line shall be designed to satisfy or exceed the requirements of GO-95 and shall be in accordance with the design intent as contained in the certificate.
 - a. Verification--None.
 - b. Enforcement--None.
 - c. Filings and Notifications--None.
2. Construction Requirements--The transmission line will be constructed in accordance with GO-95 requirements and as certified by the CEC staff.
 - a. Verification--None.
 - b. Enforcement--None.
 - c. Filings and Notifications--None.
3. Preoperation Requirements
 - a. Verification--DWR will certify that the transmission line has been designed, constructed and will likely be operated in accordance with GO-95 and as certified by the CEC staff. Any waivers granted by CPUC to GO-95 will be noted and the basis and resolution for waivers specified.

1. DWR will verify the use of the major general design characteristics (Design Intent) as certified by the CEC staff, including:

- a. Number, type and configuration of towers.
- b. Voltage (phase to phase).
- c. Number of circuits.
- d. Size, number and type of conductors (including static wires).
- e. Normal and emergency rating of conductors (MVA and MW).
- f. Route, route length and right-of-way width.
- g. CEC grounding criteria.

- b. Enforcement--If noncompliance with GO-95 or the design characteristics approved by the CEC becomes apparent, the CEC staff will determine the appropriate action.
 - c. Filings and Notifications--DWR will file a certification of compliance with GO-95 and the design characteristics as approved by the CEC. The verification will be signed by a California registered electrical engineer and filed with the CAM within 30 days after completion of line construction.
4. Operating Requirements--The transmission line shall be maintained in accordance with GO-95 and the design intent.
- a. Verification--DWR shall inspect the line at least annually and will maintain a summary of the results of these inspections (noncompliance and maintenance) such summaries shall be made available to authorized CEC staff upon request. The transmission line is to be inspected annually for fire prevention purposes also, see XIV, Issue II. C.)
 - b. Enforcement--same as 3.b.
 - c. Filings and Notifications--None.
5. Postoperation Requirements--Postoperation requirements will be in accordance with GO-95.

Issue II

Will the proposed transmission line be constructed and operated in conformance with the following (Items B through H) applicable laws, standards and criteria?

- B. Law--Cal/OSHA, 8 California Administrative Code, Article 85, Section 2940 et seq., Article 87, Section 2950, et seq., Section 5095-5099 (Noise).

Law--Construction Safety Orders, Title 8, Subchapter 4 and General Industry Safety Orders Subchapter 7.

The delegate agency is the Division of Occupational Safety and Health (DOSH).

- 1. Preconstruction Requirements--None.
- 2. Construction Requirements--Construction activities will be in compliance with applicable law.
 - a. Verification--DOSH can inspect construction activities in accordance with Title 8, Chapter 4 procedures.

- b. Enforcement--If DOSH cites DWR and/or recommends enforcement activities, the CAM will be advised by DOSH.
 - c. Filings and Notifications--DOSH will notify the CAM of alleged violation(s) and recommended course of action in writing within seven days of such determination.
 3. Preoperation Requirements--None.
 4. Operating Requirements--The operation (maintenance activities) of the transmission line will be in compliance with applicable law.
 - a. Verification--Same as B.2.a.
 - b. Enforcement--Same as B.2.b.
 - c. Filings and Notifications--Same as B.2.c.
 5. Postoperation Requirements--Decommissioning activities shall be in conformance with applicable law.
 - a. Verification--Same as B.2.a.
 - b. Enforcement--Same as B.2.b.
 - c. Filings and Notifications--Same as B.2.c.
- C. Law--Public Resources Code Sections 4292 - 4296 and PRC Title 24, Section 1250 through 1258 of the California Administrative Code (State and Private Land Fire Protection, Electrical Clearances).

The delegate agency is the California Department of Forestry (CDF).

1. Preconstruction Requirements--None.
2. Construction Requirements--The transmission line shall be constructed in accordance with PRC 4292 - 4296 and PRC Title 14, Section 1250 through 1258 of the California Administrative Code.
 - a. Verification--None.
 - b. Enforcement--None.
 - c. Filings and Notifications--None.
3. Preoperation Requirements
 - a. Verification--within 30 days after completion of construction, DWR shall prepare a signed certificate verifying that the transmission line has been constructed in accordance

with applicable portions of PRC 4292-4296 and PRC Title 14, Section 1250 et seq. of the California Administrative Code.

b. Enforcement--None.

c. Filings and Notifications--The certification that the transmission line has been constructed in accordance with the applicable requirements shall be sent to the CAM and the California Department of Forestry within 30 days of construction completion.

4. Operating Requirements--Clearances will be maintained during operation of the transmission line in accordance with applicable law. DWR shall inspect the transmission line at least annually in a manner which insures that the line will be in compliance throughout the year with an emphasis to insuring that the line maintains clearances during the fire season.

a. Verification--CDF can inspect the transmission line for compliance with requirements.

b. Enforcement--In the event noncompliance is determined by the CDF, DWR shall be so advised by the CDF along with CDF recommendations to achieve compliance within seven days of such a determination.

c. Filings and Notifications--The CDF will simultaneously file a copy of any such notice with the CAM.

5. Postoperation Requirements--None.

D. Law--Federal Aviation Administration (FAA), 49 USCA 1348, 14 CFR, Part 77.

The responsible agency is the FAA.

1. Preconstruction Requirements--A "Notice of Proposed Construction or Alteration" form shall be filed with the FAA if required by Part 77.

a. Verification--DWR shall submit a "Notice of Proposed Construction or Alteration" form to the FAA if it is anticipated that actual construction would result in the transmission line tower or any appurtenances being more than 200 feet in height above the ground level at the site per FAA Part 77.13.

b. Enforcement--Case by case basis.

c. Filings and Notifications--At least 30 days prior to the date the proposed construction is to begin, the form shall be filed with the FAA. A copy of this form shall also be forwarded to the CAM concurrently.

2. Construction Requirements--The transmission line shall be constructed in accordance with applicable law.
 - a. Verification--None.
 - b. Enforcement--None.
 - c. Filings and Notifications--None.
 3. Preoperation Requirements--None.
 4. Operation Requirements--None.
 5. Postoperation Requirements--None.
- E. Law--Federal Occupational Safety and Health Act of 1970, 29 USCA 655 et seq., 29 CFR 1910 et seq. (Compliance is covered in Section XIV, Issue II. B of this report.)
- F. 47 CFR Part 15.25, Federal Communications Commission (FCC).

The responsible agency is the Federal Communications Commission (FCC).

1. Preconstruction Requirements--None.
 - a. Verification--None.
 - b. Enforcement--None.
 - c. Filings and Notifications--None.
2. Construction Requirements--None.
3. Preoperation Requirements--None.
4. Operating Requirements--FCC Part 15.25 requires that an incidental radiation device (transmission facility) be operated so that the radio frequency energy that is emitted does not cause harmful interference. In the event that harmful interference is caused, the operator of the device is required to promptly take steps to eliminate the harmful interference.
 - a. Verification--None.
 - b. Enforcement--The FCC allows California utilities to resolve radio or television interference complaints with the source of the complaint.
 - c. Filings and Notifications--None.
5. Postoperation Requirements--None.

g. CEC Criteria--Radio and Television Interference.

The responsible agency is the CEC.

1. Preconstruction Requirements--None.
2. Construction Requirements--DWR shall take reasonable precautions prior to and during erection of the conductors to minimize scratches or abrasions on the conductors.
 - a. Verification--None.
 - b. Enforcement--None.
 - c. Filings and Notifications--None.
3. Preoperation Requirements--None.
4. Operating Requirements--Upon receipt of a radio or television interference (RI/TVI) complaint DWR shall make every reasonable effort to locate and correct, at DWR's expense, on a case by case basis, all RI/TVI caused by the power plant transmission facilities, including but not limited to, if necessary, the modification of receivers and/or installation of antennas.
 - a. Verification--None.
 - b. Enforcement--None.
 - c. Filings and Notifications--None.
5. Postoperation Requirements--None.

h. CEC Criteria--CEC Grounding

The responsible agency is the CEC.

1. Preconstruction Requirements--None.
2. Construction Requirements--DWR shall ground all ungrounded metallic fences in a manner equal to or more stringent than the CEC grounding standard, PGandE Drawing 020607, Sheet 1 through 5 of 5 as modified by the following: Regardless of location or ownership all ungrounded fences longer than 150 feet within the right-of-way shall be grounded.
 - a. Verification--Included in Section XIV. A.3.a.
 - b. Enforcement--Case by case basis.
 - c. Filings and Notifications--Same as XIV. A.3.c.
3. Preoperation Requirements--None.

4. Operating Requirements--In the event of complaints regarding induced currents from vehicles, portable objects or such other objects (large metallic roofs, fences, gutters, etc.) DWR will investigate the complaints. If, at DWR's determination, a valid complaint exists, then measures shall be taken at DWR's expense to correct the identified problem provided:

- o The object is located outside the right-of-way; or
- o The object is within the right-of-way and existed prior to right-of-way acquisition.

For objects installed within the right-of-way after right-of-way acquisition (fences are the only permanent object allowed without prior utility consent), DWR shall notify the owner of the object that it should be grounded. In this case, grounding of the object is the responsibility of the owner. DWR shall advise the owner of this responsibility in writing prior to signing the right-of-way agreement.

- a. Verification--None.
- b. Enforcement--None.
- c. Filings and Notifications--None.

5. Postoperation Requirements--None.

XIV. NOISE

Will the construction and operation of the plant and steam field comply with applicable noise performance criterion, regulations and law?

A. Lake County has an adopted Noise Element to its General Plan. The Noise Element limits noise to 55 dBA L_{dn} . Certain construction activities such as the movement of heavy equipment during daylight hours are exempt. The delegate agency is the Lake County Planning Department.

1. Preconstruction Requirements--None.
2. Construction Requirements--In the event that DWR receives public complaints of the noise due to construction, DWR shall immediately conduct an investigation to determine the extent of the problem. DWR shall take reasonable measures to resolve the complaint.

In the event that DWR is informed that public complaints have been registered with a public official or agency, and DWR fails to resolve the problem, DWR shall so inform the Lake County Planning Department. If requested by the Department, DWR shall implement the monitoring outlined below:

- o Conduct noise surveys at the sensitive receptors registering the complaints and at the facility property line nearest the complaining receptors.
 - o Surveys shall be taken for the period of construction working day and under similar circumstances that the complaints were registered.
 - o Surveys shall be reported in terms of the L_x and L_{eq} levels (where $x = 10, 50, 90$).
 - a. Verification--DWR shall notify Lake County of the surveys, of the public complaints, of the mitigation measures which DWR has applied to resolve the impact, and the results of mitigation plans.
 - b. Enforcement--Lake County will advise the CAM in writing of any continuous noncompliance conditions, and of any recommendations to achieve compliance.
 - c. Filings and Notifications--See a. (Verification) above.
3. Preoperation Requirements--None.
4. Operating Requirements--(Off-site monitoring) DWR will conduct a noise survey at 500 feet from the generating station and the nearest sensitive receptors within 90 days after the plant

reaches its rated power generation capacity and construction is complete. The survey will cover a 24-hour period and will be reported in terms of L_x , L_{eq} , and L_{dn} levels. (L_x where $x = 10, 50, 90$).

- a. Verification--Within 120 days DWR will prepare and submit a report to Lake County Planning Department of the survey and a record of any public complaints of noise from operation of the project. The report will also detail any mitigation plans and schedules to correct noncompliance in the event that the county standards have been exceeded. Following implementation of any mitigation measures, DWR shall submit a second report to Lake County verifying that the results of the mitigations have alleviated any nonconformance. DWR need not provide any additional noise surveys or reports of the off-site operational noise of the project unless the public registers complaints or the noise from the project is suspected of increasing due to change in the operation of the facility.
 - b. Enforcement--Lake County will advise CAM of their review of DWR's report of any nonconformance with applicable standards and any recommendations to achieve compliance.
 - c. Filings and Notifications--See a.1 (Verification) above.
- B. Regulation--Cal/OSHA noise exposure regulations, 8 CAC Article 105, (General Industrial Safety Orders).

Law--The Occupational Health and Safety Act of 1970, (29 CFR 1910), et seq.). These are basically the same as Cal/OSHA (8 CAC Article 105) noted above, and therefore, no separate monitoring and reporting activities with respect to 29 CFR 1910 are required.

The delegate agency is California Division of Occupational Safety and Health (DOSH).

1. Preconstruction Requirements--None.
2. Construction Requirements--None.
3. Preoperation Requirements--None.
4. Operating Requirements--DWR will conduct a noise survey of the anticipated noise-hazardous areas in the facility when the facility has reached its anticipated capacity factor.
 - a. Verification--DWR will make the results of the survey available within 90 days after the facility has reached its rated power generation capacity and construction is complete. The results of the noise surveys shall be maintained by DWR and shall be made available upon request to DOSH of the Department of Industrial Relations and CAM.

Surveys should be conducted as prescribed in Title 8, CAC Article 105. The surveys are to provide baseline information should future worker complaints arise.

b. Enforcement--If employee complaints arise during the life of the project due to excessive noise, a compliance determination will be made by DOSH, Department of Industrial Relations. At DWR's option, DOSH Cal/OSHA Consultant Service will aid in correcting nonconformance conditions.

c. Filings and Notifications--DOSH will advise the CAM in writing of all confirmed noncompliance within 30 days of the event.

5. Postoperation Requirements--None.

XV. RELIABILITY

Does the Applicant's proposed criteria and programs ensure that an 80 percent or greater capacity factor will be achieved at plant maturity?

A. LAW--There are presently no applicable standards requiring that a given level of reliability be attained or maintained. Considering the nature of the proposed facility, the CEC staff must ensure that plant reliability be consistent with the target of an 80 percent capacity factor.

1. Preconstruction Requirements

a. Verification--CEC to verify submittal of filing (see c. below).

b. Enforcement--Commission to condition facility certification on Applicant submitting the indicated filing.

c. Filings and Notifications--Applicant to file with the CAM no later than 120 days prior to abatement construction the following information:

(1) EIC component redundancy level (list components necessary for continued abatement operation, number of redundant units, percent capacity of each unit with 100 percent equal to design load).

(2) EIC Equipment Quality Control (prior to equipment purchase or acceptance, detail inspection procedures testing and equipment warranty clauses in purchase contracts).

d. Costs--CEC staff costs are estimated to be 10 man-days.

B. Construction Requirements--None.

C. Preoperation Requirements--None.

D. Operation Requirements--None.

E. Postoperation Requirements--None.

XVI. VISUAL AESTHETICS

Will the construction and operation of the facility create an adverse visual impact in Cobb Valley?

- A. Plan--Scenic Highway Element of the Lake County General Plan. (Bottle Rock Road qualifies as a scenic highway under this plan element.)

Lake County Policy--Conditions, Procedures, and Performance Standards for Geothermal Regulation.

1. Preconstruction Requirement--DWR shall prepare a detailed visual mitigation plan. The plan will discuss the specific steps to be undertaken in order to carry out the mitigation proposals identified in the Draft EIR (page 142). These measures should be coordinated with the mitigation requirements identified in the Monitoring and Compliance Plan for biological resources, since most of the activities required for visual mitigation are similar to those proposed for biological resource impacts. In addition to on-site impacts, the visual mitigation plan will include measures for the visual disturbances associated with the access roads and transmission lines.
 - a. Verification--DWR will submit the mitigation plan to CEC staff. CEC staff in consultation with the Lake County Planning Department will review the plan for its adequacy.
 - b. Enforcement--DWR will not begin construction activities until it has obtained CEC staff approval of the plan. If the submittal is found unacceptable, the CEC staff, Lake County Planning Department, and DWR will meet to resolve the differences.
 - c. Filings and Notification--DWR will submit the visual mitigation plan to the CEC staff no later than January 16, 1981. This plan may be submitted as a part of the biological resource mitigation plan. If this is done, the joint plan must be identified as such and specify how the measures are intended to mitigate the visual disturbances of the project.
2. Construction Requirements--DWR will implement the measures identified in the approved visual mitigation plan. DWR will inspect the revegetation progress of all disturbed areas for impacts from erosion and will take corrective action whenever necessary until permanent vegetation is established.
 - a. Verification--DWR will submit an annual report, during the construction phase, to the CEC indicating compliance with the applicable requirements of the visual mitigation plan.

Upon reasonable notice, CEC staff will be allowed access to the leasehold.

- b. Enforcement--If the requirements are not fulfilled, CEC staff and DWR will attempt to resolve any problems.
 - c. Filings and Notification--DWR will submit an annual report to the CEC Land Use/Economics staff indicating which measures of the visual mitigation plan have been implemented. This may be submitted in conjunction with the report to be filed as required by the biological resources mitigation plan. Any joint filing should be clearly labeled as such.
3. Preoperation Requirements--DWR will implement applicable measures of the approved visual mitigation plan. DWR will inspect the revegetation progress of all disturbed areas and take corrective action where necessary.

Upon reasonable notice, CEC staff will be allowed access to the leasehold.

- a. Verification--DWR will submit a statement to CEC staff indicating compliance with the applicable measures of the visual mitigation plan. This may be submitted in conjunction with the report to be filed as required by the biological resources mitigation plan.
 - b. Enforcement--If the requirements are not fulfilled, CEC staff and DWR will attempt to resolve any problems.
 - c. Filings and Notification--DWR will submit the report to CEC staff. The report will indicate which mitigation measures included in the visual mitigation plan have been complied with. This may be submitted in conjunction with the report to be filed as required by the biological resources mitigation plan.
4. Operating Requirements--DWR will implement the measures of the approved visual mitigation plan.

If CEC staff in consultation with the Lake County Planning Department determine that the measures included in the approved visual mitigation plan are not sufficient to alleviate the visual disturbances, the CEC staff, Lake County Planning Department, and DWR will meet to determine if and what reasonable additional measures are to be required.

- a. Verification--None required.
- b. Enforcement--Any disagreements regarding additional measures may be brought before the Commission for final resolution.
- c. Filings and Notification--None required.

XVII. WATER RESOURCES

1. California Administrative Code, Title 23

California Water Code, Part 23

These laws pertain to the appropriation of water within the state, other than through riparian right. ,

In the event that DWR or its contractor(s) utilize a water supply for construction water, irrigation water, domestic uses, sanitary uses, etc. other than from a DWR facility, then DWR shall:

- a. Contact the appropriate county, the CEC, the State Water Resources Control Board, Division of Water Rights, and the appropriate RWQCB, identifying the potential source(s), the quarterly volumes, and the methodology for obtaining the construction phase water and operational water.
- b. Obtain needed permits or waivers, as directed by any of the above agencies.

As a condition to CEC certification, no earthmoving activities shall proceed without such permits or waivers, and no water shall be obtained without such notification (Item a) DWR should forward to the CEC copies of correspondence showing contact with the above agencies, and those agencies responses.

There would be no other monitoring/compliance required by this Commission in this matter, but any individual agency requested compliance/monitoring should be evaluated and adhered to if reasonable.

APPENDIX F

Applicant/Staff Jointly-Sponsored Findings,
Conclusions and Conditions

(Except for the Transmission Line Engineering Section,
modified per Decision, p.32)



RELIABILITY

Findings

1. The Applicant's performance criteria for the proposed Bottle Rock power plant are a capacity factor of 80 percent (lifetime average) and an availability factor of 90 percent.

2. All major components have planned redundancies of 100 percent capacity except the cooling water pumps (50%), hydrogen coolers (50%), and steam jet injectors (33 1/3%).

3. In systems with redundancy, equipment designs and layouts will be employed to allow servicing of individual components at full or reduced plant capacity.

4. For major components where installed redundancy is not practical, such as for the main power transformer and turbine-generator, the Applicant will procure selected spare parts or provide for back-up protection.

5. The Applicant has solicited bids for the steam-turbine generator. Procurement policies proposed by the Applicant include inspection, certified testing, facility testing, financial penalty clauses, and guarantees. These policies are described in the Standard Provision sections of the draft bid document submitted to the CEC by the Applicant.

6. The Applicant proposes to use a Stretford process system combined with a H₂S abatement system (hydrogen peroxide addition) and an upstream cleanup method (EIC process).

7. The Stretford and condensate systems are currently being tested at Geysers Unit 15. However, nongeothermal, industrial experience indicates that the Stretford system will not be a major

reliability problem and the critical components necessary for abatement operation will have installed spares.

8. There has been limited experience with the condensate treatment systems that the Applicant proposes to use. Some problems have arisen due to the adding of hydrogen peroxide to the main circulating system. This chemical addition has caused solids and sludge to form which can clog and foul internal machinery. The design and selection of the system shall be compatible with the original plant design. Thus, the facility should achieve an 80 percent or greater capacity factor at plant maturity.

9. Specific design criteria for the EIC system has not been identified. However, the system is being designed to achieve a 90 percent availability factor.

10. To ensure the ability of the EIC system to achieve a 90 percent availability factor, the Applicant has agreed to submit to the Commission 120 days prior to abatement system construction, its plans for equipment redundancy and quality control for the EIC system.

11. The Applicant is designing the proposed facility for a design earthquake (peak ground acceleration of 0.22g) which has a 10 percent probability of exceedance during the 30-year facility lifetime.

Conclusions

1. If the Applicant implements its proposed procedures and design measures in Findings 1, 2, 3, 4, 6, 8, 9, and 10, it is reasonable to expect the facility to achieve an 80 percent or greater capacity factor at plant maturity.

2. The Applicant's proposed seismic design parameters and associated risk of exceedance are consistent with the system reliability goals.

Conditions

1. The Applicant shall implement its proposed procedures and design measures in Findings 1, 2, 3, 4, 5, 8, 9, and 11.

2. The Applicant shall submit the plans to the Commission specified in Finding 10. If the Applicant fails to submit the plans or those plans are inadequate, the Commission may order the Applicant to delay, or change its plans for, construction and operation of the EIC system.

WATER QUALITY

Findings

1. The water quality standards applicable to the project include:
 - a. Clean Water Act (33 USC 1321);
 - b. United States Environmental Protection Agency Quality Criteria for Water (1976);
 - c. Porter-Cologne Water Quality Control Act (Cal. Water Code §§ 1300, et seq.);
 - d. California Regional Water Quality Control Plan-- Sacramento River Basin (5a), (1975);
 - e. "Waste Discharge Requirements for Nonsewerable Waste Disposal Land", 1978, California State Water Resources Control Board;
 - f. California Health & Safety Code sections 25100, et seq.;
 - g. 22 Cal. Admin. Code, Division 4, Chapters 1 and 30;
 - h. 23 Cal. Admin. Code, Chapter 3, Subchapter 15;
 - i. Waste Discharge Requirements, CVRWQCB Order No. 76-202.
2. The surface waters potentially affected by construction and operation of Bottle Rock and its appurtenant facilities are Kelsey Creek, High Valley Creek, Alder Creek, and their tributaries.
3. The principal potential sources of water pollution from the construction and operation of the plant are: (1)

spills from the hydrogen sulfide (H₂S) abatement processes, the cooling water and the condensate reinjection systems; (2) storm runoff; (3) disposal of domestic waste water; and (4) plume-drift deposition.

4. The Applicant plans to store the following chemicals in the H₂S abatement areas:

- a. Alkali (sodium carbonate or sodium hydroxide);
- b. Sodium ammonium polyvanadate (Vanasol);
- c. Anthranquinone disulfonic acid (ADA);
- d. Hydrogen peroxide;
- e. Copper sulfate; and
- f. Ferrous sulfate.

5. The DOHS classifies chemicals listed in Finding 4 as hazardous or toxic.

6. If the chemicals used in the H₂S abatement process are spilled and allowed to enter surface waters they could have lethal and toxic effects on fish and other aquatic organisms.

7. The steam condensate will be utilized for cooling water and the excess will be reinjected into the geothermal reservoir. The steam condensate contains harmful materials, including, but not limited to, ammonia, boron, arsenic, and mercury.

8. The adverse impacts that a condensate spill may have on the environment may include: erosion by the condensate flow off the site; increased steam turbidity by the loss of vegetation; increased erosion; effects on aquatic organisms; and changes in the water's chemical composition.

9. To prevent spills of H₂S abatement process materials, condensate and other materials from leaving the site, the Applicant will separately berm or basin the cooling towers, the condensate reinjection sump, the H₂S abatement systems, and to berm and cover the pad with an asphaltic layer. The permeability of the asphaltic layer, concrete areas, and associated berms will be 1×10^{-6} cm/sec or less. As a result of this construction, the paved area of the plant site also will serve as a spill retention basin.

10. The proposed total retention volume is equal to approximately 389,000 gallons, or 2.3 times the maximum anticipated spill of 170,000 gallons.

11. All paved areas and the spilled H₂S abatement system materials will drain to sumps on-site, and those collected liquids will be routed from these sumps to the reinjection system.

12. During the dry season, drift (boron, mercury, and ammonia), oil drips from machinery and vehicles, residuals from spills, particulates settled from the air, and other pollutants will accumulate on the plant site.

13. Storm runoff could wash these materials from the plant site in sufficient quantities to adversely affect water quality.

14. To minimize the possibility of contaminated storm runoff discharges from the paved areas to surface waters, the Applicant will divert at least the first 1/2 inch (1.27 cm) of precipitation runoff of the first continuous storm, and

(1) as much as possible of lesser storms, or (2) the maximum possible of "first" storms (after an extended dry period) to the condensate reinjection system.

15. Only after Finding 14 has been complied with and in the event of no spills on-site, will the rainfall discharge gates be opened, allowing runoff to be discharged off the power plant pad to the High Valley Creek drainage. Under such conditions, the impacts on water quality will be minimal due to natural dilution from heavy rainfall and runoff.

16. The soils in the area are not practical for leach-field use because of insufficient depth and poor percolation quality.

17. The Applicant has agreed to utilize a 3,000 gallon septic tank and to dispose of effluent by injection into the steam reservoir, along with the condensate, through the steam suppliers' injection system.

18. The Applicant will file its proposed septic tank drawings with Lake County for review and comment prior to commencement of construction. Lake County will notify the Applicant and the Commission of its comments.

19. The wastes will be treated in a septic tank to remove solids, and the liquid effluent then discharged to the reinjection system line; after the cooling tower basin.

20. The heat and pressure in the steam reservoir is expected to sterilize the wastewater, killing any pathogens, and the combination of the blow-out prevention controls and deep well casings will lessen the chances of transfer of the

wastewater from the steam reservoir to any groundwater aquifers.

21. Bottle Rock's cooling tower is designed to allow .002% of the cooling water flow (83 gallons per hour) to be emitted as drift. This drift will include some noncondensable gases and minute traces of mercury, arsenic, and boron.

22. Atmospheric dispersion, oxidation by the sun and air, and dilution by rainfall will reduce the concentration of contaminants.

23. Analysis from other Geysers geothermal power plants indicates that cooling tower drift deposition does not impact water quality directly, but impacts it indirectly through vegetation loss, and therefore contributes to erosion. The cumulative indirect effects on water quality are not known at this time.

Conclusions

1. There will be no intentional discharge of any toxic or hazardous materials into surface waters.

2. The measures described in Findings 9, 10, 11, and 14 are sufficient to minimize the risk of hazardous materials from leaving the plant site and entering nearby waters.

3. In almost all instances, the containment plan described in Findings 9, 10, 11, and 14 will prevent harmful substances contained in the steam condensate and other materials from entering ground or surface waters in the event of a spill.

4. The measures described in Findings 14 and 15 are adequate to minimize, to an acceptable level, the risk of

toxic runoff entering ground and surface waters.

5. The measures described in Findings 17 and 19 are sufficient to minimize the risk of domestic wastes entering ground and surface waters.

6. Cooling tower drift deposition alone will not measurably affect water quality.

7. Any adverse impacts on water quality due to the proposed development should be insignificant.

8. The Applicant's proposed mitigation and protection measures described in these findings are adequate at this time to protect and preserve the good water quality of Kelsey, High Valley, and Alder Creek.

Conditions

1. The Applicant will implement the specified aforementioned mitigation and protection measures, and the probability for adverse impacts on water quality due to the construction and/or operation of the power plant will be minimal.

2. The Applicant will participate in the forthcoming cooperative Geysers KGRA Aquatic Resources Monitoring Program, or, if this program fails to materialize, will perform the water quality monitoring program as described in the AFC.

WATER RESOURCES AND HYDROLOGY

Findings

1. About 10 acre-feet (3.25 million gallons) of water will be used at the proposed plant for (1) construction, (2) dust control, (3) domestic uses, (4) landscaping, (5) initial filling of the cooling tower, and (6) power plant cooling during the 42-month construction period.

2. Annual water needs for operation of the plant will be about 4 acre-feet (1.3 million gallons).

3. Mean annual runoff in the hydrologic basin consisting of Upper Lake, Scotts Valley, Big Valley, Lower Lake, and Clear Lake is 294,000 acre-feet.

4. Water requirements for plant operation and domestic and landscaping will be met using sources of water on or near the site.

5. Potable water will be required for sanitary use, building maintenance, and the operation of the hydrogen sulfide abatement system.

6. To meet the water requirement described in Finding 5, water will be acquired from an outside source, now being developed between the Applicant, the California Department of Transportation, and California Department of Forestry, and treated to meet potable standards. Bottled drinking water will be supplied.

7. The initial filling of the cooling tower basin will require approximately 450,000 gallons, or 1.4 acre-feet.

8. Steam condensate will be used for power plant cooling. The plant produces enough condensate to satisfy the requirements of cooling tower make-up, except for initial start-up. Initial start-up

water will come from outside sources, other than a spring, seep, or surface stream. Alternatives include the Applicant's facilities or local water suppliers.

9. There are no specific design standards with respect to flood hazards that apply to the site and related facilities. Drainage design is primarily a matter of sound engineering judgment and proper assessment of the risks and inconveniences associated with a chosen level of drainage protection.

10. The proposed site is located approximately 40 feet above an unnamed tributary. Under the worst flooding scenario, the proposed plant site will be safe from stream flooding.

11. The power plant pad drainage system will be designed to carry the 100-year expected flood or the maximum accidental spill, whichever is greater.

12. Drainage water will be collected in a reinforced, concrete drainage sump.

13. Rainfall runoff and all accidental spills, as discussed in Findings 14 and 15 of Water Quality will be routed to the steam supplier's reinjection well.

14. The spill retention basin described in Water Quality Finding 9 will accommodate rainfall from a 100-year storm.

Conclusions

1. Water requirements of the proposed project will not significantly impact the region's water resources.

2. The location of the proposed plant site, the design of the drainage system, and the construction of the retention basin, will adequately protect the proposed project from flood damage.

Condition

1. The Applicant shall implement its latest proposed water use plans and flood protection measures, as agreed to during the May 27, 1980 workshops.

BIOLOGICAL RESOURCES

Findings

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

--Federal Endangered Species Act of 1973
and implementing regulations.

--Ecological Reserve Act of 1968 and implementing regulations, Fish and Game Code sections 1580-1584.

--California Species Preservation Act of 1970,
Fish and Game Code sections 900-903, 2050-2055.

--Fully Protected Species Act, Fish and Game Code sections 3511, 4700, 5000, and 5515.

--Native Plant Protection, Fish and Game Code sections 1900-1913.

2. Vegetation stress has occurred from cooling tower drift at the Geysers. Field and laboratory studies have tentatively implicated borates as a prime cause of these impacts. The Applicant has proposed to provide a drift eliminator system for the cooling tower which specifies a drift loss rate of 0.002% of the circulating water rate. The Applicant's proposed use of the EIC abatement system will further reduce the boron content in the drift. Accordingly, the operation of the proposed project is likely to cause less vegetation damage resulting from the boron in cooling tower drift than other existing units in the Geysers.

3. The Applicant will monitor vegetation stress and damage in the vicinity of the power plant by use of visual observation and infrared aerial photography, as follows:

a. Visual observations and infrared aerial photography shall begin prior to power plant observation to establish a baseline against which cooling tower drift impacts may be evaluated.

b. The Applicant shall submit the Commission a statement indicating that Condition a. has been met. The statement shall identify where, when, and how the visual observations were made; the date, area, time, and altitude coverage of the aerial photography; and the results of the observations and photography.

c. The Applicant shall continue the visual observations and aerial photography for the first three years of plant operation. The photography shall be done in the same season each year. These photographs will be made available to CEC upon request. Annual reports documenting the results of the observations and photography shall be filed with the Commission by January 1 of each year. If significant stress, damage or changes are identified, the Applicant, CEC Staff, and California Department of Fish and Game shall meet to decide what further mitigation measures are necessary. If agreement cannot be reached the dispute may be referred to the Commission.

4. The Applicant will participate in a regional study, if deemed necessary by the Commission, in cooperation with other appropriate developers, applicants, and utilities, to

determine cumulative impacts from drift in the Geysers KGRA and to determine a regional mitigation and management program.

5. Areas of critical concern which contain unique habitats and which therefore need special protection are known to exist within the Francisco leasehold.

6. The riparian corridors, springs, seasonably wet areas, relic stands of native coastal prairie, meadows, and snags have been identified as areas of critical concern on the leasehold.

7. The meadows, springs, and seasonably wet areas are of vital importance to wildlife survival during dry seasons and should be protected from destruction or degradation.

8. There have been adverse impacts to the biological resources due to leasehold development by the steam supplier. These impacts are being mitigated according to conditions found in the use permits for exploratory drilling (Appendix of NOI) and in the full field use permit issued by Lake County. The steam supplier has agreed to update the Applicant on the implementation of these measures.

9. The Department of Fish and Game has indicated that it considers the proposed power plant site, ponderosa pine-mixed evergreen forest, to be valuable wildlife habitat.

10. Full field development including the power plant site will result in the loss of approximately 15 acres of ponderosa pine-mixed evergreen forest.

11. The Applicant will implement the mitigation measures as set forth in the AFC (pages V-108 to V-115) with the

possible exception of brush piles to compensate for this habitat loss.

12. A small meadow of biological significance also exists just north of the power plant site, at the toe of the fill slope.

13. This meadow could be adversely affected by sediment deposition or any other disturbances.

14. The Applicant will utilize a sedimentation control method adequate to stop sediment deposition in this meadow area. A description of this method has been submitted and accepted as adequate by the CEC Staff.

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

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

17. No active breeding sites for the American Peregrine Falcon are known to exist at the Francisco leasehold.

18. The Bottle Rock site is not included within the federally proposed "Critical Habitat Zone" for the American Peregrine Falcon.

19. There are no rare, threatened, or endangered wildlife species known to exist at the Francisco leasehold.

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

21. The Golden Eagle and the Ringtail have been observed in the Geysers-Calistoga Known Geothermal Resource Area.

22. The Francisco leasehold is not known to be a

significant breeding or feeding area for either the Golden Eagle or the Ringtail.

23. No rare or endangered plant species are known to exist at the Francisco leasehold.

24. Two plant species of special concern, the St. Helens fawn lily (Erythronium helenae) and Lomatium repostum, a member of the carrot family, are found on the leasehold.

25. Population of these plants existing in the vicinity of construction activities will be flagged and the construction crews alerted so that no disturbance will occur in these areas.

26. At present, the leasehold does not support significant quantities of commercially important plant species.

27. Eight wildlife species of recreational value, in addition to trout, are known to exist in or near the Francisco leasehold.

28. Loss of habitat from the project will include some loss of breeding and feeding areas for some of these recreational species.

29. Direct loss of habitat due to full field development including the power plant site will be approximately 15 acres of mixed evergreen and yellow pine forest, 7.5 acres of chaparral, and 0.3 acre of riparian habitat.

30. Reduction in habitat value may occur in areas adjacent to developed areas for some species.

31. The Applicant has agreed to submit a detailed field implementation plan for the proposed mitigation measures and

monitoring studies. This plan will be submitted to the Commission for review by January 16, 1981. The Commission Staff will inform the Applicant by February 2, 1981, of the adequacy of the proposed plan. If the proposed plan is found inadequate the Applicant and the Commission Staff shall meet to resolve their differences.

32. On the leasehold in the vicinity of the proposed power plant site is an intermittent tributary to High Valley Creek. Further downstream, High Valley Creek becomes a year-round stream. This creek, along with Alder Creek located east of the leasehold, empties into Kelsey Creek. This drainage system into Clear Lake is an important trout spawning area which will be carefully protected from siltation and accidental spills associated with site development and power plant operations.

33. The Applicant will build a retention barrier around the plant site to contain accidental spills, and an on-site drainage system to collect and dispose of spill material. This will provide protection to off-site wildlife habitat and spawning areas in High Creek Valley, described in Finding 32.

34. The Applicant will implement the mitigation measures found in the NOI (pages V-16 and VII-14 and 15) and the AFC (pages V-102 to V-109) to control erosion and sedimentation of valuable biological resources described in Finding 32.

35. The Applicant will monitor for the life of the project, cut and fill slopes and other disturbed areas for impacts from gulley erosion, and will take corrective measures

whenever necessary until permanent vegetation is established and no further erosion occurs.

36. The Applicant will not undertake major earthmoving activity during December, January, February, and March, unless permission is obtained from the CEC. Permission will be given in a timely manner. If earthmoving activities are planned from November to April, temporary measures will be implemented to control erosion, as discussed in the AFC (pages V-101 to V-104).

37. The Applicant will undertake mitigation measures for the protection and preservation of biological resources. These mitigation measures are specified in the NOI on pages V-16 and VII-14 to 15, and AFC pages V-108 to V-115.

38. Both the U.S. Fish and Wildlife Service and the California Department of Fish and Game have expressed concern over the acceptability of cumulative impacts from this and other geothermal projects. This is not an issue which can or should be resolved within the context of this AFC, as it is a problem which is generically associated with all geothermal development in the Geysers region. The Applicant has agreed to participate with other appropriate agencies, developers, and utilities in a generic proceeding to identify these cumulative impacts and to specify appropriate mitigation measures, compensation plans or regional monitoring programs which are needed to reduce these cumulative impacts to an acceptable level.

39. The Applicant will submit a detailed decommissioning plan to CEC for review and approval one year prior to power

plant operation termination. This plan will describe in detail the measures required to either restore the leasehold to its pre-geothermal development condition or explain why restoration is not being considered and describe any alternative plans that are being considered with regard to biological resources.

Conclusions

1. The proposed project will contribute to a cumulative biological resources impact in the KGRA.
2. If the measures identified in Findings 3, 4, 11, 14, 31, 33, 34, 35, 36, 37, 38, and 39 are implemented, the impacts on biological resources will be mitigated to an acceptable level.
3. No rare, threatened, endangered or legally protected species, species of special concern, or commercial and recreational resources will be significantly impacted, if the mitigation measure in Finding 24 is implemented.

Condition

1. The Applicant will implement the measures specified in Findings 3, 4, 11, 14, 24, 31, 33, 34, 35, 36, 37, 38, and 39.

GEOTECHNICAL

Findings

1. The laws and ordinances applicable to the proposed project are:

- a. California Business and Professions Code Section 7835.
- b. Uniform Building Code, Chapter 70, section 7015 (1979 edition).
- c. Uniform Building Code, Chapter 70, section 7014.

2. Except for the location of the proposed cooling tower, no hazardous or adverse geologic conditions exist at the project site. The nature and potential effects of the actual site conditions will be better understood based on information obtained during and after site preparation.

3. The proposed cooling tower will be located on shear zone rocks, a potentially hazardous or adverse geologic condition. The specific measures to mitigate this potential adverse condition cannot be determined until the exact conditions are encountered during site excavation.

4. The Applicant will effect the following mitigation measures:

- a. A certified engineering geologist will inspect the shear zone during and after site excavation.
- b. During and after excavation, additional plate bearing tests may be made to verify estimated bearing pressures. If the tests indicate the estimated foundation pressures are not sufficient

for the structure's foundation, the Applicant will:

- 1) Increase the structural strength of the reinforced concrete mat foundation or,
 - 2) Over-excavate and replace with engineered fill or back fill concrete or,
 - 3) Stabilize the shear zone by grouting, or
 - 4) Use a combination of these.
- c. Use expansion joints in the reinforce concrete foundation to allow for minor movement of the concrete or soil.
- d. Install survey markers on both sides and in the shear zone area after the major earthwork is performed to monitor any movement across or along the shear zone.

5. The final choice of specific mitigation methods are best determined after the geologic conditions are encountered. If it is determined that the foundation mitigation measures proposed in Finding 4 are not sufficient, there will be adequate time to modify the design of the cooling tower.

Conclusion

1. There are no hazardous or adverse geologic conditions which cannot be adequately mitigated to preclude the siting of the proposed power.

Conditions

1. Site excavation and grading shall be done according to applicable laws and ordinances.

2. The Applicant shall implement the mitigation measures in Finding 4.

3. In implementing mitigation measure in Finding 4.d., the Applicant shall notify the Commission staff at least seven days prior to completion of the final grading of the proposed location of the survey markers. Unless the Commission staff indicates otherwise, the Applicant's proposal shall be deemed adequate within seven days after the Commission's receipt of notification. The survey markers shall be installed and surveyed according to the following schedule:

- a. Once a month until start of foundation construction.
- b. Every three months thereafter until completion of facility construction.
- c. Once a year thereafter.

4. The Applicant shall submit to the Commission staff specific plans to mitigate any adverse geologic conditions associated with the shear zone rocks. Unless the Commission staff indicates otherwise within three working days after receipt of notification, the proposal shall be deemed adequate. If the Commission staff indicates the proposal is inadequate, construction in the affected area shall be halted, except for construction necessary to provide safety. The Applicant and CEC staff shall resolve the dispute within seven days of notification to the Applicant. If the matter cannot be resolved, it may be brought to the Commission.

5. The Applicant shall assign a qualified engineering geologist to assure compliance with the geotechnical requirements. The engineer shall notify the Commission staff of any newly confirmed imminent geologic hazards or adverse geologic conditions warranting substantial changes in facility design or other mitigation measures. ("Substantial changes" is defined in the Structural Engineering section). Upon reasonable notification, the Commission staff and Lake County Building Department shall make whatever site inspection of adverse geologic conditions and mitigation measures they deem necessary.

6. A registered engineering geologist shall inspect the site at least once a week during excavation. Upon completion of site excavation he will evaluate site geologic conditions and geologic safety. He also will prepare a geologic map of the completed excavation and submit this map to the Commission staff.

7. The Commission staff and Lake County Building Department may make unscheduled site inspections during excavation, grading, and completion of earthwork. Notice shall be given to the Applicant's construction headquarters the day prior to the inspection and inspectors shall check in with the Project Engineer upon arrival. Inspectors shall bring their own safety equipment.

NEED

Findings

1. In the most recent Biennial Report (adopted December 20, 1979), the Commission concluded that "there are severe limits on the extent to which the state can look to conventional energy sources.... for new electricity supplies" and that for environmental, health, and resource considerations, energy sources such as geothermal "should be significantly expanded in the state's mix of electricity supplies."

2. In the Biennial Report, the Commission found that geothermal energy is "one of the cheapest sources of electricity generation" and "should be expanded because of [its] favorable environmental characteristics, efficiency, more stable costs, and the fact that [it is] indigenous to California."

3. In the Biennial Report, the Commission determined that a reasonable balance of state interests, as required by Section 25309(b) of the Public Resources Code, would be promoted for the reasons outlined in Finding 2, by giving "first priority to geothermal energy, co-generation, and other renewable energy sources" and by authorizing the state's utilities to construct and to give preference to such energy sources, including geothermal power plants, not only to meet expected increases in electricity demand but also to meet a Commission policy to reduce oil and natural gas use by 50% by 1991.

4. In the Biennial Report, the Commission determined that to meet anticipated growth in demand for electricity, to allow retirement of older facilities, to make up for potential losses resulting from the expiration of contracts for power from the Pacific Northwest, and to meet a 50% oil and gas reduction policy, approximately 7,000 megawatts of new generating capacity would be required in Northern California service areas by 1991.

5. The Bottle Rock power plant will, when operational, produce energy equivalent to 674 thousand barrels of oil per year and thus is consistent with the

Commission's oil reduction policy.

6. In the Biennial Report, the Commission determined that since the probable maximum amount of new generation capacity achievable from geothermal and other preferred energy sources by 1991 would be less than the total amount of new capacity needed to achieve a reasonable balance of state interests, as required by Section 25309(b), each and every geothermal proposal would be deemed needed provided the proposal generally possessed the favorable characteristics which made geothermal a preferred source for electricity supply. For that reason, the Commission determined that any geothermal facility which demonstrates reasonably mitigable environmental impacts and complies with air and water quality standards shall be deemed needed and in conformance with the forecast and assessment adopted pursuant to Section 25309(b).

7. As the findings and conclusions in the other sections demonstrate, the environmental impacts associated with Bottle Rock are reasonably mitigable.

8. As the findings and conclusions in Water Quality and Air Quality demonstrate, the proposed project will comply with all applicable air and water quality laws, standards and ordinances.

Conclusions

1. The Bottle Rock project is deemed to be needed.

SOILS

Findings

1. The CEC Staff has applied the following laws, standards, and ordinances to the Bottle Rock power plant:

- a. Waste Discharge Requirements for Non-Sewerable Waste Disposal to Land, California State Water Resources Control Board, 1978.
- b. Lake County Planning Commission Resolution No. 75-154, Sections IIB and IIC (except II C7 and IIC8).
- c. California Regional Water Quality Control Plan-Sacramento River Basin (5A). (1975).

2. Two soil series, Josephine and Maymen, are found at the plant site. These series are highly erosive.

3. Earthmoving activities associated with the construction of the proposed power plant create a significant potential for sedimentation and accelerated erosion.

4. The Applicant has estimated the sediment yield from the power plant site at between 12 to 100 tons per acre-per year without the use of adequate controls.

5. Two main environmental impacts may result from accelerated erosion of soil at the site: 1) the loss of the soil resource itself; the associated loss of watershed and biological habitats; 2) the degradation of the water quality of High Valley and Kelsey Creeks by sediment deposition, and the consequent adverse impact on beneficial uses of those waters.

6. The Sacramento River Basin Plan (5a), of the Central

Valley Regional Water Quality Control Board, requires that no materials, including soil, be discharged to waterways of a basin if they negatively affect the beneficial uses of the water.

7. The Applicant will effect the following mitigation measures to control soil loss and erosion/sediment transport:
 - a. Sprinkling operation during construction.
 - b. Small debris dams/settling basins or other erosion control techniques will be constructed and maintained in the runoff drainage channels of the plant site area during construction.
 - c. Those measures implemented in item b will be effectively maintained throughout the construction period.
 - d. Slopes will be vegetated with grasses, trees and shrubs.
 - e. Disturbed areas will be hydromulched, seeded, and straw-punched (revegetated) immediately following construction activities. The revegetated areas will be irrigated (watered) as needed, in order to establish vegetation prior to the rainy season.
 - f. Slopes will be monitored for gullying on a periodic basis. Gullies that form on the slopes will be refilled, shaped, and revegetated, as described in items d and e, as soon as is practicable.
 - g. No earth-moving activities will occur during rainy or high-wind periods.
 - h. A sedimentation collection and containment system will be constructed during site preparation to collect

the northward flow of drainage from the plant pad.
(There is no need for sedimentation control to the southwest of the plant site because all drainage will be directed to the north.)

- i. The Applicant will follow the requirements set forth in Sections IIB and IIC (Except IIC7 and IIC8) of the Lake County Planning Commission Resolution No. 75-154.

8. At this time, there are few field measurements of soil loss or rates of soil sedimentation to verify the success of existing erosion control plans employing similar measures for other geothermal projects in the Geysers KGRA.

9. The Applicant agrees to maintain an adequate working level within the sediment collection system.

10. The Applicant agrees to quantify annually the sediment removed from the sedimentation containment system; and to provide this information to the Commission and to the Central Valley Regional Water Control Board Quality Board (CVRWQB). This information will be used by CEC staff to evaluate the effectiveness of the erosion control practices.

11. The Applicant will replace straw bales as needed to assure sediment control until adequate permanent vegetation is established to reduce erosion to insignificant levels.

12. The Applicant will remove sediment deposited in front of straw bales in order to provide an adequate area for sediment deposition at all times.

13. Drainage downdrains will be an adequate size to facilitate drainage and to prevent clogging. These drains will be inspected periodically and cleaned/maintained as needed.

14. The Applicant will provide proper sediment control devices at the drain discharge areas. These controls will include riprap and will be maintained to assure sediment containment after vegetation is permanently established and straw bales are deemed no longer necessary.

Conclusion

1. If the Applicant's proposed mitigation measures are implemented, the rate of soil erosion and consequent sediment yield to local waterways will be minimized, and the proposed project will comply with applicable laws, standards and ordinances.

Conditions

1. To prevent sedimentation and accelerated erosion of soil at the proposed site, the Applicant shall implement the mitigation measures described in Findings 7, 9, 11, 12, 13, and 14.

2. The Applicant will annually quantify the amount of sediment removed from the proposed sedimentation collection and containment system and will provide this information prior to October each year to the CEC Staff and the CVRWQCB. If the sediment yield information supplied to the CEC Staff indicates that the applied mitigation measures are inadequate, the CEC Staff in consultation with the CVRWQCB retain jurisdiction to impose alternative mitigation measures.

TRANSMISSION LINE ENGINEERING

Findings

1. The Applicant proposed to construct a 1.1 mile, 230 KV transmission line from the proposed 55 MW Bottle Rock power plant on the Francisco leasehold to the PG&E Unit 17 power plant tap line. The power would flow to PG&E Unit 11, to Castle Rock junction, and to PG&E's electrical system.

2. The Applicant has rights to two nearby leaseholds, one of which is contiguous to the Francisco leasehold. The Applicant has identified a total potential of approximately 110 MW at these leaseholds. If constructed, these units could connect to the proposed Bottle Rock transmission line. Development of these leaseholds is speculative, however, since neither steam field is proven and neither potential unit is in the Applicant's 1979 resource plan (South Geysers NOI).

3. In March, 1980, Northern California Power Agency (NCPA) received NOI approval for a 66 MW unit, designated "NCPA 1", north of Bottle Rock power plant. At the present time, NCPA is considering connecting NCPA 1 to Bottle Rock power plant as well as to Unit 11, Unit 17, and a nearby

115 KV line. NCPA has also indicated the possibility of constructing an additional 100 MW in the same vicinity.

4. CEC Staff and consultant Dr. Hans Puttgen have conducted a transmission engineering economic analysis of six transmission configurations for the area, assuming varied degrees of development. Environmental factors were not included as a part of this particular study.

5. The analysis referred to in Finding 4, concludes that if a unit were constructed on either leasehold specified in Finding 2, it would be more economical for the Applicant to connect Bottle Rock to PG&E Unit 11 than to Unit 17.

6. The analysis also concludes that if Bottle Rock is connected with Unit 17 and if NCPA 1 is subsequently constructed, it will be uneconomical for NCPA 1 to connect to Bottle Rock.

7. Whether Bottle Rock connects to Unit 11 or to Unit 17, the Applicant will need a wheeling contract with PG&E. As of August 1, 1980, the Applicant had not yet completed a wheeling contract with PG&E.

8. As a result of the Applicant's intervention in the PG&E Unit 17 proceedings before the Commission, PG&E by stipulation agreed to provide Applicant with transmission service out of the Geysers. Applicant has other facilities within PG&E's service area which require the Applicant to complete a wheeling contract with PG&E by April 1, 1983. The Applicant has no alternative transmission plans.

9. The Applicant has proposed constructing a single-circuit transmission line consisting of 1113 kcmil all aluminum (AA) conductors.

10. The proposed conductor size (1113 kcmil) makes use of conductors commonly used in the KGRA and would have moderate transmission losses for loads up to 120 MW.

11. This size and type of circuit is generally considered to have a thermal limit of approximately 300 MW, but can only carry up to 120 MW economically (based on transmission losses), according to CEC Staff analyses. The Applicant is presently proposing to carry 55 MW on the circuit.

12. The existing collector system from Unit 11 to Castle Rock junction consists of two 113 kcmil single circuit transmission lines. This system has a capacity of 600 MW, based on the thermal limit, but only carries up to 240 MW economically (based on transmission losses), according to CEC staff analyses.

13. Existing PG&E Units 5, 6, and 11, which use the collector system described in Finding 12, total 212 MW. PG&E Unit 17, recently approved by the California Energy Commission, is scheduled to go on line in 1982, and will add 110 MW to this system. Bottle Rock, scheduled to start up in 1984, will add 55 MW, resulting in a total of 377 MW, for the Unit 11-Castle Rock System.

Conclusions

1. Future development in the vicinity of the Bottle Rock power plant is uncertain at this time. The proposed route for the Bottle Rock transmission line from Bottle

Rock to PG&E Unit 17 is economically acceptable if the Applicant or another developer does not connect a future unit on either of the other leaseholds to which the Applicant has rights to the Bottle Rock line. Otherwise Unit 11 would be the preferable termination point, according to the analysis described in Finding 4.

2. If the condition of Conclusion 1 is met, the proposed 1113 kcmil conductor size is reasonable and adequate in that it (1) makes use of standardized conductors, (2) has moderate transmission losses, and (3) will accommodate the generation from the proposed power plant plus an additional 65 MW.

3. The existing system from Unit 11 to Castle Rock junction can accommodate the power from the Bottle Rock plant, based on the thermal limit, but will be uneconomical unless the collector line is modified by PG&E.

Conditions

1. The Applicant will verify to the Commission that a wheeling contract has been completed with PG&E.

TRANSMISSION LINE SAFETY AND NUISANCE

Findings

1. The CEC Staff is applying the following laws, standards, and criteria to the Bottle Rock proposed 230 kV transmission line and alternatives.
 - a. Noise: (Construction) Cal-DOSH, 8 California Administrative Code section 5095-5099. (NOI Noise section pp. 32 & 36.)
 - b. Noise: (Operation) Sonoma County--Sonoma County General Plan Noise Element (adopted January 1978).
 - c. Noise: Lake County--Lake County General Plan Noise Element (NOI Noise section pp. 35 & 37.)
 - d. Safety/Reliability: CPUC GO-95. (NOI pp. VI-4, V-32, AFC p. VIII-3.)
 - e. Safety: Cal-DOSH, 8 California Administrative Code, Article 85, sections 2940, et seq., Article 87, sections 2950, et seq., and general Construction Safety Orders Title 8, Chapter 4, Subchapters 4 and 7 (AFC p. VII-3).
 - f. Safety: (Interference with Navigable Airspace) FAA, 49 USCA 1348, 14 CFR Part 77.
 - g. Nuisance: (Radio interference) Federal Communications Commission rules and regulations, 47 CFR Part 15.25 (Incidental radiation devices).
 - h. Electrical Clearances: Public Resources Code sections 4292-4296, State and Private Land Fire Protection (Power Line Fire Prevention Field Guide, 1977).
 - i. Staff grounding criteria.

j. Staff RI/TVI criteria.

2. Due to the absence of residences near the transmission line, it is unlikely that there will be community annoyance impacts due to transmission line construction noise. If noise impacts do occur they will be short term.

3. The proposed transmission line will produce audible noise under wet conductor conditions of less than or equal to 40 dB(A) at 100 feet from the transmission line.

4. The noise level in Finding 3 will usually be near or below ambient background levels, and is not expected to violate the Sonoma or Lake County General Plan Noise Elements or to be a nuisance to the public.

5. California Public Utilities Commission (PUC) General Order 95 (GO-95) sets forth minimal safety and reliability related construction standards.

6. The Applicant has agreed to comply with the provisions of GO-95.

7. If any transmission tower or conductors will be greater than 200 feet above ground at the site, the Applicant will file a notice of proposed construction or alteration (Form 7460-1) under Part 77.13 of the Federal Aviation Agency rules and regulations.

8. The Commission Staff has developed radio interference and television interference RI/TVI mitigation measures. These measures require the Applicant, upon receipt of a valid complaint, to take all reasonable steps to locate and correct, on a case-by-case basis, all RI/TVI caused by the transmission

facilities including, if necessary, the modification of receivers and/or installation of antennas.

9. The Applicant has agreed to perform at its expense the mitigation measures referenced in Finding 8 if radio or television interference is determined to be caused by the proposed transmission facilities for Bottle Rock.

10. The California Department of Forestry requires minimum fire protection clearance standards under Public Resources Code sections 4292-4296.

11. The Applicant has agreed to provide a certification from a Registered Electrical Engineer to the effect that the transmission line has been constructed in accordance with the CEC certification and applicable laws, standards, and criteria. This certification shall be provided to the Commission within 30 days of completion of construction.

12. The Applicant will inspect the transmission line annually and ensure that adequate clearances in accordance with Public Resources Code sections 4292-4296 are provided for, especially during the fire season.

13. The Applicant will inspect the transmission line annually to assure compliance with the provisions of GO-95 and for maintenance identification. Records of such inspections shall be maintained by the Applicant and shall be made available to authorized CEC Staff upon request.

14. The electric and magnetic fields produced by a transmission line can induce a voltage on nearby ungrounded metallic objects which may be an electrical shock hazard. Grounding

fences or other metallic objects is effective in minimizing shock hazards.

15. The Applicant agrees to use the grounding criteria as specified in the Pittsburgh 8 and 9 NOI, Docket No. 78-NOI-2, Section 5.2, Figures CEC 5.2-6 through 5.2-10 and modified as follows:

a. Regardless of location or usage, all ungrounded fences longer than 150 feet within the right-of-way shall be grounded following the procedures of Figures 5.2-6 through 5.2-10.

b. In the event of complaints regarding induced current from vehicles, portable objects or other objects (such as large metallic roofs, fences, gutters, etc.), the Applicant shall investigate the complaints. If a valid complaint exists, measures shall be taken at Applicant's expense to correct the identified problem.

16. It is highly unlikely that the proposed transmission line will cause a safety hazard due to induced current if the grounding criteria referenced in Finding 14 are followed.

Conclusion

1. If the Applicant agrees to comply with the standards and measures set forth in Findings 1, 5, 7, 8, 10, 11, 12, and 14, the proposed transmission line will be designated, constructed, and operated in conformance with all applicable laws, standards, and criteria, and will not pose a significant safety hazard or be a nuisance to the public.

Condition

1. The proposed transmission line shall be designed, constructed, and operated to comply with the laws, standards, and criteria listed in Findings 1, 5, 7, 8, 10, 11, 12, and 14.

WASTE DISPOSAL

Findings

1. CEC Staff has applied the following to the Bottle Rock power plant:
 - a. California Water Code, §13000 et seq; §13360;
 - b. 23 Cal. Admin. Code, Chapter 3, Subchapter 15;
 - c. California Health and Safety Code §25100 et seq;
 - d. 22 Cal. Admin. Code, Division 4, Chapter 30;
(Department of Health Services regulations).
 - e. 14 Cal. Admin. Code, Division 7, Chapter 3;
 - f. "California Assessment Manual for Hazardous Waste," published by the Department of Health Services;
 - g. "Waste Discharge Requirements for Non-Sewerable Waste Disposal to Land," published by the State Water Resources Control Board;
 - h. Lake County Code, Chapter 9, "Health and Sanitation," Article 1;
 - i. "Hazardous Materials Transportation Act," 49 U.S.C. §1801 et seq;
 - j. 49 CFR, Parts 100-199;
 - k. California Vehicle Code, §2402, §34501, and
 - l. 13 Cal. Admin. Code, Articles 1.3 and 1.5
2. 22 Cal. Admin. Code, §66088, describes a "hazardous waste" as any waste or mixture of wastes that is toxic, corrosive, flammable, an irritant, explosive, or which may cause substantial injury, serious illness or harm to humans, domestic livestock, or wildlife. The wastes produced by the Bottle Rock project are

considered to be hazardous because they may contain toxic substances that are present in the steam that is used by the power plant.

3. If any waste contains a hazardous material, 22 Cal. Admin. Code §66505 requires that the Applicant insure that the waste is taken to a facility that is permitted to accept the waste. Haulers of this waste (except for saleable waste) must be "Hazardous Waste Haulers" registered with the Department of Health Services.

4. Cal. Admin. Code 22, Division 4, Chapter 30 requires that the recovered spills of toxic chemicals that are stored or contained at the plant site be transported to a licensed disposal site. Any spills that occur while the substance is within the control of the Applicant are the Applicant's responsibility.

5. The Applicant can comply with the regulations described in Findings 3 & 4.

6. Spills that occur during transportation are the responsibility of the entity transporting the substance. The Applicant, however, may be required to retain collected remnants of spilled substances at the plant site until such time as their proper disposal can be arranged.

7. Any storage of a hazardous material at the site for a period exceeding 60 days may require a modification of the operating permit.

8. Solid wastes to be disposed of are:

- a. Sulfur;
- b. Cooling tower sludge;
- c. Waste oil;

- d. Maintenance waste;
- e. Sewage;
- f. Construction waste.

9. Class II-1 disposal sites near Richmond, Martinez, Kelseyville and Middletown are presently available and licensed to receive hazardous geothermal wastes such as cooling tower sludge and sulfur from the Geysers. The use of any of these sites for the disposal of the appropriate wastes listed in Finding 8 will satisfy the statutory requirements for hazardous waste disposal.

10. Approximately 380 lbs/hr. of sulfur can be produced by the Stretford Unit, but the actual rate of production is unknown at this time.

11. Sulfur produced as an H₂S abatement system waste is considered to be a hazardous waste by DOHS.

12. The Applicant is currently conducting a study of the marketability of its sulfur. If the sulfur is not sold, it will be disposed of in one of the disposal sites listed in Finding 9.

13. Approximately 16,800 gals/yr. of cooling tower sludge will be produced by the heat dissipation system.

14. The cooling tower sludge is considered to be a hazardous waste by the DOHS.

15. The Applicant proposes to have the sludge and sulfur disposed at an appropriately licensed site in Richmond, California.

16. A shorter haul route would lessen the chances of accidental spills and reduce transportation costs. Kelseyville and Middletown sites have the capacity to contain the wastes and would require a shorter hauling distance.

17. The Regional Water Quality Control Board discovered a violation of the permit by the operator of the Middletown site. Continued noncompliance could result in the disposal site being closed.

18. The Applicant will investigate disposal of the sulfur and sludge at Kelseyville or Middletown. If these sites are found to be unsuitable the Applicant will dispose of the wastes at the Richmond or Martinez sites. Applicant will inform the Commission of its decision and the reasons therefor.

19. Although at present there are no laws or regulations which require the Applicant to recover wastes generated by the power plant, the DOHS may request the producer of a hazardous waste that has been determined to be recyclable to provide a written statement justifying why they have not recycled the waste. The DOHS staff has indicated that no such requests will be made of the Applicant for the sulfur at this time.

20. Approximately 100 gallons per year of waste oil will result from the operation of the proposed project.

21. Waste oil will be disposed of by hauling to the Cobb-Village Chevron Service Station in Cobb Mountain, California.

22. Approximately 6 cubic yards per month of maintenance waste will be produced by the operation of the proposed project.

23. Maintenance wastes will be hauled away twice a month by a commercial collection service. The Applicant will include in its contracts with a commercial collection service requirements for the use of a suitably licensed disposal site.

24. Approximately 200 gallons per day of sewage will be produced by the operation of the proposed project.

25. The sludge from the septic tank will be removed by

a vacuum truck once every two years. This sludge will be disposed of in an appropriately licensed sanitary land fill.

26. All construction wastes will be considered the property of the contractors and will be disposed of by them offsite according to state and local regulations and ordinances. The Applicant will ensure proper construction waste disposal by complying with 22 Cal. Admin. Code §66505.

27. Liquid wastes to be disposed of consist of:

- a. Stretford purge steam
- b. EIC process purge steam

28. The Applicant will dispose of the Stretford purge stream by mixing the waste stream with the excess steam condensate and reinjecting the mixture in the steam reservoir. The waste stream will not be circulated through the cooling tower or discharged in any other way.

29. The Applicant will dispose of the EIC process purge stream by mixing the waste stream with the excess steam condensate and reinjecting the mixture in the steam reservoir. The waste stream will not be circulated through the cooling tower or discharged in any other way.

30. If a secondary treatment system is used to abate H₂S emissions, the plant may produce additional hazardous wastes. To ensure that these wastes are disposed of properly, the Applicant will submit its secondary abatement waste disposal plans to the CEC for review as soon as the Applicant determines that secondary abatement is required but not later than 120 days prior to commencement of operation of such secondary H₂S treatment system.

Conclusion

1. If implemented, the proposed mitigation and protection measures are adequate to ensure the lawful disposal of solid wastes generated by the Bottle Rock project.

Conditions

1. To ensure the lawful disposal of solid wastes, the Applicant will comply with the regulations specified in Findings 3 and 4, and shall dispose of the wastes as described in Findings 18, 21, 23, 25, 26, 28, 29 and 30.

SOCIOECONOMICS

Findings

1. The Energy Commission Staff has applied the following to the Bottle Rock project:

- a. Lake County General Plan: Land Use and Scenic Highway Elements
- b. General Plan Interim Policies
- c. Conditions, Procedures and Performance Standards for Geothermal Regulations County of Lake.
- d. Lake County Zoning Code.

2. The proposed power plant site and all lands comprising the leasehold are located entirely within Lake County.

3. According to the Land Use Element of the Lake County General Plan, the leasehold is located in an "unclassified" zoning district. Section 21-10 of the Lake County Zoning Code allows for geothermal development in an "unclassified" district, subject to approval of a use permit. "On February 19, 1980, McCulloch Geothermal Inc., was granted a use permit from Lake County to drill 10 steam wells at three sites on the Francisco leasehold. This brings to 14, including four wells already drilled pursuant to prior use permits, the total number of wells needed to begin full field steam production for the Bottle Rock power plant."

4. The Conditions, Procedures and Performance Standards for Geothermal Regulations of Lake County prohibits the drilling of any geothermal well within one-half mile of any populated area (10 or more dwelling units within a one-quarter mile area) or within one-half mile of any recorded subdivision without written consent of a minimum of 75 percent of the owners having been obtained. It further requires that any well must be drilled a minimum of 500 feet from the nearest residence.

5. No populated area nor recorded subdivision exists within one-half mile of any proposed drilling location; no residence exists within 500 feet from any proposed drilling location.

6. The proposed project is located in Cobb Valley, where the principle land uses are residential and geothermal exploration.

7. "Although the proposed project does not represent a departure from the pattern of geothermal development in the southwestern portion of the Geysers KGRA, it will be the first power plant in Cobb Valley."

8. Potential adverse impacts on the residential and recreational uses of the area include visual, noise, and odor effects.

9. The primary visual impact from the project will be on those residential and recreational areas to the east of the site. Due to the surrounding topography and vegetation, as well as the distance, the visual intrusion will be minimal.

10. The noise and odor impacts can be reduced to insignificant levels provided the Applicant implements the mitigation measures proposed in the Noise and Air Quality sections.

11. Construction of the Bottle Rock project will limit recreational opportunity within the leasehold boundary which include hunting and hiking.

12. Because hunting, hiking and fishing have been limited by the private ownership of the lands within the leasehold, a reduction or elimination of these activities due to the development of the proposed project will not be a significant impact.

13. The Scenic Highway Element of the Lake County General Plan was adopted for the purpose of preserving and enhancing areas of special scenic quality visible from designated roads.

14. Bottle Rock Road has been identified by the Scenic Highway Element as meeting the criteria of a Scenic Route. The area approximately one-half mile either side of Bottle Rock Road from Cobb to Highway 29 has been designated as a Scenic Corridor.

15. The power plant facilities and the Coleman and Francisco Well Sites will not be visible from Bottle Rock Road.

16. The Coleman West Well site may be visible from Bottle Rock Road and the Scenic Corridor described in Finding 14.

17. The significant visual impacts from the Coleman West Well site will result from the drilling derrick. Since the derrick is portable and will be erected for only a short period of time, the visual impacts will not be significant.

18. Lake County's Conditions, Procedures and Performance Standards for Geothermal Regulations states that all permanent installations and premises must be harmonious in appearance with the area, and that a landscaping screen be installed.

19. The Applicant has proposed the following mitigation measures to reduce the visual impact of the power plant facilities:

- a. All engineered slopes will be revegetated;
- b. All cleared areas will be reforested with trees to block the view of the plant, particularly views from the northeast;
- c. A consultant will be employed to determine the most appropriate plant species for reforestation purposes at the site;
- d. The power plant structures will be earthtone colors to blend with the surrounding environment.

20. A significant visual disturbance will be created by the cooling tower plume. This impact cannot be mitigated.

21. The peak work force required during the construction of the proposed power plant facilities will be approximately 80 workers.

22. The previous operations in The Geysers area have established a resident labor force in the Sonoma-Lake Counties area.

23. Based on the cumulative demand for labor from NCPA's Units 1 and 2, PG&E's Units 16, 17, and 18, the Applicant's Bottle Rock and South Geysers' projects and SMUD's Unit 1, approximately 310 new workers will be required.

24. According to Staff's analysis, construction of the proposed projects specified in Finding 23 will cause approximately 280 new residents to move into Lake County, of which approximately 90 will be children.

25. The number of new residents anticipated to move into Lake County is sufficiently low so as not to cause an adverse impact on local housing.

26. Many of the in-migrating workers related to geothermal development have moved into the Middletown-Cobb Valley area. This area is served by the Middletown Unified School District, which has reached its enrollment capacity as of the 1980/1981 school year. Survey results indicate that much of the enrollment growth of this district appears to be caused by recent geothermal development in the area. The additional number of school age children expected to move to Lake County as a result of the Bottle Rock project is sufficiently low so as not to cause an adverse impact on the Middletown

Unified School District. However, this project may contribute to a cumulative adverse demand on educational services. The Applicant, therefore, agrees to participate in a comprehensive mitigation program involving other utilities and steam field developers, if such a program is recommended by the Commission. This effort would involve an assessment of all growth-induced impacts and identification and implementation of appropriate mitigation measures.

27. The Bottle Rock power plant itself will be state-owned and therefore will not be subject to property taxation.

28. Lake County will derive tax revenues from the development and operation of the Bottle Rock steam field.

29. The tax revenues from the steam field improvements, local agency fees, if paid, and CEC reimbursement under Public Resources Code, Section 25538 will be sufficient to offset the costs to Lake County of providing administrative and regulatory services.

30. It is anticipated that the activities associated with construction and operation of the Bottle Rock Power Plant could adversely impact Bottle Rock Road.

31. The Applicant and Lake County have agreed in writing to a proposal for the realignment and reconstruction of Bottle Rock Road. The Applicant has agreed to pay for the entire cost of the project. The Applicant will then be reimbursed by other utilities and steam developers for part of the cost as subsequent geothermal developments are sited which use Bottle Rock Road.

32. Vehicular traffic generated by project construction, operation, and maintenance will be significant source of noise, and will add traffic on the roads of the region.

Conclusions

1. The proposed project complies with applicable Lake County Land Use regulations.
2. If the Applicant implements the mitigation measures proposed in the Noise and Air Quality sections, the noise and odor impacts should be insignificant.
3. The project will not cause significant adverse impacts on existing land uses of the area.
4. The only significant visual impact of the project will be caused by the cooling tower plume.
5. The project will not cause a significant increase in the population of Lake County.
6. The project will not cause significant adverse impacts on housing and public services in Lake County.
7. The in-migrating population due to the Bottle Rock project may, however, contribute to a cumulative growth which could adversely affect educational services in the Middletown Unified School District.
8. Lake County will recover more than its costs of providing administrative and regulatory services.

Conditions

1. The Applicant shall implement the mitigation measures identified in Findings 9, 19, 27, and 32.

OFFSITE IMPACTS

Findings

1. Applicant has agreed to improve and correct deficiencies on portions of nine miles of Bottle Rock Road to eliminate excessive maintenance and to mitigate future traffic problems that might be aggravated by construction of the Bottle Rock power plant. Improvements will consist of improving the structural base and/or paving in some areas, widening and/or realigning certain segments of the road, as described in Appendix E of the Bottle Rock Revised Draft EIR.

2. The main air pollutants associated with the proposed road improvement will be dust and engine exhaust emissions. Neither of these should be generated to an extent that existing air quality in the area will be significantly affected.

3. In order to mitigate the potential impacts described in Finding 2, Applicant will:

- a. Comply with all existing rules and regulations of the Lake County Air Pollution Control District, and
- b. Minimize fugitive dust generated during construction activity by sprinkling the road with water.

4. Road construction may cause a short term increase in silt sediment loads to water courses draining the roadway.

5. In order to mitigate the potential impacts described in Finding 4, Applicant will:

- a. Schedule construction activity such that earth moving activities will be completed prior to the annual rainy season. If earth moving must occur during periods of wet weather, temporary erosion protection measures will be employed to protect exposed soils.
- b. Exposed cut slopes in soils will be revegetated/covered and maintained until established to protect them from erosion following construction. Revegetation will include a seed mixture of fast growing native annual herbaceous species on all soil slopes and native drought-tolerant shrubs and trees where shrubs and trees have been removed as a result of construction. Seeds for native species shall be collected on the project site. Seeded areas shall be mulched and fertilized at the time of planting and maintained until established.

6. Potential geologic impacts include cut slope failure and failure of fill sections.

7. In order to mitigate the potential geologic impacts, Applicant will:

- a. Ensure that the design of cuts and fills for Bottle Rock Road are under the supervision of a Registered Civil Engineer.
- b. If necessary for construction in landslide terrain one or more of the following provisions shall be incorporated as determined by the engineer:

1. Remove landslide material and replace with engineered fills or flatten slopes where appropriate.
2. Construct subdrains to de-water landslide areas and protect engineered fills.
3. Locate cut-off ditches and other surface drainage improvements to route run-off away from landslide areas.
4. Construction of buttresses.

Implementation of these provisions will be made in the initial improvement design and modified as required under the direction of licensed engineers and geologists when grading exposes the foundation condition.

- c. Drainage design of the road will focus upon the control of seeps and springs. Energy dissipaters and collection devices to reduce the erosion force of unnatural run-off will be used if required. Existing culverts will be retained. Drainage design of new culverts will be accomplished using the following provisions:

1. Culverts will be designed/redesigned using the California Culvert Practice manual as a guide.

2. Drainage design and specific soil erosion protection devices will be developed under the direction of a Registered Civil Engineer.

8. Potential impacts on biological resources include removal of vegetation and adverse impacts on some wildlife species. No rare or endangered species are likely to be affected.

9. In order to mitigate potential impacts on biological resources, Applicant will:

- a. During construction avoid removing any more vegetation than is essential for project completion.
- b. Not remove large trees or snags or cause other disturbance to valuable biological resources without consultation with CEC Staff, CDFG, and Lake County. Applicant will participate in an onsite workshop with CEC Staff, CDFG and other concerned agencies to identify the areas which could be impacted and discuss possible mitigation measures. This workshop will be conducted prior to termination of the Bottle Rock power plant Revised DEIR comment and review period.
- c. Where possible, avoid construction activity on the banks of Kelsey and Cole Creeks where they are adjacent to or near Bottle Rock Road.

10. Areas near Bottle Rock Road will be exposed to the noise associated with heavy equipment and trucks involved with road construction. Residences adjacent to the road may be exposed to noise intrusions of 30 dBA to 40 dBA above the ambient during the construction period.

11. In order to mitigate the impacts described in Finding 10, Applicant agrees to implement the following measures:

- a. If noise complaints result from road construction, sound level measurements will be taken to determine if noise levels are exceeding those anticipated. Construction activities that are determined to produce unacceptably high noise levels will cease until a suitable means of noise abatement is determined.
- b. Construction activities in areas where excessive noise could cause complaints will be limited to daylight hours. When feasible, work will not be done on weekends, holidays, or before or after normal weekday working hours.

12. Widening and realignment will alter the appearance of segments of Bottle Rock Road by removing some vegetation and changing the appearance of some cut banks. The removal of several large trees in the northern portion of Segment 3 will significantly alter the appearance of this area of road.

13. In order to mitigate the potential visual effects described in Finding 12, Applicant will follow the provisions of Finding 5b.

14. No identifiable archeological sites were found to be located within areas of planned soil disturbances in Segments 1, 3, 5 and 6 of the proposed Bottle Rock Road Reconstruction project. No potential impact to cultural resources is foreseen in these areas at this time.

15. The archeological sites CA-LAK-907 and CA-LAK-1177 are located immediately adjacent to areas of planned soil disturbance in Segment 4 and Segment 2, respectively, of the proposed project. CA-LAK-907 is a small, relatively intact occupation site or seasonal camp, one which has the potential to yield significant amounts of scientific data. CA-LAK-1177, although subject to previous disturbance, also appears capable of yielding limited amounts of scientific data.

16. In order to mitigate the potential impacts described in Finding 15, Applicant will:

- a. If feasible, limit widening along the south side of Bottle Rock Road to a corridor of no more than 20 feet in width measured from the center line. The purpose of this measure is to ensure that site CA-LAK-1177 suffers no direct impact and to provide a narrow "buffer zone" between the site and the construction activities. If the limited widening is not feasible, Applicant will consult a qualified archaeologist to evaluate the nature and extent of the potential impacts, and to formulate the necessary mitigation measures.
- b. Use a qualified archaeologist to flag the limits of site CA-LAK-1177 prior to commencement of the road improvement.

- c. If at all possible, limit realignment and widening of Bottle Rock Road in Segment 4 to the areas lying north of the driveway which is immediately north of site CA-LAK-907. Should it prove absolutely necessary to undertake widening or realignment of Bottle Rock Road to the south of the driveway, a qualified archaeologist will be consulted to evaluate the nature and extent of the potential impacts, and to formulate the necessary mitigational measures.
- d. Ensure that additional records searches and field inspections are conducted for any road areas in the final plans not already analyzed for potential environmental impacts.

Conclusion

1. If Applicant implements the measures specified in Findings 3, 5, 7, 9, 11, 13 and 16, impacts from the reconstruction of Bottle Rock Road will be mitigated to an acceptable level.

Condition

1. Applicant will implement the measures specified in Findings 3, 5, 7, 9, 11, 13 and 16.

SEISMIC HAZARDS

Findings and Conclusions

1. An analysis of the seismic hazards at the site is contained in "A Report on Seismic Hazard Analysis, Bottle Rock and South Geysers Power Plants", H.C. Shah, May 1980.

2. The methods used in the Shah report to evaluate the seismic hazards are adequate.

3. The proposed power plant facilities will be designed to withstand a level of earthquake shaking which has a 10 percent probability of being exceeded during a 30-year facility lifetime.

4. The 10 percent exceedance probability corresponds to a peak ground acceleration value of $0.22g$.

Conclusion

1. The Shah report is acceptable as a design reference document for this project.

CIVIL ENGINEERING

Findings

1. The following law is applicable to the Bottle Rock power plant: Uniform Building Code, ICBO, 1979, as incorporated in the California Administrative Code.

2. Grading and site preparation will require the construction of fill slopes and a retaining wall.

3. The applicable standard for constructing fill slopes is contained in the UBC.

4. The fill slopes referenced in Finding 2 will be constructed no steeper than two horizontal to one vertical. The fill slope will be designed with minimum static factor of safety equal to 2.0 and a dynamic factor of safety of a minimum of 1.15 using an effective horizontal acceleration of 0.15g. A subdrain system will be placed under each fill slope, to collect seepage, if a seep or spring is encountered.

5. Construction of fill slopes as described in Finding 4 will comply with applicable provisions of the UBC.

6. The retaining wall referenced in Finding 2 will be constructed as concrete walls with rock facing and the design will follow standards set forth by the UBC.

7. Geologic investigations have indicated the presence of a shear zone under the cooling tower location.

8. After the excavation to grade and before construction of cooling tower foundation, a registered engineering geologist

shall inspect the site and recommend mitigation measures if necessary.

9. The foundations for all the major structures (e.g., turbine building, cooling towers, electrical switch yard, and hydrogen sulfide abatement facilities) will be constructed with reinforced concrete following the requirements of UBC and Building Code Requirements for reinforced concrete (ACI-318-77) by the American Concrete Institute. The bedrock upon which the Applicant proposes to place the structures is capable of supporting live load, dead load, and lateral loads (due to wind, seismic and operating equipment). The UBC requirements for reinforced concrete govern the construction of such facilities.

10. The applicable design standards for the Stretford unit berm surrounding the entire plant site referenced in Water Quality Finding 9 are contained in the "Waste Discharge Requirements for Non-Sewerable Waste Disposal to Land", California State Water Resources Control Board, January, 1978.

11. Water Quality Finding 9 demonstrates that the Stretford unit berm and the berm surrounding the entire plant site will comply with the applicable design standards contained in the waste discharge requirements referenced in Finding 10.

Conclusion

1. As proposed, the engineering design for the fill slopes, retaining wall, the Stretford unit berm, and the plant site berm, complies with all applicable laws, standards, and ordinances.

Conditions

1. The Applicant shall comply with the mitigation measures specified in Finding 8.

2. Upon completion, the Applicant shall prepare an "As-built" grading plan in conformance with the UBC for submittal to Lake County.

3. The Applicant shall reimburse Lake County for its costs of review of the grading plans which Applicant submits pursuant to Condition 2.

4. The Applicant will submit building plans (as defined in the UBC) to the Commission for review.

5. The Commission staff and Lake County Building Department may make unscheduled site inspections. Notice shall be given to the Applicant's construction headquarters the day prior to the inspection and inspectors shall check in with the Project Engineer upon arrival. Inspectors shall bring their own safety equipment.

CULTURAL RESOURCES

Findings

1. The laws applicable to the project are:

- a. National Historic Preservation Act of 1966 (16 U.S.C. 470 et seq).
- b. California Public Resources Code section 5097.9.

2. Cultural resources include archaeological, historical, paleontological, and ethnographic resources, including resources of educational, scientific, religious, and other significance.

3. There are five prehistoric archaeological sites within the project area: CA-LAK-605, CA-LAK-607, CA-LAK-608, CA-LAK-609, and CA-LAK-610, and one historical site: CA-LAK-974.

4. Sites 605, 609, and 610 meet the criteria for inclusion in the National Register of Historic Places.

5. Site 605 lies within the steam field but outside the proposed steam development area. No impact is anticipated.

6. Site 609 lies close to the access road and could be adversely affected by any road improvement or by steam line construction. The steam supplier has erected a fence around a portion of site 609 to restrict access to it.

7. Site 610 has been adversely impacted by road use. Any road improvement will destroy the integrity of this site. The Applicant has developed a systematic archaeological recovery program for site 610 acceptable to CEC staff.

8. There are known places within the project area where paleontological resources exist. The impact from construction and operation of the proposed project will not destroy these known paleontological resources.

9. There are no significant ethnographic or ethnohistoric sites in the project area.

10. The Applicant's archaeologist will provide archaeological observance training to the construction inspectors. In addition, a qualified archaeologist will inspect the plant site twice a week during stripping and clearing activities, and will be available at all other times. If any cultural resources are discovered during land alteration activities, the Applicant will cease any portion of such activities affecting the resources and notify the Commission staff within 48 hours of discovery.

11. If the onsite archaeologist determines that the discovered resource is significant, the Applicant and Commission staff will meet within seven days of such discovery with the State Office of Historic Preservation to determine an appropriate mitigation plan. If the Applicant, Staff, and State Office of Historic Preservation cannot reach agreement on an appropriate mitigation plan within 10 days of the discovery, the matter will be referred to the Commission for resolution. The Commission shall render a decision within 20 days. Construction activity affecting the resource shall remain stopped until a decision is made and for a reasonable period

thereafter to allow implementation of any mitigation measures to protect or salvage the resource.

Conclusions

1. The proposed facility will not adversely affect any identified paleontological, archaeological, or historical sites protected by Public Resources Code section 5097.9.

2. The proposed facility will not adversely affect any archaeological sites eligible for inclusion in the National Register of Historic Places if the Applicant complies with mitigation measures specified in Findings 7, 10, and 11. Therefore, the proposed project will comply with 16 U.S.C. 470, et seq . . .

Condition

1. The Applicant shall implement the mitigation measures specified in Findings 7, 10, and 11.

SAFETY

Findings

A. Fire Safety

1. The following laws are applicable to the Bottle Rock power plant:

- a. Fire-resistive design and construction techniques and recommended materials of construction as specified in the Uniform Building Code (UBC, 1979 Edition) Chapters 5, 20, 32, and 33.
- b. General Industry Safety Orders for the handling and storage of flammable liquids as specified in Title 8, California Administrative Code (CAC), Chapter 4.7, Group 20.
- c. Public Resources Code section 4291 which requires the establishment of firebreaks around buildings or structures on lands covered with flammable material.
- d. Federal Occupational Safety and Health Act of 1970 (same as Title 8, CAC).
- e. General fire safety standards applicable to all buildings owned or occupied by the State of California, found in Title 19, CAC.

In addition, the following industry consensus standards issued by the National Fire Protection Association (NFPA) are applicable to the on-site fire protection system:

- a. Standards (Stds.) 10, 12, and 13; Water Portable Fire Extinguishers, CO₂ Systems, Sprinkler Systems.

- b. Stds. 15, 19B, 20, 24, 194, and 196; Spray Fixed Systems, Respiratory Protective Equipment, Fire Hose, Centrifugal Fire Pumps, Outside Protection.
- c. Std. 43A; Storage of Liquid Oxidizers.
- d. Std. 50A - Hydrogen Gas Systems.
- e. Std. 58; Storage and Handling of LP-Gases.
- f. Std. 70; Wiring not related to the generation of electrical power.
- g. Stds. 72E and 80; Automatic Fire Detectors, Fire Doors and Windows.
- h. Std. 90A; Air Conditioning and Ventilating Systems.
- i. Std. 214; Water Cooling Towers.
- j. Stds. 13A, 26, 198; Sprinkler Systems, Valves, Fire Hose Maintenance.
- k. Std. 49; Hazardous Chemical Data.

2. Key power plant components which must be protected from fire include the turbine-generator unit (bearings), lube oil system, lube reservoirs, cooling towers, and transformers. In addition, principal sources of combustion include generator coolant (hydrogen gas) and the hydrogen peroxide in the storage tanks.

3. The Applicant has proposed an on-site fire protection system including the following features:

- a. Automatic water sprinklers installed above the turbine lube, hydraulic and seal oil reservoirs,

generator seal, oil unit, and in the cooling tower.

- b. Automatic CO₂ purge in the oil purification room.
- c. Carbon dioxide gas purge for the generator.
- d. Automatic water-spray deluge system for transformers.
- e. Fire hose stations, manually operated fire extinguishers placed at various yard locations, in the turbine building, and on the cooling tower deck.
- f. Water will be taken from the cooling tower basin by three pumps, each sized for full expected fire flow. Two pumps will be driven by electric motors and the third by a standby diesel generator.
- g. All lube oil storage and oil filled equipment will be surrounded by impermeable berms.

4. A registered fire safety engineer or the Applicant's fire insurance company shall file with the CEC, prior to the commencement of commercial operation of the project, an affidavit stating that the design, construction, and anticipated operation of the on-site fire protection system conforms with standards and regulations referred to in Findings 1.a, 1.c, and 2.

5. The Applicant shall make the Bottle Rock facility available for inspection by safety personnel designated by the

CEC. CEC staff shall give notice of a fire inspection not less than 24 hours prior to such inspection.

6. The California Division of Forestry, the Middletown Fire District, and the Kelseyville Big Valley Fire District have responsibility for off-site fire protection. The Applicant is in the process of completing mutual aid agreements for fire protection with these agencies.

7. The Applicant shall submit a copy of the final mutual assistance agreement that is reached between the respective parties. If the agreement is necessary to complete the facility's overall fire protection program, it shall be filed prior to plant construction. If it is not necessary to complete the program, the copy of the agreement shall be filed prior to commercial operation of the facility.

Conclusions

1. Implementation of the measures described in Finding 3 will ensure that reasonable on-site protection will be provided.

2. With the implementation of the requirements of the mitigation measures specified in Findings 4 and 6, compliance with standards for on-site fire protection will be assured.

3. With the implementation of the mitigation measure described in Finding 7 above, reasonable compliance with standards for off-site fire protection will be assured.

Conditions

1. The Applicant shall undertake the mitigation measures for on-site fire protection specified in Findings 4 and 5.

2. The Applicant shall undertake the mitigation measures specified in Finding 7 for off-site fire protection.

B. Hazardous, Toxic and Flammable Materials

Findings

1. The following laws and standards are applicable to the Bottle Rock power plant:

- a. Code of Federal Regulations, Title 49, sections 173.302, 178.36, 178.37, and 173.249.
- b. Title 8, Article 138, California Administrative Code.
- c. Title 8, section 5162, Cal. Admin. Code.
- d. Title 8, section 5204, Cal. Admin. Code.
- e. Title 8, Chapter 4.1, Cal. Admin. Code.
- f. Title 8, Art. 145, Cal. Admin. Code.
- g. Title 8, Art. 139, Cal. Admin. Code.
- h. Title 8, Art. 76, Cal. Admin. Code.
- i. Title 8, Art. 107, Cal. Admin. Code.
- j. Title 8, section 3203.

2. In addition, the following industry consensus standards and design methods are applicable for storage tanks and pressure vessels:

- a. Oil and Stretford System tank - API 650, Tri-Services Manual.
- b. Unfired Pressure Vessels - ASME Pressure Vessel Code.
- c. Hydrogen Peroxide - Manufacturing Chemists Association Chemical Safety Data Sheet SD-53.

For flammable materials the following safety practices contained in the National Fire Codes also apply:

- a. Propane - National Fire Codes Vol. 5, Section 58-1 through 58-165, Vol. 13, Appendix A, Pages 49-307 to 49-310.
- b. Hydrogen - National Fire Codes Vol. 4, Section 50 A-1 through 50 A-15; Vol. 13, Appendix A, Pages 49-307 through 49-310.

3. The approximate quantities of toxic, hazardous, or flammable materials to be stored on-site are:

- | | |
|---|-------------------------------------|
| a. Propane | 1,000 gallons |
| b. H ₂ Gas | 4,000 cu. ft. (20 cylinders) at STP |
| c. Lube Oil | 5,000 gallons |
| d. Hydrogen Peroxide (H ₂ O ₂) (if necessary) | 17,500 gallons (7 days storage) |
| e. Vanasol | 1,125 lbs. |
| f. Anthraquinone Disulfonic Acid (ADA) | 400 lbs. |
| g. Sodium Hydrogen Carbonate (NaHCO ₃) | 23,000 lbs. |
| h. CO ₂ Gas | 1,500 lbs. |
| i. Ammonia, Copper Sulfate, Liquid Oxygen | Amount Unknown |
| j. EIC Process Inventory
10% ammonia sulfate,
2% sulfuric acid, .5%
copper sulfate | 50,000 gallons |

4. The provisions of adequate on-site storage and containment facilities, together with the adoption of proper handling and transportation procedures for the materials listed

in Finding 2 will minimize to an acceptable level the risk to health and safety posed by these chemicals and compounds.

5. The propane will be stored in a tank that conforms to design requirements contained in Title 8, CAC, Chapter 4.1.

6. Hydrogen gas will be stored in its original shipping cylinder which is approved by the Federal Department of Transportation.

7. The Applicant has proposed high purity aluminum alloys for hydrogen peroxide storage tanks. The specific alloys listed by the Applicant are consistent with those recommended by the Manufacturing Chemists Association in Chemical Safety Data Sheet SD-53. Additional storage and handling precautions contained in section 5204, Title 8, Cal. Admin. Code will be used to ensure a safe working environment.

8. Stretford H_2S abatement chemicals (Vanasol, ADA, and $NaHCO_3$) will be delivered and stored in a dry powder form before being used. These chemicals will be used in unfired pressure vessels and storage tanks designed to the ASME Boiler and Pressure Vessel Code which has been adopted by the California Department of Industrial Relations, Division of Occupational Safety and Health under Title 8, Chapter 4.1 CAC.

9. An alkali that may be substituted for $NaHCO_3$ is sodium hydroxide (NaOH). If NaOH is used in the Stretford process, the Applicant will adhere to container specifications prescribed in 49 C.F.R. 173.249 and handling precautions in section 5162, Title 8, Cal. Admin. Code.

10. If carbon dioxide, used to purge rooms of oxygen in event of a fire, is stored in cylinders, the Applicant will comply with Article 76, Title 8, Cal. Admin. Code.

11. Ammonia will be used in the EIC process. Storage of this gas under pressure requires tanks designed and constructed according to Chapter 4.1, Title 8, Cal. Admin. Code. Handling of this gas will comply with Article 107, Title 8, Cal. Admin. Code.

12. Copper sulfate (CuSO_4) will also be used in the EIC process. If CuSO_4 is stored as a liquid, it will be stored in tanks designed and constructed to Chapter 4.1, Title 8, Cal. Admin. Code. Handling of CuSO_4 will be according to regulations in Article 107, Title 8, Cal. Admin. Code.

13. Storage and process tank design will utilize the method described in the Tri-Services Manual to account for dynamic fluid forces.

14. The EIC process tanks and/or pressure vessels will be designed and constructed according to standards in Chapter 4.1, Title 8, Cal. Admin. Code.

15. To prevent accidental spills of flammable and hazardous substance due to seismic shaking, the Applicant proposes to design equipment anchorages and tiedowns to resist forces equal to 0.5g lateral and 0.3g vertical. Using this criteria, the equipment should resist a Maximum Credible Earthquake. Additionally, the Applicant proposes to use design methods contained in NBS-SP-510 (same as ATC 3-06).

16. An effective method to ensure that the Applicant's storage tanks and pressure vessels comply with the relevant design codes, excluding structural design provisions which are

addressed under Structural Engineering, is to require the Applicant to submit to the Commission the following documents:

a. An affidavit signed by a registered civil, mechanical, or industrial engineer and stating as follows:

- (1) Stretford system and EIC system pressure vessels and liquid petroleum gas tanks have been designed, constructed and installed in accordance with Title 8, California Administrative Code (CAC) and the Tri-Services Manual, and anchored in accordance with ATC-3-06, section 8.3 or to a more stringent criterion.
- (2) EIC system and Stretford system tanks have been designed, constructed, and installed in accordance with American Petroleum Institute (API) Standard 650 and the Tri-Services Manual, and anchored in accordance with ATC-3-06, section 8.3 or to a more stringent criterion.
- (3) Lube oil storage tanks are designed and constructed according to article 145, Title 8, Cal. Admin. Code and anchored according to ATC-3-06, section 8.3 or to a more stringent criterion.
- (4) Hydrogen and oxygen systems are installed according to articles 138 and 139, Title 8, Cal. Admin. Code.

- (5) Ammonia and CO₂ gas are stored according to articles 107 and 76, Title 8, Cal. Admin. Code.
- (6) All storage bins and cylinder anchorages for flammable and hazardous substances are designed and constructed to an ELF of 0.5W.

- b. Copies of certified code papers for pressure vessels or storage tanks required to be designed to the ASME Boiler and Pressure Vessel Code.

17. The Applicant will adhere to the General Industry Safety Orders in Title 8, CAC that prescribe safe handling practices for flammable and hazardous substances. Plant personnel will be required to wear protective clothing (eye protection, aprons, head protection) when working with those substances. The Applicant will install wash and safety shower stations in all work areas in which flammable or hazardous materials are stored or handled. A water purge system for rapid dilution of H₂O₂ will be installed.

Conclusions

1. If the Applicant stores the substances as described in Findings 5, 6, 7, 8, 9, 10, 11 and 12, it will comply with the applicable laws, standards, and ordinances identified for handling and storage for these materials.

2. If the Applicant designs, fabricates, and constructs the various storage tanks and pressure vessels as described in Finding 8, 13, 14 and 15, submits the documents required in Finding 16, and implements the measures specified in Finding 17, plant personnel and the general public will be adequately protected from the hazards posed by the handling and storage of materials listed in Finding 3.

Conditions

1. The Applicant shall store hazardous, toxic and flammable materials as described in Findings 5, 6, 7, 8, 9, 10, 11 and 12.
2. The Applicant shall design, construct, and install storage tanks and pressure vessels as described in Findings 8, 13, 14 and 15.
3. The Applicant shall submit the documentation in Finding 16.
4. The Applicant shall implement the measure in Finding 17.

C. Worker Safety

Findings

1. The following laws are applicable to the Bottle Rock power plant:
 - a. Title 8, Cal. Admin. Code, Section 1509.
 - b. Title 8, Cal. Admin. Code, Section 3203.
2. The Applicant has proposed a worker safety/accident prevention program which is described in detail in the Applicant's Administrative Manual. Section 3800 et seq, the Division of Operation and Maintenance Safety and Training Instruction Series, and Division of Operations and Maintenance Safety Rules Manual. The primary elements of the Applicant's Accident Prevention Program are:
 - a. Training of all employees in safety consciousness and safety habits.
 - b. Training in identifying hazardous conditions and unsafe practices.

- c. Conducting formal and informal ("tail gate") safety meetings.
- d. Enforcement of established safety and health standards and orders.
- e. Periodic inspections of work sites and facilities will be conducted not less than twice annually to identify and correct unsafe conditions and work practices.
- f. A project safety engineer will be assigned to be responsible for the safety practices of both department and contractor employees.
- g. Protective clothing, such as for eye protection and head protection, will be employed when necessary.
- h. Contractors will be required to submit to the Applicant a written program for accident prevention subject to review and revision by the Applicant.

3. The California Department of Industrial Relations, Division of Occupational Safety and Health (DOSH) monitors plant construction in response to worker complaints about unsafe conditions or practices. If a complaint is received, DOSH inspectors will make a site inspection and investigate the complaint. DOSH may issue a citation with recommended corrective actions and/or an order to cease plant operations until such actions are completed.

4. The Applicant has agreed to request the State Division of Occupational Safety and Health's (CAL-OSHA) Consultation Service to review its accident prevention program for compliance with the requirements of Title 8, CAC, Section 1509 and 3203.

5. The CAL-OSHA Consultation Service has agreed to review the accident prevention program proposed by the Applicant.

6. The Applicant shall submit to the Commission, not later than 150 days prior to the operation of Bottle Rock, a letter from the CAL-OSHA Consultation Service or CAL-DOSH verifying compliance with the Title 8 section 3203 requirements.

7. If a disagreement arises between the Applicant and CAL-OSHA Consultation Service that cannot be mutually resolved, the Applicant may petition the Commission to hear the dispute. The Commission shall issue a decision within a reasonable time period not to exceed 45 days of receipt of the petition.

8. In the event of a safety violation as determined by DOSH, the Applicant shall notify the Commission of the infraction and the necessary corrective action. The Commission reserves the right to review any citation issued and to evaluate the adequacy of corrective actions ordered by DOSH.

Conclusion

1. If the Applicant complies with Finding 6, the proposed project will comply with the applicable standards relating to worker safety.

Condition

1. The Applicant shall comply with the provisions of sections 1509 and 3203, Title 8 of the Cal. Admin. Code and

shall ensure such compliance by performing the acts specified in Findings 4, 6, 7, and 8 above.

STRUCTURAL ENGINEERING

Findings

1. The Applicant will design and construct the proposed Bottle Rock power plant and its related facilities in accordance with:

- a. DWR Bottle Rock AFC, Section IV.D. (entitled, "Seismic Performance Criteria", revised May 22, 1980), Appendix A (Part III, entitled, "Structural Design and Construction Policy", revised May 22, 1980, and Part IV, entitled, "Power Plant Facility Structural Design Criteria", added May 22, 1980), and Appendix B (entitled, "A Report on Seismic Hazard Analysis, Bottle Rock and South Geysers Power Plants", by Dr. Haresh C. Shah, dated May 1980).
- b. Applicant's responses (dated November 5, 1979) to Staff Interrogatories.
- c. Record of telephone conversation, Gaylon Lee (CEC) and Dale Martfeld (DWR), July 21, 1980.
- d. Uniform Building Code, 1979 Edition (UBC 79), excepting Section 2312. (Note: UBC 79 is scheduled to be adopted under Title 24, California Administrative Code (CAC) as the minimum state building standard.)
- e. American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME BPV Code). (Note:

ASME BPV Code is adopted by Title 8, CAC.)

- f. American National Standards Institute, "B 31.1 Power Piping Code" (ANSI B 31.1).
- g. American Concrete Institute (ACI), "Building Code Requirements for Reinforced Concrete" (ACI 318-77).
- h. ACI "Building Code Requirements for Structural Plain Concrete" (ACI 322-72).
- i. ACI, "Commentary on Building Code Requirements for Reinforced Concrete" (ACI 318C-77).
- j. American Institute of Steel Construction (AISC), "Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings" (AISC CSDFESS 78).
- k. AISC, "Commentary on the Specifications of the Design, Fabrication, and Erection of Structural Steel for Buildings" (AISC CSDFESS 78).
- l. AISC, "Specification for Structural Joints Using ASTM A325 or A490 Bolts", April 1978 (AISC SST 78).
- m. American Welding Society, "Structural Welding Code AWS D1.1-79" (AWS D.1.-79).
- n. American Welding Society AWS D12.1-75, "Reinforcing Steel Welding Code".
- o. "National Design Specification for Stress-Grade Lumber and Fastenings, 1977" (NDS 77).

- p. "Timber Construction Standards", AITC-100, American Institute of Timber Construction, 1972.
- q. American Iron and Steel Institute (AISI), "Specifications for the Design of Light Gauge Cold Formed Steel Structural Members" (AISI SDLCFSS).
- r. Steel Joist Institute, "Standard Specifications and Load Tables" (SJI SSLT).
- s. American Association of State Highway and Transportation Officials, "Standard Specifications for Highway Bridges", 1977 edition (AASHTO BRIDGE 77).
- t. Structural Engineers Association of California (SEAOC), "Recommended Lateral Force Requirements", 1975, Recommendations and Commentary (SEAOC Recommendations and Commentary).
- u. Cooling Tower Institute, "CTI Code Tower, Standard Specifications for the Design of Cooling Tower with Douglas Fir Lumber", October 1974 (CTI).
- v. Departments of the Army (TM 5-009-10), the Navy and the Air Force, "Seismic Design for Buildings", Section 9 excepting subsection 9-06), April, 1973.

2. In the case of discrepancies between the criteria contained in Finding 1, subparts (a) through (c) and the criteria contained in Finding 1, subparts (d) through (v), the Applicant shall use the highest design criteria in the final design of the facility.

3. The Applicant will use the Applied Technology Council, "Tentative Provisions for the Development of Seismic Regulations for Buildings", ATC 3-06, 1978 (NBS-SP-510), as a guide in the design of Bottle Rock power plant and related facilities.

4. For other than seismic loads, the Applicant will use UBC 79 structural design criteria (augmented as necessary by special live loads) and structural analysis methods.

5. The Applicant will design and construct the Bottle Rock power plant and related facilities to withstand a Design Earthquake (vibratory ground motions having a 10 percent probability of being exceeded during a 30-year facility lifetime) with minor structural damage and uninterrupted power generating capacity, and to withstand a Maximum Possible Earthquake (vibratory ground motion having a five percent probability of being exceeded during a 30-year facility lifetime) with no structural collapse and damage repairable within 12 months.

6. The Applicant will design and construct the Bottle Rock power plant and its related facilities to withstand seismic loads indicated by the site response spectra shown as Figures 32 and 35 of the AFC, Appendix B (revised May 1980), corresponding to the Design Earthquake (ten percent damping with a ductility of 1.0) and Maximum Possible Earthquake (10 percent damping with a ductility of 2.0) respectively.

7. For seismic design of critical structures and components, the Applicant will perform dynamic analyses using

appropriate computer programs, such as STRUDL, SAP IV, TABS, or STRESS and incorporating the site seismic response spectra set forth herein, (Critical structures include the Turbine-Generator Building, H₂S Control and Chemical Buildings, Switchyard Support Structures, Cooling Tower, and Transmission Towers).

8. In lieu of the dynamic analysis, the Applicant may use the Equivalent Lateral Force (ELF) method of seismic analysis as set forth in UBC 79, SEAOC Recommendations and Commentary, and ATC 3-06 with base shear of 0.28W for all structures except the Turbine-Generator Building, the Cooling Tower and the Stretford absorber column (H₂S Abatement).

9. The Applicant will specify and use design stresses for the proposed wood Cooling Tower structure for the Design Earthquake in accordance with the applicable codes in the Findings, and for the Maximum Possible Earthquake will specify and use design stresses not more than twice those for the Design Earthquake.

10. The Applicant will design and construct anchorage of critical equipment to withstand a minimum force of 0.5W recognizing the dynamic properties of the structure. In any event, the anchorage criteria shall be consistent with other design and performance criteria.

11. The Applicant will design piping, valves and anchorages to withstand equivalent static loads (ESL) in accordance with ANSI B31.1. The ESL shall be consistent with other seismic design criteria.

12. The Applicant will design tanks and anchorages containing toxic or hazardous substances to an ELF of 0.5W.

13. In the case of discrepancies between the criteria and methods set forth in Findings 1, 5, 6, 7, 8, 9, 10, 11, and 12, the Applicant will use the highest calculated loads in final design of the facility.

14. The Applicant will design noncritical structures and anchorages for noncritical equipment using seismic design criteria specified in UBC 79, with a base shear coefficient of 0.5W or more.

Conclusions

1. The seismic and nonseismic design criteria and analysis methods for critical and noncritical equipment and structures specified or referred to in the Findings provide an acceptable level of safety and reliability for the Bottle Rock power plant and its related facilities and will likely achieve the Applicant's performance criteria.

2. Although a final determination of compliance with applicable laws and standards cannot be made until after preparation and submittal of final design plans and specifications (which will occur after the AFC Certification), if the Bottle Rock power plant and its related facilities are designed as specified by the Findings, the design of the unit will likely comply with applicable laws and standards with respect to structural engineering and seismic safety.

3. In order to ensure compliance with the approved performance criteria, design criteria analysis methods and with applicable standards, the Applicant will submit final plans, specifications, and substantial¹ change orders for review; also construction inspections will be performed to ensure conformance of the work with the final plans, specifications, and change orders pursuant to the procedures described in Conditions 1 through 6.

Conditions

1. The Applicant shall demonstrate in the final design plans and specifications conformance with the criteria and requirements set forth in the Findings. Final plans, as used herein, are the plans upon which the construction will be based (e.g., used for bid purposes). The Applicant shall certify to the CEC that the final plans and specifications conform to the requirements listed in the Findings.

2. The Applicant shall submit plans and specifications for review in accordance with the following procedures:

¹ 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 one foot, this condition would be reflected in the As-built drawings since the facility design change will be considered minor. However, if newly discovered geologic conditions were encountered which required the foundation to be deepened by two or three feet or redesigned as a network of pier foundations, these conditions would be substantial and promptly brought to the attention of the Commission.

- a. The Applicant shall furnish two sets of preliminary plans and specifications to both the CEC and to the Lake County Chief Building Official (CBO) for review and comment concurrently with the Applicant's staff review process.
- b. The Applicant shall furnish two complete sets of final structural design plans and specifications for each structure and structure foundation to the CEC and CBO, respectively, as per the memorandum of understanding between the Applicant and the County. At least 30 days prior to intended filing date for such plans, the Applicant will notify the CBO and CEC of the intended filing. The final plans and specifications shall be filed not later than 75 days prior to the intended date of bid opening and shall be developed using the approved structural design criteria, structural analysis methods, seismic performance criteria, seismic design criteria, and seismic analysis methods. The plans and specifications shall reflect the inclusion of approved criteria, assumptions, and methods used to develop the design, and for the Turbine-Generator Building, Cooling Tower, and Stretford Absorber Column, shall include design calculations. The CEC will review the submittals to determine conformance with the criteria and standards set forth in these findings.

c. The Applicant's proposed final plans shall be deemed acceptable as to the requirements outlined in the Findings by the CEC unless the Applicant is notified otherwise in writing within 60 days of receipt by CEC of such plans.

3. The Applicant will file with the CEC any substantial changes to the final plans and specifications, and will notify the CEC at least 15 days in advance of intended filings of such change orders. The Applicant's proposed change orders will be deemed acceptable as to the requirements outlined in the Findings unless the Applicant is notified otherwise in writing within 30 days of filing with CEC.

4. The Applicant shall provide through its Construction Office a staff of field engineers and inspectors to monitor conformance with the accepted final plans, specifications, and change orders. Field engineers and/or inspectors will be present on site at all times to monitor construction activities and will have the authority to require changes or remedial work to construction and to halt construction in the affected area until the work conforms with the applicable requirements. The CEC staff or its agent may, upon reasonable notice, inspect the construction at any time to ensure that construction conforms to the accepted final plans, specifications, and substantial change orders.

5. In the event that the Applicant is notified that the Applicant's proposed final plans, specifications, or change orders are not acceptable to the CEC staff, the Applicant will not proceed with the work described in those documents until such time as the alleged deficiency is resolved. The Applicant will modify the plans, specifications, or change orders as necessary according to the agreed upon resolution. Should the Applicant believe that the requirements of the CEC staff are infeasible or unreasonable, the Applicant may appeal the decisions of the CEC staff in accordance with the procedures set forth in the generic Compliance/Monitoring program.

6. In the event that UBC 1979 is not adopted prior to construction by the state (under Title 24 CAC), the Applicant will demonstrate that facility design conforms with the requirements of UBC 1976.

NOISE

Findings

1. The CEC Staff has applied the following to the project:
 - a. Lake County Noise Element;
 - b. 8 Cal. Admin. Code, Article 105 (State Occupational Noise limits);
 - c. 8 Cal. Admin. Code, Chapter 3.29 (Procedures and Sanctions); and
 - d. Occupational Safety and Health Act of 1970 (Federal Occupational Noise Limits).

2. Lake County has adopted a noise element to its general plan. The intent of the Lake County noise element is to limit the ambient noise levels at sensitive receptors to 55 dBA Ldn. Lake County currently established noise limits by placing conditions in the use permit. The most recent permits establish a standard of 55 dBA Ldn at a sensitive receptor. Certain construction activities, such as the movement of heavy equipment during daylight hours, are exempt from the noise standards. Lake County has issued a proposed draft noise ordinance. The date of adoption, content and form of the ordinance, are presently uncertain.

3. The state occupational noise limits are established in Title 8, California Administrative Code, Article 105. The provisions of CAL-OSHA are enforced by the Division of Occupational Safety and Health (DOSH) of the Department of Industrial Relations, insofar as these provisions relate to construction and operational employee noise hazards. The procedures and sanctions specified in Chapter 3.29 of Title 8 of the California Administrative

Code apply to violations of the provisions of Title 8, California Administrative Code, Article 105.

4. The Federal Occupational Noise Standards, set by the Occupational Safety and Health Act of 1970, are basically the same as CAL-DOSH standards.

5. The ambient noise levels at sensitive receptors in the vicinity of the site are presented in the NOI in Tables 1-5 of the Noise Section.

6. The two closest identified sensitive receptors are located approximately 2,000 feet to the northeast of the Bottle Rock plant site. Based upon the estimated facility operational noise level of 60 dBA at 500 feet, the projected noise level to these receptors would not exceed any of the applicable standards. The projected operating noise level would also not exceed the standards to other identified sensitive receptors which are further than 2,000 feet.

7. The typical frequency spectrum data for geothermal units at the Geysers is shown in the Noise Section of the NOI, pages 18-24. Certain tonalities from the steam jet ejector, cooling tower and turbine generator are expected to be discernible at the plant, but through the implementation of mitigation measures, molecular absorption and the barrier effect of the turbine generator building, it is expected that these tonalities will be barely audible out-of-doors at the sensitive residential receptors. This should not be considered an adverse noise impact.

8. The Applicant proposes to implement the following noise mitigation measures:

- a. The steam jet injector located on the outside of the turbine-generator building will have lagging installed on its exterior surface consisting of mineral wool and an impervious membrane (aluminum and/or lead jacket);
- b. Combined thermal and sound insulation will be installed on the exterior surfaces of the steam turbine which reduces the noise inside the turbine building;
- c. The concrete walls and roof of the turbine building will provide an effective barrier to noise propagation to the outside from the electro-mechanical equipment within the building;
- d. An enclosed and acoustically insulated office space will be installed within the turbine/generator building;
- e. Steam drain lines will be routed back to the condenser so that steam will not be vented to the atmosphere during plant start-ups;
- f. During outage conditions, steam will be vented through a rock muffler or its equivalent installed and operated by the steam supplier. Use of a rock-filled muffler would mitigate the most serious noise impact potential of the project;
- g. Equipment suppliers will be encouraged to supply mechanical equipment which produces a sound level no greater than 80 dBA at 3 to 5 feet from the boundaries of the device;
- h. All project employees and contractors will be

required to comply with the current provisions of Cal-OSHA for hearing conservation.

9. The highest plant construction noises will be caused by large earth moving equipment. Noise associated with this equipment will be discernible to some of these receptors. However, the activity will be temporary in nature and performed during daylight hours whenever possible.

10. Representative lists of typical noise sources and levels associated with steam supply activities are set forth in the Environmental Impact Report for Union Oil, Unit 17 (December 1977) and Union Oil Simplified Noise Model, Unit 17 Geothermal Development Area (March 1978).

11. The nearest receptor to a well pad is approximately 0.3 miles away.

12. The projected noise levels of production well testing with portable test mufflers, steam transmission lines start-up via unmuffled well head venting and well head master valve changes will be significant noise sources and will be discernible to sensitive receptors in the site vicinity. However, these three events occur infrequently. The noise, other than the above three associated with the steamfield development and production, will be barely audible to audible at the nearest sensitive receptor. Noise from steamfield development will be less noticeable to receptors farther away.

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

14. The rock muffler or equivalent system mentioned in Finding 8(f) should reduce noise during periods of steam stacking to an inaudible level at the closest receptors at the power plant.

15. To verify compliance with standards for the protection of the employees from noise impacts, a noise evaluation as required by Title 8, Cal. Admin. Code, Article 105, will be performed by the Applicant to determine the magnitude of employee noise exposure. The results of the evaluation shall be available to the Commission within 180 days of the time that the facility has reached its rated power generation capacity and construction is complete. The results of the noise survey will be maintained by the Applicant and will be made available to DOSH or CEC upon request.

16. Consistent with the policy set forth in the Lake County Noise Element, the Applicant will undertake the following measures within 90 days after the plant reaches its rated power generation capacity and construction is complete. The Applicant will conduct noise surveys at 500 feet from the generating station and at the nearest sensitive receptor:

- a. The survey shall cover a 24-hour period during which the plant is operating;
- b. Results of the survey shall be reported in terms of L_x , L_{eq} , and L_{dn} levels;
- c. The Applicant will provide a report of the survey to the Energy Commission and Lake County. If the report indicates that the County's guidelines are being exceeded the report will contain a mitigation plan and a schedule to correct the inconsistency;

- d. The Applicant need not provide any additional noise surveys or reports of the off-site operational noise of the plant unless the public registers complaints or the noise from the project is suspected of increasing due to change in the operation of the facility.

17. In the event that the Applicant receives public complaints of the noise due to construction, the Applicant will immediately conduct an investigation to determine the extent of the problems. The Applicant will take reasonable measures to resolve the complaint.

18. In the event that the Applicant is informed that public complaints have been registered with a public official or agency and the Applicant fails to resolve the problem, the Applicant will so inform the Lake County Planning Department and the Commission. If requested by the Department and the Commission, Applicant will perform the monitoring procedures outlined below:

- a. Conduct noise surveys at the sensitive receptors registering the complaint and at the facility property line nearest the complaining receptors. Surveys shall be taken for the period of the construction working day and under similar circumstances that the complaints were registered. The surveys should be reported in terms of the L_x and L_{eq} levels;
- b. Notify Lake County and the CEC of the results of the survey, of the public complaints, of the feasible mitigation measures which the Applicant has applied to resolve the impact, and the

results of the mitigation plans.

Conclusions

1. If the mitigation measures specified in Finding 8 are implemented, power plant noise levels during normal operations will be consistent with the guidelines of the Lake County Noise Element and will be in compliance with requirements of CAL-DOSH and federal standards.

2. If the mitigation measures specified in Finding 8(f) are implemented, noise levels during periods of steam stacking will be consistent with the guidelines of the Lake County Noise Element and will be in compliance with requirements of CAL-DOSH and federal standards.

3. Noises caused by steamfield operations will be generally discernible during events described in Finding 12 but such noises are within the tolerable range.

4. Noises caused by construction of the power plant and related facilities may be discernible to some of the receptors closest to the power plant site but will be consistent with the guidelines of the Lake County Noise Element and will be in compliance with CAL-DOSH requirements and federal standards. If the Applicant limits the use of earth moving equipment to daylight hours, the noises caused by plant construction will be tolerable to local receptors.

Condition

1. The Applicant shall implement the measures specified in Findings 8, 9, 15, 16, 17, and 18.

PUBLIC HEALTH

Findings

General

1. Bottle Rock power plant will emit pollutants which can be adverse to human health when present in sufficient concentrations. These pollutants include: regulated pollutants (pollutants for which there are ambient air quality standards or emissions standards) such as hydrogen sulfide (H_2S), sulfur dioxide, particulate matter, sulfates, and radon-222 (^{222}Rn); and nonregulated pollutants (pollutants for which there are presently no standards) such as mercury, arsenic, boron, and ammonia. Hydrogen sulfide abatement systems can result in the emissions of anthraquinone disulfonic acid (ADA), vanadium, copper, sulfates, and other particulate matter. The severity of health impacts from these pollutants depends upon the concentration, length and frequency of exposure, and sensitivity of the individuals exposed. Particularly sensitive individuals include children, the elderly, and the infirm.

2. Ambient air quality standards and emission standards are based upon protection of public health and/or protection against public nuisance (e.g., odor and visibility). Where resultant ambient concentrations of regulated pollutants from Bottle Rock will not cause a violation of these standards, it is likely that adverse health impacts will not be significant.

Applicable standards for regulated ambient pollutants are listed in the Bottle Rock Revised Draft EIR, Public Health Section.

3. Some potentially hazardous pollutants are not presently regulated by ambient air quality standards. Federal agencies and other research groups have funded studies which suggest safe levels of these pollutants in ambient air. These suggested levels can be used as a guide for assessing the potential for public health impacts.

4. The maximum expected emission rates of pollutants from the Bottle Rock power plant based upon data provided by the Applicant are as follows:

<u>Pollutant</u>	<u>Maximum Expected Emission Rates</u>	
<u>Steam Contaminants</u>		
hydrogen sulfide (unabated)	600	lbs/hr
ammonia	208	lbs/hr
mercury	0.64	lbs/hr
arsenic	< 0.005	lbs/hr
boron	7.5	lbs/hr
radon-222	65	mCi/hr.
<u>Abatement System Chemicals</u>		
anthraquinone disulfonic acid (ADA)	0.005	lbs/hr
vanadium	0.01	lbs/hr
sodium carbonate	0.06	lbs/hr

sodium sulfate	0.25	lbs/hr
sodium thiosulfate	0.55	lbs/hr
copper	0.00035	lbs/hr

Actual emissions of each of these pollutants will depend upon, among other things, the design and the effectiveness of abatement equipment, the cooling tower drift rate, and the chemical interactions among pollutants.

5. The LCAPCD is presently conducting well tests to determine ammonia and H₂S in the steam supply. The maximum values listed in Finding 4 may be modified as a result of these tests.

Regulated Pollutants

6. Concentrations of ²²²Rn in the atmosphere at The Geysers KGRA were measured by Lawrence Livermore Laboratory for PGandE in 1975-1977 when Units 1-11 were operational. The highest recorded ²²²Rn concentrations were 0.5 pico Curies per liter in air at Geysers Units 1 and 2, and 1.4 pico Curies per liter in air at the SRI Station 7 (Sawmill Flat).

7. Emissions of ²²²Rn from Bottle Rock are not expected to exceed ²²²Rn emission standards.

8. Pursuant to Section 25607 of the California Health and Safety Code, the California Department of Health Services Radiologic Health Section (RHS) currently requires periodic monitoring of ²²²Rn concentrations in incoming steam of

geothermal power plants to verify compliance with applicable standards and to provide input into the RHS multiple source modeling study investigating the cumulative impacts of ^{222}Rn .

9. The Applicant will implement a ^{222}Rn monitoring program mutually acceptable to RHS/DOHS, CEC Staff, LCAPCD and Applicant. This program will be described in the Bottle Rock Compliance and Monitoring Report.

Nonregulated Pollutants

10. Total exposure of receptors to ammonia, arsenic, boron, mercury, vanadium, ADA, and copper includes existing ambient concentrations (baseline) in combination with incremental concentrations from Bottle Rock and other future sources. Information regarding existing ambient concentrations of these elements and compounds is very limited. Therefore, characterization studies of emissions and existing ambient air concentrations must be performed if the public health effects of Bottle Rock emissions are to be assessed. The rationale for performing these studies is described in the Bottle Rock Revised Draft EIR, Public Health Section.

11. Applicant agrees to perform an analysis on incoming steam for Bottle Rock similar to those to be performed for Geysers Units 16, 17 and 18. This program will be described in the Compliance Monitoring Report to be developed jointly by the Applicant and Staff.

12. Applicant agrees to perform theoretical mass balance estimates for mercury, arsenic, ammonia, and vanadium for the Bottle Rock power plant to estimate the percent of incoming pollutants being emitted. These estimates will be combined with Bottle Rock steam analyses to predict Bottle Rock emissions of mercury, arsenic, ammonia, and vanadium.

13. Applicant agrees to perform baseline ambient measurements for mercury, arsenic, ammonia, and vanadium in nearby populated areas such as Pine Grove, and the Pine Summit Subdivision similar to those for Units 16, 17, and 18. This program will be described in the Compliance Monitoring Report to be developed jointly by Staff and Applicant.

14. Baseline ambient concentrations of mercury, arsenic, ammonia, and vanadium will be combined with predicted Bottle Rock impacts to determine short term (1-hour) population exposures. Predicted impacts from other sources, where available, will also be used in this analysis.

15. The Commission Staff will arrange necessary meetings among Staff, Applicant, CARB, LCAPCD, and DOHS, and other interested parties to determine significant ambient guideline concentrations (related to public health concerns) for use in the Bottle Rock ambient monitoring program for mercury, arsenic, ammonia, and vanadium. Criteria for determining significant ambient concentrations will be described in the Compliance Monitoring Report to be developed jointly by Staff and Applicant.

16. Ambient monitoring for mercury, arsenic, ammonia, and vanadium after Bottle Rock becomes operational will not be initiated unless significant ambient concentrations in populated areas are predicted to occur due to Bottle Rock emissions.

17. Staff will met with Applicant and LCAPCD to develop a Compliance Monitoring Report.

Occupational Health

18. The Applicant will request Cal/OSHA Consultation Service to review the Applicant's accident prevention program. Verification of review will be submitted to the CEC no later than 150 days prior to power plant operation.

Conclusions

Regulated Pollutants

1. If the Applicant complies with the State Ambient Air Quality Standards for regulated pollutants, public health should be adequately protected from exposure to H₂S, sulfur dioxide, particulate matter, and sulfates.

2. Significant health impacts are not expected to occur from ²²²Rn emissions.

Nonregulated Pollutants

3. If the Applicant performs the measures specified in the nonregulated pollutant Findings, the public should be adequately protected from adverse health impacts from nonregulated pollutants from Bottle Rock power plant.

Occupational Health

4. If the Applicant performs the measures specified in Finding 18, the employees at Bottle Rock power plant should be adequately protected from adverse health impacts from pollutant emissions.

Conditions

1. The Applicant will implement the measures as described in the above Findings.

AIR QUALITY/AIR QUALITY SYSTEMS ENGINEERING

Findings

Operation of Abatement Systems

1. The Applicant has proposed to use three separate H₂S abatement systems. These systems are the EIC process, the Stretford process (including surface condenser), and the hydrogen peroxide process. Additionally, a turbine bypass system will be installed.

EIC Abatement System

2. The EIC system will be used upstream of the power plant. The design is scheduled to be completed in May, 1982.

3. The maximum abatement efficiency of the EIC process for the Bottle Rock plant cannot be determined until the plant is in operation.

4. Information provided by the Applicant indicates the abatement efficiency potential for the EIC process to be in the range of 90-99%.

5. The EIC corporation is still in the process of obtaining design information from the Applicant. Therefore, no detail design information has been generated to define the abatement process and the required monitoring and control.

6. Reliability related aspects of the EIC system are also unknown at this time. EIC, LCAPCD and the Applicant expect the

reliability of the EIC system, once in operation, to be similar to that of the Stretford unit.

7. The EIC manufacturer has stated that operator training and performance are critical to the reliability of the EIC system.

8. No guarantees of reliability of the EIC unit will be given to the Applicant by the EIC manufacturer. The Applicant will require guarantees of performance.

9. The EIC manufacturer recommends a daily check of the system. A DWR operator will inspect the system at least daily and as necessary.

10. The main constituent of the EIC chemical solution is copper sulfate. To maintain abatement efficiency, the copper ion content will be kept at an automatically controlled setpoint by modulation of a chemical feed control valve.

11. The EIC system will also treat steam during power plant outages. If utility service power is lost during this condition, an emergency generator will supply the necessary power to run the EIC system.

12. Problems of corrosion, carryover of chemical products of the process downstream of the scrubber, and slugs of water occasionally contained in the steam were encountered in tests of the EIC system, on a 100,000 lb/hr of steam, experimental plant (PG&E Unit 7). These problems have been addressed in the design of the proposed plant.

13. EIC will install on Bottle Rock a demister superior to that at the experimental plant to reduce some of the problems listed in Finding 12. The performance of the demister, however, is unproven at this time. Vendor testing is presently underway.

14. A steam testing program is currently being conducted for the Applicant by LCAPCD. This data will be used by EIC to establish some of their design criteria.

15. No formal contractual agreements have been reached between the EIC Corporation and MCR Geothermal Corp., Bottle Rock's steam supplier.

16. The incorporation of the EIC system with the other two processes indicated in Finding 1 raises the capital cost of the abatement systems. However, the EIC system has an anticipated low operational cost relative to the other two systems, and will reduce the abatement requirements of the other two systems when it is in operation. Therefore, it will reduce the operational cost below that of the combined systems using the Stretford and hydrogen peroxide processes.

17. The potential beneficial aspects of the inclusion of the EIC system are:

- a. Capital cost gains associated with the possibility of not needing a downstream abatement system in some future plants;
- b. Operational cost savings associated with (a) above;
- c. Demonstration of appropriate technology for possible retrofitting of the plants in the Geysers;

- d. Capability of treatment of steam for H₂S abatement during a plant shutdown condition;
- e. Cleaner steam being supplied to the power plant. This would result in less maintenance and operational problems at the power plant;
- f. Waste disposal included with the power plant cooling tower waste stream that is returned to the reinjection well;
- g. Partial removal of boron, arsenic, particulates, and other constituents from the steam.

Stretford Abatement System

18. The Stretford system design is not scheduled to be completed until approximately February, 1981.

19. The preliminary information submitted by DWR (Data Request Responses of November 15, 1979) indicates that equipment failure or system problems will be detected at the Stretford and power plant control rooms by alarms, indicators, or recorders or by direct observation by an operator. All critical temperature, pressure, flow and level indicators will have high and low levels that terminate on the control panels.

20. The information also indicates that in the event that the flow of noncondensable gases to the Stretford unit has to be stopped in order to facilitate repair or prevent equipment damage, a bypass system will be built into the system design, allowing venting of untreated gases into the cooling tower. In this way, the power plant can be kept in operation with the

other abatement units operating or reduced generation could occur while repair takes place.

21. The expected H₂S abatement efficiency of the Stretford Unit is 99%+ of the H₂S in the noncondensable gas flow. The reliability of the Stretford Unit is not known but is expected to be 90% or greater availability.

Condensate Treatment System - Hydrogen Peroxide System

22. The Applicant has agreed to provide a secondary H₂S abatement system downstream of the power plant. The type of process proposed at this time is a hydrogen peroxide treatment using iron sulfate as a catalyst.

23. The actual abatement efficiency of the hydrogen peroxide process for the Bottle Rock plant cannot be determined at this time. Bechtel National, Inc. will be conducting a testing program on the hydrogen peroxide process from the Bottle Rock steam field to determine abatement efficiency and other aspects such as solids formation. Until the tests are completed and results of the abatement efficiency determined, the abatement efficiency is projected to be in the 95-98% range.

24. The results of these tests are scheduled to be released approximately January 1, 1982. The Applicant will design the system after the testing program is completed. The final design is scheduled to be completed in approximately August, 1982.

Turbine Bypass System

25. The function of the proposed turbine bypass system is to allow by-passing of the steam around the turbine. This provides

treatment of the steam by the H₂S abatement systems downstream of the turbine during scheduled and emergency shutdowns, or startup conditions.

26. The system is presently in the preliminary design stage. Such a system has never been used before on a geothermal power plant, although it has been used successfully on other power-generating facilities.

27. It is not expected that the use of the steam bypass system will in some way affect normal power plant operation or partitioning of condensibles and noncondensibles within the turbine condenser. However, the effects on normal power plant operation or partitioning have not been evaluated.

28. Although actual abatement efficiencies for the EIC and hydrogen peroxide systems are not established, there has been some evidence indicating a potential for high abatement efficiencies (greater than 95%) by each system. There appears to be a number of potential ways that the three proposed abatement systems identified in Finding 7 could operate to achieve H₂S emissions of no more than 5 lb/hr.

Compliance With Air Quality Laws

29. Bottle Rock power plant is proposed to be located in the Lake County Air Pollution Control District (LCAPCD). The following laws are applicable to the Bottle Rock power plant:

- a. Clean Air Act and implementing regulations;
- b. Lake County Air Pollution Control District Rules

- (1) 602, 602.1, 604, 605 (New Source Review)
- (2) 411
- (3) 412
- (4) 421.2-A
- (5) 430

c. California Health and Safety Code and implementing regulations.

30. Bottle Rock power plant will not undergo federal NSR or PSD review, provided the Lake County APCD issues the necessary enforceable permits.

31. LCAPCD Rule 411 limits Bottle Rock's emissions of particulate matter to whichever is the lesser of:

- a. 0.2 grains per standard cubic foot of gas, or
- b. 40 pounds per hour.

32. Until the Applicant determines the performance of the EIC system and the extent to which the condensate treatment system will be used, the amount of particulates that could be emitted from the process cannot be precisely determined. Nonetheless, including an assumed contribution from condensate H₂S treatment, the plant's total particulate emissions are expected to be less than 40 lbs. per hour.

33. Particulate emissions during power plant outages are not expected to exceed those resulting from normal plant operation.

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

- a. 10 ppm H₂S by volume, and

b. 100 lbs. per hour of sulfur compounds calculated as SO_2 . The LCAPCD Air Pollution Control Officer (APCO) has interpreted Rule 412 as applicable to the Stretford and EIC Units.

35. The H_2S emissions from the Stretford unit, regardless of whether or not the EIC system is operating are guaranteed to be less than 10 ppm by volume. At 10 ppm by volume the H_2S emission rate should be less than 1 lb/hr.

36. LCAPCD Rule 421.2.A. limits H_2S emissions from a geothermal power plant to not more than 100 grams/GMWH. H_2S emissions from all geothermal power plants located in Lake County will be limited to 50 gr/GMWH beginning January 1, 1990. The 50 gr/GMWH emission limitation will be reviewed at a public hearing in 1987. The Applicant proposes to operate the Bottle Rock power plant with an H_2S emission rate not to exceed 38 gr/GMWH (5 lbs/hr).

37. A general emissions limitation contained in LCAPCD's Rule 430 prohibits the discharge of any contaminant in an amount which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or which causes injury or damage to business or property. Further, LCAPCD Rule 430 states that emissions in quantities which cause the ambient air quality to exceed those amounts listed in the Table of Standards applicable statewide (as shown in 17 California Administrative Code §70200) is a violation of that rule.

38. The H_2S ambient air quality standard is based in part on a nuisance emissions threshold and on public health

considerations. If the Bottle Rock plant is built and operated as proposed, it is expected to comply with Rule 430.

39. LCAPCD Rules 602 and 605 require that the APCO perform an air quality analysis for any source which will emit more than 20 lbs. per hour or 150 lbs. per day of any pollutant, except CO, for which there is a local, state, or federal ambient air quality standard (AAQS). The APCO must deny an authority to construct for such a source unless he determines that emissions from the source may not be expected to result in the violation or measurable contribution to the continued violation of any AAQS, and provided that the best available control technology (BACT) will be used on the contaminant-emitting equipment for any pollutants for which there is an AAQS. Further, Rule 604 allows the APCO to conduct an air quality analysis for a source which will emit less than 20 lbs. per hour or 150 lbs. per day of any pollutant for which there is an AAQS if the emissions from the source may be expected to result in the violation or measurable contribution to the continued violation of an AAQS.

40. If an analysis performed pursuant to LCAPCD Rule 605 indicates the source will result in the violation of the measurable contribution to the continued violation of an AAQS, Rule 602-B provides that that source may still be permitted if emissions offsets, beyond those reductions required by existing control strategies, are obtained in such an amount that a "demonstrable basinwide air quality benefit" will result.

41. The State AAQS for Hydrogen Sulfide (H_2S) which may not be equalled or exceeded, is 0.03 ppm. H_2S measurements in

the vicinity of Bottle Rock show that the standard has been exceeded several times in previous years. In the absence of contrary evidence, it is thus assumed that the standard will be exceeded when Bottle Rock comes on line. Therefore, Bottle Rock must comply with LCAPCD's measurable contribution provisions set forth in Finding 39.

42. A central element of the initial air quality analysis for the Bottle Rock project was the interpretation of a series of atmospheric tracer tests conducted by Meteorological Research Inc. (MRI) at the proposed plant site from 1978 through 1979. The release height of the tracer gas for Test 5 was 500 feet. The analysis of MRI Tracer Test 5 (September 27, 1978) indicated that the Bottle Rock project as proposed at 100 grams/GMWH of H₂S would not comply with Lake County Rule 602.

43. Applicant contended that the release height for Test 5 should have been higher in order to more accurately depict the power plant's plume rise. Calculations performed subsequent to the test suggested that plume rise from the Bottle Rock cooling towers might, under the conditions of the test, have been somewhat higher than 500 feet. The Staff, Applicant, and ARB reviewed the plume rise analysis¹ and agreed that a plume rise of 500 feet was not appropriate for a geothermal power plant cooling tower. All parties agreed that release heights of 750 and 1,000 feet were more realistic.

¹ Systems Applications, Inc., Simulated Hydrogen Sulfide Impacts From the Proposed Bottle Rock Power Plant Under Subsidence-Inversion Conditions, dated August 7, 1980, Table 1, p. 6.

44. The Applicant submitted the SAI Geysers Hybrid Model, which compared the power plant ambient H₂S impacts at release heights of 500 feet, 750 feet, and 1,000 feet under Test 5 meteorological conditions.²

45. The model demonstrated in conjunction with Test 5 that at a plume rise of either 750 or 1,000 feet the Bottle Rock project will not result in a measurable contribution to an existing violation when the H₂S emission rate is limited to 5 lbs/hr. The LCAPCD will independently review this and additional analytical techniques in making the Determination of Compliance for the power plant.

46. The steam supplier has proposed to limit the H₂S emissions resulting from steam stacking by utilizing the power plant H₂S control systems. The EIC process and a turbine bypass will be used to provide H₂S abatement for the uncurtailed steam.

47. Emission rates of H₂S during unit outage conditions, provided abatement systems outages are not the cause of unit trip, would be approximately equal to or less than normal plant operations.

48. Based on the controls described in Finding 46, the APCC of the LCAPCD has indicated that, pending resolution of APCD conditions, it is likely that the steamfield will receive an air quality permit.

49. Unit 16 and other PG&E power plants recently proposed do not incorporate technological advances of this proposed power

² Id. ,Table 6, p. 107.

plant.] [Finding proposed by LCAPCD; CEC Staff does not support; Applicant is neutral.]

Conclusion

1. If the Applicant implements the measures specified above and complies with the Conditions below, it is likely that:

- a. the abatement systems will perform effectively and will be adequately monitored and protected; and
- b. the plant will conform to all applicable air quality laws.

Conditions

Abatement Systems Design

Definitions

The following definitions will apply to the DWR Bottle Rock facility only:

Review - Review shall mean a 30-day period during which the control agency(s) shall assess and inform Applicant of any apparent deficiencies. If no notification is given, the Applicant shall proceed on its project schedule. If notified of an apparent deficiency, the Applicant shall inform the agency(s) of its intentions to provide additional information or modifications to correct the deficiency within 30 days. A projected schedule for this information shall also be provided.

Design Information - This information shall contain the equivalent level of detail as the Stretford system flow diagram (AFC figure 4.3-15, attached) submitted by PG&E in Geysers Unit

18. This information shall also consist of a tabulation of associated equipment (e.g., pumps, blowers, tanks, etc.) and a list indicating numbers of components and capacities. This information may be based upon final bid specifications.

Forty-five (45) days before procurement - This shall mean 45 days before specific equipment hardware is purchased. If design information is not provided 45 days in advance of procurement the Applicant shall have proceeded at its own risk.

1. The Applicant shall provide the CEC staff, ARB, and LCAPCD, for their review, design information on the following:

[a. EIC systems] [This finding is still being discussed by the Staff and Applicant, to determine to what extent and under what procedures proprietary information concerning the EIC system may be released].

- b. Stretford system,
- c. Turbine by-pass,
- d. Condensate Treatment (Hydrogen peroxide), and
- e. any performance information which is not proprietary on the condenser/sparger system acquired during shop testing and preoperation compliance and monitoring activities;

when this becomes available, but no later than 45 days before procurement of equipment.

2. The Applicant shall submit verification to the CEC, ARB and LCAPCD that the initial EIC operators have been trained in accordance with EIC manufacturer recommendations.

3. The Applicant shall provide the results of vendor testing of EIC demister systems to the CEC, ARB and LCAPCD for

their review when they become available, but no later than 45 days before procurement of the demister equipment.

4. The Applicant shall provide the results of LCAPCD's steam testing to the CEC staff and ARB when they become available, but in no case later than 45 days before procurement of H₂S abatement equipment.

5. The Applicant shall provide to the CEC and LCAPCD a summary description of the contractual relationship among the Applicant, the steam supplier, and EIC Corporation.

6. The Applicant shall provide the CEC, ARB and LCAPCD a summary results of the Bechtel tests described in Finding 23 as soon as they become available, but in no case later than 45 days before procurement of equipment.

7. The Applicant shall provide the CEC, ARB and LCAPCD a verification that it has received a performance guarantee of 90% or better obtained from EIC Laboratories for the EIC system.

Monitoring and Compliance

The Applicant shall as a minimum undertake the following monitoring and compliance programs. Specific details on testing procedures, monitoring equipment specifications, monitoring program duration, and reporting procedures shall be established in the Final Monitoring and Compliance Report on the Bottle Rock project, or in the Generic Geothermal Monitoring and Compliance Program (currently under development by the CEC). As described in Conditions 8-11, the Applicant shall submit a monitoring program at least 60 days prior to start up of the Bottle Rock Facility. Continuous instrumental methods of measuring H₂S will be

considered. LCAPCD will advise the ARB and CEC on the acceptability of the programs.

8. The Applicant shall develop a program to measure at least quarterly inlet steam constituents (upstream of the EIC system), and steam constituents downstream of the EIC system.

9. The Applicant shall develop a program to measure H₂S in the noncondensable gas flow upstream of the Stretford unit and in the off-gas vents of the Stretford unit to the atmosphere and to the cooling tower.

10. The Applicant shall develop a program to measure H₂S concentrations and liquid flowrate of the condensate upstream of the secondary abatement system and H₂S concentrations downstream of the secondary abatement system prior to its release to cooling tower circulating water.

11. The Applicant and LCAPCD shall develop a program to monitor ambient H₂S and TSP concentrations and/or other pollutants prior to and during operation of the Bottle Rock facility at locations to be mutually agreed upon. The Applicant shall submit the monitoring plan to ARB and CEC for approval at least 6 months prior to start up of the facility.

12. The Applicant shall develop a program to monitor the H₂S abatement system's performance. Results of this monitoring program shall be submitted to LCAPCD, ARB, and CEC as follows:

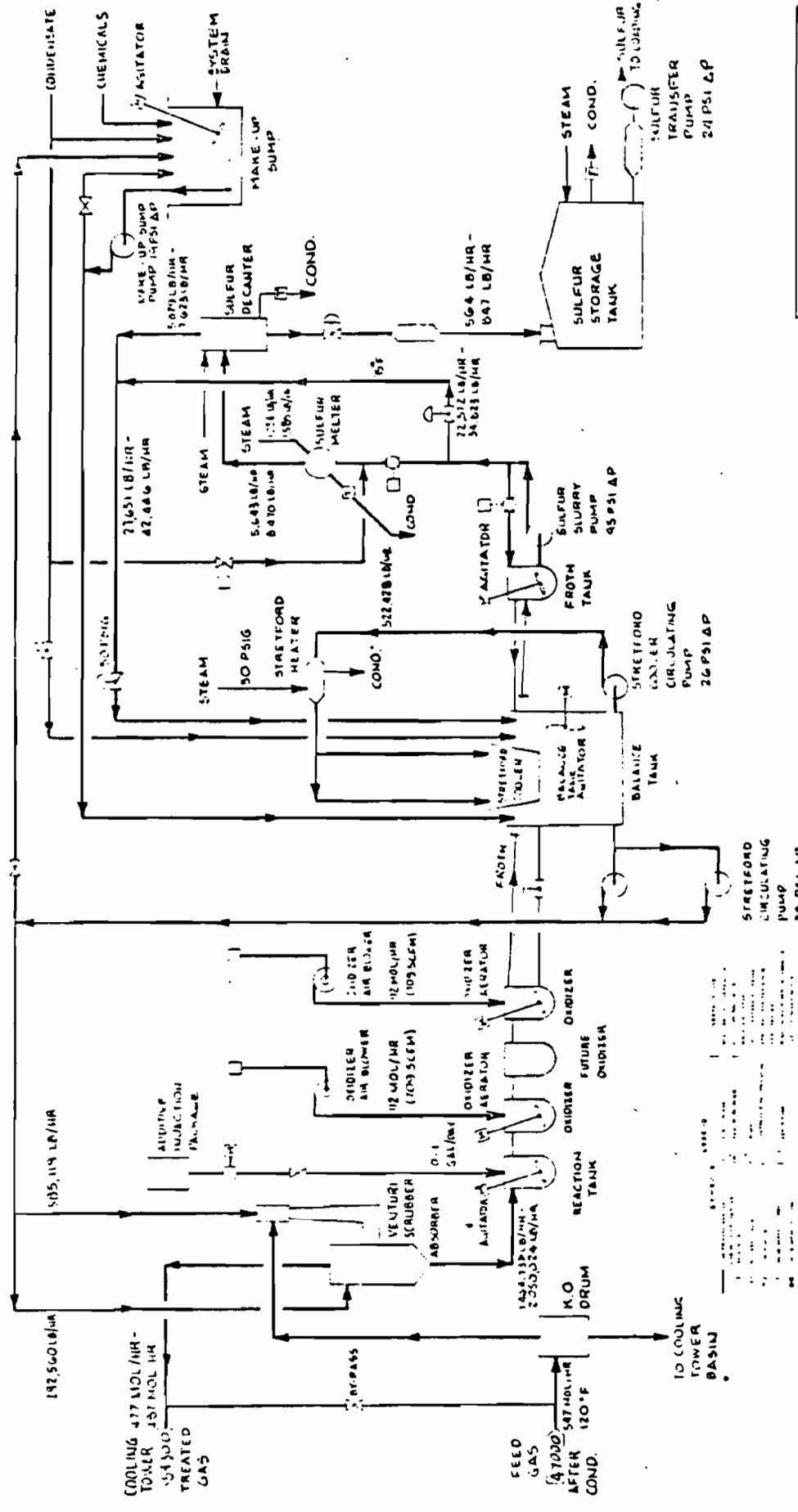
- a. The Applicant shall provide a compliance report on the results of the monitoring program within 100 days after the facility has been declared

operational. The monitoring activity is to cover a minimum period of 75 days after the time the facility has been declared operational. The report shall contain data obtained during the 75 day monitoring period. A minimum of 30 days of data (not necessarily consecutive days) at 90-110% rate power generation shall be required. The report shall contain as a minimum hourly H₂S concentrations in the off-gas and condensate, power generation rates, a description of the abatement system's failures, if any, and data obtained in Items 9, 10, 11, and 12 above.

- b. If, during the first 75 days of monitoring described in Item a, 90-110% rated power has not been achieved for a minimum total equal to 30 days, monitoring shall continue and a second report is to be submitted within 15 days of obtaining 30 total days at 90-110% rated power. The second report shall include a summary statement of why 90% rated power was not being achieved, and a description of any corrective action taken.
- c. Upon review of the information in Item(s) a and b, the Air Pollution Control Officer of the LCAPCD shall present to the Commission and ARE findings on conformity of air quality standard(s).

- d. If the APCO finds that the facility has not met applicable emissions limitations, the Applicant shall prepare and submit its response to the Commission, ARB and LCAPCD. The response shall be submitted within 30 days after the submittal of the report(s) showing noncompliance. The response shall include a description of the mitigation measures or additional control(s) to be applied to the facility or other actions taken to meet the emission limitations. The report will also describe a schedule for implementation of these measures.
- e. Upon review of the information in Item d, the Commission, ARB, and LCAPCD shall jointly determine what actions the Applicant shall take to comply with emission limitations.
- f. After the implementation of the approved mitigation measures, the Applicant shall conduct monitoring programs described in Items a and b. The LCAPCD shall perform the actions described in Item c.

13. After obtaining a finding of conformance described in Item 12.c., the Applicant shall continue to monitor the H₂S emissions from the power plant and report on the status of compliance as required by LCAPCD, but not less than on a quarterly basis. In case of noncompliance, actions identified in Items 12d, 12e, and 12f, will be required to return to a condition of compliance.



GEYSERS UNITS 18
STARTFORD SYSTEM
FLOW DIAGRAM
 (54360)
 FIGURE 4.3-15

ITEM	DESCRIPTION	UNIT	VALUE
1	Feed Gas	lb/hr	47000
2	Feed Gas After Cond.	lb/hr	47000
3	Gas to Cooling Tower	lb/hr	142560
4	Treated Gas	lb/hr	142560
5	Gas to Venturi Scrubber	lb/hr	142560
6	Gas to Absorber	lb/hr	142560
7	Gas to Oxidizer Aerator	lb/hr	102000
8	Gas to Oxidizer Blower	lb/hr	102000
9	Gas to Oxidizer Future	lb/hr	102000
10	Gas to Balance Tank	lb/hr	102000
11	Gas to Froth Tank	lb/hr	102000
12	Gas to Sulfur Slurry Pump	lb/hr	102000
13	Gas to Sulfur Storage Tank	lb/hr	102000
14	Gas to Sulfur Transfer Pump	lb/hr	102000
15	Gas to Sulfur Loading	lb/hr	102000
16	Steam to Startford Heater	lb/hr	5.433
17	Steam to Startford Heater	lb/hr	21.651
18	Steam to Sulfur Melter	lb/hr	22.572
19	Steam to Sulfur Melter	lb/hr	216.51
20	Steam to Sulfur Melter	lb/hr	225.72
21	Condensate from Sulfur Melter	lb/hr	56.4
22	Condensate from Sulfur Melter	lb/hr	88.7
23	Condensate from Sulfur Storage Tank	lb/hr	56.4
24	Condensate from Sulfur Storage Tank	lb/hr	88.7
25	Condensate from Sulfur Storage Tank	lb/hr	145.1
26	Condensate from Sulfur Storage Tank	lb/hr	145.1
27	Condensate from Sulfur Storage Tank	lb/hr	145.1
28	Condensate from Sulfur Storage Tank	lb/hr	145.1
29	Condensate from Sulfur Storage Tank	lb/hr	145.1
30	Condensate from Sulfur Storage Tank	lb/hr	145.1

SYSTEMS ENGINEERING

Plant Facilities Control/Monitoring-Power Cycle System

Findings

1. The Bottle Rock power plant will be operated as a baseload unit. Daily adjustments, therefore, will be minimal.

2. Monitoring and control is designed to be done automatically; however, at least one attendant will be assigned to monitor plant operation on each shift. Electricians, mechanics, and technicians will also be available during the dayshift working hours and on call during off hours.

3. In its response to CEC Staff Data Request No. 1, dated November 15, 1979, the Applicant listed 30 plant operating conditions that will result in an alarm.

4. Of the 30 conditions, 22 can cause an automatic shutdown. Where possible, early warning alarms are given in the 22 shutdown conditions to allow possible operator corrective action to prevent a shutdown.

5. There are five conditions in the plant which can result in reduced generation to minimize total shutdowns.

6. Other than the cooling tower fans, all auxiliaries required to maintain the turbine-generator unit at full load will have installed spares which will automatically start up in the event of the failure of an operating auxiliary component.

7. The main steam turbine generator has a capability of a load reduction to approximately 5 Mw to operate all in-house power plant components and abatement systems.

Conclusion

1. If the Applicant designs the power plant as described in the above Findings, the proposed power cycle monitoring and control system appears adequate to protect the facility's components and to reduce the possibilities of power outages.

Condition

1. The Applicant will design the power plant as described in the above Findings.

