**MASTER USGS and
ENGINEERING
and
ENVIRONMENTAL
DIVISION**

**JOINT COMPLIANCE
MONITORING REPORT
for
Sacramento Municipal
Utility District's
SMUDGE NO. 1
Geothermal Project
80-AFC-1**

**APPENDIX D
TO FINAL DECISION**

March 25, 1981

CALIFORNIA ENERGY COMMISSION

P800-81-003

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Rev.: March 25, 1981

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COMPLIANCE MONITORING REPORT
SMUDGE NO. 1

A. INTRODUCTION

California Public Resources Code, Section 25532 requires the Commission to establish a monitoring system to assure that any facility certified under the Warren-Alquist Act 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 in the application.

Because the SMUDGE #1 power plant is being constructed on federal land, the Commission has joined with the United States Geological Survey by a March 2, 1981, Letter of Understanding (see Appendix A) to meet the requirements of PRC Section 25532.

The following report is referenced in the Commission's Decision on the Sacramento Municipal Utility District's Application (80-AFC-1, publication no. 800-81-001) as Appendix D.

The Compliance Monitoring Program for the SMUDGE #1 Project is managed by the Deputy Conservation Manager (DCM) for Geothermal, USGS, through his Chief, Engineering Section. The manager is responsible for implementing the approved program after CEC certification, maintaining compliance monitoring records for the program, ensuring that all aspects of the program are done in a timely manner, and bringing to the attention of the CEC any need for issue resolution. In cases of dispute, the DCM for Geothermal has final authority to resolve the dispute.

All compliance verifications will be part of the public record and will be maintained by United States Geological Survey (USGS).

B. GENERAL PROVISIONS

1. The United States Geological Survey (USGS) and the United States Bureau of Land Management (BLM) shall be the responsible agencies for compliance monitoring and enforcement. All submittals of materials shall be directed to the USGS who may then delegate responsibility 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 USGS's and BLM's exclusive authority to approve sites and related facilities. The final recommendation approval shall be from the USGS and the BLM.
2. This document references 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 USGS, BLM, and CEC to assure that the facilities are designed, constructed, and operated in compliance with air and water quality, public health and safety, environmental and such other laws, ordinances, and standards specified.
3. This document applies to the Area of Operations which is defined in the Applicant's Plan of Operations and includes 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 USGS to consider the conflict.

The Deputy Conservation Manager for Geothermal (DCM, Geothermal) will review the petition and, if needed, convene meetings and take any other steps to resolve the conflict. In the event such efforts are not successful, the DCM, Geothermal will, after review, render a decision. This decision is subject to the provisions of appeal as contained in 43 CFR Part 290.

5. Any matter of noncompliance with the terms of the CEC's Certificate, the BLM's License, or the USGS's Geothermal Utilization Permit that comes to the attention of the USGS is subject to review by the USGS, the BLM, and the CEC. Any person may file a complaint with the USGS, the BLM, or the CEC alleging a violation of statute, regulation, order, or decision adopted, administered, or enforced by the USGS, BLM, or the CEC.
6. USGS's mailing address for all Compliance Monitoring matters is:

Deputy Conservation Manager for Geothermal
United States Geological Survey
Conservation Division
2465 E. Bayshore Road, Suite 400
Palo Alto, CA 94303

The CEC's mailing address for Compliance Monitoring matters is:

Compliance Audit Manager (80-AFC-1C)
California Energy Commission (MS-2000)
1111 Howe Avenue
Sacramento, CA 95825

7. 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. USGS, BLM, and CEC staff, upon reasonable notification, will have access to these files.
8. USGS 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 USGS.
9. Any information which Applicant deems proprietary shall be submitted to the USGS pursuant to the Freedom of Information Act (Public Law 93-502). Any information which is determined to be confidential shall be kept confidential as provided for in the Freedom of Information Act.

C. COMPLIANCE REQUIREMENTS

I. AIR QUALITY/SYSTEMS ENGINEERING

The Northern Sonoma County Air Pollution Control District (NSCAPCD) is the delegate agency.

SMUD shall comply with all applicable federal, state, and local laws, standards, and ordinances in the operation of SMUDGE0 #1.

A. Law

Hydrogen sulfide (H₂S) and suspended particulate matter (total suspended particulates or TSP) emitted from a geothermal power plant are governed by federal ambient air quality standards for TSP and California ambient air quality standards for H₂S and TSP in addition to the Northern Sonoma County Air Pollution Control District (NSCAPCD) New Source Review (NSR) Rule and specific emission limitations for H₂S and TSP.

NSCAPCO Regulations

Rule 220

The NSCAPCD NSR regulations (Rule 220 et seq.) limit TSP and H₂S emissions from a single plant to a level that will neither by itself nor when added to the background values of TSP or H₂S cause a violation, interfere with the maintenance, nor prevent the attainment of the applicable ambient air quality standard. The Northern Sonoma County Air Pollution Control Officer (NSCAPCO) has determined that compliance with NSR regulations is achieved when the H₂S emission rate from the SMUDGE0 #1 Facility is limited to five (5) lbs/hr. The NSCAPCO will recommend increasing the H₂S emission rate to 8 lbs/hr provided ambient air monitoring during 2 years prior to operation or 2 years after commencement of operation indicates that the ambient H₂S concentrations do not exceed 22 ppb at location(s) to be specified in the plan submitted in accordance with item 3.4 of this compliance and monitoring report. The 5 lbs/hr H₂S emission limitation will be used for examining compliance of the facility with H₂S regulations unless the NSCAPCO allows an increase to 8 lbs/hour.

Rule 455(b)

The emission limit of H₂S from geothermal power plants, effective since January 1, 1980, is 100 grams H₂S per gross megawatt hour (g/GMWH) of electricity generated. Effective January 1, 1985, any new plant will be limited to 50 g/GMWH. The SMUDGE0 #1 facility at a 72.3 gross megawatt rating would meet the 50 g/GMWH limit (8 lbs H₂S/hour).

Rule 420(d)

TSP emissions are limited to 0.2 grains/standard cubic foot (SCF) maximum.

Rule 540

This rule applies to breakdown conditions.

Rules 400(a), 430, 455(a)

These rules govern public nuisance, fugitive dust emissions, and the emissions of sulfur compounds from geothermal operations. The Determination of Compliance indicates that SMUDGE #1 power plant will comply with these requirements.

SMUD shall be responsible for maintaining files for all reports and informational requirements discussed in the following monitoring program. SMUD shall inform the USGS, NSCAPCD, ARB, and CAM of the location of the central repository for this information. SMUD shall make these files available to USGS, NSCAPCD, ARB, and CEC staff upon request.

1. Preconstruction Requirements

The hydrogen peroxide/catalyst and Stretford/surface condenser as proposed in the AFC shall be the equipment used to meet the H₂S emissions limitation of five (5) lbs/hr. In the event that SMUD seeks to change the equipment to control H₂S emissions, SMUD shall request that the NSCAPCD Hearing Board and CEC determine whether the alternate technology can meet the H₂S limitation of 5 lbs/hr. This request shall be made at least two years prior to the scheduled commercial operation date of the power plant. SMUD shall submit data from a full-scale or pilot-scale test demonstrating that the alternate technology is expected to maintain emissions at levels that will comply with the H₂S emissions limitation of 5 lbs/hr. In no event shall SMUD begin construction of the alternate technology without the approval of the NSCAPCD Hearing Board, the USGS, and CEC.

The following definitions apply to the SMUDGE #1 facility only:

Review--Review means a 30-day period during which the control agencies (NSCAPCD, ARB, CEC, and USGS) will assess SMUD's proposal and advise SMUD of any deficiencies.

NSCAPCD shall notify SMUD and participating control agencies of any unacceptable items 30 days after receipt of information. The control agencies shall notify the NSCAPCD of any discrepancies they have found. If no notification is given, SMUD shall proceed on its project schedule. If notified of an

apparent deficiency, SMUD shall inform the agencies of its intention to provide additional information or modification of the proposed design, including a schedule to correct the deficiency within 30 days.

Receipt of Information--Specific proposal or information sent to NSCAPCD shall be by certified mail with a return receipt. The 30 calendar day period commences on the date of the receipt.

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 NSCAPCD. This information shall also consist of a tabulation of associated equipment (e.g., alarms, monitoring devices, 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.

Sixty (60) days before release for fabrication--This shall mean 60 days before manufacture of specific equipment hardware is ordered. If design information is not provided by this time, SMUD shall have proceeded at its own risk.

1.1 SMUD shall provide the USGS, CAM, and NSCAPCD, for their review, design information on the following:

- o Stretford system,
- o Turbine by-pass,
- o Condensate Treatment, and
- o Condenser/sparger system, and
- o Solids removal system (if this system is required).
- a. Verification--SMUD shall submit the information identified above to the appropriate agencies.
- b. Enforcement--NSCAPCD shall notify the USGS, CAM, and SMUD in writing as soon as possible but not less than 30 days after receipt of the data, of any unacceptable item or apparent deficiency. NSCAPCD shall also identify, to SMUD, the USGS, and the CAM, NSCAPCD's recommendation to resolve the deficiency. Within 30 days of receipt of data, the CAM and the USGS shall notify the NSCAPCD of any discrepancies the USGS or CEC staff has found.
- c. Filings and Notifications--The information in 1.1 above will be provided by SMUD to NSCAPCD, the USGS, and CAM when it becomes available, but no later than 60 days before release for fabrication of equipment.

2. Construction Requirements--None

3. Preoperation Requirements

SMUD shall submit a monitoring program at least 60 days prior to start up of the SMUDGE #1 facility to NSCAPCD, the USGS, and CAM which will detail equipment, duration, frequency, and reporting procedures. At a minimum the monitoring program will include the following requirements.

3.1 SMUD shall pursue development of continuous H₂S monitoring devices to meet the following requirements: H₂S shall be monitored by measuring parameters indicating total volume flow rates and H₂S concentrations at the following locations: (a) incoming steam to the power plant; (b) outlet of the Stretford unit; and (c) in the treated condensate or in the circulating water upstream of the cooling tower. A log of such monitoring shall be maintained and made available to NSCAPCD, the USGS, and CEC staff upon request. The H₂S monitoring devices must have an accuracy of plus or minus 1 ppm, provide measurements at least every 15 minutes, and be readily accessible to NSCAPCD staff. Flow rate measuring devices must have accuracies of plus or minus 5 percent at 40 percent to 100 percent of the total flow rate and calibrations must be performed at least quarterly. The monitor shall not require more than 16 hours of maintenance per month. Calibration records must be made available to NSCAPCD staff upon request. SMUD shall submit 60 days prior to start-up of the plan a copy of the continuous monitoring development plan to the NSCAPCD, the USGS, and the CEC.

3.2 SMUD shall provide safe access to sampling ports to enable representatives of the NSCAPCD and ARB to gather samples from the incoming steam, the freshly treated condensate, cooling tower stack, treated gas from the Stretford system, and the direct off-gas vent.

3.3 For the first two years of operation, the incoming steam to the power plant shall be analyzed for hydrogen sulfide, radon-222, mercury, vanadium, arsenic, silica, boron, benzene, ammonia, and total suspended solids. These components (except H₂S) shall be monitored every quarter. Until the NSCAPCO determines a continuous monitoring system as described in 3.1 is available, H₂S shall be monitored at least every 30 days for the life of the power plant. The results of these tests shall be submitted to the NSCAPCD, the USGS, and the CEC on a quarterly basis. After two years, the NSCAPCD shall determine if annual testing for the above mentioned steam constituents is sufficient. SMUD may join with the steam supplier in performing such tests.

3.4 SMUD, after consultation with the ARB, CEC, USGS, and NSCAPCD, shall submit to the NSCAPCD and the CAM for approval a monitoring plan for ambient H₂S, particulate matter, benzene, silica, arsenic, ammonia, vanadium, boron, mercury vapor, and radon-222 and its daughters. This plan shall specify the

location of monitoring stations, the duration of the monitoring program, a quality assurance program to maintain the integrity of the collected data, the test method, and the frequency and method of data collection. SMUD will submit the monitoring plan to the ARB, CAM, and NSCAPCD for approval at least 120 days prior to startup of the program. (See corresponding requirement in II.D.3.)

3.5 Quarterly reports summarizing the results of monitoring defined in 3.3 and 3.4 shall be submitted to NSCAPCD, the ARB, the USGS, and the CAM.

- a. Verification--SMUD shall submit the monitoring program plans to NSCAPCD, the ARB, the USGS, and CAM at least 60 days prior to startup of such program (with the exception of the Ambient Monitoring Plan in 3.4 which is due 120 days prior to plan startup).
- b. Enforcement--NSCAPCD shall notify the CAM, the USGS, and SMUD in writing, 30 days after receipt of the programs, of any unacceptable items. NSCAPCD shall also identify to SMUD, the ARB, the USGS, and CAM, NSCAPCD's recommendation to resolve the unacceptable items. The CAM and USGS shall notify the NSCAPCD of any discrepancies the USGS or CEC staff has found. If the program is approved by NSCAPCD, the ARB, and CEC, in consultation with the USGS, SMUD shall implement the program and any recommendations.
- c. Filings and Notifications--See Verification and Enforcement above.

4. Operational Requirements.

4.1 Initial Compliance Determination

SMUD shall submit for approval a detailed performance test plan and schedule to NSCAPCD and the CAM for an emission limitation compliance test at least 60 days prior to scheduled commercial operation. The USGS will be provided with a copy of the report. In the event of plan disapproval, the NSCAPCD will notify SMUD, the USGS, and the CAM in writing within 30 days of receipt of plans and include recommendations on how to achieve approval. If SMUD, the ARB, and the CEC agree with recommendations, to be made in consultation with the USGS, SMUD shall implement those recommendations.

4.1.1 Within 60 days of commercial operation SMUD shall demonstrate that the applicable emission limitations of NSCAPCD rules, the NSCAPCD DOC, and CEC Final Decision are being maintained, per DOC condition 13.J. The purpose for such a determination will be to issue a Permit to Operate.

SMUD shall file an Application for a Permit to Operate with the NSCAPCD within 90 days after the commercial operation date or

as soon as possible after completion of DOC condition 13(J), and submit appropriate permit fees. The application shall include the results of the performance test plan above. The Permit to Operate conditions shall be consistent with the CEC Final Decision on the SMUDGE #1 Facility, unless CEC approval is obtained.

The NSCAPCD shall issue a Permit to Operate if compliance is determined. If compliance is not determined, the NSCAPCD, the ARB, the CEC, and SMUD shall follow the procedures in 4.1.5, 4.1.6, and 4.1.7.

4.1.2 SMUD shall provide to NSCAPCD, the USGS, and CAM an additional detailed compliance report on the results of the performance test within 100 days after the facility has been declared commercially operational. The monitoring activity is to cover a minimum period of 75 days after the time the facility has been declared commercially operational. A minimum of 30 days of data (not necessarily consecutive days) at 90 - 110 percent rate power generation shall be required (a compliance report shall be issued by SMUD--in any case--within 100 days after the facility has been declared commercially operational). The report shall contain data obtained during the 75 day monitoring period, including performance data at less than 90 percent rated power. The report shall contain as a minimum H₂S concentrations in the off-gas and freshly treated condensate, power generation rates, abatement system settings, and a description of abatement system's failures, if any.

4.1.3 If, during the first 75 days of monitoring described in Item 4.1.2, 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 to NSCAPCD, the USGS, and CAM within 25 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.

4.1.4 Upon review of the information in Items 4.1.2 and 4.1.3, the Air Pollution Control Officer of the NSCAPCD shall within 30 days specify in writing to SMUD, the USGS, and the CAM whether the power plant conforms with NSCAPCD rules and regulations, conditions of the Final DOC, and the CEC Final Decision on the SMUDGE #1 facility. If noncompliance is determined, the NSCAPCD will reconsider his Permit to Operate.

4.1.5 If the APCO finds that the facility has not met applicable emission limitations, SMUD shall submit a plan to the USGS, CAM, and NSCAPCD. The plan shall be submitted within 30 days after receiving a notification of noncompliance from the NSCAPCD. The plan shall include a description of the mitigation measures or additional controls to be applied to the

facility or other actions taken to meet the emission limitations. The report will also describe the initial date of construction of the additional mitigation measures, the date when the installation of the additional mitigation measures will be complete, the date of initial startup of the additional mitigation measures, and the date of the performance test that demonstrates the power plant is in conformance with the H₂S emission limitation.

4.1.6 Within 30 days after receipt of SMUD's plan, the NSCAPCO shall determine whether SMUD's plan is adequate to meet the H₂S emission limitation of 5 lbs/hr [or 8 lbs/hour if this emission limitation is applied per DOC condition 13 (A)]. If the NSCAPCO determines the plan is inadequate, the NSCAPCO shall notify SMUD, the USGS, and CAM in writing of the areas where the plan is deficient. SMUD shall submit a response to the NSCAPCO correcting the deficiency within 15 days after receipt of the NSCAPCO's determination. The NSCAPCO shall approve, modify, or disapprove SMUD's final plan within 30 days of receipt. The CEC shall, in consultation with the USGS, concur or deny concurrence within fifteen (15) days after the NSCAPCO's approval of the plan.

4.1.7 SMUD shall implement the plan immediately after concurrence by the CEC.

4.2 Power Plant Outages and Malfunctions

4.2.1 The NSCAPCD shall be notified by telephone within one hour following determination that any power plant outage or equipment malfunction has resulted in emissions in excess of five (5) pounds per hour H₂S [or 8 lbs/hour if this emission limitation is applied per DOC condition 13 (A)] at a number to be provided by the NSCAPCD. SMUD shall maintain a log of all power plant outages and abatement equipment malfunctions. The log, at a minimum, shall contain (1) the period of abatement equipment malfunction, reason for malfunctions, and the corrective action; (2) the periods of scheduled and unscheduled outages and the cause of the outage, if known; (3) a summary of any irregularities that occurred with the continuous monitors, if used; and (4) the dates and hours in which SMUDGE0 #1 was in excess of the H₂S emission limitation of 5 pounds per hour [or 8 lbs/hour if this emission rate is applied per DOC condition 13(A)]. Nothing in this item shall relieve SMUD from compliance with NSCAPCD Rule 540 (Equipment Breakdown). SMUD shall provide to NSCAPCD, the USGS, and CAM a report on the outage, within 10 days after breakdown occurrence has been corrected, which shall contain the information in the log of power plant outages. In the event that power plant outages recur because of equipment malfunctions that are not indicated by alarms, SMUD shall replace malfunctioning equipment or retrofit alarms on the malfunctioning equipment as soon as possible. The log of power plant outages shall be available

for inspection upon the request of the staffs of NSCAPCD, the USGS, the ARB, and the CEC.

4.2.2 The power plant abatement system shall have the necessary instrumentation and automatic controls to meet emission limitations. Instrumentation will detect, alarm, and initiate corrective action in the event of power plant outages or equipment malfunctions in order to meet the conditions of the Determination of Compliance.

4.3 One year after the commencement of commercial operation, SMUD shall submit a final report to the NSCAPCO on the availability of acceptable continuous monitors which satisfy the criteria specified in Item 3.1. Within 30 days of receipt of the report, the NSCAPCD shall determine whether or not such monitors are available and should be installed on SMUDGE #1. Until such monitors are installed or in the event that the NSCAPCO determines that monitors meeting the above specifications are not commercially available within one year of commencement of commercial operation, SMUD shall conduct testing no less than once every thirty (30) days to ensure compliance with the H₂S emission limitation. The testing procedure used to determine compliance shall be submitted to the NSCAPCD for approval. The NSCAPCO shall approve, disapprove, or modify the test procedure within 30 days of receipt. A log of such testing shall be maintained and available to the NSCAPCD, the USGS, and CEC upon request.

In all cases, a summary of the monitoring and/or testing shall be forwarded to the NSCAPCD, the USGS, and CEC every calendar quarter but not later than 15 days after the close of the calendar quarter.

In case of noncompliance, SMUD shall follow the procedure in Items 4.1.5, 4.1.6, and 4.1.7.

4.4 SMUD shall, at the request of the NSCAPCD, install, operate and maintain an appropriately located meteorological station capable of determining wind direction, wind speed, standard deviation of the wind direction, and temperature. The data shall be furnished to the NSCAPCD at least once per calendar quarter in an hourly/day format which is acceptable to the NSCAPCD.

4.5 SMUD shall issue quarterly reports to the NSCAPCD detailing: (a) hours of operation; (b) any periods for which abatement equipment malfunctioned, reason for the malfunction(s), and the corrective action taken; (c) amounts and types of chemicals consumed for treatment of condensate; (d) periods of scheduled and unscheduled outages and the reasons for such outages, if known; (e) a summary of the output of continuous emission monitors with explanations of any irregularities; and (f) the dates and hours when SMUDGE #1's H₂S emissions were in excess of 5 lbs/hr [or 8 lbs/hour if this emission rate is applied per DOC condition 13(A)].

4.6 SMUD shall allow authorized representatives of the NSCAPCD and/or ARB to enter the premises where SMUDGE #1 is located, within one hour of notification, to inspect the plant for compliance with the items addressed in this report.

In the event that SMUD cannot comply with the request of the NSCAPCD and/or ARB because of safety considerations, SMUD shall submit in writing within one week an explanation of the reasons why entry to the premises could not be provided within one hour.

- a. Verification--SMUD shall submit the monitoring program plans to NSCAPCD, CAM, the USGS, and the ARB. NSCAPCD shall review the plans for adequacy.
 - b. Enforcement--NSCAPCD shall notify the CAM, the USGS, and SMUD in writing, in accordance with the schedule established in subparagraph 4 (Operational Requirements). The CAM, in consultation with the USGS, shall notify the NSCAPCD of any discrepancies the CEC staff has found within 30 days of receipt of the plans.
 - c. Filings and Notifications--See Verification and Enforcement above.
5. Postoperational Requirements--None.

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	FEED GAS	11	OXIDIZER AIR BLOWER
2	K.O. DRUM	12	OXIDIZER AIR BLOWER
3	VENTURI SCRUBBER	13	OXIDIZER AERATOR
4	ABSORBER	14	OXIDIZER AERATOR
5	REACTION TANK	15	STRETTFORD HEATER
6	ADDITIVE INJECTION PACKAGE	16	CONDENSATE
7	OXIDIZER AIR BLOWER	17	CHEMICALS
8	OXIDIZER AIR BLOWER	18	SYSTEM DRAIN
9	OXIDIZER AERATOR	19	MAKE-UP PUMP
10	OXIDIZER AERATOR	20	COND.

GEYSERS UNITS 18

STRETTFORD SYSTEM
FLOW DIAGRAM
(542001)
FIGURE 4.3-15

II. HEALTH

(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 (DOHS/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--SMUD shall conduct quarterly sampling and analysis for radon-222 concentrations in noncondensable gases in the cooling tower exhaust. An outline of the current DOHS/RHS minimal requirements for monitoring and reporting on radon-222 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 radon-222 emission rate (Ci/sec) to the environment is accurately determined.

This radon-222 monitoring program will be conducted for at least the first two years of commercial operation. If monitoring results indicate that the radon-222 release for the SMUDGE0 facility is well within applicable standards, the program may be modified, reduced in scope, or eliminated provided the approval of RHS is obtained by SMUD. SMUD shall send a copy of the RHS approval to the USGS and CAM. As new information and techniques become available, with concurrence of SMUD and RHS, changes may be made to the program or the methods employed in monitoring radon-222.

- 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 SMUD'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. The 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 radon-222 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 radon-222 emission standards. If the radon-222 emission standard is violated, SMUD must inform the DOHS/RHS and USGS with special advisory reports. SMUD will provide a written report to DOHS/RHS and USGS within 30 days of confirmation of an exceedance of 3.0 pCi/liter (pCi/l) radon-222 in the cooling tower exhaust. If the radon-222 concentrations exceed 6.0 pCi/l in the cooling tower exhaust, SMUD will notify DOHS/RHS and USGS by telegram or telephone within 24 hours of the confirmation of the sample result. Confirmation includes the reanalysis of the sample by SMUD 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. SMUD shall notify the USGS of corrective actions taken.
- c. Filings and Notifications--SMUD 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 USGS and CEC staff and the public on request. DOHS/RHS shall report annually the results of the radon-222 monitoring program to the USGS and the CAM. This report shall include at a minimum data concerning average and high values of radon-222 emissions, and incidences of the 3.0 pCi/l and 6.0 pCi/l level exceedances.

5. Postoperation Requirements--None.

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--

SMUD shall obtain baseline ambient air measurements for benzene, silica, mercury, arsenic, ammonia, and vanadium in accordance with the following requirements (see corresponding requirement in I.A.3.4). These requirements may be accommodated as a part of any established regional data gathering program acceptable to NSCAPCD, USGS, and CEC staff.

- o Measurements shall be made in the populated areas in Cobb Valley downwind of the power plant, to be determined by NSCAPCD, USGS, CEC staff, and SMUD.
- 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 particule induced X-ray emission (PIXE) techniques, atomic absorbtion 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 H₂S. If a uniform ratio exists between ammonia and H₂S, ambient H₂S 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 SMUD as approved by USGS in consultation with the CEC staff.

SMUD, USGS, 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 USGS and the CAM.

- a. Verification--A sampling plan consistent with the above sampling requirements will be prepared by SMUD for approval by the USGS, in consultation with the CEC staff, the CARB, and DOHS/RHS before monitoring begins.
- b. Enforcement--Per General Provisions.
- c. Filings and Notification--Same as air quality (3.6).

4. Operating Requirements--

There are four requirements related to public health protection:

- o Initial Steam Sampling Program - See Air Quality/Systems Engineering (I.A.3.3). Continuation of the initial steam sampling program will depend upon:
 - The variation of the concentration of each pollutant in the steam;
 - 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 or if rates of emissions are low (as compared to agreed-upon significant levels), monitoring will be terminated for specific pollutants upon approval of the USGS in consultation with the CEC staff.

- o Mass Balance Measurements--In the second year of commercial operation, SMUD shall perform two mass balance measurements for mercury and arsenic. Samples will be collected twice during the year from incoming steam,

condensate, noncondensable gas to the Stretford, non-condensable gas to the cooling tower, Stretford solution, cooling tower emissions, cooling tower blowdown, and cooling tower sludge. Mass balance calculations will be made to quantify the emission rate of all incoming arsenic and mercury leaving the power plant. SMUD will prepare a report to be submitted to the USGS on the mass balance measurements and calculations.

- o Ambient Monitoring--See Air Quality/Systems Engineering (I.A.3.4).
 - 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--See Air Quality/Systems Engineering (I.A.3.3).
 - o Mass Balance Measurements--SMUD shall send 8 copies of a report on the Mass Balance Measurements and calculations to the USGS 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.
 - o Ambient Monitoring Program--See Air Quality/Systems Engineering (I.A.3.5).
 - o New Well Steam Analysis--SMUD shall send the new well steam analysis to USGS within 30 days after the sampling.
 - o Method for sampling, analysis, quality control/quality assurance, and reporting results from the above programs will be prepared by SMUD for approval by the USGS, in consultation with CEC, NSCAPCD, CARB, and DOHS 120 days before the programs begin. (See also I.A.3.4. and 3.5.)
 - b. Enforcement--See General Section.
 - c. Filings and Notifications--See Verification above.
5. Postoperating Requirements--None established.

II. WATER RESOURCES

A. Standards

- o Porter-Cologne Water Quality Control Act,
- o Water Quality Control Plan, Sacramento River Basin (5A),
- o Water Quality Control Plan, North Coastal Basin (1B),
- o California Administrative Code, Title 23,
- o California Water Code, Part 2.

The delegate agency is the NCRWQCB.

1. Preconstruction Requirements--

- a. Verification--SMUD or its contractor shall contact the CEC, the counties of Sonoma and Lake, the appropriate RWQCB, and the State Water Resources Control Board-Division of Water Rights (SWRCB-DWR), and the USGS, identifying the time schedule, the potential source, projected monthly volumes, and the method (purchase, diversion) for obtaining the construction phase water; and obtain any required permits or waivers.
- b. Enforcement--The contractor shall not proceed with earth-moving activities without such permits or waivers, and the contractor shall not obtain water without such notification and obtaining required permits or waivers.
- c. Filings and Notifications--Prior to any water withdrawals, the contractor shall file an application or letter of intention with all appropriate agencies (RWQCB, SWRCB-DWR, USGS, county); a copy of such shall be supplied to the CAM. A copy of all agencies' responses shall be forwarded immediately on receipt to the CAM and USGS.

2. Construction Requirements--

3. Preoperation Requirements--

- a. Verification--SMUD shall provide documentation to the CAM and USGS that all mitigation measures included in the Water Resources Findings and Conclusions and Conditions contained in the CEC certificate (see list below) are complied with, or clearly identifies CAM authorized deviations from the required mitigation measures.

Water Resources Findings, Conclusions, and Conditions, pertaining to:

Findings--2 The design and construction of the power plant pad to drain a 100 year storm.

3, 5 The utilization of geothermal steam condensate for:

1) Initial start-up cooling water (supplied by a steam developer).

2) Operation cooling water.

6, 7, 8 The amounts of initial start-up cooling water, construction water utilized, and a forecast of annual operations water needs.

9 The outside source and method of obtainment/transport for the domestic "potable" annual water.

Conditions--1 The construction of the power plant above the flood zone.

2, 3 Identification of the sources of initial start-up cooling water and construction water.

b. Enforcement--Per General Provisions.

c. Filings and Notifications--SMUD shall file the appropriate affidavits, signed by a registered civil engineer and the project manager, identifying compliance and/or deviations to the above mitigation measures. These filings may be made after each mitigation measure feature is constructed, or phase is completed, or they can be made at the end of the power plant construction phase.

4. Operating Requirements--Maintain power plant pad drainage system to meet or exceed the certificate's criteria.

a. Verification--None.

b. Enforcement--Per general provisions.

c. Filings and notifications--None.

5. Postoperations Requirements--None established.

IV. SOCIOECONOMICS

A. LAW

Warren Alquist Act, Public Resources Code, Section 25001, and,

State EIR Guidelines: California Administrative Code, Title 14, Division 6, Chapter 3, Article 9, Sections 15142, 21083, and Appendix G,

1. Preconstruction Requirement--SMUD will provide adequate compensation for incurred county costs specified in the Commission decision. These items include (a) road construction and maintenance fees, (b) indemnification of Sonoma County from third party damage claims attributable to construction traffic related to the SMUDGE0 #1 facilities, and (c) reimbursement for emergency medical costs incurred by Sonoma County attributable to the construction of the facility.

SMUD, in consultation with the Labor Coordinator, will design a van pool program to transport workers across the KGRA to and from Sonoma County.

- a. Verification--SMUD will document all transactions in compliance with these requirements and forward copies to USGS.
- b. Enforcement--Per General Provisions.
- c. Filings and Notification--Copies of all submissions will be sent by SMUD to the USGS within 10 business days of the reimbursement or other relevant transaction.

Thirty Days prior to construction, SMUD will forward to the USGS interim plans for a van pool program to provide workers with transportation across the KGRA to Sonoma County.

2. Construction Requirements--SMUD will implement a van pool program to provide transportation across the KGRA to locations in Sonoma County. The program should begin when required construction work force of the site reaches 10 or more, with continuation until the close of construction.

- a. Verification--Within 10 days after the formalization of any agreements between SMUD and (a) firms which will provide service as a part of the van pool program or (b) The Geysers Labor Coordinator and/or individual craft unions concerning the transportation program, SMUD will submit 8 copies of relevant passages from the agreements to USGS. In the event that a new Geysers Labor Agreement requires changes in the transportation program as carried out by the interim plan described in c. above, SMUD will

by letter describe and document reasons for these modifications. Such a letter should be countersigned by the Labor Coordinator.

b. Enforcement--Per General Provisions.

c. Filings and Notification--Items required under "Verification" above will be filed within 60 days of the date of CEC certification.

3. Preoperation Requirements--None.

4. Postoperation Requirements--None.

V. VISUAL AESTHETICS

- A. Plan--Scenic Highway Element of the General Plan, County of Sonoma.
U.S. Route 101 qualifies as a scenic highway under this plan.

1. Preconstruction Requirement--None.
2. Construction requirements--SMUD will paint the facilities in colors to reduce contrast between the facilities and the natural background as seen by distant viewers.

SMUD will prepare color photographs of the facilities, as completed, as viewed from the south, southwest, and northwest directions. Photographs will clearly represent the facility, but also include elements of the background against which it is silhouetted.

- a. Verification--SMUD will submit eight copies of the photographs to the USGS. BLM and Sonoma County Planning Department, as requested by the USGS, will review the photographs to advise the USGS regarding the acceptability of the mitigation measure.
 - b. Enforcement--Per General Provisions.
 - c. Filings and Notifications--Photographs will be submitted to USGS subsequent to completion of construction and prior to unit startup.
3. Preoperation Requirements--None.
 4. Operation Requirements--None.
 5. Postoperation Requirements--None.

VI. SOILS

A. Standards

- o The North Coast Basin plan of the North Coast Regional Water Quality Control Board, which is based on the Porter-Cologne Water Quality Control Act, provides for the protection against physical and chemical quality degradation of the beneficial uses of the waters of the basin.
 - o Federal Standards--GRO Order No. 4 (Geothermal Resources Operational Order) which provides for the protection of the environment by specifying the lessee's responsibilities and enforcing the applicable federal, state, and local standards.
1. Preconstruction Requirements--None.
 2. Construction Requirements--SMUD will adhere to the requirements set forth in the North Coast Basin Plan concerning stabilization of disturbed areas.
 - a. Verification--Site inspection may be performed by NCRWQCB prior to the operating phase, and upon completion of grading, a statement verifying compliance with the North Coast Basin Plan will be prepared by SMUD and counter-signed by a representative of NCRWQCB.
 - b. Enforcement--Any NCRWQCB determination of noncompliance substantial enough to require corrective action will be reported to the USGS and SMUD in writing. In the notification, NCRWQCB will recommend any action they deem necessary.
 - c. Filings and Notifications--SMUD will file with the USGS, prior to the operating phase, a statement of compliance with the NCRWQCB basin plan. USGS will provide a copy of the statement of compliance to the NCRWQCB.
 3. Preoperation Requirements--None.
 4. Operating Requirements--SMUD will remove collected sediments from the check dam system on an as-needed basis and dispose of them properly at a site approved by USGS and BLM. SMUD will annually quantify the amount of sediment removed and provide this information prior to October of each year to the USGS.

If the sediment yield information indicates that applicable mitigation measures are inadequate, the USGS, in consultation with the CEC, may require alternative mitigation measures. This condition may be reviewed by the CEC and USGS after three years of operation. The USGS, in consultation with the CEC and NCRWQCB, may determine the need for its continuation.

- a. Verification--SMUD shall annually monitor the sedimentation yield by measuring the amounts of sediments accumulated in the sedimentation retention system.
 - b. Enforcement--NCRWQCB, upon determination of excess sedimentation and in consultation with the USGS, may issue a cease and desist order to SMUD.
 - c. Filings and Notifications--SMUD will annually submit eight copies of a report of sediment accumulated in the sediment retention system to the USGS.
5. Postoperation Requirements--None determined.

VII. STRUCTURAL ENGINEERING

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 Sonoma County Ordinance 2395 adopting (with appropriate additions or deletions) UBC 76 or equivalent building standard.

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, (ANSI), "B 31.1 Power Piping Code."
- o ANSI, Building Code Requirements for Minimum Design Loads in Buildings and Other Structures" (ANSI A 58.1 - 1972).
- 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 SDFESS 78).
- o AISC, "Commentary on the Specifications of the Design, Fabrication, and Erection of Structural Steel for Buildings" (AISC CSDFESS 78).

- o AISC, "Specification for Structural Joints Using ASTM, A325 or A490 Bolts," April 1978 (AISC SST 78).
- o AISC, "Code of Standard Practice for Steel Buildings and Bridges," September 1976 (AISC CSPSBB 76).
- o American Welding Society, "Structural Welding Code AWS D1.1-179" (AWS D1.1-79).
- o AWS, "Reinforcing Steel Welding Code," (AWS D12.1-75).
- o "National Design Specification for Stress-Grade Lumber and Fastenings, 1977" (NDS 77).
- o American Institute of Timber Construction, 1972, "Timber Construction Standards," AITC-100.
- o American Iron and Steel Institute (AISI), "Specification 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).

Other Criteria:

- o SMUDGE #1 AFC, Section 1.3.1 (entitled, "Civil and Structural Design"), Appendix B (entitled, "Seismicity Study") and Appendix C (entitled, "Structural Design Criteria").
- o SMUD's responses (dated June 23, November 12, December 11, 1980 and January, 1981) to staff interrogatories and review comments.
- o Criteria set forth in Finding 1 which govern the design of specific structures and facilities, will be used in the final design and construction of each such structure and facility. However, in the case of discrepancies between various criteria, the most stringent criteria will be used unless SMUD can justify use of a less restrictive criteria to the USGS.
- o The Applicant will use the following references as guides in the final design of the power plant and related facilities.
 - a. Applied Technology Councils, "Tentative Provisions for the Development of Seismic Regulations for Buildings," (NBS-SP-510; ATC-3-06).
 - b. Structural Engineers Association of California, "Recommended Lateral Force Requirements," 1975, Recommendations and Commentary.

- o Applicable Findings and Conclusions regarding Structural Engineering contained in the Decision.
 - o Applicable terms and conditions of the certificate.
 - o In the event that UBC 79 is not adopted by the state (under Title 24, CAC) prior to construction, SMUD will demonstrate that facility design conforms with the requirements of UBC 1976.
 - o 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.
1. Preconstruction Requirements--SMUD shall prepare and submit to the USGS eight copies of proposed design criteria, structural analyses and final plans* and specifications (final design documents) for review by the USGS, CEC staff, and by Sonoma County CBO.

a. Verification

The responsible 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 analysis methods accepted by the USGS, in consultation with the CEC staff.
- o SMUD'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.

For turbine generator building and turbine generator pedestal, SMUD will clearly demonstrate through submittal of design calculations and drawings that the proposed final plans and specifications are based on and conform with the design criteria and analysis methods required by the certificate or that any nonconformance is justified.

The Sonoma County Chief Building Official or his agent may review and comment on compliance of proposed final plans and specifications with requirements (primarily UBC 76) of County Ordinance 2395.

*Final plans are defined as the plans approved by a registered structural engineer, upon which construction will be based.

The USGS, in consultation with the CEC staff or its agent, shall review SMUD's proposed design criteria and analysis methods to determine that the proposed design or design approach conforms with terms and conditions of the certificate (other than county requirements) or, if not, that any nonconformance is justified. In addition, the USGS and CEC staff may, upon request, review proposed procurement specifications.

b. Enforcement

If SMUD's proposed design criteria or methods, final plans and specifications, and procurement specifications are not acceptable, CEC staff will notify the USGS within the review time frame established by the USGS. The USGS and CEC will then meet to resolve the unacceptable items.

SMUD shall not begin construction of any structure or foundation for which final plans and specifications have not been approved by the USGS.

c. Filings and Notifications

At least 30 days prior to submittal of any design documents, SMUD will notify the USGS of the intended submittal date.

At least 60 days prior to start of any construction of the turbine generator building and turbine generator pedestal, SMUD will submit to the USGS the final results of a dynamic analysis based on accepted response spectra, to demonstrate the adequacy of proposed seismic design.

SMUD will simultaneously submit 8 complete sets of final structural designs, plans and specifications for each structure and structure foundation to the USGS at least 60 days prior to the intended construction start date.

The final plans and specifications will clearly reflect the inclusion of approved criteria, methods used to develop the design for category 0 and category 1 structures and components, and shall include design calculations.

The CBO may, within 30 days of receipt of final plans and specifications from the USGS, file with the USGS a compliance letter containing the county's review comments. If no compliance letter is received by the USGS, the USGS may assume the proposed design is acceptable to the CBO.

The CAM will, within 30 days of receipt by CEC of SMUD's proposed final plans and specification, file a compliance letter to notify the USGS 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 30 days, the USGS may deem SMUD's 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 SMUD propose substantial changes (as defined in the Structural Engineering Findings and Conclusions) 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 USGS, in consultation with 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.

SMUD will provide 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 times to monitor construction activities.

Upon submittal by SMUD to the USGS of adequate quality assurance and quality control procedures for inspection of construction work, USGS may delegate to SMUD responsibility for determining that construction work conforms with UBC 79 or other requirements of the certificate.

Should responsibility for inspections be delegated to SMUD, SMUD 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 USGS as soon as discovered.

The USGS, CEC staff, the CBO, or their agents, 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 SMUD propose substantial corrective measures for any nonconforming construction work, the responsible civil engineer shall sign and/or stamp the proposed corrective plan and specifications and shall certify that they conform with the applicable criteria. Any nonconformance shall be justified by SMUD.

Any proposed substantial corrective measures shall be reviewed by the USGS who, in consultation with the CBO and CEC staff or their agents, will determine whether or not they conform with the applicable criteria or with the design intent.

The responsible civil engineer shall certify in writing to the USGS 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

SMUD shall not begin any construction based on proposed change orders or corrective measures unless these design documents have been accepted by the USGS.

If, upon inspection of construction work any of SMUD's quality control engineers or inspectors discover minor nonconformance with the approved plans, specifications, and change orders, he shall require whatever changes or remedial work is required to reestablish conformance. The USGS 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 SMUD of completed construction for each major structure or component, the USGS, in consultation with the 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 5 days prior to submitting a proposed change order which substantially* revises approved final plans

*See "substantial changes" in Geotechnical and Civil Engineering [Section VIII, Item 2.a.(1)] for definitions.

and specifications, SMUD shall notify the USGS of its intent to submit such change orders.

If substantial nonconforming work is discovered by any of SMUD's quality control engineers or inspectors, designated inspectors, or by CEC staff the CBO or their agent, the discoverer will immediately notify the USGS of the nonconformance.

At least 15 days prior to intended start of construction based on a proposed change order or corrective measure, SMUD will submit eight copies of such change order or corrective measure to the USGS for distribution and review.

Unless the CBO and CAM notify the USGS otherwise within 10 days of receipt of a change order, the proposed change order will be deemed acceptable to the CBO and to the CEC staff.

Eight copies of a monthly summary of construction progress will be submitted to the USGS by SMUD.

SMUD will notify the USGS upon completion of each major structure or component.

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

- 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 USGS shall be identified on the as-built drawings).

3. Preoperational 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 USGS approval before the change is made. USGS will consult with the CEC prior to its decision of approval or non-approval.

a. Verification

SMUD will file engineering descriptions of intended major changes with the USGS. Verification as in Construction above.

b. Enforcement

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

c. Filings and Notifications

Same as Construction above.

5. Postoperation Requirements--None determined.

VIII. GEOTECHNICAL AND CIVIL ENGINEERING

A. Ordinances:

Uniform Building Code (1979), especially Chapters 3, 29, and 70 as adopted by Sonoma County Ordinance 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.

Federal Standards:

Title 30 CFR Part 270. Geothermal Resources Operations on public acquired, and withdrawn lands.

GRO Order No. 4. General environmental protection requirement.

GRO Order No. 5. Establishes guidelines and requirements for preparation of plans, operation, permits, and reports.

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--SMUD shall prepare and submit to the USGS eight copies of proposed grading plans for review by the USGS, CEC staff, and the Sonoma County Chief Building Official (CBO).

SMUD shall make in lieu payments to Sonoma County equivalent to the fees listed in Chapter 70 of the UBC for review of the grading plans and in lieu permit.

a. Verification--

SMUD'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 UBC 76) of County Ordinances. The USGS, in consultation with the CEC staff or its agent, shall review SMUD'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 SMUD to the USGS of adequate quality assurance/quality control procedures for review and checking of grading plans, the USGS may delegate to SMUD responsibility for determination that proposed grading plans conform with UBC 79 or other requirements of the certificate. The USGS will consult with the CAM prior to its decision on a determination of quality assurance/quality control adequacy.

b. Enforcement--

The USGS shall not accept SMUD'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 USGS, it shall be modified by SMUD until substantial compliance is attained.

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

c. Filings and Notifications--

At least 30 days prior to submittal of proposed grading plans, SMUD shall notify the USGS 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, SMUD will submit 8 copies of proposed grading plans to the USGS for review.

The CBO will, within 30 days of grading plan receipt, file with the USGS, a compliance letter containing the County's review comments. Should the CBO fail to file with the USGS a compliance letter within 30 days, the USGS may deem the proposed grading plan acceptable to the CBO.

The CAM will, within 30 days of receipt by CEC of SMUD's proposed grading plans, file a compliance letter to notify the USGS 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 30 days, the USGS may deem the proposed grading plans acceptable to CEC staff.

2. Construction Requirements--Site excavation and grading shall comply with accepted grading plans and change orders. A staff of field engineers and inspectors shall be provided by SMUD and be on site at all times during working hours to monitor contract and construction activities.

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, SMUD'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.

The USGS 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. SMUD 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 UBC 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.

*"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.

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

SMUD 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 CEC's agents, may, upon reasonable notice to SMUD, inspect the site at any time to examine for conformance of site earthwork with approved plans and change orders and/or to evaluate newly discovered adverse site conditions.

Upon submittal by SMUD to the USGS of adequate quality assurance/quality control procedures for inspectors of earthwork and grading, the USGS staff may delegate to SMUD, responsibility for determining that such work conforms with UBC 79 or other requirements of the certificate.

Should the USGS delegate earthwork inspections to SMUD, SMUD 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. SMUD'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 examine for conformance of site earthwork with the accepted final grading plan.

b. Enforcement

- (1) Substantial Changes. SMUD 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 the USGS. The USGS will consult with the CEC prior to any USGS decision.
- (2) Inspections. If, upon inspection of site earthwork, SMUD's quality control engineers or designated inspectors, or CEC staff or its agents discover non-conformance with approved grading plans and change orders, they will notify the USGS and may make recommendations for changes to ensure compliance with design intent.

If the USGS delegates inspection to SMUD:

- o SMUD'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 SMUD'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.

SMUD will not begin construction of any structure or foundation until notified by the USGS that site earthwork is acceptable to the USGS. The USGS will

consult with the CAM prior to any USGS decision concerning notification.

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 SMUD to the USGS. Such new geotechnical information will be reflected in the as-graded and as-built plans. SMUD will maintain the as-built and as-graded files for the life of the project. The USGS and CEC staff will have access to these files.

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

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

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

- (2) Inspections. CEC staff, or CEC's agents, shall give SMUD reasonable notice (at least 24 hours) prior to unscheduled inspections of site earthwork, unless an imminent hazard requires more immediate inspection.

SMUD will notify the USGS 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 USGS, eight copies of the signed/sealed as-graded plan, soils engineering report, and geologic grading report.

- (3) Progress Reports and As-graded Plans. SMUD will submit to the USGS eight copies of a monthly summary of construction progress. Upon completion of site earthwork, SMUD will prepare and maintain as a public record for the life of the project the As-graded plans with approval of responsible civil engineer that the work was done in accordance with final approved grading plan. CEC staff and its agents shall have access to these filed documents.

(4) Attestments of Compliance. If the CAM does not notify the USGS otherwise within 10 days of receipt of the final as-graded plan and supplementary reports, the USGS may deem these documents and site earthwork acceptable to CEC staff.

3. Preoperation Requirements--None.

4. Operating Requirements--None.

5. Postoperation Requirements--SMUD will prepare and submit for acceptance, a reclamation plan to the USGS to restore the site to its original condition as nearly as practicable at least six months prior to decommissioning of the facility.

IX. Biological Resources

PART I: Rare, threatened, endangered, and fullyprotected species (legally protected species); commercial and recreational resources; species of special concern; and areas of critical concern.

- A. Federal Law--Public Law 93-205 (U.S. Endangered Species Act of 1973) and implementing regulations.

State Law--Fish and Game Code Sections 2050 - 2055 (California Endangered Species Act of 1970) and implementing regulations.

State Law--Fish and Game Code Sections 1580 - 1584 (California Ecological Reserve Act of 1968) and implementing regulations.

State Law--Fish and Game Code Sections 3511, 4700, 5000, 5050, and 5515 (Fully Protected Species).

Federal Law--Federal Regulations implementing the Geothermal Steam Act of 1970 [30 USC 1001 - 1025 and CFR 270.34(k)].

Federal Law--Guidelines for Acquiring Environmental Baseline Data on Federal Geothermal Leases (Geothermal Environmental Advisory Panel, 1977, Section 5.0, Biological Data).

Federal Law--Federal Geothermal Resources Operational Order (GRO Order 4). General Environmental Protection Requirements.

These laws designate specific plant and animal species that are to be preserved, protected, and enhanced, and the laws provide for protection of aquatic resources.

The delegate agencies are the U.S. Geological Survey (USGS) and the Bureau of Land Management (BLM).

1. Preconstruction Requirements--SMUD has undertaken studies to provide information on these biological resources for the power plant site. No additional studies are required (Findings 2, 3, 4, 5, 6, 7, and 8).

To determine impacts to legally protected species and other biological resources within the steam field portion of the project, the steam field developer will file with the USGS Deputy Conservation Manager for Geothermal a Plan of Baseline Data Collection (Response No. 1, May 3, 1980). Based on federal law these studies must be conducted at least one year prior to operation.

2. Construction Requirements--None.
3. Preoperation Requirements--None.

4. Operating Requirements--None.

5. Postoperation Requirements--None.

PART II: Unavoidable losses to biological resources, cooling tower drift, and cumulative impacts.

- B. State Law--California Public Resources Code Section 25503 (requires that "...in planning for future electrical generation...environmental protection...should be considered.")

State Law--Fish and Wildlife and Protection and Conservation, Fish and Game Code Section 1600 et seq.

State Law--California Public Resources Code Section 21000 et seq., (California Environmental Quality Act). State EIR Guidelines, 14 California Administrative Code, Section 15000 et seq., (cumulative impacts).

Federal Law--Federal Regulations implementing the Geothermal Steam Act of 1970 [30USC 1001 - 1025 and CFR 270.34(k)].

Federal Law--National Environmental Policy Act, 42 U.S.C., Section 4321 et seq., (cumulative impacts).

Federal Law--Guidelines for Acquiring Environmental Baseline Data on Federal Geothermal Leases (Geothermal Environmental Advisory Panel, 1977, Section 5.0, Biological Data).

Federal Law--Federal Geothermal Resources Operational Order (GRO Order 4). General Environmental Protection Requirements.

These laws provide for protection of environmental resources, including biological resources, and require that appropriate mitigation and compensation be provided to reduce or avoid adverse impacts.

The delegate agencies are the USGS and the BLM.

1. Preconstruction Requirements--None

2. Construction Requirements--SMUD will implement the mitigation measures identified in the Final Decision. SMUD will submit to the USGS a statement of compliance upon completion of each group of related measures that are designed to meet similar needs. Measures utilized to mitigate or avoid biological resource losses must be completed to the satisfaction of the USGS and the BLM under the direction of an appropriately

qualified biologist* who is employed by SMUD. The qualified biologist will prepare the statement of compliance for SMUD. The measures will have included the following specific items:

2.01. SMUD will not conduct earth moving activities during the months of December, January, and February (AFC, p. 5-46; Finding 11). However, if weather conditions are favorable and SMUD desires to carry out earth moving operations during the wet season (November, December, January, February, and March), they will notify the USGS and BLM and receive their concurrence. Extra effort to control erosion and sedimentation will be initiated during this time period, and these measures will be specified in the notification to the USGS and BLM. The USGS will notify the CEC and CDFG of such construction activities and the erosion control measures to be implemented.

2.02. SMUD will utilize other erosion control measures (AFC, p. 5-46).

2.03. SMUD will control erosion of the cut and fill slopes and sedimentation into the creeks by the check dam drainage system (Mitigation and Monitoring Plan, December 1, 1980; Finding 9a).

2.04. SMUD will implement mitigation measures to reduce impacts to Birdsong Meadow (Finding 9b):

- a. The road through the meadow will not exceed 30 feet in width, and the maximum paved surface will be 24 feet wide (Workshop, September 30, 1980).
- b. The portion of the road through the meadow will be upgraded and the road surface paved immediately following roadbed preparation (prior to October 1, 1981) (Workshop, September 30, 1980; Finding 9b).
- c. Improved drainage across the road and additional culvert drainages will be provided. Gully erosion of the meadow will be controlled by use of energy dissipators at the outflow from the culverts (Workshop, September 30, 1980; Finding 9b).
- d. SMUD will correct and monitor gully erosion in the meadow (Mitigation and Monitoring Plan, December 1, 1980; Finding 16e).

*A qualified biologist is defined as having a bachelor's degree in biological science, zoology, botany, ecology, or a closely related field, plus three years of working experience in field biology. Formal advanced education in the above subject areas may be substituted for experience on a year-for-year basis up to a maximum of two years.

- e. SMUD will construct and maintain a fence along the road to control access onto the meadow (Mitigation and Monitoring Plan, December 1, 1980; Finding 9b). The fence will be in place prior to road construction (Workshop, September 30, 1980; Finding 9b).
- f. SMUD will revegetate the cut and fill areas of the road through the meadow as soon as possible following construction. Shrub species will be planted along the road (Workshop, September 30, 1980; Mitigation and Monitoring Plan, December 1, 1980; Finding 9b).
- g. SMUD will utilize a few trees from the road clearing to create snags in the meadow (Mitigation and Monitoring Plan, December 1, 1980) and at other locations designated by CDFG (CDFG letter, April 18, 1980; Workshop, September 30, 1980; CDFG letter, November 11, 1980; Finding 9f).
- h. SMUD will implement a program to monitor the effectiveness of the erosion control measures, revegetation, and use of the snags (Mitigation and Monitoring Plan, December 1, 1980; Finding 16e).

2.05. SMUD will implement a monitoring program for water quality and flow rate on Calm Creek above the road to PGandE Units 9 and 10 (Mitigation and Monitoring Plan, December 1, 1980; Finding 16e). If adverse impacts occur, the USGS will consult with CEC, CDFG, BLM, and SMUD to determine appropriate mitigation (Workshop, September 30, 1980, AFC, p. 5-87B; Finding 14c).

2.06. SMUD will carry out a water quality monitoring program on Cobb Creek (Mitigation and Monitoring Plan, December 1, 1980; Finding 16b).

2.07. Vehicle access to trails in the vicinity of the power plant and those diverging from the emergency access road will be blocked (Workshop, September 30, 1980; Mitigation and Monitoring Plan, December 1, 1980; Finding 9c).

2.08. Controlled burns will be conducted in areas of mixed chaparral and chamise to improve forage and compensate for loss of wildlife habits (Mitigation and Monitoring Plan, December 1, 1980; Finding 9e).

- a. SMUD will contribute funds to BLM so that this federal agency can select and conduct the prescribed burning (Mitigation and Monitoring Plan, December 1, 1980).
- b. Burning will cover approximately 12 acres in each 10-year period during the life of the power plant (Mitigation and Monitoring Plan, December 1, 1980).

- c. SMUD will implement a monitoring program to assess the controlled burn program (Mitigation and Monitoring Plan, December 1, 1980; Finding 16f).

2.09. SMUD will implement a drift monitoring program which will include (Finding 16a):

- a. Spring and fall monitoring of vegetation during the first three years of power plant operation (AFC response, June 3, 1980; Mitigation and Monitoring, December 1, 1980).
- b. Annual infra-red color photography (AFC response, June 3, 1980).
- c. Monitoring of the mixed evergreen forest northeast of the power plant site (Mitigation and Monitoring Plan, December 1, 1980).

2.10. SMUD will revegetate the cut and fill slopes at the power plant site and along the main access road (Workshop, September 30, 1980, Mitigation and Monitoring Plan, December 1, 1980; AFC response, June 3, 1980). Revegetation efforts will be completed on disturbed areas before November of those years in which revegetation is performed (Finding 9d).

2.11. SMUD will monitor the use of the purple martin nesting area near the power plant to determine if there are effects from cooling tower drift (Mitigation and Monitoring Plan, December 1, 1980; Finding 16a). If adverse impacts occur, the USGS will consult with CEC, CDFG, BLM, and SMUD to develop and implement mitigation (Memo, October 24, 1980; SMUD, December 1, 1980; Finding 14).

2.12. Usage of surface water for a construction water source will be monitored by a qualified biologist employed by SMUD to avoid adverse biological impacts. Sources of surface water being used for construction purposes and the name of the qualified biologist will be submitted to the USGS prior to withdrawal of water. The qualified biologist will have the authority to suspend usage of the water source if adverse biological resource impacts are imminent and will notify the USGS of the decision (Finding 12).

2.13. Construction activities shall be monitored by a qualified biologist(s) employed by SMUD. The qualified biologist will be given authority to temporarily suspend construction activities, if adverse biological resource impacts are imminent, until corrective actions can be taken. The biologist will notify the USGS of action taken and the corrective measures that were implemented (Finding 13).

- a. Verification--The USGS, in consultation with CEC biology staff, CDFG staff, and BLM, will review the statement of compliance and/or monitoring program reports submitted by SMUD and reports by the qualified biologist on actions taken during construction and corrective measures that were implemented. If deemed necessary, or in response to a registered complaint, the USGS, in consultation with CEC, CDFG, and BLM, will inspect mitigation related activities and, if appropriate, will require SMUD to take recommended corrective actions. CEC biology staff, CDFG staff, BLM, and USGS will, upon reasonable notice, be allowed field access to inspect mitigation related activities and to inspect SMUD's mitigation and monitoring program files.
- b. Enforcement--Field enforcement of measures to protect biological resources will be the responsibility of both the project site supervising construction engineer and the qualified biologist. The qualified biologist will advise the supervising construction engineer of details concerning required mitigation prior to need for its implementation and shall supervise, as necessary, construction activities to ensure proper implementation of all compensation/mitigation measures. The supervising construction engineer will act on the advice of the qualified biologist to correct and/or temporarily halt construction or construction practices which are not in conformance with the compensation/ mitigation plan, terms, and conditions of AFC approval, or to protect biological resources until corrective action can be taken. With respect to overall implementation, if any specific mitigation measure or monitoring program is not implemented, is done incorrectly, or is determined to be ineffective, SMUD, in consultation with the USGS, will take action to correct the problem. If deemed necessary, or in response to a registered complaint, staff of CEC, CDFG, BLM, and USGS will be allowed to conduct field inspections and review SMUD's mitigation and monitoring program files. Staff of SMUD, CEC biology staff, CDFG, BLM, and USGS will endeavor to arrive at a mutually acceptable resolution to the problem. If the parties cannot reach a resolution, the matter will be referred to the Deputy Conservation Manager for Geothermal, Western Region, USGS.
- c. Filings and Notifications--The qualified biologist shall inform (by telephone) the USGS, as soon as possible, of difficulties which are pursuant to Issue II, Section A.2.b, above, and follow with a written report within 10 days to describe the problem and corrective actions taken.

SMUD will submit a statement to the USGS indicating they have completed the various phases of the mitigation/ compensation program.

Eight copies of an annual progress report covering all aspects of ongoing or unfulfilled project mitigation/compensation measures will be sent no later than April first of each year to the USGS. The USGS will provide one copy of the report to the CDFG and one copy to the CEC.

3. Preoperation Requirements--SMUD will conduct baseline data collection which will be adequate to assess the success of mitigation measures and monitoring programs. The studies will include:

- 3.01. Baseline studies of vegetation and the purple martin in order to monitor cooling tower drift effects (Mitigation and Monitoring Plan, December 1, 1980; Finding 16a).

- a. Verification--The USGS, in consultation with the CEC biology staff, CDFG staff, and BLM, will review and, if necessary, recommend modifications in locations of baseline monitoring programs.
 - b. Enforcement--If any specific mitigation measure or monitoring program is not implemented, is done incorrectly, or is determined to be ineffective, SMUD will take action to correct the problem. Staff of SMUD, CEC, CDFG, BLM, and USGS will endeavor to resolve any conflicts or problems. If differences cannot be resolved, the USGS will take action necessary to resolve the problem.
 - c. Filings and Notification--SMUD will submit to the USGS eight copies of a report, including a map (scale 1:50 or more detailed) showing the locations and types of monitoring stations that have been implemented, and the USGS will provide one copy of the report and map to the CDFG and one copy to the CEC.
4. Operating Requirements--SMUD will continue implementation of applicable measures of the project mitigation and monitoring program (see Requirements 1 - 3 above) and prepare a decommissioning plan for the power plant a year in advance of decommissioning.

More refined and specific information regarding cumulative impacts to biology may become available at a later date. If so, mitigation measures of a regional nature requiring inter-agency/interutility cooperation may be deemed appropriate. Should participation in such cooperative efforts be mandated by the USGS in consultation with the CEC, the implementation of these mitigation efforts will be audited by the USGS.

SMUD will continue the following biological resource related monitoring programs until the effectiveness of the mitigation measures has been established or it has been demonstrated mitigation will not be required:

4.01 Visual and infra-red photographic assessment of potential cooling tower drift effects on vegetation near the power plant and assessment of potential effects on the purple martin nesting area (Mitigation and Monitoring Plan, December 1, 1980; Finding 16a).

4.02 Water quality and sedimentation sampling of Cobb Creek (Finding 16b).

4.03 Water quality, sedimentation, and stream flow sampling of Calm Creek (Finding 16c).

4.04 Effectiveness of revegetation and erosion control methods (Finding 16d).

4.05 Effectiveness of measures implemented at Birdsong Meadow and the snag creation plan (Finding 16e)

4.06 Effectiveness of wildlife habitat improvements by controlled burns and information on appropriate time for reburning of selected sites (Finding 16f).

4.07 The need to continue the monitoring programs will be reviewed in 1985 (Finding 16).

- a. Verification--The USGS, in consultation with the CEC biology staff, CDFandG, and BLM, will review the project monitoring progress reports and the decommissioning plan, and, if necessary, provide recommendations for changes in the program.

A year before the power plant is due to be deactivated, SMUD shall submit eight copies of a decommissioning plan to the USGS for review and approval. USGS will provide one copy of the plan to the CEC and one copy to the CDFandG.

- b. Enforcement--If the requirements are not implemented, SMUD will take appropriate action to correct any deficiencies. Staff of SMUD, CEC, CDFandG, BLM, and USGS will endeavor to resolve any conflicts or problems. If differences cannot be resolved, the USGS will take action necessary to resolve the problem.

- c. Filings and Notification--SMUD will submit to the USGS eight copies of the monitoring progress reports that are due by April first of each year. The USGS will provide one copy of the report to the CDFandG. SMUD will provide immediate notification, including a written statement of impacts and corrective actions taken, if monitoring studies or field observations indicate adverse impacts to biological resources.

5. Postoperation Requirements--SMUD will implement the approved decommissioning plan.
 - a. Verification--SMUD will submit a statement of compliance to the USGS indicating the required actions have been completed. CEC, CDFandG, BLM, and USGS will be allowed access to the leasehold to make observations as appropriate or necessary.
 - b. Enforcement--If requirements are not complied with, SMUD will take appropriate action to correct any deficiencies. Staff of SMUD, CEC, CDFandG, BLM, and USGS will attempt to resolve any problems or conflicts. If the parties cannot reach a resolution, the USGS will take appropriate action to arbitrate the dispute.
 - c. Filings and Notifications--SMUD will submit a statement of compliance indicating they have successfully implemented the decommissioning plan to the USGS upon completion of the plan or any phase of the plan.

X. NOISE

- A. Sonoma County General Plan Noise Element. The Noise Element does not establish specific dBA limits for geothermal activities. Noise limits are set in the Sonoma County Use Permits. The most recent Use Permit set standards for construction activities of 65 dBA day and 55 dBA night, as measured at the nearest sensitive receptor. The responsible agency is Sonoma County Planning Department.

Federal--USGS Geothermal Resource Order #4 sets a limit of 65 dBA at the lease boundary or 1/2 mile from the source, whichever is greater.

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

In the event that SMUD is informed that public complaints have been registered with a public official or agency, and the Applicant fails to resolve the problem, SMUD shall so inform the Conservation Division of USGS. The USGS shall inform the Sonoma County Planning Department of the problem. The Sonoma County Planning Department shall inform the USGS of any public complaints it has received. If requested by the USGS, SMUD shall implement the monitoring procedures 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 one construction working day and under similar circumstances that are similar to those under which the complaints were registered.
- o Survey should be reported in terms of the L_x and L_{eq} levels, (where $x = 10, 50, \text{ and } 90$).
- a. Verification--SMUD shall notify the USGS (the USGS shall notify Sonoma County of SMUD's response) of the surveys, of the public complaints, of the mitigation measures which SMUD has applied to resolve the impact, and the results of mitigation measures.
- b. Enforcement--Sonoma County will advise the Conservation Division of the USGS within 30 days of any continuing noncompliance conditions and of any recommendations to achieve compliance. (USGS shall notify the CAM in writing within seven days.)

c. Filings and Notifications--See a. (Verification) and b. (Enforcement) above.

3. Preoperation Requirements--None.

4. Operating Requirements--(Off-site Monitoring) SMUD will conduct a noise survey at 500 feet from the generating station and at 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 $x = 10, 50, \text{ and } 90$.)

a. Verification--Within 120 days SMUD will prepare and submit a report to USGS (USGS shall forward the report to Sonoma County) 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 or federal standards have been exceeded.

If there is any noncompliance following implementation of mitigating measures, SMUD shall submit a second report to the USGS (the USGS shall forward the report to Sonoma County) verifying that the results of the mitigations have alleviated the nonconformance item. SMUD need not provide any additional noise surveys or reports of the off-site operational noise of 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--Sonoma County will advise the Conservation Division of the USGS within 30 days of continuing non-compliance conditions and of any recommendations to achieve compliance. (USGS shall notify the CAM in writing within seven days.)

c. Filings and Notifications--See a. (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 responsible 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--(On-site) SMUD will conduct noise surveys of the anticipated noise-hazardous areas in the facility when the facility has reached its anticipated capacity factor.
 - a. Verification--SMUD will make the results of the survey available within 180 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 SMUD and shall be made available upon request to the USGS, CAL-DOSH of the Department of Industrial Relations, and the 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 CAL-DOSH, Department of Industrial Relations. At SMUD's option, DOSH CAL/OSHA Consultant Service will aid in correcting non-conformance conditions.
 - c. Filings and Notifications--CAL-DOSH will advise the USGS and CAM in writing of all confirmed noncompliance conditions within 30 days of the events.
5. Postoperation Requirements--None.

XI. TRANSMISSION LINE ENGINEERING/SAFETY AND NUISANCE

Issue I

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

The delegate agency for GO-95 is the CPUC. The CEC is the responsible agency for 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 decision.
 - a. Verification--None.
 - b. Enforcement--None.
 - c. Filings and Notifications--None.
2. Construction Requirements--The transmission line shall be constructed in accordance with GO-95 requirements and as certified¹ by the CEC.
3. Preoperation Requirements--
 - a. Verification--SMUD shall certify to the USGS and the CEC that the transmission line has been designed, constructed and will likely be operated in accordance with GO-95 and as certified by the CEC. Any waivers granted by CPUC to GO-95 shall be noted and the basis and resolution for waivers specified. Waivers to GO-95 or modifications to the design intent shall not be implemented without CEC approval. CEC will consult with the USGS prior to any CEC decision on approval or nonapproval.
 - b. Enforcement--If noncompliance with GO-95 or the design characteristics approved by the CEC becomes apparent, the CEC, in consultation with the USGS, will determine the appropriate action.

1. SMUD shall verify to the USGS and CEC the use of the major general design characteristics (Design Intent) as certified by the CEC, 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. Actual installed construction cost (provide within 90 days after construction).
- h. SMUD staff grounding criteria.

- c. Filings and Notifications--SMUD shall file a certification of compliance with GO-95 and the design characteristics as approved by the CEC. The verification shall be signed by a California registered electrical engineer and 8 copies forwarded to the USGS for distribution within 30 days after completion of line construction. A copy shall be forwarded to the CEC by USGS.
- 4. Operating Requirements--The transmission line shall be maintained in accordance with GO-95 and the design intent.
 - a. Verification--SMUD shall inspect the line at least annually and shall maintain a summary of the results of these inspections (noncompliance and maintenance). Such summaries shall be made available to authorized CEC staff or the USGS upon request. (The transmission line is to be inspected annually for fire prevention purposes also; see XIII.B.4.)
 - b. Enforcement--CEC, in consultation with the USGS, will determine appropriate action.
 - c. Filings and Notifications--None.
- 5. Postoperation Requirements--None.
- 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 shall 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 SMUD and/or recommends enforcement activities, the CAM and USGS will be advised by DOSH.
 - c. Filings and Notifications--DOSH will notify the CAM and USGS of alleged violation(s) and recommended course of action in writing within seven working days of such determination.
 - 3. Preoperation Requirements--None.

4. Operating Requirements--The operation (maintenance activities) of the transmission line shall 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, SMUD shall prepare a signed certificate verifying that the transmission line has been constructed in accordance with PRC 4292 - 4296 and PRC, Title 14, Section 1250 through 1258.
 - b. Enforcement--Case by case basis.
 - c. Filings and Notifications--The certification that the transmission line has been constructed in accordance with the applicable requirements shall be sent to the USGS within 30 days of construction completion. The USGS will provide a copy of the certification to the California Department of Forestry and the CEC.

4. Operating Requirements--Clearances shall be maintained during operation of the transmission line in accordance with PRC 4292 - 4296. SMUD shall inspect the transmission line at least annually in a manner which ensures that the line will be in compliance throughout the year, with an emphasis to ensuring 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, SMUD shall be so advised by the CDF along with CDF recommendations to achieve compliance.

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

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--SMUD shall prepare a "Notice of Proposed Construction or Alteration" 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 "Notice" shall be filed with the FAA. Copies of this "Notice" shall also be concurrently forwarded to the CAM and the USGS.

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 XII, 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--SMUD 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, SMUD shall make every reasonable effort to locate and correct, at SMUD's expense, on a case by case basis, all RI/TVI caused by the 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 staff grounding criteria.

The responsible agency is the CEC.

- 1. Preconstruction Requirements--None.
- 2. Construction Requirements--SMUD shall ground all ungrounded metallic fences in a manner equal to or more stringent than the SMUD grounding standard.
 - a. Verification--Included in Section XII.A.3.a.
 - b. Enforcement--Included in Section XII.A.3.b.
 - c. Filings and Notifications--Same as XII.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.), SMUD will investigate the complaints. If, at SMUD's determination, a valid complaint exists, then measures shall be taken at SMUD'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), SMUD 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. SMUD shall advise the owner of this responsibility prior to signing the right-of-way agreement.

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

5. Postoperation Requirements--None.

XII. SAFETY

Fire Safety

- A. Law--California Administrative Code, Title 8, Chapter 4.7, Groups 20 and 27; Uniform Building Code (1976 edition), Chapters 5, 20, 32, 33; National Fire Protection Association Standards 10, 12, 12A, 13, 14--Class II Service, 16, 19B, 20, 194 (1974 edition), 30, 70, 214, 26, 27, 198 (1972 edition), 231A.

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

1. Preconstruction Requirements--SMUD will arrange agreements for mutual assistance with BLM, CDOF, and appropriate local entities.
 - a. Verification--SMUD will prepare or have prepared agreements for mutual assistance with BLM, CDF, and appropriate local entities.
 - b. Enforcement--CEC shall condition facility certification pending SMUD submitting the indicated findings. If SMUD fails to submit to the CEC the indicated documentation prior to construction of the facility, the CEC may request the USGS to order SMUD to delay operation of the facility or request the USGS to take other appropriate action consistent with the certification decision and applicable laws. If a delayed filing is apparent, SMUD may petition the CAM to consider actions regarding the delayed filing.
 - c. Filings and Notifications--Prior to commencement of construction of SMUDGE0 #1, SMUD shall submit to the USGS eight copies of agreements from BLM, CDF, and appropriate local entities for mutual assistance.
2. Construction Requirements--None.
3. Preoperation Requirements--SMUD will arrange for a review by SMUD's fire insurance company to assure that SMUDGE0 #1 is designed or has been constructed in reasonable conformance with applicable fire safety codes and standards and the underwriter's requirements as set forth above.
 - a. Verification--SMUD will prepare or have prepared a certificate of compliance signed by SMUD's fire insurance company.
 - b. Enforcement--CEC shall condition facility certification pending SMUD submitting the indicated filings. If SMUD fails to submit the indicated documentation prior to commercial operation of the facility, the CEC can request the USGS to order SMUD 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, SMUD shall file with the USGS eight copies of the signed affidavit of compliance.

4. Operation Requirements--None.

5. Postoperation Requirements--None.

Handling and Storage of Hazardous, Toxic, and Flammable Materials

B. Law--Title 8, California Administrative Code, Chapter 4.

1. Preconstruction Requirements--None.

2. Construction Requirements--None.

3. Preoperation Requirements--SMUD will arrange for a review by a registered civil, mechanical, or industrial engineer of the following:

3.01 Stretford system pressure vessels have been fabricated in accordance with ASME Code, Section VIII, Division 1, which is adopted in Chapter 4.1, Title 8, CAC.

3.02 Stretford tanks and permanent H₂O₂ storage tanks, if used, are fabricated in accordance with API 620 and 650 and that H₂O₂ storage tanks are fabricated in accordance with Manufacturers Data Sheet SD-53.

3.03 Lube oil storage tanks are designed and constructed according to Article 145, Title 8, CAC, and anchored and designed to 0.4W.

3.04 SMUD will design and construct bolted and/or welded anchorage on H₂O₂, acid, caustic and chelating agent tanks to withstand a force of 0.87W at working stress design, using UBC formula 12.8. All other bolted and/or welded anchorages for Category 1 equipment will be designed and constructed to 0.4W. In any event, the anchorage criteria shall be consistent with other design and performance criteria.

SMUD shall design and construct tanks containing H₂O₂, acid, caustic and chelating agent, or the containment surrounding these tanks to withstand a force of 0.87W at working stress design.

3.05 Hydrogen systems are installed according to Article 138 of Title 8, CAC.

3.06 Caustic soda systems are installed and handled according to Section 5162 of Title 8, CAC.

SMUD will acquire certified code papers and field inspection reports (if used) for pressure vessels and storage tanks required to be designed to the ASME Boiler and Pressure Vessel Code.

- a. Verification--SMUD will have prepared a certificate of compliance stamped by a registered civil, mechanical, or industrial engineer.
 - b. Enforcement--CEC shall condition facility certification pending SMUD submitting the indicated filings. If SMUD fails to submit the documentation, the CEC may request the USGS to order SMUD to delay facility operation or request the USGS to take other appropriate action consistent with its certification decision and applicable laws and standards. If a delayed filing is apparent, SMUD may petition the USGS to consider actions regarding the delayed filing.
 - c. Filings and Notifications--Prior to commercial operation of the power plant, SMUD shall submit to the USGS eight copies of the following documents: (1) Certificate of Compliance with the requirements under 3. above, and (2) Copies of Certified Code Papers and field inspection reports (if used) for pressure vessels.
4. Operation Requirements--None.
 5. Postoperation Requirements--None.

Worker Safety

- C. Law--California Administrative Code, Title 8, Industrial Relations, Chapter 4, Division of Industrial Safety.

Title 8, Chapter 4.4, Section 1509--Construction Safety Orders, Accident Prevention Program.

Title 8, Chapter 4.7, Section 3203--General Industrial Safety Orders, Accident Prevention Program.

Title 8, Chapter 4.7, Section 5155--Airborne Contaminants.

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 forward to the CAM and USGS a copy of any citations or corrective actions.
3. Preoperation Requirements--SMUD 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. These sections include chemical handling and storage and include provisions for hazardous materials and airborne contaminant exposure based on Section 5155 of Title 8, CAC.

- 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--SMUD shall submit to the USGS, prior to commencement of operation of SMUDGE #1, eight copies of a letter from the CAL/OSHA Consultation Service verifying compliance with the requirements of Section 3203 of Title 8, CAC. DOSH will forward to the CAM and the USGS a copy of any citations or corrective orders.
4. Operation Requirements--SMUD 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 forward to the USGS and the CAM a copy of any citations or corrective orders.
5. Postoperation Requirements--None.

XIII. WASTE MANAGEMENT

- A. Law--California Health and Safety Code, Division 20, Chapter 6.S, "Hazardous Wastes."

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

The delegate 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).

The delegate agency is the Central Valley or the North Coast Regional Water Quality Control Board.

1. Preconstruction Requirements--SMUD shall inform the CAM and the USGS of the disposal site selected for all chemical toilet wastes.
2. Construction Requirements--SMUD shall inform the CAM and the USGS and Solid Waste Management Board (SWMB) of the disposal option selected for construction wastes generated.
3. Preoperation Requirements--SMUD will ensure availability of Class II-1 solid waste disposal sites that are approved for geothermal wastes and Class II sites for sewage sludge.
 - a. Verification--Ninety days or more prior to operation, SMUD shall sign an agreement with an operator of an appropriately licensed disposal site.
 - b. Enforcement--DOHS, Hazardous Materials Management Section can inspect hazardous waste disposal facilities, and will act to enforce the laws and regulations applicable to hazardous waste facilities. The county and the RWQCB can inspect Class II disposal facilities and will act to enforce the laws and regulations applicable to them.
 - c. Filings and Notifications--Sixty days prior to commercial operation, SMUD shall forward eight copies of the waste disposal agreement to the USGS for distribution.
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 the USGS and CEC staff upon request.
 - b. Enforcement--Illegal dumping of wastes from the plant site will be determined by the DOHS or the North Coast Regional Water Quality Control Board (NCRWQCB) or appropriate board. DOHS will continue to have authority over the waste hauler, and DOHS and the NCRWQCB will have authority over the disposal site operator. Any DOHS or NCRWQCB proceeding or action that could affect disposal of waste generated by SMUDGE #1 will be reported to the CAM and the USGS by DOHS or the NCRWQCB.
 - 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 NCRWQCB or appropriate board. If the selected disposal site for hazardous wastes can no longer be used for SMUDGE #1 wastes during the active life of the power plant, SMUD must notify the CAM and the USGS and seek an alternative site.
- B. 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 delegate agency is the Department of Health Services (DOHS).
1. Preconstruction Requirements--None.
 2. Construction Requirements--None.
 3. Preoperation Requirements--If SMUD 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 SMUD has satisfactorily complied with DOHS requirements.
 - b. Enforcement--Per general provisions.

c. Filings and Notifications--Any Hazardous Waste Facility Permit application will be filed with the DOHS. DOHS will notify the CAM and the USGS when all requirements have been met.

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

XIV. WATER QUALITY

The North Coast Regional Water Quality Control Board is the delegate agency.

- A. Standards--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. The delegate agency is the Department of Health Services (DOHS). (See WASTE MANAGEMENT section.)

Law--Porter Cologne WaterQuality 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 on July 7, 1980 with North Coastal Regional Water Quality Control Board (NCRWQCB) by SMUD pursuant to CAC, Title 23, Section 13269, and NCRWQCB Order No. 74-151.

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, SMUD or steam field operator, pursuant to the above order, will implement the monitoring program described in the "Spill Contingency and Containment Plan."
 - a. Verification--SMUD or the steam field operator will report a spill by telephone to the NCRWQCB as soon as possible and submit to the NCRWQCB a detailed written report within two weeks after the spill has occurred. This information and the monitoring reports will be available to the USGS and CEC staff upon request.
 - b. Enforcement--The NCRWQCB is responsible for enforcing the waste discharge requirements, Order No. 78-17, and the requirements of the spill contingency and containment plan, Order No. 74-151.
 - c. Filings and Notifications--Reports of spills are to be filed with the NCRWQCB by SMUD or the steam field operator. These files are open to the public. The NCRWQCB shall notify the USGS and the CAM of any potential enforcement actions.

5. Postoperation Requirements--None.

- B. Law--California Porter-Cologne Water Quality Control Act--In lieu of filing a Report of Waste Discharge with the North Coastal Regional Water Quality Control Board, as required by Section 13260 of the Act, SMUD has proposed a spill containment system that will preclude discharges of condensate and other wastes off the plant site, a provision of Section 13269.

Plan--NCRWQCB Order No. 74-151 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. SMUD filed the required plan with the NCRWQCB on July 7, 1980.

1. Preconstruction Requirements--None.

2. Construction Requirements--To contain condensate and other on-site spills SMUD will construct and maintain an impermeable retention-containment system as described, finalized, and accepted during the AFC process.

a. Verification--SMUD will maintain "as-built" drawings signed by a registered civil engineer, for the above described spill containment system. Additionally, SMUD shall provide documentation that the spill containment system liner impermeability is 1×10^{-6} cm/sec or less. (Documentation can be actual performance testing of the spill containment system liner, or of a signed statement from a registered civil engineer in the field of hydrology, or a related expertise, attesting that, in his professional judgement, the containment system liner was constructed and can be maintained to meet or exceed the performance criteria.)

b. Enforcement--Per General Provisions.

c. Filings and Notifications--SMUD will maintain "as-built" drawings upon completion of construction activities. SMUD will maintain these files for the life of the project. The USGS and CEC staff will have access to SMUD "as-built" files.

(1) SMUD shall notify the USGS and the CAM of completion of items as required in Item a.

3. Preoperation Requirements--None.

4. Operating Requirements

a. Verification--SMUD shall prepare an annual statement for NCRWQCB review which describes the condition of the spill containment basin, barrier, and pump-back system.

b. Enforcement--Per General Provisions.

- c. Filings and Notifications--The statement shall be filed with the NCRWQCB by July 1 each year.
- 5. Postoperation Requirements--None.
- C. Standard--Water Quality Control Plan for the North Coastal Basin, 1B, adopted by the NCRWQCB.
 - 1. Preconstruction Requirements--SMUD or its Transmission Line contractor shall prepare a report containing the Transmission Line route map (showing pads, towers, roads, etc.), and a construction schedule.
 - a. Verification--NCRWQCB shall review the report for its acceptability and prepare any terms and conditions for construction deemed necessary.
 - b. Enforcement--See General Notes.
 - c. Filings and Notifications--SMUD shall file the report with the NCRWQCB, the USGS, and the CAM 120 days prior to start of construction.
 - 2. Construction Requirements--Vegetation removal and erosion/siltation contributing construction shall be minimized whenever possible, and SMUD and its contractors shall comply with any waste discharge requirements, conditions, or monitoring the NCRWQCB may require attendant to the NCRWQCB accepted construction plan.
 - a. Verification--RWQCB routine inspections or response to complaints. Any changes to the domestic waste treatment facility shall be noticed to the NCRWQCB and to the Sonoma County Health Department.
 - b. Enforcement--Per General Provisions.
 - c. Filings and Notifications--Drawings and specifications to the County Health Department and to the NCRWQCB, specifying any changes to the domestic waste treatment facility.
 - 3. Preoperation Requirements--
 - a. Verification--SMUD shall prepare "as-built" drawings with signed verification of compliance with the NCRWQCB accepted domestic waste disposal system for carrying the domestic wastes to the steam supplier's reinjection line.
 - b. Enforcement--Changes to the NCRWQCB accepted domestic waste disposal system may require NCRWQCB approval.
 - c. Filings and Notifications--SMUD will: (1) file a copy of the "as-built" drawings with the NCRWQCB and the USGS and (2) maintain a copy for the life of the project.

4. Operating Requirements--SMUD shall maintain the domestic waste treatment facility in good operating condition. No filings are necessary.

5. Postoperation Requirements--None established.

D. Law--Porter-Cologne Water Quality Control Act.

Law--Warren-Alquist Act, PRC-Division 15, Section 25532.

Plan--North Coastal Water Quality Control Plan (1B).

These laws and plans contain the authorization, and set forth the state's intent, for the formulation and implementation of a monitoring program for the determination of impacts or adverse affects upon the quality of the waters of the state.

1. Preconstruction Requirements--SMUD shall continue the water quality monitoring program initiated under the AFC (page 5 - 27).

a. Verification--SMUD shall continue to implement the program outlined in the December 1, 1980 Biological Mitigation Plan as agreed to in the Water Quality Findings and Conclusions, December 19, 1980.

b. Enforcement--Per General Provisions.

c. Filings and Notifications--SMUD shall submit annually to the USGS and the CEC a copy of the data collected and eight copies of a summary of the results. Data shall be collected and summarized per water year (October 1 - September 30).

2. Construction Requirements--

3. Preoperation Requirements--

a. Verification--SMUD shall provide documentation, to the USGS and CAM, that all mitigation measures included in the Water Quality Findings and Conclusions and Conditions contained in the CEC certification (see list below) are complied with, or clearly identifies any CAM authorized deviations from the required mitigation measures.

Findings:

3. The storage of chemicals and materials in paved and bermed areas.

6. Power plant pad to be paved.

7. The placement drains, berms, sumps throughout the power plant.

8. The power plant pad drainage, capable of adequately handling (designed for) a 100 year (intense frequency) storm.
9. The type of domestic waste treatment system.
10. The domestic waste water disposal method and discharge point.
11. The capability of the power plant pad to withstand a 100 year storm.
14. The off-site discharge point of storm runoff (point of discharge).
15. The cooling tower drift factor of the utilized cooling tower (.001 percent).
- 19, 20, 22 The final construction drawings of the erosion control/sediment containment systems.
24. The revegetation of the fill slope (north face).
25. The description of the drainage and erosion controls implemented along the access road.
- 26, 27 The implementation and participation in water quality monitoring programs.
28. The reconstruction measures accomplished along the "fire road."
29. The status of the Birdsong Meadow restoration project.

b. Enforcement--Per General Provisions.

- c. Filings and Notifications--SMUD shall submit the appropriate affidavits, to the USGS, signed by a registered civil engineer and the project manager, identifying compliance and/or deviations to the above mitigation measures. These filings may be made after each mitigation measure feature is constructed, or phase completion, or they may be made at the end of the power plant construction phase.

4. Operating Requirements--

SMUD shall continue the approved water monitoring program for four years after the commencement of commercial operation. SMUD may petition the CEC for alteration of the program.

SMUD will have water quality monitoring responsibilities for at least the lifetime of their participation in the SMUDGE0 #1 project.

If a regionwide monitoring program is developed and implemented, SMUD will participate in such a regionwide system.

- a. Verification--None.
- b. Enforcement--Per General Provisions.
- c. Filings and Notifications--None.

APPENDIX A

LETTER OF UNDERSTANDING BETWEEN CEC AND USGS WITH
RESPECT TO POST-LICENSING DUTIES
AND RESPONSIBILITIES FOR THE SMUDGE NO. 1 GEOTHERMAL PROJECT

LETTER OF UNDERSTANDING BETWEEN CEC AND USGS
WITH RESPECT TO POST-LICENSING DUTIES
AND RESPONSIBILITIES FOR THE SMUDGE NO. 1 GEOTHERMAL PROJECT

I. INTRODUCTION

Pursuant to the Memorandum of Understanding dated February 27, 1980, the California Energy Commission (CEC), United States Geological Survey (USGS), and Bureau of Land Management (BLM) undertook a cooperative effort to compile the environmental documentation necessary to comply with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) and to issue necessary permits and licenses for Sacramento Municipal Utility District's (SMUD) proposed Geothermal Project No. 1.

The purpose of this agreement is to set forth the duties and responsibilities of the CEC and the USGS following the issuance of licenses and approvals for the SMUDGE NO. 1 Geothermal Project. This agreement also includes provisions for post-certification supervision of the project to ensure that the project is constructed and operated pursuant to the terms and conditions of certification and licenses, and is in compliance with applicable laws, standards, and ordinances. These provisions are attached to this agreement as Appendix A (Compliance Monitoring Report).

II. GENERAL PROVISIONS

A. The CEC recognizes that the proposed project is located on federally-owned lands and will utilize geothermal resources owned by the United States and managed by the USGS pursuant to the Geothermal Steam Act of 1970 (P.L. 91-581). Accordingly, the CEC acknowledges that the ultimate decision-making authority for all issues pertaining to the design, construction, and operation of the proposed facility which may arise pursuant to the implementation and execution of this agreement resides with the BLM and the USGS.

B. The USGS recognizes that the proposed project is located within the territorial confines of the State of California. Accordingly, USGS agrees to consider the interests of the State in making post-certification decisions pursuant to this agreement, and shall give great weight to the comments and recommendations of the CEC with respect to such decisions.

C. The USGS and the CEC agree that the Northern Sonoma County Air Pollution Control District shall have all of the rights, duties, and responsibilities specified in the "Approved ARB-CEC Joint Policy Statement of Compliance with Air Quality Laws by New Power Plants" executed by the CEC and the California Air Resources Board on January 23, 1979, to the extent the Statement is consistent with applicable Federal laws. A copy of the agreement is attached hereto as Appendix B.

D. The USGS shall ensure compliance with applicable local standards in conducting its post-certification duties and responsibilities in all technical areas in which the CEC is secondarily involved.

E. The CEC may recommend the use of state or local agencies in performing one or more monitoring functions as outlined in Appendix A. If the USGS does not utilize such an agency as recommended, it shall provide for such monitoring functions.

F. The USGS and the CEC agree that the terms of this agreement supersede any differing or inconsistent terms which may appear in Appendix A and that the provisions of Appendix A shall be implemented consistently with the terms of this agreement.

G. Decisions of the Deputy Conservation Manager (DCM) for Geothermal may be appealed under the provisions of 30 CFR Part 290.

H. The USGS agrees to maintain possession of all proprietary information which may be submitted by the Applicant pursuant to the provisions

of Appendix A. The CEC may review such proprietary information at the offices of the USGS.

III. PRIMARY CEC INVOLVEMENT

Subsequent to CEC certification of the SMUDGE No. 1 Geothermal Project, the Commission shall have primary involvement in the review of final seismic design criteria, structural design criteria for critical structures and equipment, design criteria of air pollution control equipment, and in the evaluation and selection of mitigation measures for significant adverse geologic conditions encountered during site preparation.

Primary CEC involvement shall be carried out as follows:

1. All drawings, reports, analyses, and other design documents of structures or equipment for which the CEC is primarily involved shall be submitted by the Applicant to the USGS. Upon receipt of such documents, the USGS shall immediately forward two copies of each such document to the CEC for review and preparation of suggestions and recommendations from the CEC to the USGS. Any responses from the CEC regarding these documents shall be made to the USGS no more than 30 days from their receipt by the CEC unless an extension of that time is agreed upon by the CEC and USGS. If no response is received by the USGS within this time, USGS will assume that the CEC is satisfied with the documents and has no recommendations or suggestions to offer. The USGS will have up to 15 additional days to review the recommendations and to resolve any areas of disagreement between the CEC and USGS.
2. The USGS shall not approve the design criteria, designs, or mitigation measures for the power plant and related essential (Category I) structures and equipment until it has expressly solicited the advice and recommendations of the CEC. If the decision of the USGS does not adopt the recommendations of the CEC, the USGS shall provide written explanation of its reasons for not adopting such recommendations.

As used in this Agreement, critical structures include the turbine generator building and turbine generator pedestal. Essential equipment includes: the turbine generator, surface condensor, gas removal equipment, overhead bridge crane, main transformers, H₂S abatement facility, circulating water pumps, switchyard equipment, and the cooling tower system.

3. The USGS shall not approve mitigation measures for significant adverse geologic conditions until it has solicited the advice and recommendations of the CEC.

As used in this agreement, a significant adverse geologic condition is a condition which requires an alteration in structural design concept or the preparation of new design calculations.

IV. SECONDARY CEC INVOLVEMENT

A. The CEC shall be secondarily involved in the execution and evaluation of all mitigation measures specified in the Final Joint Environmental Study. The Commission's secondary involvement shall be carried out as follows:

1. All required Plans of Operation, Applications for Permits, reports, designs, and similar documents shall be submitted by the Applicant to the USGS. The USGS shall immediately forward copies of such documents to the CEC so that the CEC can review the documents and make any recommendations within the time frame established by the DCM, Geothermal, USGS.
2. The CEC may submit advice and recommendations for consideration by USGS.

B. With respect to the mitigation measures specified in the Final JES; and unless the subject matter is covered in Appendix A:

1. The USGS in accordance with 30 CFR 270.34-1 shall require the Applicant to prepare for USGS approval a detailed Plan of Utilization describing the manner in which each mitigation measure will be implemented;
2. The USGS shall require the Applicant to submit Annual Reports of Compliance under 30 CFR 270.76;
3. The USGS Construction Permit shall include provisions for CEC inspection of the site and related facilities.

Dated: 03 FEB 1981

William F. Isherwood
Acting Deputy Conservation Manager,
Geothermal
United States Geological Survey

Dated: 8/2/81

Russell L. Schweickart
Chairman
California Energy Commission