CALENDAR ITEM

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07/12/84
W 9649
Hoagland

GEOTHERMAL RESOURCES LEASING ACTIVITY

BACKGROUND:

On November 27, 1978, the Commission authorized the selection of certain State mineral lands in Lake and Sonoma Counties to offer for bid for extraction of geothermal resources pursuant to Division 6 of the Public Resources Code. Additionally, on August 20, 1981, Commission authorization was given for the preparation of an EIR for leasing and development of geothermal resources on the subject lands located in Lake County as described in Exhibit "B".

ENVIRONMENTAL DOCUMENTATION:

1. Pursuant to the Commission's delegation of authority and the State CEQA Guidelines (14 Cal. Adm. Code 15025), the staff has caused to be prepared a programmatic Environmental Impact Report (EIR) identified as EIR No. 345, State Clearinghouse No. 83071905. This EIR was prepared and circulated for public review pursuant to the provisions of the CEQA.

2. The following significant environmental effects were identified in the EIR. These impacts listed below are followed by proposed changes, alterations, or permit conditions which will be required if the proposed project is approved. Additionally, a statement follows each proposed mitigation measure explaining why or how such mitigation measure will accomplish its intended goal.

A. Land Use (On-Site)

Impact: Land use impacts from geothermal development activities will be concentrated on-site in the form of areal disturbance associated with the construction of access roads, well pads and drilling sumps. Should the extent and quality of the resource prove commercially recoverable, the implementation of subsequent development activities would result in the long-term transition of undeveloped watershed lands into geothermal energy production.

Mitigation: Mitigation measures to minimize the land surface required for development, such as directional drilling and limitations on cut and fill activities, should be implemented to minimize disturbance of existing acreage devoted to watershed, wildlife habitat and recreation as specifically identified in the appropriately identified sections of the Environmental Impact Report. In addition, well sites should be located as close as feasible to existing roadways to limit the need for constructing additional access roads. All disturbed areas should be revegetated as soon as possible after the construction phase and upon termination of production operations.

Land Use (Off-Site)

Impact: Potential incompatibility with off-site land use such as residential and recreational land use.

Finding

Mitigation: Land use activities on nearby private lands are regulated by the County of Lake. Future development of residential and recreational uses on these private lands should be pursued in compliance with county development standards to minimize

incompatibility of such uses with geothermal development in the event geothermal development activities occur.

B. Geology

Impact: Geologic processes that could result in significant environmental impacts are associated with seismic groundshaking, landsliding and soil erosion.

Mitigation: Mitigation of potential impacts will primarily be necessary during facilities construction. Mitigation should include consideration of slope gradient and stability as well as adequate erosion potential measures. New road construction should be minimized as should road widths and related cuts and fills. In addition, a program of site maintenance should be developed and implemented for the life of the project.

C. Hydrology and Water Quality

Impact: Preliminary exploration, exploratory well drilling and facilities construction have the potential for creating local hydrologic effects consisting of impacts affecting erosion and drilling waste disposal, which have the potential for altering surface runoff and erosion patterns, and increasing sediment yield and groundwater degradation.

Potential impacts resulting from resource utilization activities are incremental depletion of local surface waters, and degradation of natural waters.

Mitigation: All phases of geothermal development will be subject to the waste discharge requirement imposed by the Central Valley Regional Water Quality Control Board. Requirements will include measures to control erosion-sedimentation,

to prevent accidental spills or discharge of drill wastes and steam condensate, to report, clean up, and abate discharge incidents, and to monitor steam condensate.

Lake County has established standards to protect water quality which shall be complied with in addition to those of the Regional Water Quality Control Boards in the Kelsey and Putah Creek watersheds. Specifications for proper waste disposal will be included in standards set by the appropriate agencies. Compliance with appropriate standards should substantially mitigate potentially significant effects of the proposed geothermal development on the environment.

Impact: Utilization of the leasehold for active geothermal production will contribute to depletion of the geothermal reservoir.

Mitigation: Required compliance with the terms and conditions of the lease issued by the State Lands Commission and inspections by Commission staff will insure that drilling practices will be used to develop the reservoir in accordance with accepted industry and conservation practices.

D. Atmospheric Environment:

Impact: Impact assessment at this stage of project development can only deal with generalized types of impacts based on generic sources of typical geyser activities. Impacts on air quality associated with geothermal development vary in degree, but most commonly consist of combustion emissions, fugitive dust, gases (especially hydrogen sulfide) and steam vented during the exploratory and development stages, and hydrogen sulfide (H_2S) emissions from electrical generation plants.

Mitigation: Development should proceed without any overall increase in regional H_2S emissions. Since H_2S is not a pollutant with national ambient air quality standards, it is not affected by the federal air quality management program. Thus, relevant standards are set by the local air pollution control districts. To insure public exposure to H_2S emissions will be minimized, an H_2S emissions control program will be made a condition of the permit or lease issued by State Lands Commission.

E. Acoustical Environment

Impact: Noise impact producing activities include exploratory drilling, field development, construction and operation of resource-utilizing facilities, field maintenance, and field abandonment. Ambient noise levels will increase during the exploratory and early development stages and reach a maximum during intensive field development and power plant construction. Increased noise levels will have impacts on the future construction and power plant workers in addition to people and wildlife in areas adjacent to the proposed leasehold.

Mitigation: All phases of geothermal development will be subject to the noise level limitations established by regulatory agencies having authority over noise associated with geothermal development. Federal (EPA and HUD) and state (CAL/OSHA) agencies govern occupational exposure as it affects industry employees, and local government (Lake County) is responsible for regulating all other aspects of geothermal industry-induced noise.

F. Biological Resources:

Impact: Activities of geothermal development which may serve to repel

wildlife or destroy vegetation, include grading and area clearing for development, spillage of geothermal fluids, use of wet cooling towers, and acoustical disruptions.

Mitigation: As the general botanical and wildlife resource sensitivity of the area is assessed, facilities and access roads should be oriented away from or carefully sited relative to any rare or endangered populations as well as sensitive biological habitats. Graded sites, especially cut and fill slopes, should be immediately revegetated with native plants. Wells and power plants should be properly bermed and contained in order to control fluid spills.

G. Socioeconomics and Public Services

Impact: Project-related immigration will be directly related to the availability of new jobs not already absorbed by the local labor pool. Increased activities in the geothermal industry may also generate employment in other sectors of the local economy through the increased purchasing of equipment, goods and services, and personal spending patterns of the employees. The project has the potential for impacting fire protection services, solid waste facilities and roadway conditions.

Mitigation: Compliance with appropriate regulations and provisions for fire and road safety.

H. Visual Resources

Impact: Development along the ridge tops and higher elevated portions of the view corridors will create a dominant visual element associated with industrial activity in a previously undisturbed landscape.

Mitigation: The utilization of valleys and natural depressions where feasible can effectively screen physical structures from all vantage points and essentially eliminate any adverse visual impacts. Other visual mitigation measures include blending of equipment and environment by the use of compatible color schemes, vegetative screening, and prompt revegetation of denuded areas.

I. Archaeological, Historical and Ethnographical Resources

Impact: No archaeological, historical or ethnographical resources were found on the leasehold.

Mitigation: Proposed development of the study area should be coordinated with cultural resource inventory data and additional archaeological surveys on a site-specific basis. Appropriate mitigation measures should be immediately undertaken if any evidence of such cultural resources are found during any phase of development.

If and when subsequent site-specific operations occur, a site-specific environmental document will be prepared by the Division of Oil and Gas pursuant to the provisions of P.R.C. 3715.5 that will address all subsequent site-specific activities associated with exploratory drilling.

ALTERNATIVES: The following four alternatives to the proposed project were discussed in the FEIR: (1) no project; (2) project delay; (3) alternative resource-utilizing systems; and (4) utilization of alternate forms of fuel. Each of these alternatives are discussed below, together with reasons why such alternatives are not recommended in place of the proposed project.

1. No Project Alternative:

The no project alternative would allow the proposed project area to remain in its current status rather than allow development of the land for geothermal resources. Project denial would eliminate the significant environmental impacts resulting from the proposed project as identified in the EIR. However, the project environs would continue to be modified by natural processes along with all existing activities and land uses, including forest management activities.

This alternative is not recommended because it would result in the inability to confirm the presence and quantities of any available geothermal resource and thus deny information as to the nature of State-held energy resources. Pursuant to a variety of legislative mandates, the State has determined that the development of geothermal resources on State lands must continue to establish further energy sources for California. The leasing action at this time is consistent with legislative direction and complements the current energy policies in the State and the nation.

2. Project Delay:

Delaying the proposed project would result in postponement, not mitigation, of the positive and negative impacts identified in the EIR. This alternative is not recommended for the following reasons:

The occurrence of the environmental impacts described in the EIR would be delayed, but not necessarily further mitigated.

If exploration led to the commercial extraction of the resource, postponement could result in an increase in consumption of other fuels (e.g., coal, oil) as well as

eventual increase in the cost of development of a successful geothermal development on this leasehold and for additional production of electricity within the Geysers-Calistoga KGRA.

3. Alternative Resource-Utilizing Systems:

Depending on the characteristics of the geothermal resource, a variety of resource utilizing systems may be possible, other than conventional power plant techniques. These resource use techniques may include relatively innovative electrical generation systems (e.g., wellhead and downhole). Where feasible, the application of the resource may be incorporated into space and process heating and refrigeration systems, rare mineral extraction from produced brine, and agricultural activities. Staff's recommendation for the proposed project has considered this alternative in its review of the project, and has required compliance with the terms and conditions of the lease issued by the State Lands Commission. Inspections by Commission staff will ensure compliance with applicable drilling and development regulations. Information gathered subsequent to lease will enable the determination of the most efficient use of any resource discovered during exploratory activities.

4. Utilization of Alternate Forms of Fuel:

Fossil and nuclear fuels as well as hydroelectric resources are possible sources of providing electricity if geothermal energy is not utilized. However, the impacts associated with each of these alternative sources are numerous and have been discussed at length in other documents.

This alternative is not recommended because the State has determined via legislative mandate, that the development of geothermal

resources of State lands must continue, as a constituent of the provision of a broad spectrum of energy sources for California. The leasing action at this time is consistent with legislative direction and complements energy policies in the State and the nation.

IMPLEMENTATION: Staff requests Commission certification of the EIR prepared for this project and authorization to propose a competitive bid package for extraction of geothermal resources from the State-owned lands on Cobb Mountain, Lake County.

EXHIBITS:
A. Location Map.
B. Land Description.
C. EIR Executive Summary.

AB 884: N/A.

IT IS RECOMMENDED THAT THE COMMISSION:

1. CERTIFY THAT AN ENVIRONMENTAL IMPACT REPORT (EIR), EIR NO. 345, STATE CLEARINGHOUSE 83071905, WAS PREPARED FOR THIS PROJECT PURSUANT TO THE PROVISIONS OF THE CEQA AND THAT THE COMMISSION HAS REVIEWED AND CONSIDERED THE INFORMATION CONTAINED THEREIN.

2. ADOPT THE FINDINGS USED BELOW IN CONNECTION WITH THE PROJECT IN COMPLIANCE WITH THE CEQA AND THE STATE EIR GUIDELINES:

A. LAND USE

IMPACT: ON-SITE AREAL DISTURBANCE AND PRECLUSION OF EXISTING LAND USE.

FINDING: FIND THAT CHANGES OR ALTERATIONS HAVE BEEN REQUIRED IN, OR INCORPORATED INTO THE PROJECT WHICH AVOID OR SUBSTANTIALLY LESSEN THE SIGNIFICANT ENVIRONMENTAL EFFECT AS IDENTIFIED IN THE FINAL EIR.

FACTS SUPPORTING FINDING: REQUIRED COMPLIANCE WITH THE TERMS AND CONDITIONS OF THE LEASE ISSUED BY SLC WILL ENSURE MINIMAL SURFACE DISTURBANCE.

LAND USE (OFF-SITE)

IMPACT: POTENTIAL INCOMPATIBILITY WITH FUTURE RESIDENTIAL AND RECREATIONAL LAND USE.

FINDING: FIND THAT CHANGES OR ALTERATIONS THAT WOULD BE REQUIRED TO AVOID OR SUBSTANTIALLY LESSEN THE SIGNIFICANT ENVIRONMENTAL EFFECTS ARE WITHIN THE RESPONSIBILITY AND JURISDICTION OF LAKE COUNTY AND NOT THE STATE LANDS COMMISSION. SUCH CHANGES CAN AND SHOULD BE ADOPTED BY SUCH LOCAL AGENCY.

FACTS SUPPORTING FINDING: LAND USE REGULATIONS AND CONTROL OVER NEARBY AND ADJACENT PRIVATE LANDS ARE THE LEGAL RESPONSIBILITY OF THE COUNTY OF LAKE. AT PRESENT THERE ARE NO RESIDENTIAL AND RECREATIONAL LAND USE ACTIVITIES ON ADJACENT PRIVATE LANDS WHICH ARE INCOMPATIBLE WITH FUTURE GEOTHERMAL DEVELOPMENT. IN ADDITION, A LARGE PERCENTAGE OF THE SURROUNDING LANDS ARE DEDICATED TO ACTUAL GEOTHERMAL DEVELOPMENT.

B GEOLOGY

IMPACT: GEOLOGIC PROCESSES THAT COULD RESULT IN SIGNIFICANT ENVIRONMENTAL IMPACTS ARE ASSOCIATED WITH SEISMIC GROUND-SHAKING, LANDSLIDING AND SOIL EROSION.

FINDING: FIND THAT CHANGES OR ALTERATIONS HAVE BEEN REQUIRED IN, OR INCORPORATED INTO, THE PROJECT WHICH AVOID OR SUBSTANTIALLY LESSEN THE SIGNIFICANT ENVIRONMENTAL EFFECT AS IDENTIFIED IN THE FINAL EIR.

FACTS SUPPORTING FINDING: MOST MITIGATION IS APPLICABLE TO FACILITIES CONSTRUCTED DURING THE LATTER PHASES OF DEVELOPMENT AFTER SPECIFIC SITE SELECTION. APPROPRIATE SPECIALISTS WILL BE REQUIRED TO DEVELOP PLANS AND SPECIFICATIONS FOR ALL SITES. CONSIDERATION OF SLOPE GRADIENT AND STABILITY AS WELL AS ADEQUATE EROSION POTENTIAL MEASURES WILL BE REQUIRED. NEW ROAD CONSTRUCTION WILL BE MINIMIZED AS WILL ROAD WIDTHS AND RELATED CUTS AND FILLS. IN ADDITION, A PROGRAM OF SITE MAINTENANCE WILL BE DEVELOPED AND IMPLEMENTED FOR THE LIFE OF THE PROJECT.

C. HYDROLOGY AND WATER QUALITY

IMPACT: LOCAL HYDROLOGIC EFFECTS CONSISTING MAINLY OF IMPACTS AFFECTING SURFACE EROSION AND DRILLING WASTE DISPOSAL WHICH HAVE THE POTENTIAL FOR ALTERING SURFACE RUNOFF AND EROSION PATTERNS, INCREASED SEDIMENT YIELD AND GROUNDWATER DEGRADATION.

POTENTIAL IMPACTS FROM RESOURCE UTILIZATION ACTIVITIES INCLUDE INCREMENTAL DEPLETION OF LOCAL SURFACE WATERS AND DEGRADATION OF NATURAL WATERS.

FINDING: FIND THAT CHANGES OR ALTERATIONS THAT WOULD BE REQUIRED TO AVOID OR SUBSTANTIALLY LESSEN THE IDENTIFIED SIGNIFICANT ENVIRONMENTAL EFFECTS ARE WITHIN THE RESPONSIBILITY OF THE CALIFORNIA DIVISION OF OIL AND GAS AND THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD AND NOT THE STATE LANDS COMMISSION. SUCH CHANGES CAN AND SHOULD BE ADOPTED BY THESE STATE AGENCIES.

FACTS SUPPORTING FINDING: THE CONSTRUCTION OF DRILLING AND WASTE SUMPS IS GOVERNED BY THE STATEWIDE GEOTHERMAL REGULATIONS OF THE CALIFORNIA DIVISION OF OIL AND GAS (TITLE 14, CHAPTER 4, SUBCHAPTER 4 OF THE

CAL. ADM. CODE) AND BY DISCHARGE REQUIREMENTS ISSUED BY THE CALIFORNIA REGIONAL WATER CONTROL BOARD, CENTRAL VALLEY REGIONS. REQUIREMENTS ISSUED BY THE CALIFORNIA VALLEY REGIONS. REQUIREMENTS ESTABLISHED BY THESE DOCUMENTS, IN ADDITION TO PROPER DESIGN AND CONSTRUCTION MEASURES, SHOULD ASSURE THAT POLLUTANTS ARE NOT DISCHARGED TO SURFACE WATERS BY PREVENTING FAILURE OF A GEOTHERMAL WASTE DISPOSAL PUMP. REQUIREMENTS INCLUDE MEASURES TO CONTROL EROSION SEDIMENTATION TO PREVENT ACCIDENTAL SPILLS OR DISCHARGE OF DRILL WASTES AND STEAM CONDENSATE, TO REPORT CLEAN UP AND ABATE DISCHARGE INCIDENTS AND TO MONITOR STEAM CONDENSATE.

IMPACT: POTENTIAL DEPLETION OF THE GEOTHERMAL RESERVOIR.

FINDING: FIND THAT CHANGES OR ALTERATIONS HAVE BEEN REQUIRED IN OR INCORPORATED INTO THE PROJECT WHICH AVOID OR SUBSTANTIALLY LESSEN THE SIGNIFICANT ENVIRONMENTAL EFFECT AS IDENTIFIED IN THE FINAL EIR.

FACTS SUPPORTING FINDING: REQUIRED COMPLIANCE WITH THE TERMS AND CONDITIONS OF THE LEASE ISSUED BY THE STATE LANDS COMMISSION AND INSPECTIONS BY COMMISSION STAFF WILL ENSURE THAT CONSERVATIVE DRILLING PRACTICES WILL BE USED TO DEVELOP THE RESERVOIR AS EFFICIENTLY AS POSSIBLE.

D. ATMOSPHERIC ENVIRONMENT

IMPACT: IMPACTS ON AIR QUALITY ASSOCIATED WITH GEOTHERMAL DEVELOPMENT COMMONLY CONSIST OF COMBUSTION EMISSIONS, FUGITIVE DUST, GASES AND STEAM VENTED DURING THE EXPLORATORY AND DEVELOPMENT STAGES, AND HYDROGEN SULFIDE EMISSIONS FROM ELECTRICAL GENERATION PLANTS.

FINDING: (1) FIND THAT CHANGES OR ALTERATIONS THAT WOULD BE REQUIRED TO AVOID

OR SUBSTANTIALLY LESSEN THE IDENTIFIED SIGNIFICANT ENVIRONMENTAL EFFECTS ARE WITHIN THE RESPONSIBILITY OF THE LOCAL AIR POLLUTION CONTROL DISTRICT AND NOT THE STATE LANDS COMMISSION. SUCH CHANGES CAN AND SHOULD BE ADOPTED BY SUCH LOCAL AGENCY; (2) CHANGES OR ALTERATIONS HAVE BEEN REQUIRED IN OR INCORPORATED INTO THE PROJECT WHICH AVOID OR SUBSTANTIALLY LESSEN THE SIGNIFICANT ENVIRONMENTAL EFFECT AS IDENTIFIED IN THE FINAL EIR.

FACTS SUPPORTING FINDING: A NUMBER OF STATUTORY AND REGULATORY CONSTRAINTS EXIST WHICH SAFEGUARD PUBLIC HEALTH AND WELFARE WHILE ALLOWING FOR THE ORDERLY DEVELOPMENT OF THE GEOTHERMAL RESOURCE. THE BASIC PREMISE OF THESE CONSTRAINTS IS THAT DEVELOPMENT SHOULD PROCEED WITHOUT ANY OVERALL INCREASE IN REGIONAL H_2S EMISSIONS. SINCE H_2S IS NOT A POLLUTANT WITH NATIONAL AMBIENT AIR QUALITY STANDARDS, IT IS NOT AFFECTED BY THE FEDERAL AIR QUALITY MANAGEMENT PROGRAM. THUS, RELEVANT STANDARDS ARE SET BY THE LOCAL AIR POLLUTION CONTROL DISTRICTS. AN H_2S EMISSIONS CONTROL PROGRAM WILL BE INCLUDED AS A CONDITION OF THE PERMIT OR LEASE ISSUED BY THE STATE LANDS COMMISSION.

E. ACOUSTICAL ENVIRONMENT

IMPACT: AMBIENT NOISE LEVELS WILL INCREASE DURING THE EXPLORATORY AND EARLY DEVELOPMENT STAGES AND REACH A MAXIMUM DURING INTENSIVE FIELD DEVELOPMENT AND POWER PLANT CONSTRUCTION. INCREASED NOISE LEVELS WILL HAVE IMPACTS ON THE FUTURE CONSTRUCTION AND POWER PLANT WORKERS IN ADDITION TO PEOPLE AND WILDLIFE IN AREAS ADJACENT TO THE PROPOSED LEASEHOLD.

FINDING. FIND THAT CHANGES OR ALTERATIONS THAT WOULD BE REQUIRED TO AVOID OR SUBSTANTIALLY LESSEN THE IDENTIFIED SIGNIFICANT ENVIRONMENTAL EFFECTS ARE

WITHIN THE RESPONSIBILITY OF CAL/OSHA, EPA, HUD AND LAKE COUNTY AND NOT THE STATE LANDS COMMISSION. SUCH CHANGES CAN AND SHOULD BE ADOPTED BY SUCH AGENCIES.

FACTS SUPPORTING FINDING: NOISE LEVELS RESULTING FROM GEOTHERMAL DEVELOPMENT WILL BE CONSISTENT WITH CRITERIA SPECIFIED IN THE LAKE COUNTY GENERAL PLAN AND THE LAKE COUNTY CODE (CH 21-73.6)

REGULATORY AUTHORITY OVER NOISE FROM THE GEOTHERMAL INDUSTRY SOURCES IS SHARED AMONG FEDERAL, STATE AND LOCAL LEVELS OF GOVERNMENT. THE EPA, HUD, AND CAL/OSHA GOVERN OCCUPATIONAL EXPOSURE AS IT AFFECTS INDUSTRY EMPLOYEES. LAKE COUNTY HOLDS THE RESPONSIBILITY FOR REGULATING ALL OTHER ASPECTS OF GEOTHERMAL INDUSTRY-INDUCED NOISE.

F. BIOLOGICAL RESOURCES

IMPACT: IMPACTS ON WILDLIFE AND VEGETATION MAY OCCUR FROM GRADING AND AREA CLEARING, FLUID SPILLAGE, USE OF WET COOLING TOWERS AND ACOUSTICAL DISRUPTIONS.

FINDING: FIND THAT CHANGES OR ALTERATIONS HAVE BEEN REQUIRED IN OR INCORPORATED INTO, THE PROJECT, WHICH AVOID OR SUBSTANTIALLY AFFECT AS IDENTIFIED IN THE FINAL EIR.

FACTS SUPPORTING FINDING: PRIOR TO FINALIZATION OF THE SITE LOCATIONS FOR ANY FACILITIES OR ACCESS ROADS, SPRINGTIME SURVEYS WILL BE CONDUCTED AND THE RESULTING DATA WILL BE UTILIZED IN THE PREPARATION OF REQUIRED EXPLORATORY OR DEVELOPMENT EIR'S.

AS THE GENERAL BOTANICAL AND WILDLIFE RESOURCE SENSITIVITY OF THE SELECTED SITES ARE ASSESSED, APPROPRIATE MITIGATION MEASURES WILL BE CONSIDERED AND REQUIRED BY THE STATE LANDS COMMISSION DURING ANY FUTURE LEASE DEVELOPMENT TO RECOGNIZE AND ENHANCE BOTANICAL AND WILDLIFE RESOURCE SENSITIVITY.

G. SOCIOECONOMICS AND PUBLIC SERVICES

IMPACT: INCREASED GEOTHERMAL ACTIVITY HAS THE POTENTIAL FOR IMPACTING FIRE PROTECTION SERVICES, SOLID WASTE FACILITIES AND ROADWAY CONDITIONS.

FINDING: FIND THAT CHANGES OR ALTERATIONS THAT WOULD BE REQUIRED TO AVOID OR SUBSTANTIALLY LESSEN THE IDENTIFIED SIGNIFICANT ENVIRONMENTAL EFFECTS ARE WITHIN THE RESPONSIBILITY OF LOCAL AGENCIES AND NOT THE STATE LANDS COMMISSION. SUCH CHANGES CAN AND SHOULD BE ADOPTED BY SUCH LOCAL AGENCIES.

FACTS SUPPORTING FINDING: NO SIGNIFICANT OR POTENTIALLY SIGNIFICANT ALTERATIONS TO THE LABOR FORCE OR DEMOGRAPHIC CHARACTERISTICS OF THE REGION HAVE BEEN IDENTIFIED IN THE EIR AND NO MITIGATION MEASURES CONCERNING THESE FACTORS ARE CONSIDERED NECESSARY. MITIGATION MEASURES TO REDUCE THE IMPACT OF DEVELOPMENT ON FIRE AND SOLID WASTE SERVICES AND TRANSPORTATION SYSTEMS CONSIST OF COMPLIANCE WITH APPROPRIATE LOCAL AGENCY REGULATIONS AND PROVISIONS FOR FIRE AND ROAD SAFETY.

H. VISUAL RESOURCES

IMPACT: INTRODUCTION OF A DOMINANT VISUAL ELEMENT ASSOCIATED WITH INDUSTRIAL ACTIVITY INTO A PREVIOUSLY UNDISTURBED LANDSCAPE.

FINDING: FIND THAT CHANGES OR ALTERATIONS HAV. BEEN REQUIRED IN OR INCORPORATED INTO, THE PROJECT, WHICH AVOID OR SUBSTANTIALLY LESSEN THE SIGNIFICANT ENVIRONMENTAL EFFECT AS IDENTIFIED IN THE FINAL EIR.

FACTS SUPPORTING FINDING: THE POTENTIAL FOR VISUAL IMPACT DEPENDS ON THE SPECIFIC PLACEMENT OF THE VARIOUS PROJECT COMPONENTS. THE UTILIZATION OF NATURAL DEPRESSIONS WILL POTENTIALLY SCREEN PHYSICAL STRUCTURES FROM SENSITIVE VIEWSHED RECEPTORS AND REDUCE ADVERSE VISUAL IMPACTS.

IN ADDITION, REVEGETATION, NATURAL COLOR COMPATIBILITY AND VEGETATIVE SCREENING MEASURES WILL REDUCE VISUAL OR AESTHETIC IMPACTS.

I. ARCHAEOLOGICAL, HISTORICAL AND ETHNOGRAPHICAL RESOURCES

IMPACTS: NO ARCHAEOLOGICAL, HISTORICAL OR ETHNOGRAPHICAL RESOURCES WERE FOUND ON THE LEASEHOLD.

FINDING: FIND THAT CHANGES OR ALTERATIONS HAVE BEEN REQUIRED IN OR INCORPORATED INTO THE PROJECT WHICH WILL AVOID OR SUBSTANTIALLY LESSEN POTENTIAL SIGNIFICANT ENVIRONMENTAL EFFECT AS IDENTIFIED IN THE FINAL EIR.

FACTS SUPPORTING FINDING: IF DURING DEVELOPMENT ACTIVITIES HISTORIC OR PREHISTORIC ARCHAEOLOGICAL REMAINS ARE DISCOVERED A QUALIFIED ARCHAEOLOGIST WILL BE RETAINED TO EVALUATE THE FINDS AND TO MAKE RECOMMENDATIONS FOR PRESERVATION OF STUDY.

3. AUTHORIZE STAFF TO PREPARE A COMPETITIVE BID PACKAGE FOR EXTRACTION OF GEOTHERMAL RESOURCES FOR STATE-OWNED LANDS ON COBB MOUNTAIN IN LAKE COUNTY AND REPORT BACK TO THE COMMISSION.

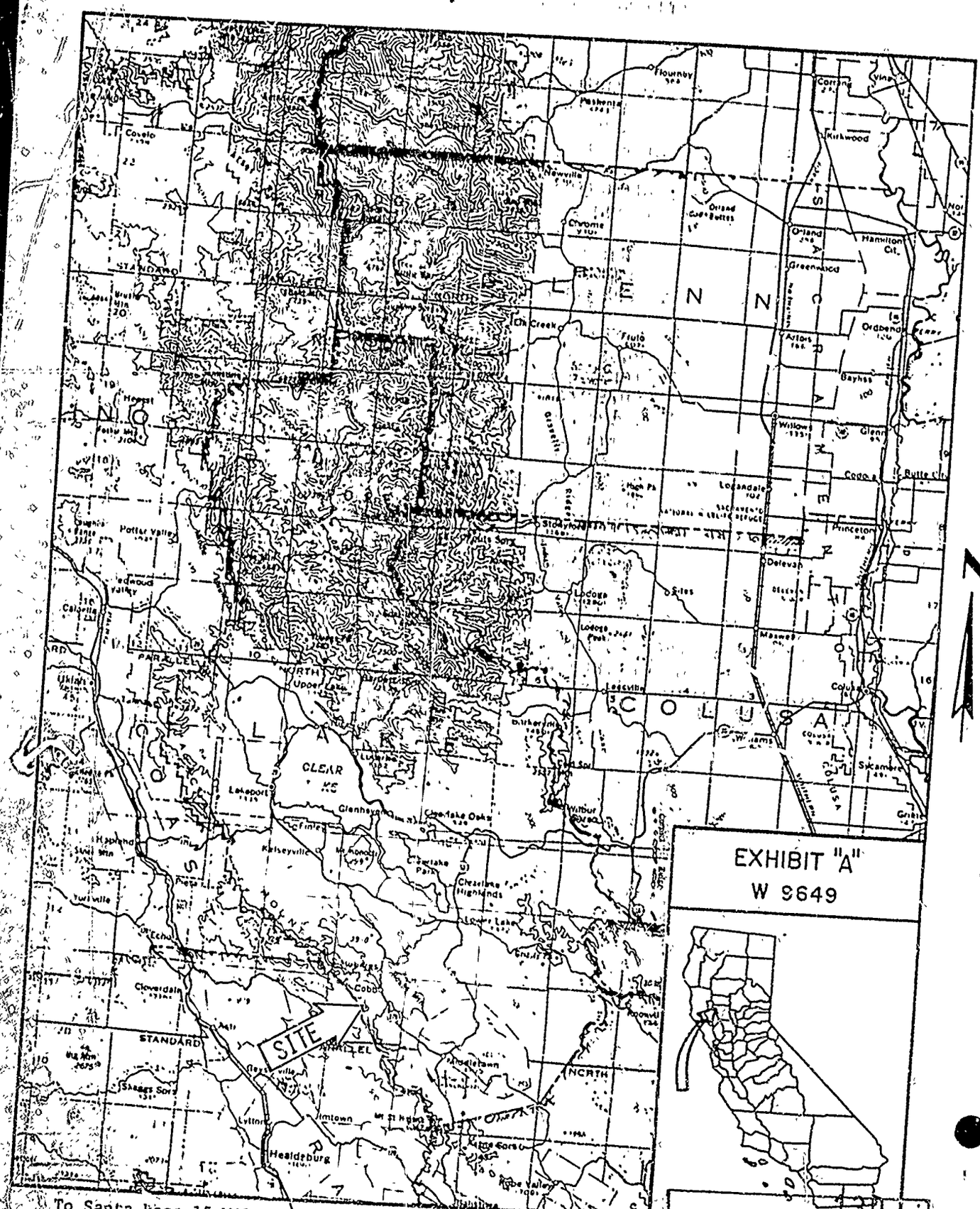

EXHIBIT "A"
W 9649

CALENDAR PAGE 130
MINUTE PAGE 1639

EXHIBIT "B"

LAND DESCRIPTION W 9649

All the State-owned mineral interests lying within a parcel of land in Lake County, State of California, described as follows:

S-1/2, S-1/2 of NE-1/4, and NW-1/4 of NE-1/4 of Section 15, T11N, R8W, MDM.

END OF DESCRIPTION

PREPARED AUGUST 5, 1981 BY TECHNICAL SERVICES UNIT, ROY MINNICK, SUPERVISOR.

EXHIBIT "C"

EXECUTIVE SUMMARY

A. AGENCY JURISDICTION

This Environmental Impact Report (EIR) has been prepared under a contractual agreement with the State Lands Commission (SLC) utilizing the State EIR Guidelines for implementation of the California Environmental Quality Act (CEQA) of 1970, as amended. The project, as proposed, involves the leasing of certain state-owned geothermal resources in Lake County pursuant to the Public Resources Code, Division 6, Part 2, and the California Administrative Code, Title 2, Division 3, Article 4.1. Therefore the California State Lands Commission is acting as Lead Agency, with principal responsibility for carrying out or approving the project.

B. PROJECT DESCRIPTION

The State has reserved the mineral rights on approximately 10,125 hectares (25,000 ac) within the Geysers-Calistoga Known Geothermal Resource Area (KGRA), which includes portions of Lake, Sonoma and Mendocino Counties. The SLC proposes to lease, by competitive bidding processes, these areas for exploratory and developmental purposes.

Upon the confirmation of a developable geothermal resource, and consistent with all applicable rules and regulations of affected governmental jurisdictions, it is anticipated that the aspects of the lease program shall further cause, or allow, the construction and operation of geothermal resource-based electrical generating and transmission systems.

In the case of the proposed project, the direct purpose is to offer for lease 440 acres of state mineral reservations in Lake County. Therefore, the singular discretionary action and permit authority lies with the SLC. However, the successful leasing of these areas will ultimately result in further activities which, under existing plans, regulations, and statutes, fall within the permitting authority of other governmental agencies. Thus, further review of development actions subsequent to the leasing of these lands will be required pursuant to the CEQA. Development in the leasehold, assuming successful leasing, will involve the discovery, extraction, and application of the anticipated geothermal resource and will likely consist of the following phases:

- issuance of the lease(s);
- surface or shallow exploration;
- intensive exploratory drilling;
- field development;

- construction of resource-utilizing (power plant) systems;
- operation of resource-utilizing systems;
- field maintenance;
- field abandonment.

C. ENVIRONMENTAL IMPACTS AND MITIGATION

Although the leasing action, which is the direct purpose for the collection of data in this document, will not in itself produce environmental impacts, subsequent actions will result in certain effects. For this reason, impact analysis is focused on actions subsequent to the leasing of State lands for geothermal energy development. The major areas of analysis include:

- land use
- geology
- hydrology and water quality
- atmospheric environment
- acoustical environment
- biological resources
- socioeconomics/public services
- visual resources
- archaeological, historical, and ethnographical resources

A brief summary of the impacts and proposed mitigation of impacts follows.

1. LAND USE

The proposed leasing of state land for geothermal resource development is a discretionary act that may ultimately commit previously undeveloped areas to relatively long-term industrial activity. The most significant impacts ensuing from development activities will be concentrated on-site in the form of areal disruption or preclusion of present land use functions. Incompatibility with sensitive land uses off-site such as residential and recreational areas could occur as geothermal development proceeds in Lake County.

The most effective mitigation of potential land use impacts is to ensure that all subsequent development activities will be pursued in compliance with county and state development standards in order to minimize conflicts to adjacent land uses.

Measures to minimize the land surface required for development, such as directional drilling and limitations on cut and fill activities, should be implemented to minimize disturbance of existing acreage devoted to watershed, wildlife habitat and recreation. In addition, well sites should be located as close as is feasible to existing

roadways to limit the need for constructing additional access roads. All disturbed areas should be revegetated as soon as possible after the construction phase and upon termination of production operations.

2. GEOLOGY

The proposed lease is subject to some potentially hazardous geologic and seisinic related conditions. The most significant of these hazards are seismic groundshaking, landsliding, and soil erosion. The recognition and mitigation of these hazards would be most important during the deep exploratory, full-field development and power plant development phases. With the possible exception of very minor soil erosion potential, they are not significant with respect to the subsurface exploration/thermal gradient phase.

Most mitigation is applicable to facilities constructed during the latter phases of development. Appropriate specialists should be required to develop plans and specifications for all sites. Consideration of slope gradient and stability as well as adequate erosion potential measures shall be required. New road construction should be minimized as should road widths and related cuts and fills. In addition, a program of site maintenance should be developed and implemented for the life of the project.

3. HYDROLOGY AND WATER QUALITY

Hydrologic impacts are best characterized by describing geothermal development in the leasehold in two phases. The first is the preliminary exploration, exploratory well drilling, and construction of the development facilities. These would involve mostly short-term local hydrologic effects, consisting mainly of impacts of surface erosion and drilling waste disposal. This could possibly cause alteration of surface runoff and erosion patterns, increased sediment yield, and groundwater degradation.

The second phase of geothermal field development is resource utilization activities. The potential impacts may include the incremental depletion of local surface waters; degradation of natural waters, and localized cooling, mineral precipitation, and/or depletion of the geothermal reservoir.

Precise quantification of these long-term impacts requires site specific geothermal development data. Such data are not presently available due to the preliminary nature of project plans. Therefore, the analysis of the hydrologic impacts are somewhat generic and are based on analysis and interpretation of existing available data from other geothermal development in the area.

All phases of geothermal development will be subject to the waste discharge requirement imposed by the Central Valley Regional Water Quality Control Board. Requirements will include measures to control erosion-sedimentation; to prevent accidental spills or discharge of drill wastes and steam condensate; to report, clean up, and abate discharge incidents; and to monitor steam condensate.

Lake County has established standards to protect water quality which shall be complied with in addition to those of the Regional Water Quality Control Boards in the Kelsey and Putah Creek watersheds. Specifications for proper waste disposal are included in standards set by the appropriate agencies. Compliance with appropriate standards should substantially mitigate potentially significant effects of the proposed geothermal development on the environment. So long as the ARM monitoring continues on the lower portions of the creeks in this area, no further mitigation is necessary.

4. ATMOSPHERIC ENVIRONMENT

Estimation of air quality impacts of possible future geothermal resource development is inherently difficult. There are many unknown variables which preclude definitive statement of the probability that resource development would aggravate existing ambient air quality conditions. Impact assessment at this stage of project development can only deal with generalized types of impacts based on generic sources of typical Geyser activities.

Impacts on air quality associated with geothermal development vary in degree but most commonly consist of: combustion emissions, fugitive dust, gases (especially hydrogen sulfide) and steam vented during the exploratory and development stages, and hydrogen sulfide (H_2S) emissions from electrical generation plants.

A number of statutory and regulatory constraints exist which safeguard public health and welfare while allowing for the orderly development of the geothermal resource. The basic premise of these constraints is that development should proceed without any overall increase in regional H_2S emissions. Since H_2S is not a pollutant with national ambient air quality standards, it is not affected by the federal air quality management program. Thus, relevant standards are set by the local air pollution control districts.

The level of H_2S emissions has decreased in the Geysers area recently as existing plants have been retrofitted with abatement systems. New plants will include H_2S abatement equipment as a standard feature based upon emission source analysis prior to power plant operation.

5. ACOUSTICAL ENVIRONMENT

Several development-related activities subsequent to the lease sale could increase ambient noise levels in the vicinity of the project, potentially impacting human and non-human noise receptors in the area. Noise producing activities include exploratory drilling, field development, construction and operation of resource-utilizing facilities, field maintenance, and field abandonment.

Ambient noise levels will increase during the exploratory and early development stages and reach a maximum during the intensive field development and power plant construction phases. Noise attenuation characteristics in the Geysers are highly variable due to the existing topography, wind direction and magnitude, temperature inversion, vegetation, and molecular absorption. For this reason, no noise propagation model has been generally agreed upon and accepted as appropriate for use under local terrain and meteorological conditions at The Geysers. However, based on geological constraints, development is unlikely to occur in the northern and northeastern portions of the leasehold which would have the potential to disturb residents in Cobb and Whispering Pines.

High noise levels will have impacts on the future construction and power plant workers in addition to people and wildlife in areas adjacent to the proposed leasehold. Protection from noise exposure is provided by the responsible authorities through appropriate regulations.

6. BIOLOGICAL RESOURCES

Biological resources consist of vegetation, wildlife, aquatic resources, and wildlife habitat. Full field development within the leasehold will have varying impacts upon existing biological resources depending on the location, timing and extent of development. No rare or endangered species have been identified as occupants in the area.

Activities of geothermal development which may serve to repel wildlife or destroy vegetation, both aquatic and terrestrial habitats, include but are not limited to: grading and area clearing for development; spillage of geothermal fluids; use of wet cooling towers; and acoustical disruptions. In many cases the effects are interrelated. For example, area clearing reduces vegetative cover which serves to increase erosion which can damage aquatic habitats. The loss of vegetative cover also reduces the size of terrestrial habitats and forage areas.

It is recommended that prior to finalization of the locations for any facilities or access roads, springtime surveys be conducted during future exploratory or

development EIR's in order to identify potential populations of rare or endangered species. Once the general botanical and wildlife resource sensitivity of the area has been assessed, facilities and access roads should be oriented away from or carefully sited relative to rare or endangered populations as well as sensitive biological habitats such as the Yellow Pine Parkland area. Also, graded sites, especially cut and fill slopes, should be immediately revegetated with native plants. Wells and power plants should be properly bermed and contained in order to control fluid spills.

7. SOCIOECONOMICS AND PUBLIC SERVICES

Accurate quantification and therefore the significance of socioeconomic and public service impacts will ultimately depend upon the proven characteristics of the resource and corresponding magnitude of development activities. It is anticipated that employment opportunities and consequently project development impacts upon population, housing and public services will occur primarily in Lake County. Although the leasehold is within the jurisdiction of two counties, Lake County services and amenities are the most directly accessible from points within the leasehold.

Development of the leasehold will provide employment opportunities of a specialized nature, yet it is not expected to draw workers from remote areas. Therefore, project-related immigration will be directly related to the availability of new jobs not already absorbed by the local labor pool.

Increased activities in the geothermal industry may also generate employment in other sectors of the local economy through the increased purchasing of equipment, goods and services, and personal spending patterns of the employees.

The provision or capacity of public services within the project area should not be adversely affected by the development of the steam field, construction, or operation of subsequent project-related activities. However, potential exceptions may be the project's impact upon fire protection services, solid waste facilities, and roadway conditions.

No significant or potentially significant alterations to the labor force or demographic characteristics of the region have been identified, and no mitigation measures concerning these factors are considered necessary. Several mitigation measures have been suggested to reduce the impact of development on fire and solid waste services and transportation systems. Generally, they involve compliance with appropriate regulations and provisions for fire and road safety.

8. VISUAL RESOURCES

Due to the terrain relief of the view corridors, the potential for visual impact will vary greatly depending on the specific placement of the various project

components. Generally, development along the ridge tops and higher elevated portions of the view corridors would contrast against the horizontal interface, and thereby create a dominant visual element associated with industrial activity in a previously undisturbed landscape. However, the utilization of valleys and natural depressions can effectively screen physical structures from all vantage points and essentially eliminate any adverse visual impacts. Other visual mitigation measures will provide a blending of equipment and environment by the use of compatible color schemes, vegetative screening, and prompt revegetation of denuded areas.

9. ARCHAEOLOGICAL, HISTORICAL, AND ETHNOGRAPHICAL RESOURCES

No archaeological, historical or ethnographical resources were found on the leasehold. Proposed development of the study area should therefore be coordinated with cultural resource inventory data and additional archaeological survey on a site-specific basis. Appropriate mitigation measures should be immediately undertaken if any evidence of such cultural resources are found during any phase of development.

D. GROWTH INDUCING IMPACTS AND CUMULATIVE EFFECTS ON THE PROPOSED PROJECT

Active resource development has been underway for over 20 years in the Geysers-Calistoga KGRA, primarily within Sonoma and Lake Counties. Such activity, depending upon the success of environmental and regulatory controls, could represent an incremental long-term deterioration of regional environmental quality. Mitigation of resulting impacts will require both the application of new or more sophisticated control technologies, as well as a significant emphasis on systematic county and regional energy and environmental planning efforts.

Geothermal development characteristically requires extensive land area, even though only a small portion of the total acreage is actually utilized. Areal requirements will further limit potential recreational, residential, commercial, agricultural, and wildlife habitat land uses within the KGRA. Cumulative development activities will also incrementally degrade air and water quality, consequently affecting agricultural lands and recreation areas.

Potential sources for surface water degradation are increased sedimentation from the clearing and grading of land, spills of hazardous waste materials, and condensation of vented steam. The region's productive fisheries and recreational opportunities may be subsequently degraded by expanding geothermal development, depending on the success of environmental controls.

Cumulative air quality impacts in the region are likely to result primarily from increased emissions of hydrogen sulfide. This has been identified as the primary impediment to the development of geothermal resources in the KGRA. Without equipping power plants with effective abatement technology, future resource utilization will be limited.

In reference to cumulative impacts of additional regional development, areas currently not exposed to geological and seismological hazards may experience such conditions. These impacts may range from topographic alteration of drainages and increased erosion to subjecting well structures and pipelines to seismic groundshaking. The specific nature of these impacts are, of course, highly contingent on actual location of facilities. Nevertheless, assuming general KGRA-wide development patterns, hazards that might be expected include surface fault rupture, seismically-induced liquefaction surface subsidence, and groundshaking.

The cumulative effect of further geothermal development in the region would result in an increase in ambient noise levels discernably above that of similar, non-industrial areas. As various geothermal components are constructed in closer proximity to each other, noise levels generated by their construction and operation will become additive. Noise monitoring programs should be strictly enforced to insure acceptable noise levels adjacent to residential developments. Existing environmental review and county permits processes should provide adequate mitigation to offset potential impacts.

Biological resources will be affected by location of development. Access roads within the parcel should attempt to minimize disturbance to the Yellow Pine Parkland.

The cumulative effects of geothermal development on cultural resources is difficult to estimate without the proper identification of existing cultural resource sites. It is anticipated that some disturbance will occur due to the incompatibility of cultural resource sites and geothermal development actions.

Geothermal development within the KGRA will inevitably change the character of the area from scenic/recreational to industrial, resulting in a gradual degradation of environmental quality. This perception of industrial activity may also result in a decline in tourism, a significant factor of the area's economy. Visual resources will be impacted by long plumes of steam and possibly by views of power plant facilities. Although additional geothermal activity will benefit the local economies by broadening

the fiscal base of the areas (viz., providing tax revenues, employment, and increased incomes), the lifespan of geothermal production within an area is limited by the quantity of the resource present and operational parameters of the power plant systems.

E. ALTERNATIVES TO THE PROPOSED PROJECT

Three alternatives exist to the proposed leasing of State lands in the study area. They include no project, delay of project, and utilization of alternate forms of fuel.

The no project alternative would preserve the leasehold in its current state of use but allow the environs to be modified by natural processes. No confirmation of the presence or magnitude negation of geothermal resources would result, and no identified impacts would occur.

Deferring action on the proposed lease would result in a delay, and not mitigation, of all related impacts. It will, however, likely result in the consumption of other fuels until the leasehold is brought to an operable state of development.

Although the project is merely the initiation of the leasing action, the ultimate goal is probably the production of electrical power from the geothermal resource. A denial of the use of this resource would, in turn, require that other forms of electrical power generation be employed. The impacts associated with alternative energy sources are numerous and have been discussed at length in other documents.

F. DETERMINATION OF SIGNIFICANT EFFECTS

Per Article 4, Section 15040 of the Guidelines for Implementation of the California Environmental Quality Act of 1970, as amended, a significant effect on the environment is defined as:

> "....substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the activity including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance."

Further, the determination of whether a project may have a significant effect on the environment "...calls for careful judgement on the part of the public agency involved, based to the extent possible on scientific and factual data" (Article 7, Section 15081(a)).

A mandatory finding of significance (Article 7, Section 15082) by the applicable public agency is required if:

a. The project has the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal community, reduce the number or

restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory.

b. The project has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals.

c. The project has possible environmental effects which are individually limited but cumulatively considerable. As used in the subsection, "cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

d. The environmental effects of a project will cause substantial adverse effects on human beings, either directly or indirectly.

With reference to the above stipulations, and utilizing the guidelines established in Article 7, Section 15081(c), Appendix G, no significant effects have been identified with reference to the proposed leasing action itself. However, activities that may occur as a result of leasing action (i.e., development of the leasehold) may in fact produce significant environmental effects. Until specific development plans are formulated, it may be assumed that environmental impacts of the type and magnitude identified in Part C of this document will likely occur.