1. Dockets
2. Central Files

FEDERAL ENERGY REGULATORY COMMISSION

WASHINGTON, D.C. 20426

Project No. 2997 - California
South Sutter Water District

Mr. Robert L. Melton
Secretary-Manager
South Sutter Water District
P.O. Box 36
Trowbridge, California 95687

AUG 1 1980

Subject: South Sutter Water District's application submitted on June 20, 1980, for license for the Camp Far West Dam and Reservoir Project No. 2997.

Dear Mr. Melton:

The subject application is accepted for filing as of the submittal date. The application for preliminary permit for Project No. 2997, filed on January 28, 1980, is withdrawn.

Please file an original of each exhibit drawing included as part of the subject application reproduced on silver or gelatin 35 mm microfilm mounted on Type D (3 1/4" x 7 3/8") aperture cards. In addition, file two Diazo-type duplicate aperture cards. Enclosed are the FERC drawing numbers which should be shown in the margin below the title block of microfilmed drawings, and also in the upper right corner of each appropriate aperture card.

Also, please file 70 additional copies of the subject application, including reduced prints of exhibit drawings, for distribution to appropriate Federal, State, and local agencies.

Further, in order for staff to be able to fully evaluate your application, please submit the supplemental information described on the enclosed list. The supplemental information should not be included in the copies of the application.

Your response within 30 days would be appreciated.

Sincerely,

William W. Lindsay
Director, Office of Electric
Power Regulation

Enclosures:
List of FERC Drawing Numbers
List of Supplemental Information for Project No. 2997

List of FERC Drawing Numbers

Camp Far West Dam and Reservoir Project No. 2997 South Sutter Water District, California.

Exhibit F	FERC No.
Sheet 1	2997-1
Sheet 2	2997-2

Exhibit G	FERC No.
Sheet 1	2997-3
Sheet 2	2997-4

Exhibit E	FERC No.
E-5 Sheet 1	2997-5

List of Supplemental Information for Project No. 2997

1) Soil properties of the dam embankment should be given.

2) A copy of the PMF and reservoir flood routing computation should be provided.

3) State whether there are any "minor" active faults in the project area.

Oregon

APPLICATION FOR LICENSE BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

CAMP FAR WEST DAM AND RESERVOIR WATER POWER PROJECT

P-2997

SOUTH SUTTER WATER DISTRICT
Trowbridge, California

JUNE 1980

SOUTH SUTTER WATER DISTRICT

P. O. BOX 36
TROWBRIDGE, CALIFORNIA 95687

Telephone 916 656-2242

June 16, 1980

Kenneth F. Plumb
Secretary
Federal Energy Regulatory Commission
825 North Capitol Street
Washington, D. C. 20426

Attention: Mr. Ron Corso

Subject: Camp Far West Dam and Reservoir
Water Power Project
License Application

Dear Mr. Corso:

The Board of Directors of South Sutter Water District (SSWD) is please to submit for approval one original and nine (9) conformed copies of the completed application for license for the Camp Far West Dam and Reservoir Water Power Project. This application is to replace the application for preliminary permit, which has been assigned No. 2997, only after the enclosed application has been officially assigned a number and is a valid document.

The District Board of Directors recognizes the benefits to the nation of developing electrical energy from falling water to replace other rapidly depleting energy sources. We are proceeding with an action plan which will bring power on-line by mid to late 1983. SSWD revenue bonds are scheduled for sale during late 1980 or early 1981 to take advantage of the annual most favorable bond marketing period.

Adherence to this schedule requires the timely receipt of the approved license application from the Commission. We trust in your attention and support to help us achieve this objective. At the same time, other important elements of the project are being carried out in accordance with the action plan.

Your continued support and assistance is greatfully acknowledged.

Very truly yours,

W. Wesley Jopson
President
Board of Directors

Robert L. Melton
Secretary-Manager

WWJ/er

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TABLES

PLATES

DRAWINGS

LETTERS OF CONSULTATION CONTAINED IN EXHIBIT E

APPLICATION FOR LICENSE

BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION
APPLICATION FOR LICENSE FOR MAJOR
PROJECT - EXISTING DAM

1. The South Sutter Water District (SSWD) applies to the Federal Energy Regulatory Commission for a new license for the proposed power project at the existing Camp Far West Dam and Reservoir, as described in the attached exhibits. This application is made in order that the applicant may secure a license for the project under Part I of the Federal Power Act.

2. The location of the proposed project is:

State:	California
County:	Placer/Yuba
Township:	T14N, R6E
Stream:	Bear River

3. The exact name and business address of the applicant are:

South Sutter Water District
P.O. Box 36
Trowbridge, California 95687

The exact name and business address of each person authorized to act as agent for the applicant in this application are:

Mr. Robert L. Melton
Secretary-Manager
South Sutter Water District
P.O. Box 36
Trowbridge, CA 95687

Mr. W. Wesley Jopson
President, Board Of Directors
South Sutter Water District
P.O. Box 36
Trowbridge, CA 95687

4. South Sutter Water District is a California Water District (political subdivision of the State of California).

5. Statutory or Regulatory Requirements

Applicant is governed under the laws of the State of California. South Sutter Water District operates in accordance with provisions of the California Government Water Code.

The appropriate requirements which apply to the Applicant are as follows:

1. Division 13, Sections 34000 to 38500, inclusive of the Water Code

2. Assembly Bill 1696 amending Section 34900 of, and to add Chapter 2.9 (Commencing with Section 25570) to Part 5 of Division 13 of the Water Code relating to California water districts

3. Water Rights Application Nos. 14804 and 10221.

4. Pending Water Rights Application filed January 1980, Number 26162.

5. Assembly Bill 329 amending 53531, 53532, 53541, 61613.1 and 61659 of, and to add Section 61670.1 to the Government Code, and to amend Sections 33645, 34354 and 34355 of the Health and Safety Code.

6. Small Reclamation Projects Act of 1956.

Division 13 of the Water Code provides the legal framework by which the South Sutter Water District was created and the provisions which regulate its operation. Under provisions of the Water Code, South Sutter Water District has the authority to hold elections to obtain voter concurrence for issuance of revenue bonds for purposes of project financing.

Assembly Bill 1696, effective January 1, 1980, allows the applicant to develop electrical power for resale. Existing water right Permits 11297 and 14871 (Applications 14804 and 10221, respectively) provide for storage, diversion, and use of the water for irrigation and domestic purposes. An application for use of this water for power generation was filed in January, 1980, and has been assigned No. 26162.

Assembly Bill 329, effective February 29, 1980, allows the statutory limit for revenue bonds issued by local agencies such as the South Sutter Water District to be marketed at an interest rate not to exceed 10 percent.

Existing Camp Far West Dam and appurtenant works were financed in part by loan provisions governed for the Small Reclamation Projects Act of 1956 administered by the U.S. Water and Power Resources Service (formerly USBR). The loan agreement provisions do not restrict the addition of a hydroelectric generating plant to the existing dam and reservoir.

EXHIBIT A

PROJECT DESCRIPTION

EXHIBIT A

PROJECT DESCRIPTION

1. EXISTING FACILITIES

(i) DAM AND OUTLET WORKS

The existing Camp Far West Dam and Reservoir and appurtenances consist of a zoned earthfill dam, an overflow spillway, an outlet works, and a discharge channel.

The zoned earthfill dam is 170 feet in height, 40 feet in width at the crest, 2100 feet in length with variable 2 to 1 and 2.5 to 1 upstream slopes, and a 2 to 1 downstream slope. Rigorous dam inspections are made annually by the Division of Safety of Dams of the State of California.

The overflow spillway is an ungated, ogee type concrete structure with a crest width of 300 feet and crest elevation at 300.00 feet msl. The downstream channel below the spillway terminates in a chute excavated in solid rock.

The outlet works consists of an upstream, ungated concrete intake structure; a 48 inch inside diameter, coal-tar-enamel-lined, concrete-encased steel pipe; and a 38 feet long by 12 feet 8 inches wide concrete outlet structure. A valve chamber containing a hydraulically operated 48 inch butterfly valve is located approximately 350 feet into the dam from the intake structure. From the valve chamber, the 48 inch steel outlet pipe is contained in a 7 feet 6 inch concrete-lined, horseshoe tunnel extending approximately 400 feet to its terminus at a 48 inch Howell Bunger outlet valve housed in the outlet structure. Water for irrigation purposes is released through a discharge channel, 20 feet wide and a 1.5 to 1 side slope, leading from the outlet works.

(ii) RESERVOIR

The existing reservoir created by the Camp Far West Dam has a storage capacity of 104,400 acre-feet of water and a surface area of 2,020 acres at its maximum normal water surface elevation of 300 feet msl. The reservoir gross storage capacity potential is 141,000 acre-feet at elevation 316 feet msl with a

corresponding surface area of 2515 acres. The crest of the dam is at elevation 320 feet msl. The reservoir contains 2200 acre-feet of water and has a surface area of about 150 acres at its minimum elevation of 175 feet.

(iii) POWER SUPPLY

Electrical power is supplied to the outlet structure by a single circuit 12KV line supported on wooden poles as shown on Exhibit G, Sheet 2. It also provides power to the recreation areas located on the reservoir and is almost entirely located on property owned by Applicant.

2. PROPOSED FACILITIES

(i) POWERHOUSE AND TUNNELS

A 760 feet long, 84 inch-diameter reinforced concrete tunnel will be constructed through the left abutment to facilitate addition of a hydroelectric powerplant at the existing dam. The tunnel intake will be approximately 350 feet south of the existing intake structure and its outlet will terminate adjacent to the existing outlet structure. The tunnel invert elevation at the powerplant is 119.50 feet msl. This results in an excavated invert elevation of about 118 feet msl. Available geologic information indicates that sound bedrock material will be encountered throughout the length of the tunnel.

The new intake structure will be located approximately 350 feet south of the existing intake structure. The location will be at the center of a depression where the ground elevation is approximately 215 feet msl. The intake structure will consist of a reinforced concrete tower extending to an elevation of 209 feet msl with the invert at elevation at 187 feet msl. The tower will have openings on three sides, two at 10 by 14 feet and one at 10 by 10 feet. The top of the tower will have a concrete hood with permanent trashracks on six-inch bar spacing installed in the 10 by 14 foot opening and a removal trashrack install in the 10 by 10 opening. A concrete bulkhead will enable positive closure. The bulkhead will have to be set into place by underwater divers as is done with the existing intake structure. An approach channel to the structure will be constructed. The channel invert will be at elevation 195, two feet below the sill elevation of the intake tower which would be at elevation 197.

A powerhouse, 45 by 60 feet, will be constructed at the terminus of the power tunnel to accommodate the turbine, generator, governor, switchgear, control equipment, and butterfly valve. It shall be a reinforced concrete structure with adequate lighting, ventilation, fire protection, sanitary accommodations, dewatering equipment including bulkheads and work space. Sufficient access will also be provided adjacent to the powerhouse for installation and removal of equipment using mobile cranes. See Exhibit F, Sheets 1 and 2 for drawings showing the existing and proposed facilities and the plan and sections of the powerhouse.

(ii) DAM AND RESERVOIR

Neither the storage capacity of the reservoir nor its maximum elevation will be altered as a result of the installation of facilities to generate power. The usable storage capacity of the impoundment for power production will be about 90,000 acre-feet which is the volume of water available between reservoir water elevations 300 and 222 feet msl.

(iii) TURBINES AND GENERATORS

(a) Turbine

One new vertical shaft Kaplan (adjustable blade propeller) turbine with wicket gate rated at 9000 HP when operating at a speed of 450 RPM under a rated head of 143 feet will be installed. A governor will control blade tilt and wicket gate opening by an oil pressure system. The turbine will be capable of operating over a range of 65 to 120 percent of design head. The turbine will accommodate flows ranging between 200 and 725 cfs.

(b) Generator

The generator will be a vertical shaft, air cooled, three phase, synchronous generator rated at 6800 KW, 0.9 power factor, 60 Hertz, 13.8 KV, 450 RPM. A direct connected exciter will supply excitation to the generator field with control by a solid state voltage regulator.

(c) Generator Leads and Switchgear

The main leads between the generator and the 15 KV metal clad switchgear will be 15 KV, 3Ø, 1200 ampere non-segregated phase bus. The switchgear will be completely metal enclosed, dead front with an air circuit breaker rated 15 KV, 1200 ampere, 250 MVA short circuit.

(iv) UTILITY CONNECTION

The utility connection will consist of 6/8 MVA, OA/FA, 3Ø, 60 Hertz, 13.8 KV-60 KV, delta-grounded wye power transformer; a 60 KV, 3Ø, 60 Hertz, 600 ampere, 1000 MVA short circuit bulk oil circuit breaker; appropriate disconnect switches; and a 60KV transmission line. The 1.92 mile transmission line will be constructed on essentially the same right-of-way which exists now for the 12KV distribution line which feeds the existing outlet works. The existing 12KV line will be retained for other loads in the area and will be underbuilt on the 60KV line. See Exhibit G, Sheet 1 and 2 for routing of the 60KV line. The 60KV line will be built using wood poles and cross arms and will require a 50 foot right-of-way. The 60KV line will be connected through a manually operated air switch to PG&E's 60KV line which exists between the Smartsville and the Lincoln substations.

(v) ADDITIONAL EQUIPMENT

One 84 inch butterfly valve will be installed immediately upstream of the turbine. The valve will be hydraulically operated to provide positive closure of the power tunnel.

(vi) LANDS OF THE UNITED STATES

No lands of the United States are within the proposed project boundary.

EXHIBIT B

PROJECT OPERATION AND RESOURCE UTILIZATION

EXHIBIT B

PROJECT OPERATION AND RESOURCE UTILIZATION

1. OPERATION OF THE POWERPLANT

The Bear River Basin produces its heaviest runoff from November through April each year. During this period the Camp Far West Reservoir fills and most years reaches full capacity at which time excess spills occur over the ungated spillway. During the period May through September each year, the reservoir is drawn down as the stored water is released for irrigation use and fish and wildlife requirements in the Bear River as it has for the past 15 years.

The Camp Far West powerplant will operate in tandem without changing the existing irrigation release operation. During the irrigation season, up to a maximum of 530 cfs will pass through the turbine in conformance with historical downstream irrigation and fish and wildlife requirements. However, during the heavy runoff period, when spilling from the reservoir occurs, a greater quantity of water (a portion of the spillway flows) will be routed through the powerplant. 725 cfs was selected as the design capacity of the turbine to achieve the maximum, economical generation output from the total operation of the facility. Thus, the powerplant will generate electricity without altering the requirements of the existing or pending water rights permits.

Plant startup will be accomplished manually. The operation of the powerplant will be automatic, except for startup, with no permanent skilled personnel stationed at the site to oversee the actual operation. A plant shutdown will activate an alarm at the dispatch center which will require sending trained personnel to the site to determine the problem and restart the plant.

During low flows, when the available head or release is not sufficient to operate the turbine, the plant will be closed and there will be no production of electrical energy.

When releases are insufficient to generate power during the irrigation season, irrigation releases will be made through the existing outlet conduit. This condition will normally occur each year starting in September and continuing into the fall until such time that surplus flows are available to be passed through the powerplant.

When the reservoir water surface is high enough to send flows over the spillway, all flows up to the maximum capacity of the turbine, which is approximately 725 cfs, will be diverted through the power tunnel. The balance of any flows greater than the 725 cfs turbine capacity flows will continue to go uncontrolled over the ungated spillway.

During normal reservoir releases for furnishing irrigation water, all releases will be utilized for power production except under those conditions when the combination of head and flow are outside the operating characteristics of the turbine.

2. DEPENDABLE CAPACITY AND AVERAGE ANNUAL ENERGY PRODUCTION

Based on the inflow into the Camp Far West Reservoir and its storage capacity, no firm power or continuous dependable capacity can be developed. Therefore, all energy produced will be non-firm. The installed capacity of the powerplant will be 6800kw. The average annual energy production has been calculated to be approximately 26,900,000 kw-hr.

(i) FLOW-DURATION CURVE

The flow-duration curve for the Bear River at the Camp Far West Dam and Reservoir was developed from daily reservoir-use records maintained by the Applicant for the period 1964 to 1979 (Plate B-1). The records reflect effects of storage, evaporation, leakage, minimum releases maintained for fish and wildlife, releases for irrigation and surplus flows over the spillway.

The records over this period show that the minimum flow that has occurred was 10 cfs, the maximum 18,000 cfs and the mean 400 cfs. During this period a severe drought occurred in 1976-1977. To illustrate the severity of this two-year drought period on the 15 years of record, flow duration curves were developed for the conditions of with and without the two-year drought period. The average annual energy calculated is based on the total period of daily reservoir use records which includes the severe two-year drought period. Excluding the drought years of 1976-1977, an increase of approximately 15 percent in the average annual energy production would be realized.

(ii) AREA-CAPACITY CURVE

The gross storage of the Camp Far West Reservoir is 141,000 acre-feet based on the routing of a probable maximum storm through the reservoir. This corresponds to an elevation of 316.3 feet msl. The usable storage of the reservoir for power production is 90,000 acre-feet. The corresponding elevations of the reservoir are 300 and 222 feet msl.

The area-capacity curve illustrates the limits of usable storage and the rule curve illustrates the limits of power production based on the 15 years of operational history available for the Camp Far West Dam and Reservoir (Plates B-2 and B-3).

(iii) HYDRAULIC CAPACITY

The hydraulic capacity of the powerplant varies as a function of the flow through the turbine. The range of flow the turbine is capable of operating within 200 to 725 cfs. The powerplant capacity versus flow curve illustrates the turbine's hydraulic operational characteristics (Plate B-4).

(iv) TAILWATER RATING CURVE

The relationship of the water surface elevation in the tailrace channel versus discharge is shown by the Tailwater Rating Curve (Plate B-5).

(v) POWERPLANT CAPACITY VS HEAD CURVE

The turbine for the powerplant will operate between 85 and 156 feet of gross head. The rated head for the turbine is 143 feet, the minimum head 85 feet and the maximum head 156 feet.

The powerplant capacity versus head curve illustrates the range of head that the turbine will operate over and the corresponding output of the turbine in horsepower (Plate B-6).

3. POWER GENERATION USAGE

Sacramento Municipal Utility District (SMUD) is negotiating with SSWD to purchase the plants total power output. The output will be utilized by SMUD to augment its energy supply to meet energy demands in its service area.

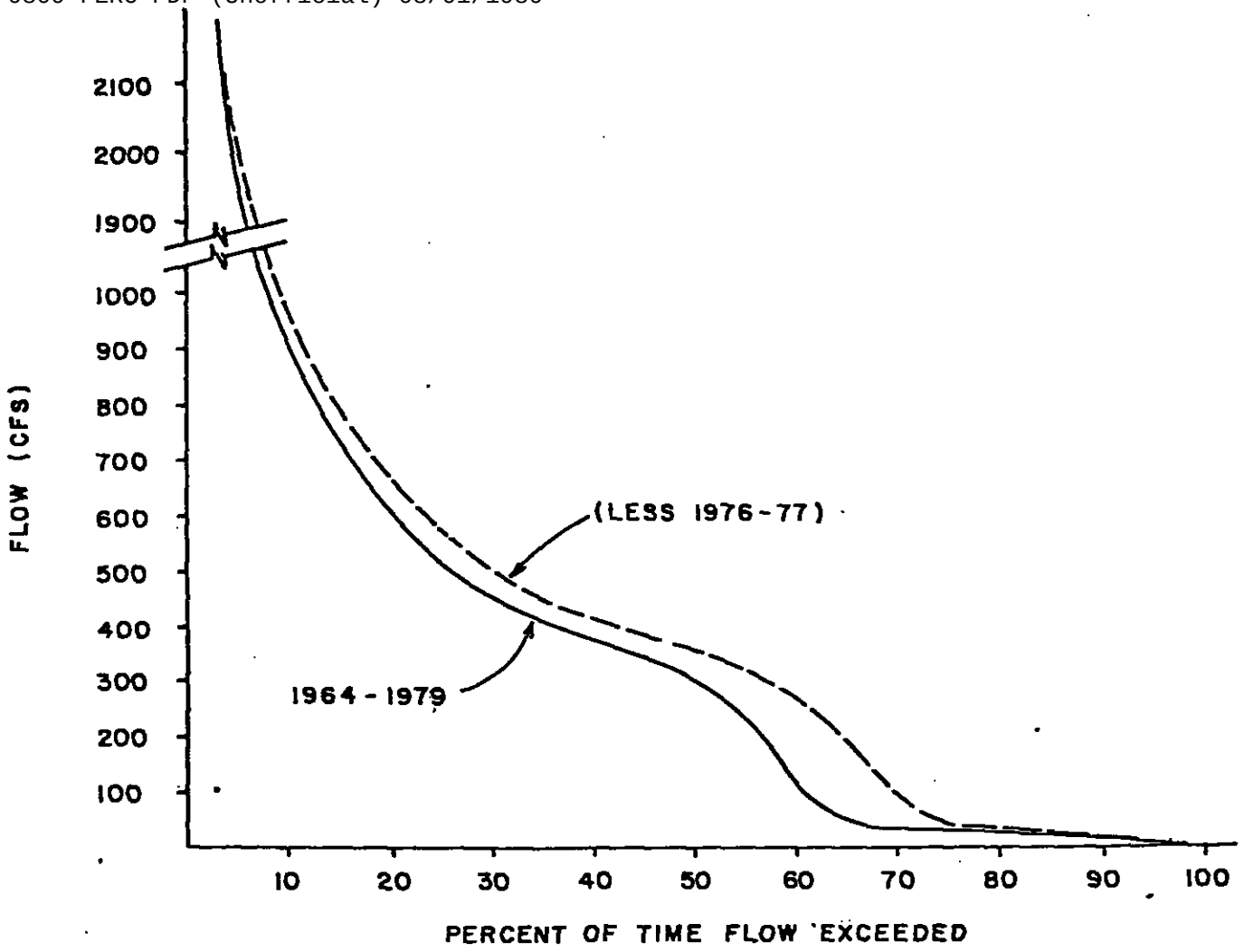
Much of the energy that will be generated coincides with the peak summer energy loads within the SMUD service area. Therefore, this energy can be conveniently utilized to supplement the peak summer electric energy load and assist in backing off on energy obtained from other sources such as nuclear. To illustrate how SMUD's current generating resources meet current and future energy and generation demands, Plates B-7 and B-8 were developed using SMUD furnished information.

4. APPLICANT'S PLANS

At present, the Applicant does not have definite plans for future development. There are opportunities for future development on the Bear River immediately upstream of the Camp Far West and Reservoir that could have a very substantial benefit to improving the energy output and enhancing the recreation opportunities of the Camp Far West Reservoir. Construction of a new dam and reservoir to store surplus runoff would be required to obtain the increased benefits. The location of this upstream site is referred to as Garden Bar.

The following plates are included in this exhibit:

Plate B-1	Flow-Duration Curve
Plate B-2	Area Capacity Curve
Plate B-3	Rule Curve
Plate B-4	Powerplant Capacity vs Flow Curve
Plate B-5	Tailwater Rating Curve
Plate B-6	Powerplant Capacity (HP) vs Head Curve
Plate B-7	Energy Demand (GW-HRS) SMUD System
Plate B-8	Generation Demand (MW) SMUD System

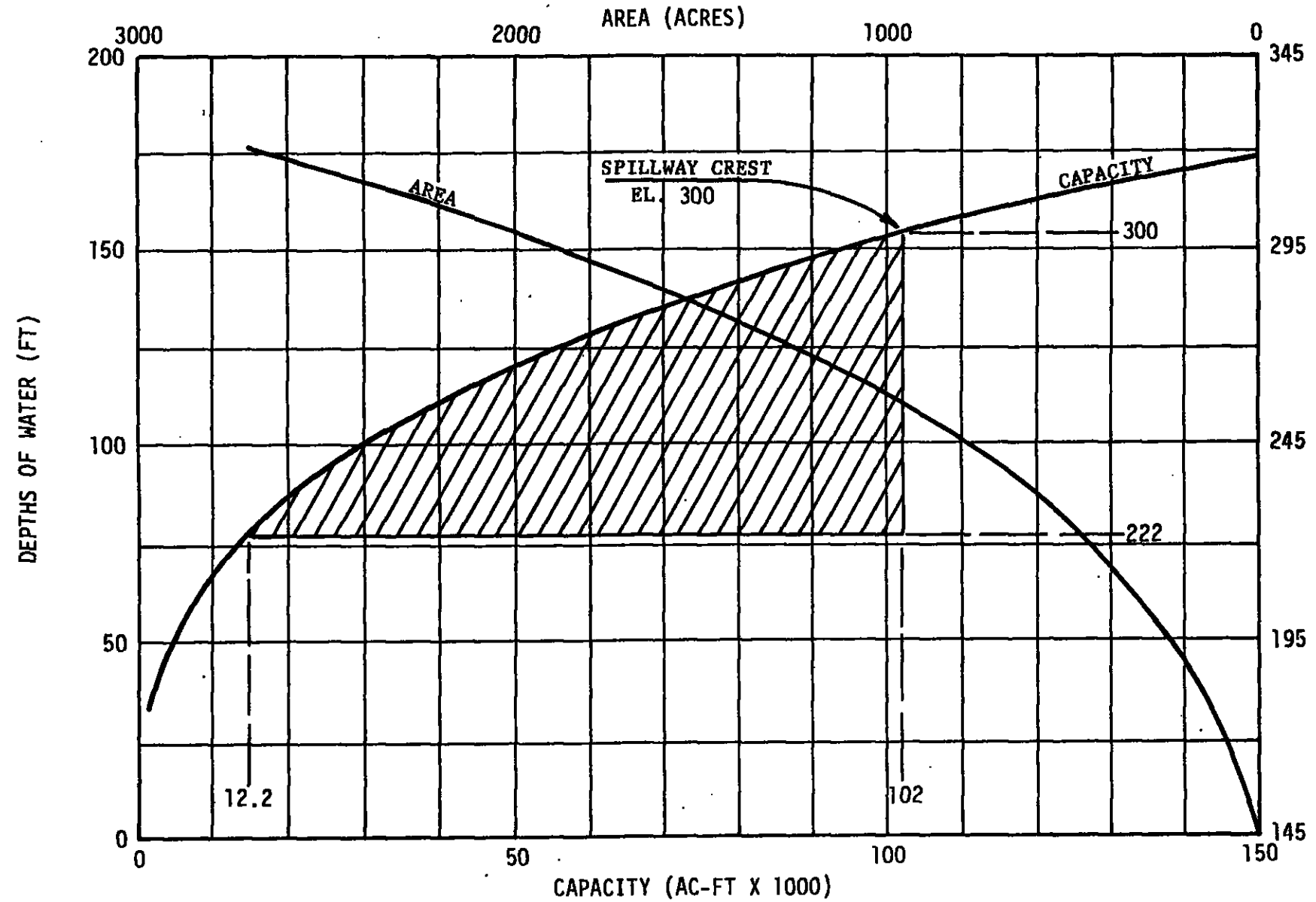


SOURCE: CAMP FAR WEST
RESERVOIR USE
RECORDS (1964-1979)

SOUTH SUTTER WATER DISTRICT
CAMP FAR WEST DAM & RESERVOIR
WATER POWER PROJECT

FLOW-DURATION CURVE

BEAR RIVER DOWNSTREAM OF
CAMP FAR WEST RESERVOIR



LEGEND:

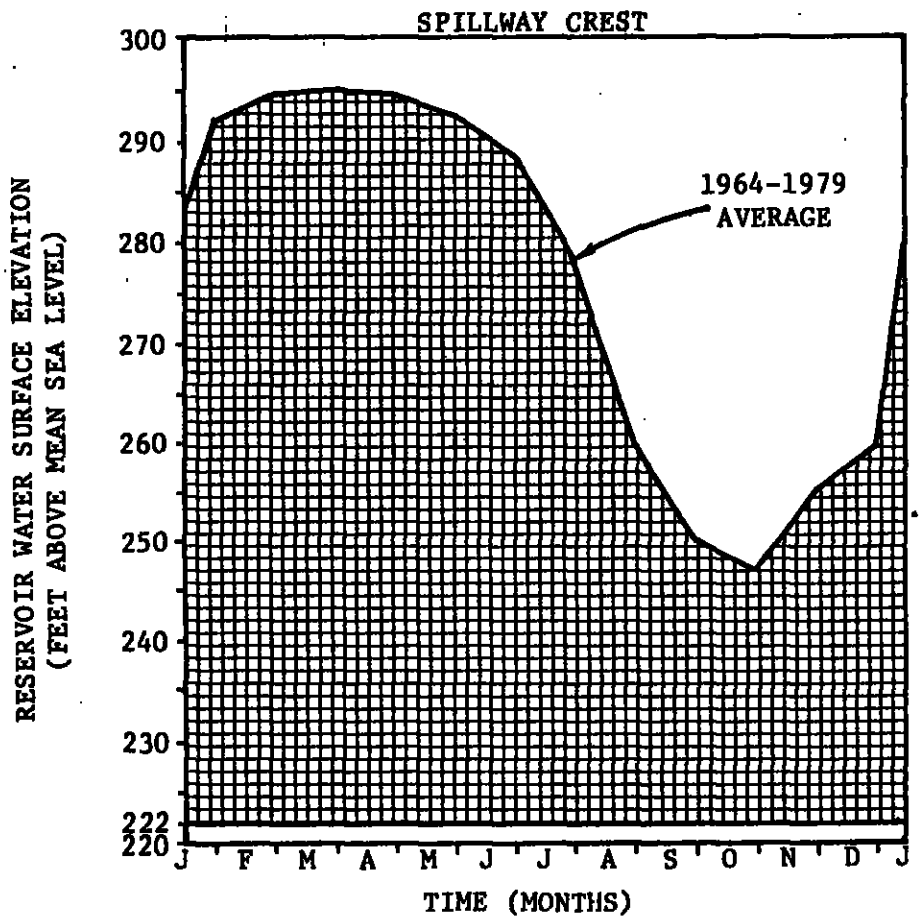
LIMITS OF USEABLE STORAGE FOR POWER PRODUCTION

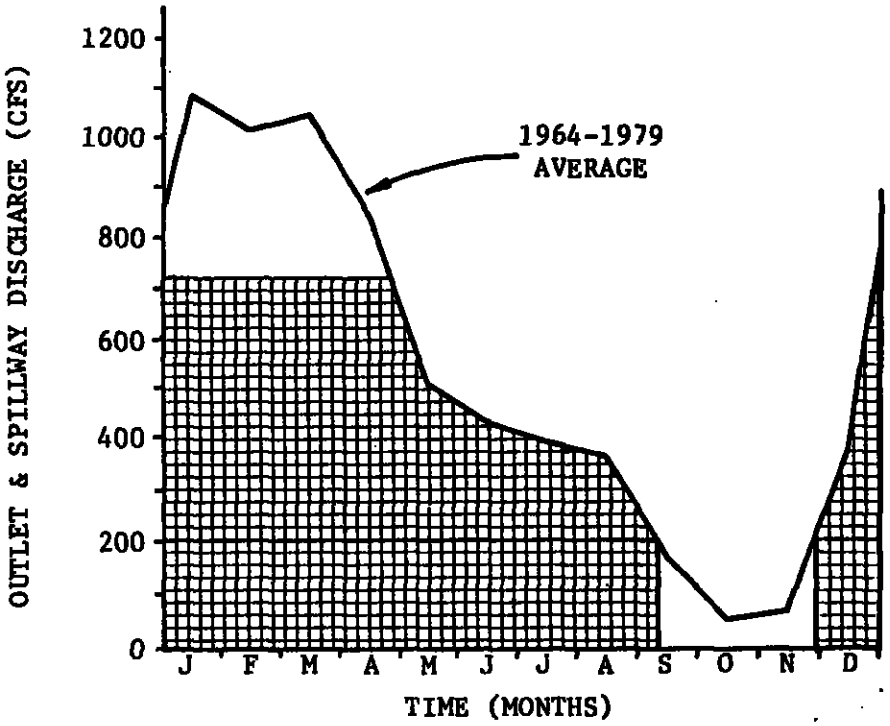
SOUTH SUTTER WATER DISTRICT
CAMP FAR WEST DAM & RESERVOIR
WATER POWER PROJECT

AREA-CAPACITY CURVE

Parsons Brinckerhoff Quade & Douglas, Inc.

Plate B-2





LEGEND:

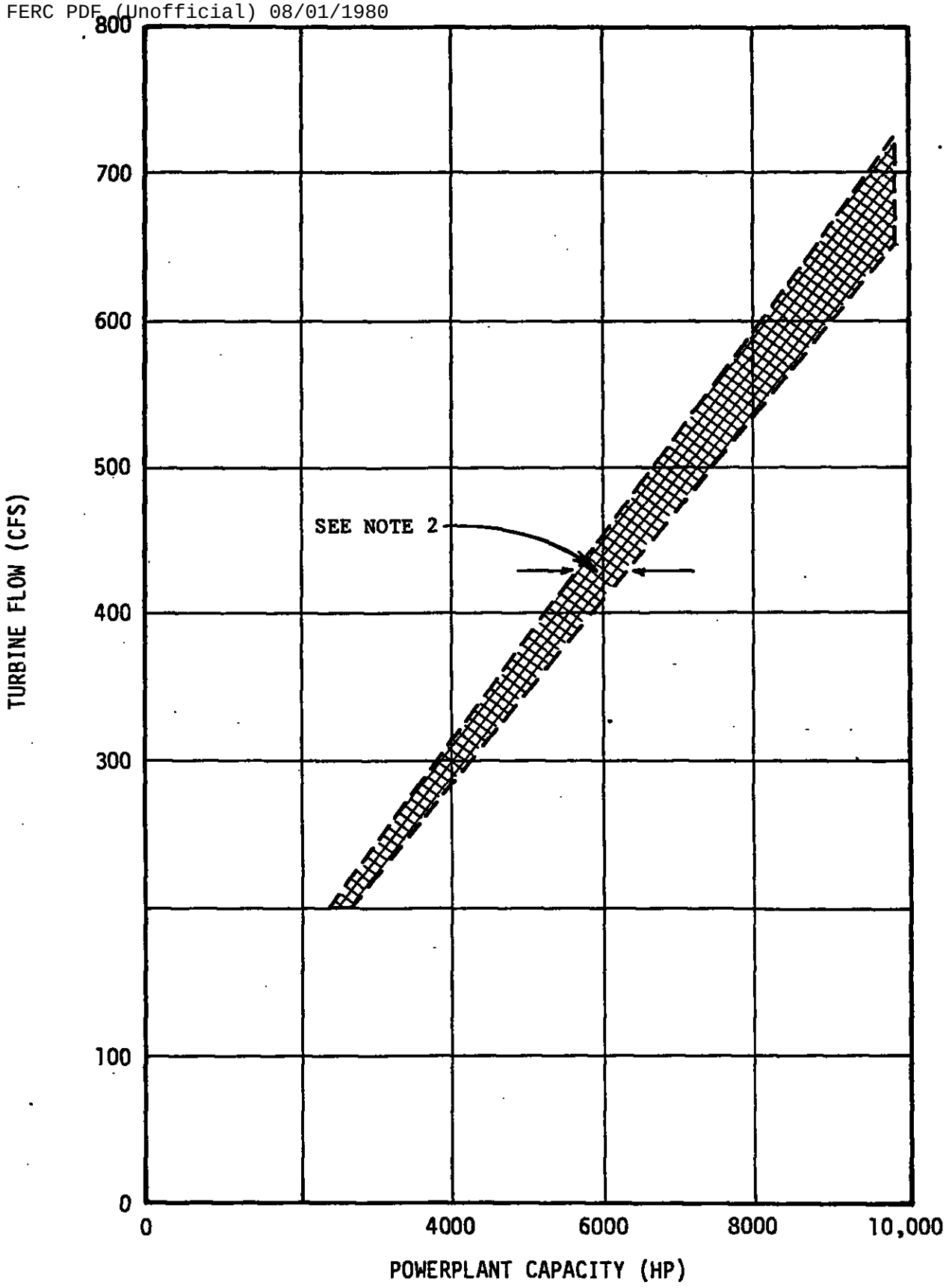
LIMITS OF POWER PRODUCTION BASED ON TURBINE OPERATING CHARACTERISTICS

SOUTH SUTTER WATER DISTRICT
CAMP FAR WEST DAM & RESERVOIR
WATER POWER PROJECT

RULE CURVE

Parsons Brinckerhoff Quade & Douglas, Inc.

Plate B-3

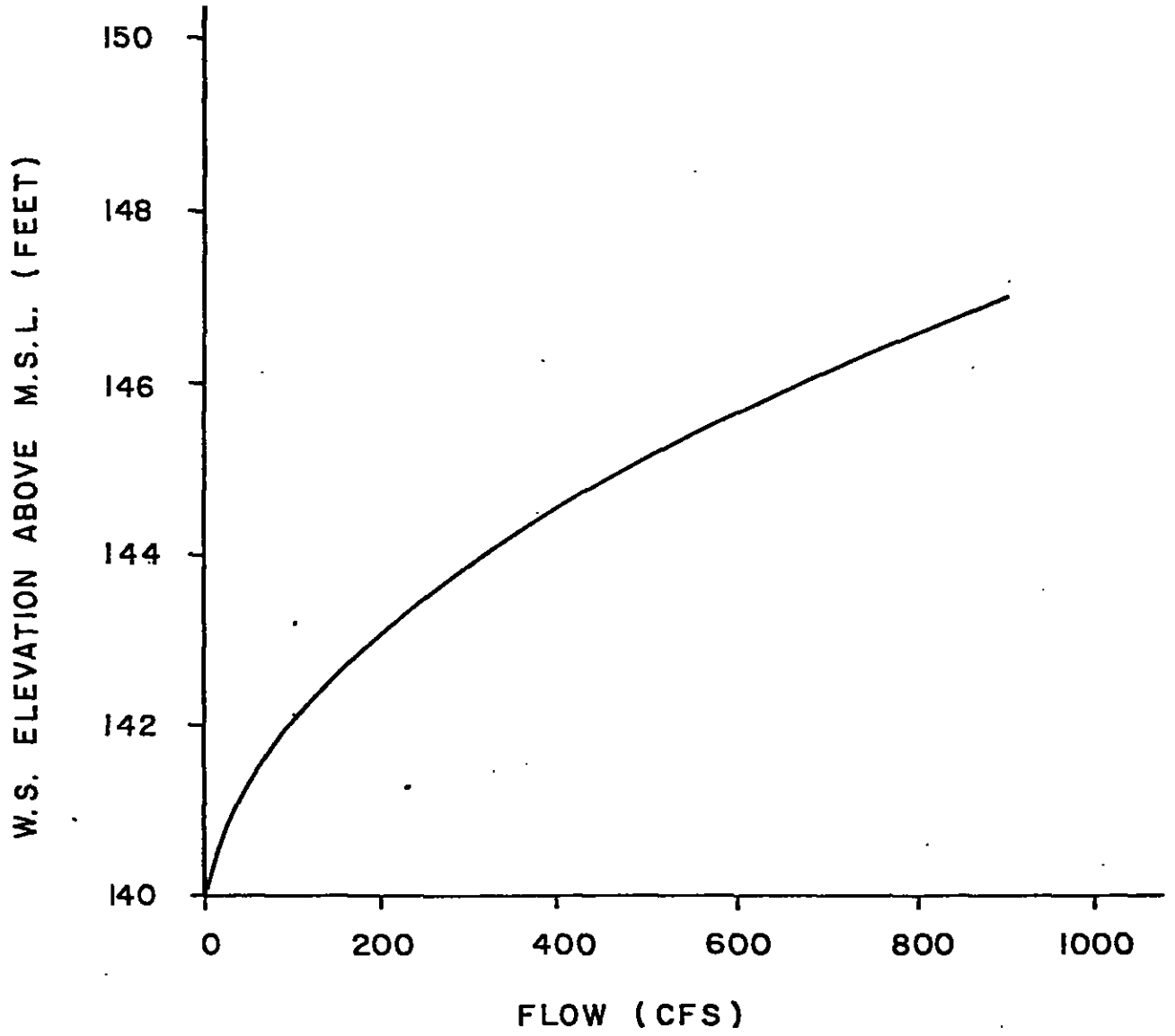


NOTES:

1. TURBINE HEAD VARIES FROM 65 TO 156 FEET.
2. POWERPLANT CAPACITY VARIES WITH TURBINE HEAD AND EFFICIENCY.

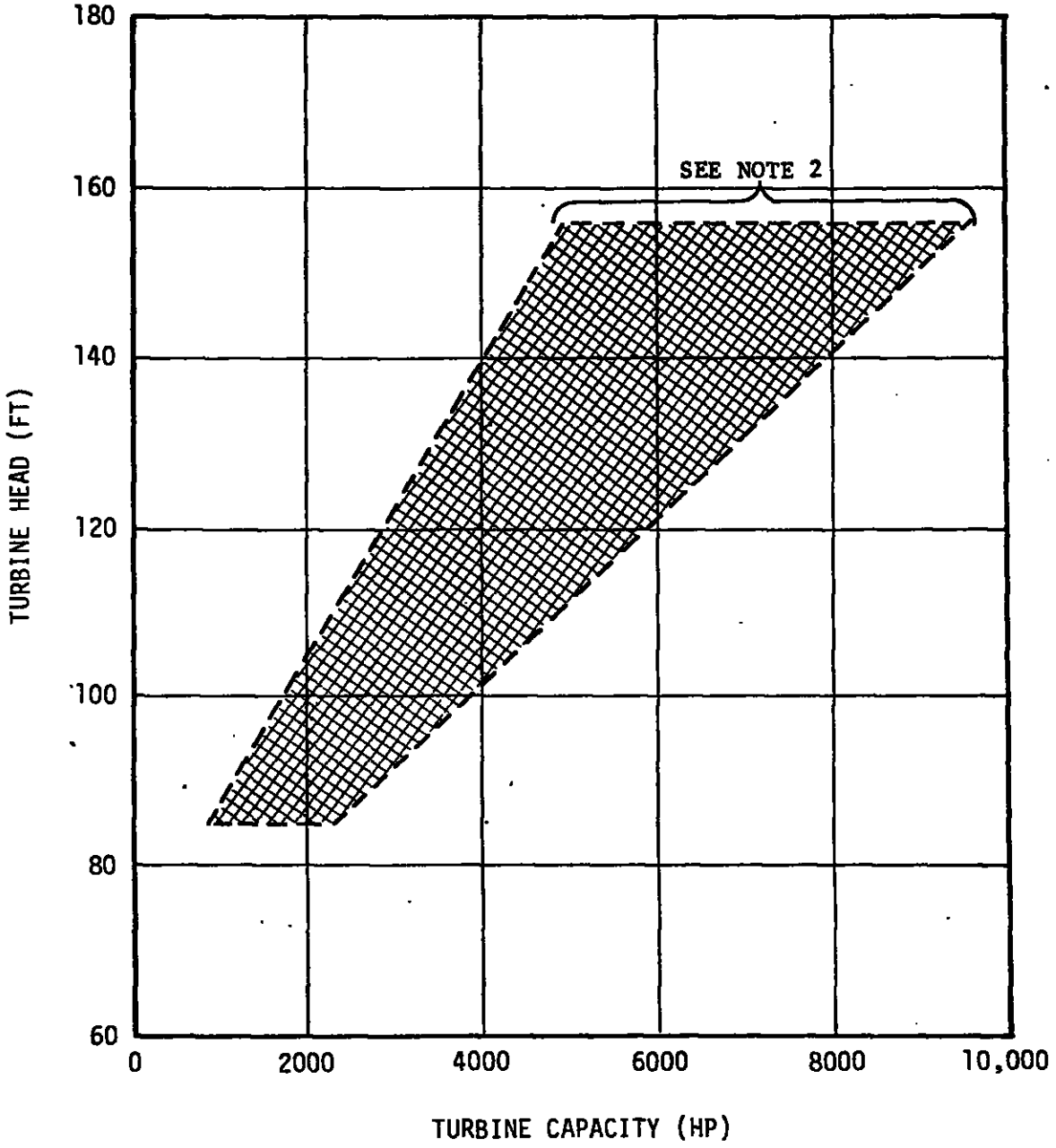
SOUTH SUTTER WATER DISTRICT
CAMP FAR WEST DAM & RESERVOIR
WATER POWER PROJECT

POWERPLANT CAPACITY
VS FLOW



SOUTH SUTTER WATER DISTRICT
CAMP FAR WEST DAM & RESERVOIR
WATER POWER PROJECT

TAILWATER RATING CURVE



NOTES:

1. TURBINE FLOW VARIES FROM 200 TO 725 CFS.

2. POWERPLANT OUTPUT VARIES WITH TURBINE FLOW AND EFFICIENCY.

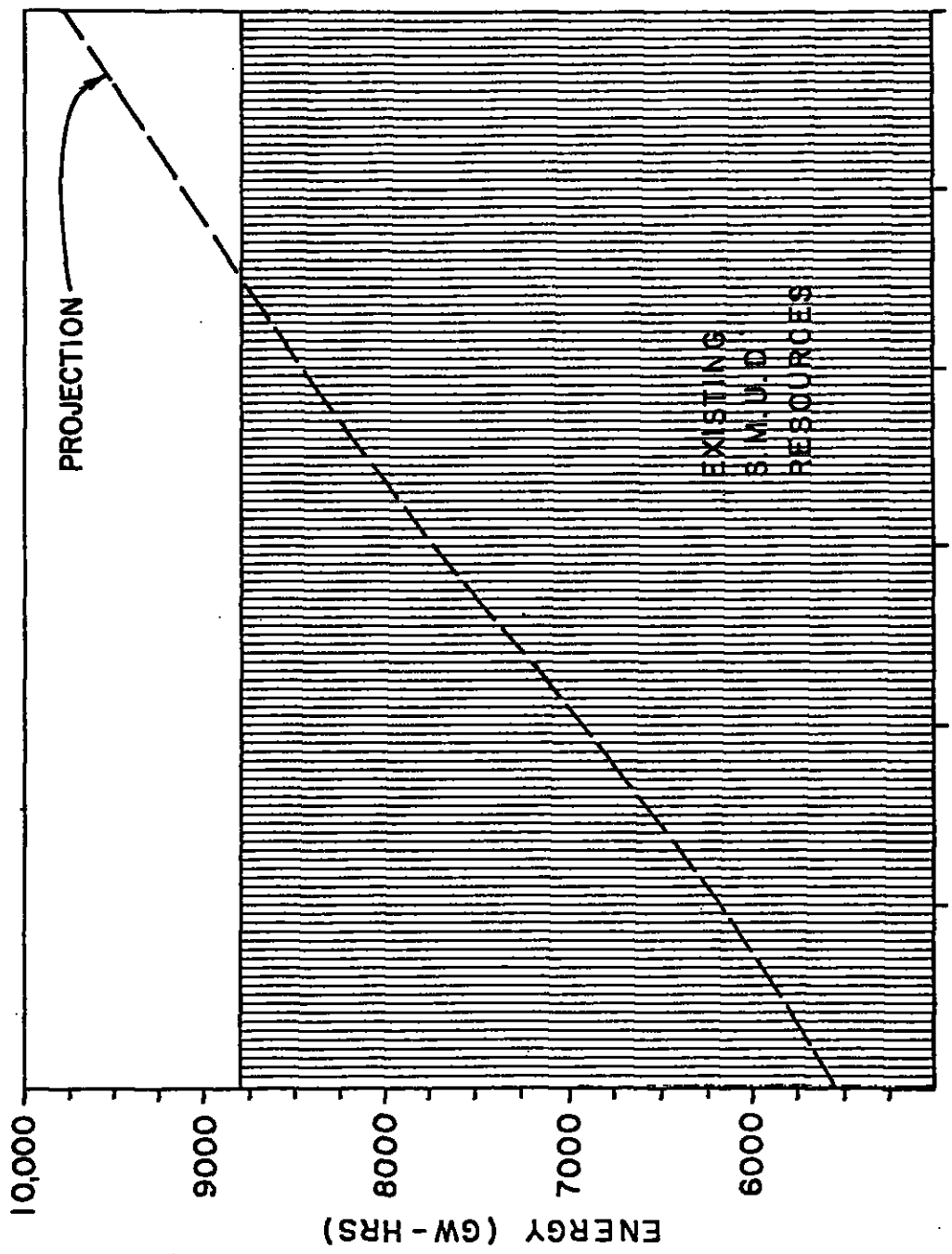
SOUTH SUTTER WATER DISTRICT
CAMP FAR WEST DAM & RESERVOIR
WATER POWER PROJECT

POWERPLANT CAPACITY (HP)
VS HEAD

SOUTH SUTTER WATER DISTRICT
CAMP FAR WEST DAM & RESERVOIR
WATER POWER PROJECT

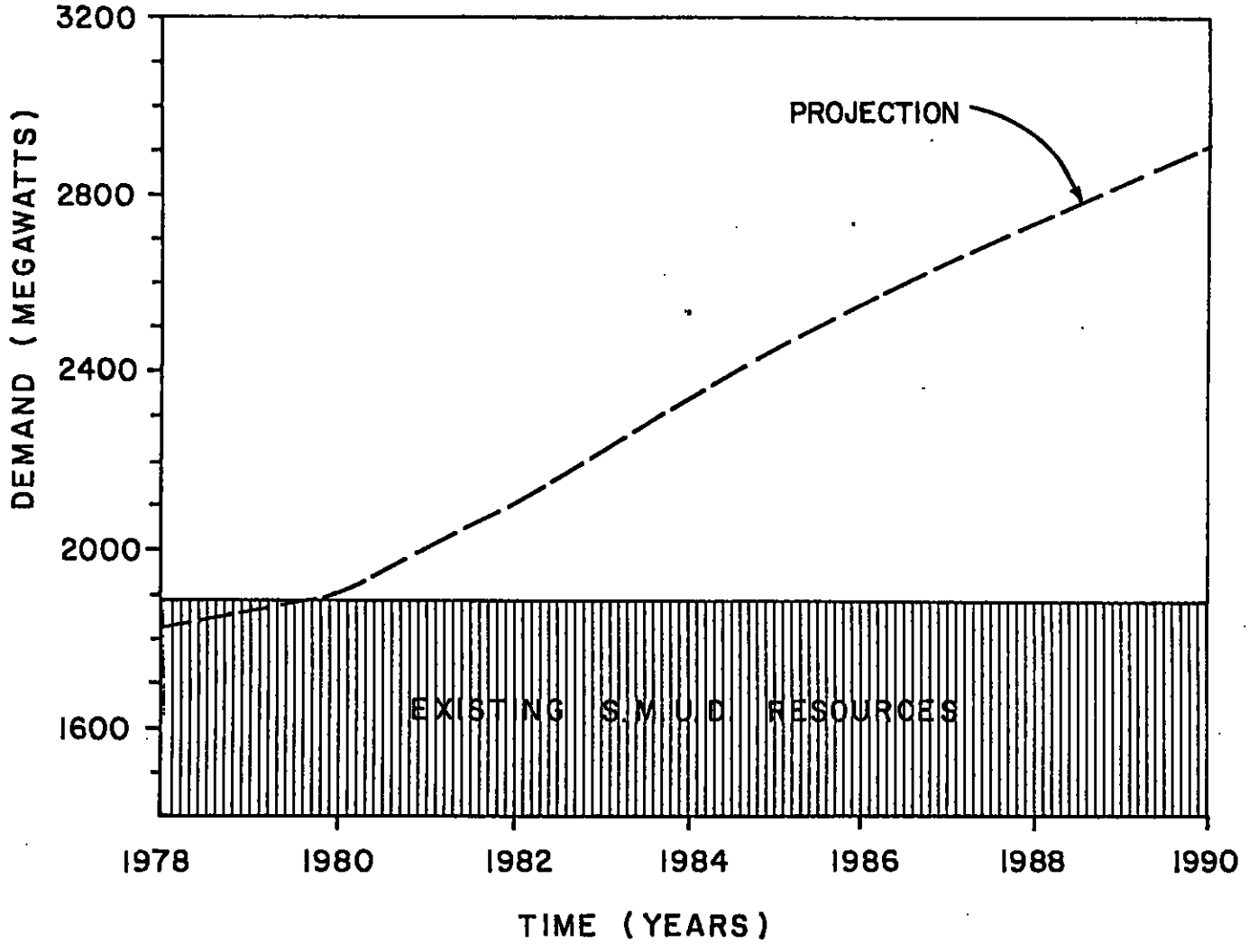
ENERGY DEMAND (GW-HRS)
SMUD SYSTEM

SOURCE: SMUD



Parsons Brinckerhoff Quade & Douglas, Inc.

Plate B-7



SOURCE: SMUD

SOUTH SUTTER WATER DISTRICT
CAMP FAR WEST DAM & RESERVOIR
WATER POWER PROJECT

GENERATOR DEMAND (MW)
SMUD SYSTEM

Parsons Brinckerhoff Quade & Douglas, Inc.

Plate B-8

EXHIBIT C

CONSTRUCTION HISTORY
AND
PROPOSED CONSTRUCTION SCHEDULE

EXHIBIT C

CONSTRUCTION HISTORY AND PROPOSED CONSTRUCTION SCHEDULE

1. CONSTRUCTION HISTORY

The Camp Far West Dam was originally constructed as a 50 feet high concrete gravity dam in 1927. During the period 1962-63 the present 170 foot high earthfill dam and its appurtenant features was constructed over the concrete dam, creating a reservoir with a storage capacity of 104,400 acre-feet. The facilities provide storage of water for irrigation of lands within the South Sutter Water District (SSWD) and Camp Far West Irrigation District boundaries.

In January 1964, the reservoir began filling, and stored water was released for irrigation commencing in May.

No additions or modifications have been made to the facilities since construction was completed in the fall of 1963.

2. PROJECT DESIGN AND CONSTRUCTION SCHEDULE

The Project implementation schedule illustrates the time required to design and construct the addition of a hydroelectric powerplant to the existing Camp Far West Dam and reservoir. The schedule reflects a forty-month implementation time frame to design and construct the project including the securing of project financing and the sale of project revenue bonds (Plate C-1).

Work has been proposed to begin on the turbine and generator contract prior to the sale of project bonds and before the bond election. This will allow placement of the turbine and generator equipment order with the manufacturer as soon as the bond sale is finalized. The purchase of this equipment is the most critical element of the project because of the long fabrication and delivery time anticipated.

Surveying and geotechnical information will be obtained. Preliminary design of the tunnel contract, will commence prior to the bond election. Considering delivery times, design requirements, construction seasons and construction

types, three separate contracts are identified. In no event will award of any supply or construction contract be made prior to the successful sale of bonds or issuance of the FERC license.

The schedule provides for some overlap of the FERC licensing and other administrative approvals with the final design activities; however, it is predicated upon completion of all permit and licensing aspects prior to commitment to any construction contracts.

(i) TURBINE AND GENERATOR PROCUREMENT CONTRACT

It is proposed to complete the preparation of the design specifications and bid documents, tender the contract, evaluate the bids and select the manufacturer prior to sale of bonds so that the contract will be ready for award immediately after the bond sale. Imbedded parts can be furnished in mid-1982 and equipment delivered in early 1983 for installation.

(ii) TUNNEL AND INTAKE STRUCTURE CONSTRUCTION CONTRACT

The early award of this contract is important so that the contractor has two construction windows to take advantage of the lowest levels of the reservoir which occur in October-November to construct the intake structure, intake channel and hole through with the tunnel. This contract is scheduled for design in late 1980/early 1981 with construction in 1981-1982.

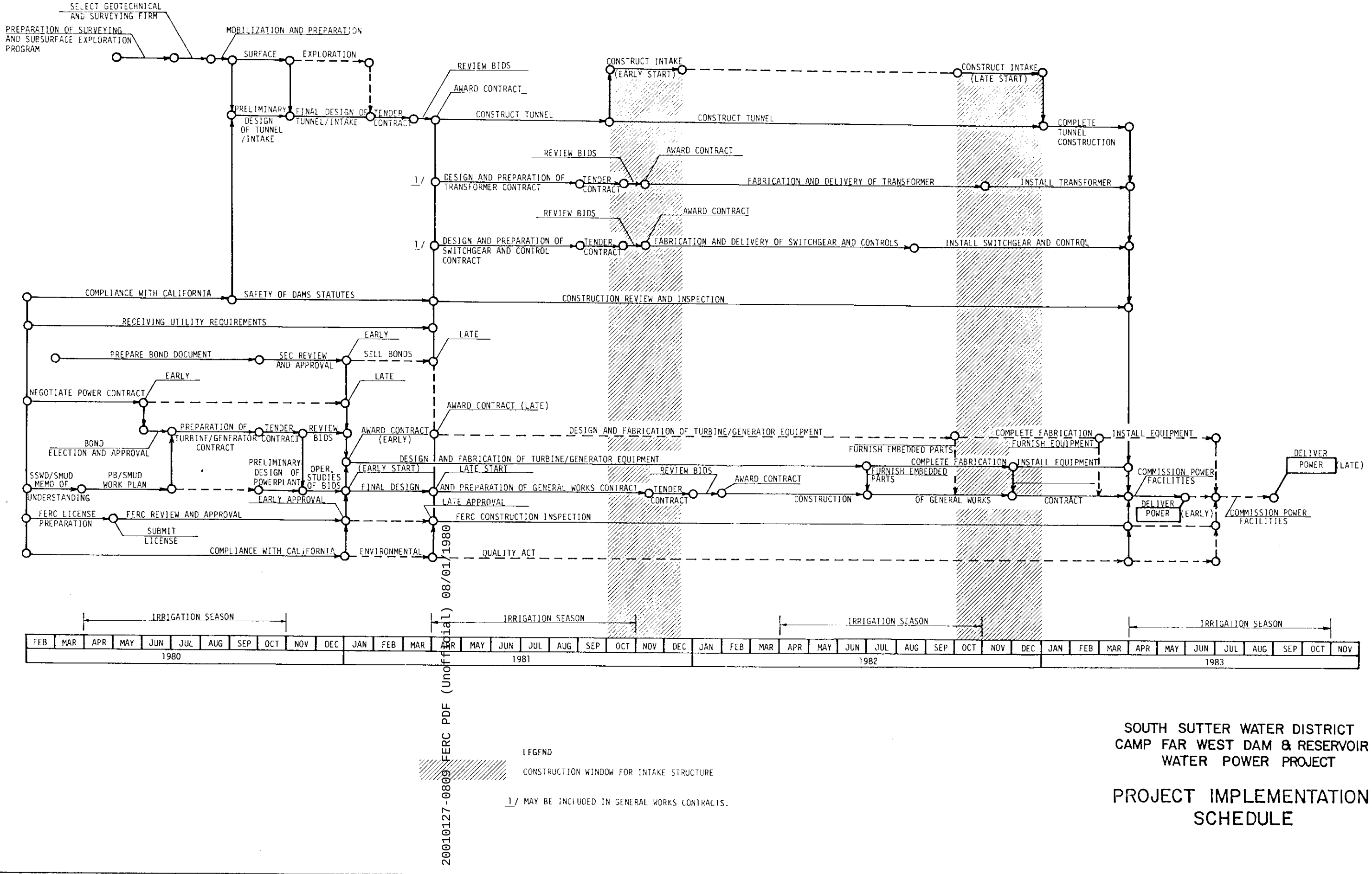
(iii) GENERAL WORKS CONTRACT

The general works contract is scheduled to be consistent with the other two contracts which are more critical from a delivery and time of construction standpoint. This contract is scheduled for design in 1981 and construction in 1982-1983.

By separating and phasing the work, it is entirely possible to commission the plant and place power on-line by mid-1983.

The following plate is included in this Exhibit:

Plate C-1 Project Implementation Schedule



SOUTH SUTTER WATER DISTRICT
CAMP FAR WEST DAM & RESERVOIR
WATER POWER PROJECT

PROJECT IMPLEMENTATION SCHEDULE

EXHIBIT D

COSTS AND FINANCE

EXHIBIT D

COSTS AND FINANCE

1. STATEMENT OF ORIGINAL COSTS

(i) LAND AND WATER RIGHTS

The costs of obtaining the necessary project lands and water rights to construct and operate the existing Camp Far West Dam and Reservoir are as follows:

Item	Cost
Lands	$ 109,000
Water Rights	25,000
Total	$ 134,000

(ii) EXISTING STRUCTURES AND FACILITIES

The cost of constructing the existing dam and appurtenant works are as follows:

Item	Cost
Dam	$3,120,000
Outlet Works	250,000
Spillway	215,000
Total	$3,585,000

2. NEW LICENSE APPLICANT

Requirements of this section do not apply to the Applicant as it is a political subdivision of the State of California and qualifies as a municipality.

3. STATEMENT OF ESTIMATED COSTS FOR NEW DEVELOPMENT

(i) COST OF LAND OR WATER RIGHTS

The existing Camp Far West Dam and Reservoir is owned by the South Sutter Water District, a political subdivision of the State of California. The proposed addition of a hydroelectric powerplant will not alter any of the

facilities of the existing dam and reservoir and will utilize only those flows stored within the reservoir boundaries. Therefore, the proposed project does not involve any costs related to acquisition of land, as it is totally within project owned lands.

A water rights application was filed in January 1980, to allow use of the water for the production of electrical energy. The filing fee associated with the application was 1,150 dollars.

(ii) COST OF NEW DEVELOPMENT

(a) Cost of Each Major Item

The estimated cost of each major item required to add a hydroelectric powerplant to the existing Camp Far West Dam and Rservoir has been itemized in accordance with FERC established account numbers. Table D-1 displays the estimated total project costs including engineering and administration.

(b) Indirect Construction Costs

No additional construction costs from those shown in Table D-1 are anticipated for the project. The site location is conveniently situated to population centers within easy commute driving distance and, therefore, no on-site special facilities for the construction workers will be required.

(c) Interest During Construction

The project economics were based on the project being completed in 40 months and having a project life of 40 years. It was assumed that revenue bonds will be the source of project financing. The bonds were assumed to sell as a single issue and, therefore, there will be a three-year period during which interest will be due. It was also assumed that distribution of the cash flow requirements of the project would be 20 percent the first year, 50 percent the second year and 30 percent the third year. The interest rate was assumed to be 7 percent. No allowance was made for invested income during construction. Interest has been estimated to be 1,200,000 dollars.

(d) Other Project Related Expenses and Contingencies

Costs that the project will incur, in addition to those shown on Table D-1, will be preparation of the bond prospectus, marketing the project bonds, and associated legal fees. The estimated costs are as follows:

Item	Cost
Preparation of Bond Prospectus	$ 75,000
Marketing Project Bonds	200,000
Legal Services	25,000
Estimate Cost to Issue Bonds	$ 300,000

4. ESTIMATED AVERAGE ANNUAL COSTS

Table D-2 summarizes the project's total capital costs, project bond requirements, annual costs composed of debt amortization, operation and maintenance, administration, insurance, repair and replacement sinking fund, and shows the cost of producing energy in the project's first year of operation.

5. ANNUAL VALUE OF PROJECT POWER

The project's total power output is under negotiations to be purchased by the Sacramento Municipal Utility District (SMUD). A Memorandum of Understanding specifying the considerations of project development and sale and purchase of the electricity was executed by the Applicant and SMUD on April 16, 1980. For purposes of this project the value of the electricity produced was assumed to be 31.0 mills per kw-hr in 1979, escalating at the rate of 8 percent per year until the powerplant is commissioned and on-line in mid to late 1983. Therefore, the value would be 39 mills per kw-hr in 1983. This value is consistent with SMUD furnished information which views this energy being compared to its lowest cost alternative source which is geothermal.

Projected costs of alternative sources of energy considered obtainable by SMUD over the next 20 years are illustrated graphically (Plate D-1).

The cost of the power produced will increase in the future by virtue of adjustments that will result from: higher labor costs that will impact the annual operation and maintenance costs, project administration costs, increases in insurance costs, and adjustments in annual license fees.

6. FINANCING AND ANNUAL REVENUES

The project will be financed by the Applicant through the sale of 40 year revenue bonds. The expected power purchaser, SMUD, proposed to guarantee the annual debt repayment and be responsible for operating and maintaining the power facilities (power tunnel, powerhouse and appurtenant facilities). The Applicant will maintain and operate the water storage and distribution facilities.

The bond issue will be for 10.5 million dollars, which is to cover all costs of developing, designing and constructing the power facilities.

The following tables and plate are included in this Exhibit:

Table D-1	Cost Estimate
Table D-2	Summary of Cost and Economic Analysis
Plate D-1	Project Energy Cost of Alternative Sources

EXHIBIT D

TABLE D-1
COST ESTIMATE

Item	Account No.	Description	Center ($)	
POWERPLANT:				
	331	Structures and Improvements	$ 947,000	
	333	Water Wheels, Turbines and Generators	1,832,000	
	334	Accessory Electric Equipment	346,000	
	335	Miscellaneous Powerplant Equipment	222,000	
		SUBTOTAL		$ 3,347,000
RESERVOIRS, DAMS & WATERWAYS:				
	332	Reservoirs and Dams	-0-	
	332	Waterways	2,364,000	
		SUBTOTAL		$ 2,364,000
SITE:				
	330	Land and Land Rights	-0-	
	336	Roads, Railroads and Bridges	215,000	
		SUBTOTAL		$ 215,000
		TOTAL DIRECT COSTS OF PROJECT		$ 5,926,000
		CONTINGENCIES		$ 1,050,000
		ENGINEERING AND ADMINISTRATION		$ 1,000,000
		TOTAL ESTIMATED COSTS OF PROJECT		$ 7,976,000

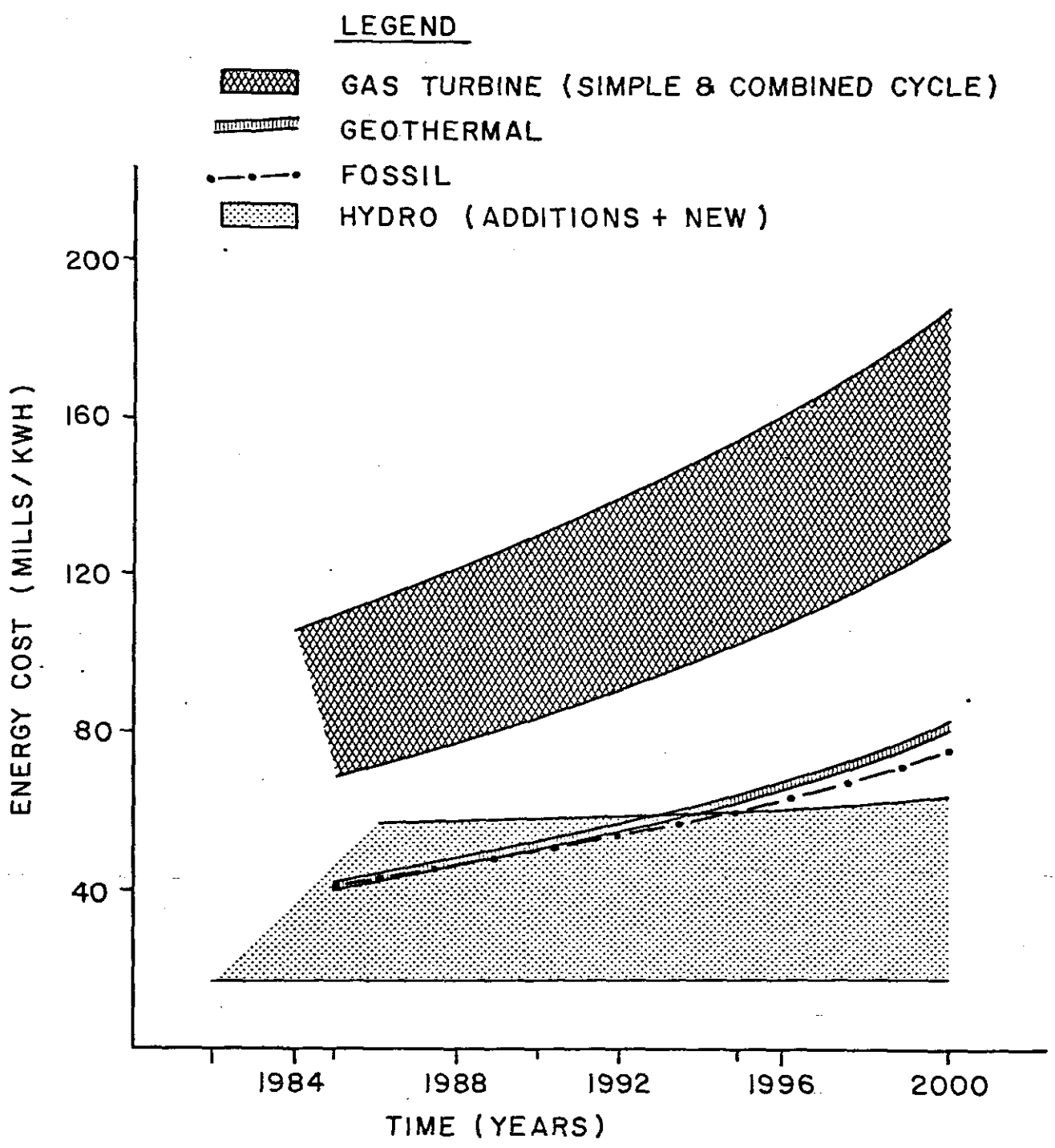
EXHIBIT D

TABLE D-2

SUMMARY OF COSTS AND ECONOMICAL ANALYSIS

ITEM	COST[6]
Capital Costs[1]	8276.0
Bonds Required[2]	9476.0
Annual Costs[3]	
Debt Amortization[4]	795.0
O & M	91.9
Administration (20% of O & M)	18.4
Insurance (0.2% of Capital Costs)	14.7
License Fee	3.1
Repair and Replacement Sinking Fund	3.9
Plant Data	
Installed Capacity (KW)	6400.0
Average Annual Energy (KWH)[5]	26.9
$/KW Installed	1480.0
Cost of Producing Energy - ¢/KWH (1st Year Cost of Operation - 1983)	3.45

NOTES:
1/ Capital cost (October 1979), includes marketing revenue bonds
2/ Completed cost including interest and escalation during construction of 7% and 8%, respectively
3/ For first year of operation - 1983
4/ Cost of money - 8% and 40 years
5/ Average annual energy in millions of KWH
6/ All costs in thousands of dollars unless otherwise noted



SOURCE: SMUD

SOUTH SUTTER WATER DISTRICT
CAMP FAR WEST DAM & RESERVOIR
WATER POWER PROJECT

PROJECTED ENERGY COST
OF ALTERNATE SOURCES

EXHIBIT E

ENVIRONMENTAL REPORT

EXHIBIT E

SECTION 1

GENERAL DESCRIPTION OF THE LOCALE

EXHIBIT E

ENVIRONMENTAL REPORT

1. GENERAL DESCRIPTION OF THE LOCALE

The source of the Bear River is located in California, in the Sierra Nevada Mountains near Lake Spaulding at an elevation of about 5500 feet. It flows generally southwest for a distance of about 65 miles where it empties into the Feather River (elevation 60 feet) about 13 miles downstream of the Camp Far West Dam and Reservoir.

Elevation exerts a strong influence on climate and, hence the vegetation in the basin. Daily summer temperatures in the upper watershed range between 50 and 72°F. Mean temperature during January is 30°F (SRAPC, 1978). The slopes are dominated by coniferous forest.

The climate at the project site is typical of the Sierra Nevada foothills at 300 feet elevation. Summertime temperatures will frequently exceed 100°F during the day, dropping into the 60's and 70's during the night. Winter temperatures will range from the low 30's during the night to the mid-50's during the day. The difference between the daily high and low temperatures varies from 20 degrees in winter to 30 degrees in summer (Fuller and Associates, 1977). Vegetation consists of scattered trees and a ground cover of grasses.

The western slopes of the Sierra Nevada act as a barrier to intercept and collect moisture from the cyclonic storms which move in from the Pacific Ocean. Due to the low elevation of Bear River Basin, most of the winter precipitation occurs as rainfall (COE, 1972). Normal annual precipitation varies from about 65 inches in the Sacramento Valley. Mean annual precipitation at the project site is estimated to be about 30 inches (Yuba County, 1978). About 90% of the annual precipitation throughout the watershed occurs during the period from October through April (COE, 1972). Temperature and precipitation records are available for stations near Camp Far West Dam. Temperature and precipitation data for Grass Valley (elevation 2411) and Colfax (elevation 2420) are given in Tables E1-1 and E1-2, respectively.

The topography around the project consists of rolling hills ranging in elevation from 300 to 400 feet with slopes from 2 to 30 percent. Sharp edged and irregular metavolcanic rock outcrops are common.

Historically, this area has not been subject to the effects of major earthquakes, nor is serious seismic activity likely since the major active faults in northern California are 100 miles distant.

Soils in the vicinity of the Camp Far West Reservoir belong to the Auburn-Sobrante Association (UCD, 1969). The Auburn series consists of well-drained, shallow soils developed from basic metavolcanic rock. Auburn soils have a surface layer of brown and reddish-brown loam and a subsoil of yellowish-red, light clay loam. Sobrante soils have a surface layer of reddish-brown loam and a subsoil of reddish-brown heavy loam and light clay loam. These soils also have slowly permeable subsoils and moderate to high soil erosion hazards.

The soils in the project area have moderate erosion hazard and are listed as having a severe limitation for septic tank filter fields (SRAPC, 1973).

The Bear River Basin contains a wide range of mineral deposits. Over half of the basin is classified as "gold-bearing area". The sand and gravel and stone industry has grown recently in years. Other minerals include tungsten, barite, pyrite, silica, copper, and chromite (COE, 1972). The Dairy Farm Mine, reported to be an inactive copper mine, is located on the south shore of the Camp Far West Reservoir. The U.S. Bureau of Mines computer inventory (Minerals Availability System) shows that copper, gold and silver were at one time recoverable marketable ores (USBM, 1980).

The current population for Yuba, and Sutter Counties is estimated to be about 48,000 and 50,000, respectively. Population has been increasing slowly, and this trend is not expected to change in the future. The character of the project area is rural with cattle ranching as the dominant form of agriculture, consequently, population and employment data for the immediate

project area is limited. The Sacramento Regional Area Planning Commission (SRAPC), which includes Yuba County, has divided the County into Regional Analysis Districts. The Camp Far West Reservoir lies within Districts 43 and 44. Beale Air Force Base is located in District 43 about six miles from the Camp Far West Dam. The largest civilian population concentration closest to the project is the City of Wheatland, which is located on the Bear River in District 44 about four miles downstream of the dam. Its population in 1975 was 1365 (Department of Finance, E-150 Series). The population of Yuba County is expected to grow at about 1-1.5% annually (Yuba County, 1980).

Total employment for Planning Districts 43 and 44 in 1975 was 6765 (SRAPC, 1975, Vol. 5, No. 2 Data Summaries, Employment Module). Government was the largest employer (about 6700) primarily as a result of Beale Air Force Base. The next largest income activity was agriculture, involving about 420 people.

The dominant land use in the immediate project area is cattle range and the two project counties have zoned it for general agriculture. This zoning classification is not very restrictive, however, and rural subdivisions with 20 acre-minimum parcels are permitted.

About 750 acres in Yuba County between Camp Far West Reservoir and Beale Air Force Base is proposed for subdivision and has been the subject of an environmental impact report (EIR) entitled "Tentative Parcel Maps Numbers 6.67 and 6.77; Final Environmental Impact Report" (Yuba County, 1978) pursuant to the California Environmental Quality Act. The portion of Nevada County which lies immediately east of Yuba County is also proposed for subdivision which has been the subject of EIR entitled "Draft Sharon Oaks Subdivision Environmental Impact Report" (Fuller Associates, 1977). The land adjacent to the project in Placer County is the subject of an agreement with the county in accordance with the Land Conservation Act which contractually attempts to assure that land will not be converted from agriculture.

The land adjacent to and surrounding the Camp Far West Reservoir is owned by the South Sutter Water District. Proposed land and subdivisions will have no effect on public access to the reservoir for recreation.

The Camp Far West Reservoir is readily accessible by existing paved county highways which appear suitable for use during construction. Public use of these roads will not be interrupted by construction.

The Department of Housing and Urban Development has identified floodplains for the Bear River. The maximum design water surface elevation for the Camp Far West Reservoir is 316.3 feet and the 100 year flood elevation for the Bear River downstream at the diversion dam, a distance of approximately one mile, is about 145 feet. The diversion dam is used to divert water from the Bear River
into the South Sutter Water District and Camp Far West Irrigation District canals. The water is essentially within the river banks at this elevation and affects no structures or other development.

The flood of record occurred on December 22, 1955 when a flow of 33,000 cubic feet per second was recorded at the "near Wheatland" gage.

The following letters of consultation from agencies responsible for land use, minerals, roads, and planning in the project area are included in this section:

- U.S. Department of the Interior
- U.S. Bureau of Mines
- County of Yuba, Department of Public Works
- County of Yuba, Planning and Economic Development Department
- County of Placer, Office of the Planning Commission
- County of Nevada, Planning Department

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
PACIFIC SOUTHWEST REGION
BOX 36098 • 450 GOLDEN GATE AVENUE
SAN FRANCISCO, CALIFORNIA 94102
(415) 556-8200

March 14, 1980

Mr. Joel R. Kushins, P.E.
Parsons Brinckerhoff
1540 River Park Drive
Suite 202
Sacramento, California 95815

Dear Mr. Kushins:

Subject: Proposed Camp Far West Hydro Project Environmental Report

The following information is provided to satisfy your requirement for the FERC license application Exhibit E - Environmental Report and constitutes a summary of the scope and substance of our meeting on March 6, 1980.

1. Agencies within the Department of Interior to contact are listed below. Those agencies underlined appear to be applicable to the Camp Far West Hydro Project.

Bureau of Mines*
Fish and Wildlife
Geological Survey
Heritage Conservation and Recreation Service
Bureau of Indian Affairs
Water and Power Service
National Park Service
Bureau of Land Management

*Robert Miller
Mineral Industry Location System
Spokane, Washington
(509) 484-1610

If you should need any additional information, please contact me.

Sincerely,

Patricia S. Port

Patricia S. Port
Regional Environmental Officer

United States Department of the Interior
BUREAU OF MINES
EAST 315 MONTGOMERY AVENUE
SPOKANE, WASHINGTON 99207

March 18, 1980

Mr. Joel Kushins
Parsons-Brinkerhoff
1540 Riverpark Drive
Suite 202
Sacramento, California 95815

Dear Mr. Kushins:

As requested in your telephone conversation with Russell Raney of this office, a computer printout of MILS data regarding the Dairy Farm Mine, Placer County, California, is enclosed. Please let us know if we can be of further service.

Sincerely,

R. N. Appling, Jr., Chief
Western Field Operations Center

Enclosure

DEPOSIT NAME: DAIRY FARM

SEQUENCE NUMBER: 0060610020

>>>> MILS - DATA SET <<<<
(MINERAL INDUSTRY LOCATION)

STATE: CALIFORNIA
COUNTY: PLACER
TYPE OF OPERATION: SURF-UNDERG
CURRENT STATUS: PAST PRODUCER
LATITUDE: N 39DEG 01MIN 51SEC
LONGITUDE: W 121DEG 17MIN 17SEC
UTM - ZONE: 10
HEMISPHERE: NORTHERN
NORTHING: 4321384
EASTING: 648184
POINT OF REFERENCE: TRENCH
PRECISION: 100 METERS
ELEVATION: 91 METERS
PRECISION: 100 METERS

YEAR FIELD CHECKED:
QUADRANGLE: CHICO
RIVER BASIN NAME:

RIVER BASIN CODE:
HYDROLOGIC UNIT CODE:
DATUM OF ELEVATION: SEA LEVEL
MAP NAME:
SCALE:
DOMAIN:
TYPE OF MINERAL HOLDINGS:
PATENTED

MINE MAP REPOSITORY:
TYPE OF EVALUATION: C
EVALUATOR: J.D.LEWIS
YEAR OF INFORMATION ENTRY: 1970
MAINTAINING FIELD CENTER:
WESTERN
MINERAL PROPERTY FILE: 21.058
CORE LIBRARY:
MINES IDENTIFICATION:
GEOLOGICAL SURVEY CRIB:
LAST MILS MODIFICATION:
AUG 30, 1978
LAST DEPOSIT MODIFICATION:
AUG 30, 1978

--PUBLIC LAND SURVEY--

PRINCIPAL MERIDIAN:
MOUNT DIABLO
TOWNSHIP: 014 N
RANGE: 006 E
SECTION: 27
SECTION SUBDIVISION:
NE 1/4, SW 1/4, SE 1/4
SURVEY STATUS: UNK

>>>> COMMODITY - DATA SET <<<<

RECORD NO.	COMMODITY	MODIFIER	MARKETABILITY	STANDARD INDUSTRIAL CODE	DATE OF LAST MODIFICATION
01	COPPER	SULFIDE	RECOVERABLE		FEB 13, 1978
02	GOLD		RECOVERABLE		FEB 13, 1978
03	SILVER		RECOVERABLE		FEB 13, 1978

>>>> NAMES(ALTERNATE) - DATA SET <<<<

TRENT
VANTRENT

>>>> BIBLIOGRAPHY - DATA SET <<<<

SET REFERENCE	LINE NO.	
	001	REF 1 CALIF.DIV.MINES, COPPER IN CALIF.,BULL.144, CALIF.DEPT.NAT.
	002	RES. 1948. INCLUDES PLATES OF MINE MAPS AND REFERENCES.
	003	SVCE V 14,NO 3,P 3;USBM MIN YB V 3,1960,P 195
	004	REF 2 LYMAN MOORE DATA FROM 1970 EVALUATION.

U. S. BUREAU OF MINES
MINERALS AVAILABILITY SYSTEM

DEPARTMENT OF PUBLIC WORKS
DONALD R. FROST, Director
JOHN MIDDLEBROOK, Deputy Director
(916) 674-6421
215 5th STREET

County of Yuba

MARYSVILLE, CALIFORNIA

February 29, 1980

Joel R. Kushins
Parsons Brinckerhoff Quade & Douglas, Inc.
1540 River Park Drive, Suite 202
Sacramento, California 95815

Dear Mr. Kushins:

This letter will confirm our discussion on February 29, 1980. Your client proposes to construct a small hydroelectric generating plant at the face of Camp Far West Dam on the Bear River.

Copies of the County's official flood hazard maps as they apply to the immediate area were furnished to you.

Access to the site was also discussed. It was noted that the Spenceville Road which intersects State Hiway 65 in the town of Wheatland would be the principal means of vehicle access. By means of this road connections are available to State Hiways 65 and 70. No unusual weight or traffic restrictions apply and the construction of the facility proposed by your client should not place any excessive burdens on the Spenceville Road. The closest unloading point for rail shipped supplies would be at the Southern Pacific Railroad in Wheatland.

We trust the foregoing is what you required. Please contact this office if you have other questions.

Very truly yours,

Donald R. Frost

Donald R. Frost
Director of Public Works

DRF:nj

cc: D. Mao, Planning

PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT

938 14th Street
Room 89
Marysville, California 95901
(916) 674-6419

HERBERT C. WIELAND, AIP, Director

County of Yuba

March 6, 1980

Mr. Thomas L. Sands
Parsons Brinckerhoff
1540 River Park Drive
Suite 202
Sacramento, CA 95815

Subject: Proposed Camp Far West Hydro Project
Environmental Report

Dear Mr. Sands:

The following information is provided to satisfy your requirement for the FERC license application Exhibit E - Environmental Impact Report and constitutes a summary of the scope and substance of our meeting on February 29, 1980.

1. General

Yuba County has a population of about 48,000 people and its economy is essentially based on agriculture and Beale Air Force Base. The Land Use Element of the General Plan is being revised by the County Planning Department, however the plan is unlikely to change the designation of land near Camp Far West Reservoir from that shown in the present plan. An area suitable for low density (1-5 persons per acre) rural village near the Johnson Rancho area is shown in the existing plan.

2. Zoning

The area is zoned for agricultural use (A-1) but that classification allows many uses. We discussed some proposed subdivisions which are in various stages of planning by private developers. The low to moderate annual growth in population (1-1 1/2%) and development experienced in the past will probably not change much in the future. For detailed population data, consult with the Sacramento Regional Area Planning Commission.

3. I provided you a copy of the Yuba County Open Space and Conservation Element.

4. I assisted in your contacting Mr. Donald Frost, Director of Public Works, to discuss County highway and flood plain matters.

5. Recommended that you consider a coordinated effort to satisfy the requirements of the California Environmental Quality Act (CEQA) and NEPA.

6. Based on your description of the project, I do not anticipate that Yuba County would deny an application for a Conditional Use Permit for the hydro project.

If you should need any additional information, please contact me.

Very truly yours,

Danny Mao, AICP
Assistant Planning Director

DM:aj

COUNTY OF PLACER

OFFICE OF THE PLANNING COMMISSION

11414 B AVENUE AUBURN, CA 95603
TELEPHONE (916) 823-4721

THOMAS D. MCMAHAN, PLANNING DIRECTOR

March 26, 1980

Thomas L. Sands
Parsons Brinckerhoff
1540 River Park Drive, Suite 202
Sacramento, California 95815

Subject: Proposed Camp Far West Hydro Project
Environmental Report

Dear Mr. Sands:

The following information is provided to satisfy your requirement for the FERC license application Exhibit E (Environmental Report) and constitutes a summary of the scope and substance of our meeting on March 11, 1980.

A major planning objective of Placer County is to maintain existing agricultural use in the county. From your description of the project, it appears that the amount of water available to farms for irrigation would not be reduced by operation of the hydro project.

The land in Placer County which borders the Bear River near the Camp Far West Reservoir is zoned for agriculture. Agreements with the landowners have been made by authority of the Williamson Act (enacted about 10 years ago by the State of California) which assures the land will not be converted from agricultural use for a stated period of time in exchange for being taxed on its value for agriculture rather than its value for recreational or other purposes.

That portion of the County has low density housing and low traffic. No highways in that part of the County have been designated as scenic. The project appears consistent with the open space and conservation element of the General Plan.

Sincerely,

Donald R. Riolo

Donald R. Riolo
Assistant Planning Director

DRR/lo'b

COUNTY OF NEVADA

PLANNING DEPARTMENT

10433 Willow Valley Road
Nevada City, California 95959
(916) 265-2461 ext. 260

April 11, 1980

Mr. Thomas L. Sands
Parsons Brinckerhoff
1540 River Park Dr., Suite 202
Sacramento, CA 95815

Subject: Camp Far West Hydro Project FERC License Application Exhibit E - Environmental Report.

Dear Mr. Sands:

The following information is provided to satisfy your requirement for the FERC license application Exhibit E (Environmental Report) and constitutes a summary of the scope and substance of our meeting on March 11, 1980.

Based on your explanation of the project, it appears that construction and operation of the project will have little effect on Nevada County, and it does not appear that any use permits would be required. Proposed subdivisions such as Sharon Oaks and Halcyon Acres, could have some affect on Camp Far West. The Water Quality Control Board has been reviewing those proposals to insure that water quality is maintained.

The General Plan depicts an east-west route used by pioneers which traverses Nevada County and exits near the existing Camp Far West Reservoir. You should contact Mr. Bert Wiley, a private researcher who took a special interest in locating the route. It is designated on the General Plan map as "Overland Emigrant Trail". The land near Camp Far West in Nevada County is zoned agricultural with minimum lot sizes ranging from about 15-30 acres. Materials provided were:

a. Nevada County Planning Department, Environmental Information Form
b. Memorandum dated October 31, 1978 (Subject, Tentative Map Approval SHARON OAKS SUBDIVISION - FM77-23 with map dated June, 1977)
c. Proposed Halycon Subdivision Tentative Map dated November, 1979

If you should have any further questions regarding this matter, please feel free to contact me.

Very truly yours,

Jeff L.B. (Ben) Hulse
Planning Director

By Thomas A. Parilo
Thomas A. Parilo
Principal Planner

EXHIBIT E

SECTION 2

REPORT ON WATER USE AND QUALITY

2. REPORT ON WATER USE AND QUALITY

(i) GENERAL

The Bear River Drainage Basin lies north of the American River watershed. The Basin drains portions of Placer, Yuba and Nevada Counties which have a combined contributing area of 284 square miles at the Camp Far West Dam. Bear River starts out as a clear, fast-flowing stream, but the natural conditions of the watershed and the existing Rollins and Combie Reservoirs located upstream greatly influence the amount and quality of water that reaches the Camp Far West Reservoir.

(ii) DESCRIPTION OF EXISTING AND PROPOSED WATER USES

The primary use of water stored in the Camp Far West Reservoir is for irrigated agriculture. The Applicant has released over 106,000 acre-feet of water annually for irrigation since operation of the reservoir in 1964. The irrigation season commences in April and generally is concluded by October. The distribution of the water used for irrigation by the SSWD and Camp Far West Irrigation District on an average monthly basis over the period of record is as follows:

Month	Average Use (acre-feet)	Range of Usage (acre-feet)
January	0	0
February	95	0- 858
March	588	0- 3520
April	6986	0-14375
May	19772	1290-29138
June	21464	2510-28384
July	24251	2624-30367
August	21886	2385-29704
September	9160	519-13498
October	2079	67- 4862
November	128	0- 1375
December	0	0
AVERAGE	106410	

The average use figures include the drought years of 1976-1977. In 1977 very little water was available for irrigation use. The South Sutter Water District Canal was completely closed, and the north and south side Camp Far West Canals released only about 12,000 acre-feet. A small amount of consumptive use take place at the north and south recreation areas. The quantity is unknown, but is insignificant.

(iii) DESCRIPTION OF WATER QUALITY

Existing water quality data for the Bear River and Camp Far West Reservoir is limited. Water quality records are not maintained by the Yuba or Placer County Health Departments. The counties indicate that water quality adjacent to the recreation area on the Camp Far West Reservoir appear to meet water quality criteria and is therefore acceptable for water contact sports.

The California Deaprtment of Water Resources collects monthly data on the Bear River near Wheatland at the location of the USGS gaging station about six miles downstream for the Camp Far West Dam. Results collected for the period May 1974 through October 1979 are shown in Table E2-1. In June 1972 the California Department of Fish and Game recorded a surface temperature of 76°F and 58°F at a depth of 50 feet in the Camp Far West Reservoir. The temperature gradually decreased with depth, and did not indicate the presence of a thermocline (Fuller Associates, 1977).

A severe drought occurred during the 1976 and 1977 years. Rainfall varied from 59% of average at Red Bluff, California located about 90 miles northwest of Camp Far West on the Sacramento River to 41% at Sacramento (USGS, 1977). The 2-year drought produced an extreme demand on the small reservoirs in the western Sierra Nevada mountain range. The quality of the surface water deteriorated because of the extreme low flows. During the period of October 1976 through December 1977 flows were considered critical to fisheries and wildlife although dissolved oxygen levels were at or near saturation throughout the drought. The recorded temperature for June, July and August was 87°, 86°, and 84°F, respectively.

Excluding the drought months, the State Regional Water Quality Control Board (RWQCB), Central Valley Region, indicates that no major water quality problems have existed on the Bear River. Results of mineral analysis show that the

water of the Bear River is a calcium bicarbonate type. Total hardness of the water is usually less than 60 mg/l and is considered to be soft by definition. The pH of the water indicates it to be slightly alkaline, and turbidity measurements suggest it to be relatively clear. An examination of values for total dissolved solids (TDS), electrical conductivity (EC), sodium absorption ratio (SAR), chloride, and boron show these waters to be of an excellent quality for irrigation use. Dissolved oxygen levels are typically at or near saturation throughout the year. Recorded water temperature during summer months other than for 1976 and 1977 ranged from 74° to 83°F.

(iv) DESCRIPTION OF FLOW RELEASE REQUIREMENTS

The existing reservoir created by the Camp Far West Dam has a storage capacity of 104,400 acre-feet and a surface area of 2,020 acres at its maximum normal water surface elevation of 300 feet msl. The impounded waters are used within the boundaries of the South Sutter Water District primarily for irrigation. The District holds permits 11297 and 14871 which allow appropriation of water from the Bear River for irrigation and domestic purposes as a source of raw water for recreation area. Permit 11297 authorizes direct diversion of 360 cfs to be diverted between January 1 and December 31 and the collection to storage of 95,000 acre-feet per annum between October 1 and July 1. Permit 14871 authorizes direct diversion of 250 cfs between March 1 and June 30, and September 1 and October 31; it also authorizes storage of 40,000 acre-feet per annum to be collected between October 1 and June 30. The combined maximum quantity which may be stored in any one season is limited to 115,000 acre-feet per annum (CSWRC, 1958).

Applicant is required to release water for fish and wildlife purposes below the Camp Far West Diversion Dam approximately 1 mile downstream of Camp Far West Dam in accordance with its water rights permits as follows:

- Twenty-five cubic feet per second (25 cfs) from April 1 to June 30 of each year
- Ten cubic feet per second (10 cfs) from July 1 of each year to March 31 of the succeeding year

Applicant is not required to provide or maintain flows in excess of the inflows to its works or to release water it has developed by storage.

Operation of the hydro project will not affect Applicant's ability to meet the fish and wildlife requirements contained in its permit. An application submitted to the California Water Rights Board seeks a permit to discharge water from the Camp Far West Reservoir through the proposed powerplant. The application would not affect the quantity or quality of water currently appropriated for irrigation and domestic purposes. A portion of the water which now passes uncontrolled over the ungated concrete spillway during winter spill periods will be routed through the powerplant and be used to generate power.

(v) STATEMENT OF PROJECT OPERATIONS ON WATER QUALITY

Effects on water quality will result primarily from erosion associated with the following short term construction activities:

- Excavation and construction of the powerhouse, tailrace and power tunnel.
- Installation and removal of a cofferdam required to protect constructon work of the powerplant intake structure.
- Excavation of the intake channel for the powerplant intake structure.
- Disposal of excavated material.
- Clearing and disposal of a limited number of trees and other plant material associated with building the 60kv over the existing 12kv transmission line.

Adverse effects of water quality will be avoided or mitigated during construction by properly planning, implementing and maintaining erosion and sediment control measures consistent with recommended guidelines contained in the Areawide 208 Management Plan (SRAPC, 1978). Measures which may be used to prevent the suspension and transportation of soil particles include diversion and perimeter dikes, straw bale check dams, sediment retention basins, and temporary and permanent ground covers.

Surface runoff from areas undisturbed by the construction of the powerhouse will be diverted to natural drainage. Runoff from disturbed areas will be collected in sediment basin, approximately sized for the area being drained, so that larger soil particles will settle out before runoff is allowed to enter natural drainage offsite. Cut slopes that are exposed will be revegetated as soon as practical.

Excavation of the intake channel, and installation and removal of a cofferdam for construction of the powerplant intake structure will result in some unavoidable local increase in the level of suspended solid concentrations in the reservoir. The extent and duration of the adverse effects will depend on whether a sheet pile, earth, or rockfill cofferdam is used. The effects will be temporary.

The reservoir water surface elevation fluctuates throughout the year due to varying inflow and irrigation releases. In some years, the reservoir has been drawn down to elevation 190 msl; therefore, installation of the cofferdam, removal of the cofferdam, construction of the powerplant intake structure and excavation of the intake channel will be coordinated to take advantage of the draw down of the reservoir. Two construction seasons have been allowed to construct the power tunnel, intake structure and intake channel. If it appears that the reservoir will not draw down sufficiently to permit work to proceed, additional water will be released from the reservoir. The release schedule will be determined at the end of the runoff season. If additional releases are required, effects on water quality in the reservoir will be minimal. If such releases occur they could have a small benefit on downstream areas. The reservoir will not be drawn down below elevation 190. The reservoir will fill as usual with the onset of the fall and winter storms. If construction of the intake structure and intake channel is not completed in one construction season, the construction area will be allowed to flood until the following low reservoir period, at which time the area will be pumped out and construction completed. This procedure will have minimal effects on water quality in the reservoir.

About 2500 cubic yards of rock and unconsolidated material will be excavated during construction of the tunnel and powerhouse and transported to a suitable disposal area. An area adjacent to the proposed powerplant which was disturbed during construction of the Camp Far West Dam appears suitable for disposal of the excavated material. This area is grass covered and is irregular in appearance. Any material not usable for enhancement of fish habitat in the reservoir will be disposed in this area, graded so as to blend into the surrounding landform, and a ground cover established to prevent erosion.

A small amount of disturbance to the ground cover will occur as a result of additional clearing and setting new wood poles for building the 60kv line over the existing 12kv line. The effects on water quality will be minimal and short in duration because the route will follow the existing 12kv alignment and the work will be conducted so as to minimize the number of trees which must be removed to obtain the required 50 foot right-of-way. The transmission right-of-way will be maintained to establish a stable ground cover of desirable vegetation. Herbicides, if used at all, will be applied selectively in a manner consistent with EPA and state regulations.

(vi) DESCRIPTION OF FUTURE IMPACTS

Operation of the Camp Far West Hydro Project will not have any long-term effects on water quality. A modification of existing flow patterns will result due to a portion of the controlled spillway flows being diverted through the powerplant; however, there will be no change in the amount of water in the Bear River downstrean of the dam. Currently, controlled releases for irrigation are made through an outlet conduit with an intake structure at an elevation of 175 feet. The powerhouse intake structure will be constructed at an elevation of about 197 feet. The difference in elevation between these two intake structures will have no significant effect on the temperature of water released from the reservoir because temperature is fairly uniform at these depths in foothill reservoirs similar to Camp Far West. Operation of the project will not affect the 100 year flood elevation.

(vii) WATER QUALITY CERTIFICATION

Applicant has received notification from the California Regional Water Quality Control Board that the requirements for a water quality certificate are being waived (CRWQCB letter dated May 12, 1980).

The following Table is included in this section:

Table E2-1 Water Quality Characteristics of Bear River at the "near Wheatland" gage.

TABLE E2-1

WATER QUALITY CHARACTERISTICS OF BEAR RIVER AT THE "NEAR WHEATLAND" GAGE

(Average of 1974-79 Data)

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Discharge (cfs)	278	510	329	345	75	19	12	6	12	11	37	19
Dissolved Oxygen (mg/1)	10.7	11.6	11.1	10.5	9.5	9.2	9.0	9.7	8.8	9.6	11.2	11.7
Temperature (Deg. F)	48	51	56	60	71	77	80	81	74	64	54	52
Field pH	7.2	7.4	7.4	7.5	7.5	7.8	7.9	7.9	7.8	7.6	7.3	7.6
Total Dissolved Solids (mg/1)	73	78	76	72	76	107	113	100	86	94	50	102
Calcium (mg/1)	8.5	9.9	10.3	12.3	8.6	14.9	14.5	13.6	12.0	17.5	5.8	13.3
Magnesium (mg/1)	6.1	5.7	5.7	4.5	6.0	9.0	8.5	11.2	7.3	6.4	3.0	7.3
Sodium (mg/1)	4.0	4.2	4.5	4.6	4.5	5.9	6.2	6.2	5.3	6.3	3.4	6.0
Bicarbonate (mg/1)	29	48	62	57	51	54	66	72	56	66	30	47
Chloride (mg/1)	4.1	4.8	4.4	5.4	5.8	7.6	6.8	7.7	6.8	6.3	3.1	4.7

Source: U.S. Geological Survey, Water Data Reports

NOTE: Data includes drought years of 1976-1977

The following letters of consultation from agencies responsible for water quality are included in this section:

- California Department of Water Resources Central District
- U.S. Environmental Protection Agency
- California Regional Water Quality Control Board - Central Valley Region

EXHIBIT E

SECTION 5

RECREATION RESOURCES

5. RECREATION RESOURCES

(i) DESCRIPTION OF EXISTING FACILITIES

The Camp Far West Reservoir has recreation facilities and is open to the public year around for day and overnight use. SSWD administers these recreation facilities in accordance with a recreation plan adopted in 1964. The location of the facilities are shown on Exhibit E Sheet 1. Table E5-1 summarizes the type and number of recreation facilities that are available at the north and south recreation areas. There are a total of 92 overnight camp sites plus 1 group overnight camp site, 108 day-use picnic sites, 2 day-use picnic sites (group), 10 recreation vehicle sites, 2 boat ramps, 2 beaches, 2 water treatment plants and 2 sewage lagoons. The north recreation area consists of 253 acres and the south area is 110 acres in size. Recreational activities include swimming, boating, water skiing, and fishing. Hunting is prohibited.

A grant administered by the California Department of Water Resource was made available by authority of the Davis-Grunsky Act for recreational development. In 1964 when the reservoir was first available for recreation only day-use facilities were provided. However, there was a demand for camping that resulted in the construction of overnight camping units.

The facilities are operated by the South Sutter Water District through a concessionaire under the administration of the Department of Water Resources. The concession agreement expires in 1993 with an option for two renewals of 10 years each.

(ii) ESTIMATES OF RECREATION USE

Recreation use is influenced by the water surface elevation of the reservoir created by the Camp Far West Dam. Historically, the reservoir is full during the spring and is drawn down throughout the summer to furnish water for irrigation. It usually reaches its minimum water surface elevation in September-October and then refills during late fall and winter. Prior to development of the recreation facilities, a study was undertaken in 1963 to

develop a plan and to make projections as to the amount of recreation use that could be anticipated at the facilities. The study assumed no overnight camping and that day-use would be the only use. Based on this study, a plan was adopted in 1964 and 200 day-use picnic sites were constructed. Over the years there developed a demand for overnight camping sites. Table E5-2 shows the historical total annual recreation use of the reservoir for the period 1965 to 1978. There has been a steady increase of overnight users since the construction of overnight camping units in 1969. Prior to 1976, the split between overnight and day-users was approximately 40 and 60 percent, respectively. This trend is apparently changing to 60 percent overnight and 40 percent day-users after 1976.

The current visitor usage of the recreation facilities is averaging approximately 70 percent of the projections if the area of influence is limited to a 30 mile radius. If future recreation use is split, 60 percent overnight use and 40 percent day-use, which is approximately the current use, there may develop a need for more overnight facilities. On the other hand, with increased costs of gasoline, there could be a leveling off of usage due to travel costs.

The Applicant, as evidenced in the past, has recognized the need of recreation facilities at the Camp Far West site. Additional recreation facilities, as well as improvements, have been made based on the demand from time to time. The facilities used are continuously under review by the governing board of the Applicant with input from the concessionaire.

(iii) AGENCY COORDINATION

Consultation with the counties of Yuba, Placer and Nevada did not result in any recommendation regarding the recreation use of the Camp Far West Reservoir. County planning staff indicated that Camp Far West probably is used primarily by people living to the south and west. People living in Nevada and Placer counties, except those close to the project site, tend to use other reservoirs or lakes lying to the north and east.

The California Outdoor Recreation Resources Plan was prepared in 1974 and is currently being updated. It contains no specific recommendations for recreation development in or near the project area. The California Trails Plan consists of a statewide evaluation to identify potential locations for hiking and equestrian, boating, off-road vehicular, and bicycle trails. No locations have been identified at or near the project area. No recommendations for recreation development as part of the project were made by state agencies.

The California Department of Parks and Recreation has gone on record, through its letter of consultation (April 24, 1980), indicating its interest in reviewing FERC license applications. Their interests are as follows:

- existing environmental features and recreation facilities or opportunities will be destroyed or damaged to the minimum degree feasible.
- where such destruction or damage in unavoidable, maximum feasible mitigation measures will be undertaken as a project purpose and funded as a project cost.
- where there are opportunities for environmental enhancement and the provision of new and/or improved recreation facilities or opportunities, these will be provided as a project purpose and funded as a project cost.

The U.S. Heritage Conservation and Recreation Service has suggested, through its May 8 letter of consultation, that the following points be considered:

- The recreation analysis should consider the overall recreation needs in the area.
- Recreation management responsibilities and agreements should be included in the recreation plan documentation.
- Consider the affects of existing and proposed projects in the vicinity.
- Consider the affects of the reservoir operation on existing and proposed recreation.
- Consider the recreation capacity of the lake as a possible indicator of the optimum design load of the on-shore facilities.
- Suggested the Corps of Engineers Recreation Evaluation studies and use-data be investigated for possible application to this project.

The addition of a powerplant will not destroy, damage or interfere with any of the recreation facilities now available to the public nor will it alter any environmental features. The Applicant, through its governing board, with input from the concessionaire will make adjustments to its recreation facilities on an as needed basis. Applicant has not rejected any recommendations for recreation adjustment from any state or local agency.

The level of recreational use will continue to vary yearly depending on many factors including the timing and extent of reservoir drawdown. The level of recreation use will not be affected by the generation of electrical power. Should the Garden Bar Reservoir be constructed upstream of the Camp Far West Reservoir, its releases would probably enable the water surface elevation of the Camp Far West Reservoir to be held at a higher elevation than at present. The higher minimum water surface elevation would have a beneficial affect on recreational use and power generation.

(iv) FACILITIES TO BE USED IN THE FUTURE

The present recreational facilities will continue to be available for public use and maintained in a condition which provides for public safety and enjoyment. Buoys within the reservoir denote areas which are unsafe for public use. Recreation is not permitted on the dam and public access to the area downstream of the dam and the point of diversion for irrigation is restricted.

Entities responsible for recreation at the Camp Far West Reservoir are (1) the South Sutter Water District and (2) Camp Far West Investors, Inc. (Concessionaire).

No waters or lands have been designated for study under the provisions of Wilderness Act or recommended for inclusion in the National Wild and Scenic Rivers System or Wilderness System, respectively.

The following tables and drawing are included in this section:

Table E5-1	Summary of location, types, and number of recreational facilities
Table E5-2	Total annual recreation use in visitor-days, Camp Far West Reservoir
Exhibit E Sheet 1	Existing Recreational Facilities

TABLE E5-1

SUMMARY OF LOCATION, TYPES, AND NUMBER OF RECREATIONAL FACILITIES

Facility	South Recreation Activity Area (No. Units)	North Recreation Activity Area (No. Units)
Overnight Campsites	67	25
Overnight Campsites (group)	1	--
Day-use Picnic Sites	37	71
Day-use Picnic Sites (group)	--	--
Recreation Vehicle Sites	--	10
Boat Ramps	1	1
Beaches	1	1
Water Treatment Plants	1	1
Sanitary Buildings, Sewage Lagoons	1	1

NOTE: Concession Agreement was amended May 8, 1979.

Source: Recreation files located at the South Sutter Water District Office, Nicolaus, California.

TABLE E5-2

TOTAL ANNUAL RECREATION USE IN VISITOR-DAYS[1]/
CAMP FAR WEST RESERVOIR

Year	Overnight-Use	Day-Use	Totals	Comments
1978	84,084	50,380	134,464	3/
1977	16,284	6,360	22,644	2/, 3/
1976	29,556	34,004	63,560	2/, 3/
1975	51,300	57,877	109,177	4/
1974	49,152	52,832	101,984	4/
1973	32,940	46,115	79,055	4/
1972	33,350	55,500	88,850	4/
1971	26,400	54,900	81,300	4/
1970	26,400	69,420	95,820	4/
1969	8,000	45,000	53,000	5/
1968	4,000	39,000	43,000	6/
1966	3,000	51,790	54,790	7/
1966	0	32,750	32,750	7/
1965	0	25,560	25,560	7/

1/ Visitor-days are defined as a measure of recreation use by one person for one day or part of a day. One person may participate in several activities during one 24-hour day, but it is still considered as one visitor-day.

2/ Drought years.

3/ 92 overnight campsites; 10 recreation vehicle sites; 108 day-use picnic sites.

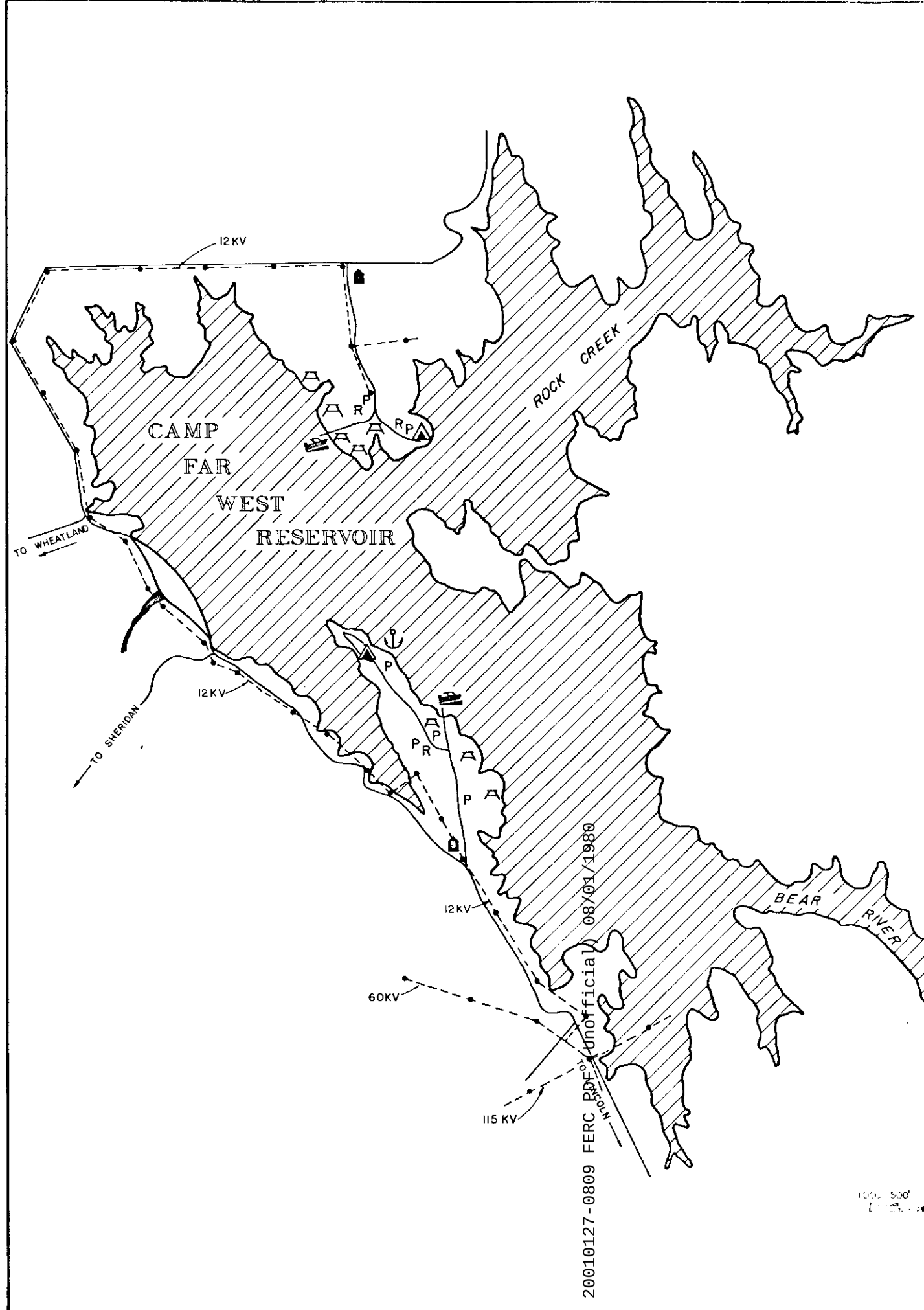
4/ 52 overnight campsites; 108 day-use picnic sites.

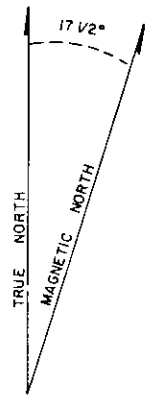
5/ 52 overnight campsites; 130 day-use picnic sites.

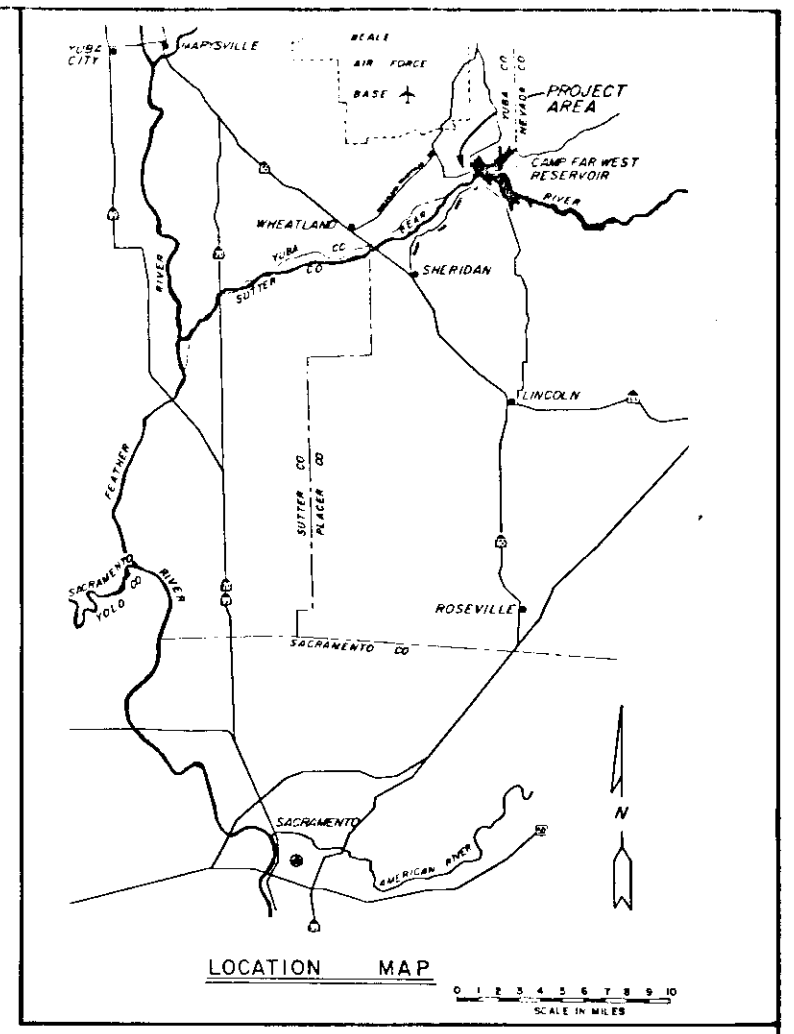
6/ 0 overnight campsites; 130 day-use picnic sites.

7/ 0 overnight campsites; 200 day-use picnic sites.

Source: South Sutter Water District Files "Annual Report on Recreation Operation at Projects Financed under the Davis-Grunsky Act", Department of Water Resources Form #2064.







LEGEND

- Entrance
- R Rest Rooms
- P Parking
- Picnicking
- Camping
- Marina
- Boat Ramp
- Maximum Normal Pool Level
- Existing Transmission Lines

EXHIBIT E SHEET 1

EXISTING RECREATION FACILITIES

CAMP FAR WEST DAM & RESERVOIR
WATER POWER PROJECT

Owner:	Engineer:
SOUTH SUTTER WATER DISTRICT	PARSONS BRINCKERHOFF QUADE & DOUGLAS INC.

The following letters of consultation from agencies responsible for recreation are included in this section:

- California Department of Parks and Recreation
- U.S. Heritage Conservation and Recreation Service

STATE OF CALIFORNIA—THE RESOURCES AGENCY EDMUND G. BROWN JR., Governor

DEPARTMENT OF PARKS AND RECREATION
P. O. BOX 2390
SACRAMENTO 95811
(916) 322-9623

APR 24 1980

Mr. Thomas L. Sands
Parsons Brinkerhoff
1540 River Park Drive
Suite 202
Sacramento, CA 95815

Dear Mr. Sands:

Camp Far West Hydro Project FERC License
Application, Exhibit "E" Environmental Report

This is provided as a summary of the scope and substance of our meeting on March 5, 1980 regarding your FERC license application and future development of the Exhibit E (Environmental Report). Based on your description, I understand that the subject project involves generating power with water passing an existing dam and reservoir without altering the existing reservoir water level operations or periods of water fluctuation. I further understand that existing recreational facilities operated by the South Sutter Water District through a concessionaire include about 100 campsites, two boat ramps, and picnic areas.

1. Need for Recreation Facilities

Through the use of the PARIS (Park and Recreation Information System) computer model, a statewide projection of need for various kinds of recreation facilities is allocated among the state's counties. We discussed the figures which apply to Yuba, Nevada, and Placer Counties which were provided together with a PARIS "User's Guide." It is important to recognize that these figures display the relative need for facilities and should be used as a tool to accomplish site specific planning to meet stated recreation deficiencies for the area. Also, these figues are based on 1970 population data with projections for 1980 and 1990. We expect that a recreation plan will be developed as part of your application and will include consideration of the identified deficiency projections.

2. Comprehensive Outdoor Recreation Planning

The California Outdoor Recreation Resources Plan (CORRP) was published in 1974 and much of the information is still quite useful. The Department is currently finalizing a report for Planning District 3, in which the Camp Far West Reservoir is located. This document will contain certain findings which you may find useful in developing your

application. I will provide a copy when it is available. No additions to the State Park System near Camp Far West Reservoir are planned.

The Department has conducted a study of recreation trails throughout California and has designated certain linear system for inclusion in the California Recreational Trails Plan. The documents provided to you are entitled as follows:

1. Summary: California Recreational Trails Plan, May 1978
2. Hiking and Equestrian Trails in California, May 1978
3. Boating Trails for California Rivers: State of California, The Resources Agency, May 1978
4. Off-Highway Vehicle Recreation in California, May 1978
5. Bicycling in California: A Recreation Perspective, May 1978

3. State Parks

The nearest State Park System units to the Camp Far West Reservoir are Folsom Lake State Recreation Area located at Folsom Lake and Empire Mine State Historic Park near Grass Valley. These units are located about thirty and fifty highway miles from the project, respectively. You should also be aware that during 1979 the Folsom area served 2,132,252 visitors, 107,791 boats were launched, and the area was closed four days during 1979 because of capacity facility use. Located 41 miles from the Sacramento metropolitan area, Camp Far West Reservoir has the potential to reduce the recreation pressure on Folsom Lake.

4. Department Interest

The Department's interest in reviewing FERC license applications will be as follows:

1. existing environmental features and recreation facilities or opportunities will be destroyed or damaged to the minimum degree feasible.

2. where such destruction or damage is unavoidable, maximum feasible mitigation measures will be undertaken as a project purpose and funded as a project cost.

3. where there are opportunities for environmental enhancement and the provision of new and/or improved recreation facilities or opportunities, these will be provided as a project purpose and funded as a project cost.

The capacity of the State of California, in terms of staff and data, is limited. We will provide whatever assistance we can to the applicant, but the burden of effort for project evaluation and the development of mitigation and recreation plans rests with the applicant. Our role will be not so much one of technical assistance than that of reviewer of the applicant's proposals and draft plans. Our comments on such materials will be transmitted directly to the applicant, to HCRS, and to FERC.

If you should need additional information, please do not hesitate to contact me.

Sincerely yours,

Ken Martin

Ken Martin, Supervisor
CORRP Unit

United States Department of the Interior

HERITAGE CONSERVATION AND RECREATION SERVICE
PACIFIC SOUTHWEST REGION
SAN FRANCISCO, CALIFORNIA 94102
450 Golden Gate Avenue Box 36062

IN REPLY REFER TO:

PSW 200

MAY 8 1980

Mr. Joel R. Kushins, P. E.
Parsons Brinckerhoff
1540 River Park Drive - Suite 202
Sacramento, CA 95815

Dear Mr. Kushins:

This letter documents the coordination with our agency undertaken by your organization in the preparation of your client's application for license from FERC to construct and operate the Camp Far West Hydro Project (FERC #2997).

Your initial contact with us by telephone was followed by a briefing by you in our office on March 6, 1980. At that meeting, we explained our mission, responsibilities, and general requirements of recreation plans for FERC licenses. Since we were not acquainted with the project features prior to your briefing, we did not attempt to assess specific needs in the short period of our meeting. However, points which we suggested be considered include the following:

1. The recreation analysis should consider the overall recreation needs in the area.

2. Recreation management responsibilities and agreements should be included in the recreation plan documentation.

3. Consider the effects of existing and proposed projects in the vicinity.

4. Consider the effects of the reservoir operation on existing and proposed recreation.

5. Consider the recreation capacity of the lake as a possible indicator of the optimum design load of the on-shore facilities.

6. Suggested the Corps of Engineers Recreation Evaluation studies and use-data be investigated for possible application to this project.

7. California Parks and Recreation "PARIS" data may need adjusting in some respects due to changes in driving habits in the past few years because

of increasing fuel costs.

We also referred you to HCRS's publication on carrying capacity and provided you with our brochure on our role in licensing hydroelectric projects.

Since we have not received any completed application documents from you, we have not been able to comment on the results of your planning process. However, our formal comments will be included in the Department of the Interior's comments to the FERC when the application is submitted for official review.

Sincerely,

Gerald R Christensen

for Louis C. Penna
Chief, Division of Federal Coordination
and Landmarks

EXHIBIT E

SECTION 6

LAND MANAGEMENT AND AESTHETICS

6. LAND MANAGEMENT AND AESTHETICS

(i) DESCRIPTION OF EXISTING DEVELOPMENT

Land use within the project consists of about 360 acres which have been developed for intensive day and overnight recreation use with the balance of the project lands generally available for grazing and low intensity recreation. The Camp Far West Dam and Reservoir and the facilities associated with recreation are the only developments located within the project boundary.

(ii) DESCRIPTION MEASURES TO PROTECT PROJECT LAND

The addition of a powerplant will result in a very minor change to the landscape. The powerhouse structure will be totally below the existing ground line and will be located adjacent to the existing outlet structure. The powerhouse area is not readily visible from public roads or other public use areas nor is the public allowed to use the powerhouse area.

The 60kv transmission line will use the same alignment as the existing 12kv. The wooden poles supporting the conductors will, for much of its 2-mile length, be screened from the county road and the south recreation area. The county road and the south recreation area has the closest public access to alignment of the 12kv transmission line.

Work limits, within which construction activities must be confined, will be specified to avoid working on steep slopes and in sensitive areas to the extent practical. Work areas will also be limited in size to areas as small as practical to minimize the extent of the total area disturbed during construction.

Slopes when brought to final grade will be smooth, stabilized, and seeded with fast growing annual and perennial grasses to establish a suitable ground cover which will blend with undisturbed areas. The exterior surfaces of the powerhouse will be composed of materials which are visually compatible with existing facilities.

The existing gravel access road to the powerhouse area will be used for construction and resurfaced with gravel and dressed after construction.

The transmisson line right-of-way will be cleared of trees only to the extent required for the safe and reliable transmission of power. Limbs will be trimmed from trees where a reasonably well formed and healthy tree would remain that could function as a visual buffer from public use areas. Construction traffic in the right-of-way will be controlled to minimize vehicular impacts. Ruts and scarred areas, other than immediately around the poles, will be reseeded with appropriate grasses.

Excavation spoil will be used for productive purposes, within sound engineering and environmental limits. Spoil areas will be graded to blend into the surrounding terrain, stabilized, and seeded to establish a permanent ground cover.

Vegetation along the banks and within the Bear River in and around the powerhouse will not be affected by project operation. About 75 feet of existing stream bank, a portion of which has vegetation, will require excavation during construction of the tailrace channel. The affect on the river channel and its associated plant community is negligible.

(iii) DESCRIPTION OF FLOOD PLAINS

Flood plain maps provided by the Department of Water Resources and Yuba County for the Bear River downstream of the Camp Far West Dam show the 100 year flood at a distance of about one mile downstream from the dam to be 145 feet elevation. This elevation is essentially within existing river banks and no houses or other buildings are located within the flooded zone. Neither construction nor operation of the project will affect the elevation of the 100 year flood.

Applicant controls the land use within the project boundary, shown on Exhibit G Sheet 1, and will continue to use it as a buffer for the life of the project. Applicant has approved the construction and use of a floating marina by the recreation concessionaire to service recreation users. Any additional facilities would require the approval of Applicant and the California Department of Water Resources.

(iv) COST OF BUFFER ZONE

The requirement is not applicable as the land surrounding the reservoir is owned by the Applicant and within the project boundary.

(v) DESCRIPTION OF PROJECT LAND AND RESERVOIR USE POLICIES

The Applicant does not have a policy that specifically restricts development of shoreline facilities but any such development would require board action and approval of the California Department of Water Resources.

EXHIBIT F

DESIGN DRAWINGS

EXHIBIT F

GENERAL DESIGN DRAWINGS

The existing and proposed facilities and powerhouse plan sections for the Camp Far West Dam and Reservoir Water Power Project are shown on Sheets 1 and 2 of Exhibit F. The principal features of the proposed facilities will consist of:

- reinforced concrete intake structure located approximately 350 feet south of the existing intake
- reinforced concrete lined power tunnel located in the left abutment
- reinforced concrete powerhouse sited at the terminus of the power tunnel and whose location will be approximately 100 feet from the existing outlet structure
- 60kv transmission line that will be supported by new wood poles that will follow the alignment of the existing 12kv transmission line

The existing facilities, completed in 1964, consist of a zoned earthfill dam, an ungated overflow spillway located on the right abutment and an outlet works located at the foundation level through the embankment of the dam. Design and construction of the existing facilities required the review, inspection and approval of the State of California, Division of Safety of Dams and the U.S. Water and Power Resource Service (formerly USBR). The dam and facilities are inspected annually by both parties and therefore, the adequacy of the dam, spillway and outlet works for continued use is not considered a problem. Design parameters for the dam embankment, spillway and outlet works were as follows:

(a) <u>Dam Embankment</u>

- The slopes are stable and resistant to deformation under all operating conditions, including rapid reservoir drawdown
- Seepage through the embankment and its abutments and foundation is controlled so that piping and sloughing will not occur.
- The embankment is safe from overtopping by both flood inflow and wave action.
- The embankment is safe from catastrophic failure during reasonably expectable earthquakes at the site.

- The slopes are safe from excessive damage from wave action or rain.

Stability analysis results of the dam embankment, as determined by the State of California, Division of Safety of Dams show the following:

Loading Condition	Water Surface Elevation	Seismic Factor	Soil Property	Factor of Safety
Submerged U/S slope	225	0	$\emptyset$ = 28°C = 0	1.27
			$\emptyset$ = 31°C = 0	1.36
Submerged U/S slope	225	0.1g	$\emptyset$ = 28°C = 0	0.91
			$\emptyset$ = 31°C = 0	0.96
Steady Seepage D/S slope	300	0	$\emptyset$ = 28°C = 0	1.42
			$\emptyset$ = 31°C = 0	1.59
Steady Seepage D/S slope	300	0.1g	$\emptyset$ = 28°C = 0	1.06
			$\emptyset$ = 31°C = 0	1.19

(b) Spillway

The spillway is designed to pass the probably maximum flood with a residual freeboard of 3.7 feet. The probably maximum flood (PMF) when routed through the reservoir has a peak outflow value of 75200 cfs. The reservoir water surface reaches 316.3 feet MSL. The PMF is also the design flood used for performing structural and stability analysis of the project facilities. Except for the ogee crest portion which is constructed of reinforced concrete the remainder of the spillway is unlined and located in sound rock composed of metavolcanics. The lower portion of the spillway has eroded to expose sound rock and is inspected annually after each winter spill season. No safety hazard has resulted from this action. The spillway discharge curve is shown on Plate F-1.

(c) Outlet Works

The outlet works is designed to structurally withstand static and dynamic loadings and hydraulically to pass a maximum of 600 cfs when the reservoir is at elevation 300 feet msl.

The 48-inch outlet conduit is composed of a 1/4 inch steel liner encased by reinforced concrete from the intake structure to the valve chamber which is located at the center of the dam. For the remainder of its length, the steel liner is housed in a reinforced concrete horseshoe tunnel. The interior of the steel liner is coated with coal-tar-enamel to provide protection from corrosion.

At the terminus of the 48-inch pipe is a Howell-Bunger valve that is used to regulate the amount of discharge and to serve as a energy dissipator.

The outlet will continue to be used as may be necessary for maintaining flows required for irrigation and/or fish and wildlife.

PROPOSED FACILITIES

(a) Power Tunnel

The power tunnel as proposed will be 84 inches in diameter and lined with a minimum thickness of 12 inches of reinforced concrete and be approximately 760 feet in length. Hydraulically the tunnel is designed to pass a maximum of 725 cfs. This results in water velocities through the tunnel of 18 feet per second under the maximum operating condition. Structurally the tunnel will be designed for static and dynamic loadings. The maximum static head will be 176 feet or 76 psi. The dymamic loading will result from pressure rise due to surges from valve closure (water hammer). The maximum pressure rise due to water hammer is 186 feet or 81 psi. Therefore, a surge chamber was not provided for.

The tunnel will be located in the left (south) abutment and in the meta-volcanic rock underlying the dam. Existing geologic information indicates sound rock (unweathered, moderately fractured, and with clean and tight joints or fractures) exists at tunnel elevation for nearly the full tunnel length. The sound rock surface has an apparent strike of approximately N 60° E and dips northerly, essentially parallel to the dam centerline, at about 1 vertical to 4 horizontal. A geotechnic program is planned to refine the geologic definition and to provide design information.

The tunnel lining will be reinforced concrete with a minimum thickness of 12 inches. The reinforcing steel will be designed to resist the full static head and for close control of any shrinkage cracking and elimination of service spalling. Contact grouting will be specified to insure full structural contact with the surrounding rock, thereby providing an additional structural safety factor. Open joints disclosed during construction will be grouted to increase the rock structural capacity and to decrease any rock permeability due to jointing. The dynamic head will be resisted by a combination of one-third the overburden stress (with a maximum of 35 psi), low tensile concrete stress (.03 f') and an increase in allowable steel stress (20%). Concrete will be specified to have an ultimate compressive strength (f'_c) of 4000 pounds per square inch (psi) at 28 days. Grade 60 reinforcing steel will be specified with an allowable (static) load working stress of 24,000 psi.

It is anticipated that rock reinforcement will provide adequate construction support for nearly all of the tunnel length; a reinforcement pattern of 5 radial steel dowels, 7 feet long and spaced at 5-foot centers along the tunnel is planned and will be refined as additional geologic data and conditions exposed during construction warrant. The dowels will be fully encapsulated with an epoxy resin to assure full length bonding with the rock and to provide long term protection as an added structural safety factor. Structural steel sets will also be used as required in the portal areas.

(b) Intake Structure

The intake tower structure will be at the center of a depression where the ground elevation is approximately 215 feet msl. The intake structure will consist of a reinforced concrete tower extending to an elevation of 209 feet msl with the invert at elevation 187 msl. The tower will have openings on three sides, two at 10 by 14 feet and one at 10 by 10 feet. The top of the tower will have a concrete hood with permanent steel trashracks on six-inch bar spacing installed in the 10 by 14 foot opening and a removal trashrack installed in the 10 by 10 opening. A concrete bulkhead will enable positive closure. The bulkhead will have to be set into place by underwater divers as is done wth the existing intake structure. An approach channel to the structure will be considered. The channel invert will be at elevation 195, two feet below the spill elevation of the intake tower which would be at elevation 197.

Velocities through the intake were limited to less than 3 feet per second for normal operating conditions. In the event clogging of the trashrack take place, it has been assumed that no more than 50 percent of the clear opening would be affected. Under this condition, velocities through the intake will remain below 5 fet per second.

The intake tower will be supported by competent rock. Geologic information indicates the rock to be fresh moderately fractured metavolcanics which are structurally competent to support the loads of the tower structure.

(c) Powerhouse

The powerhouse will be approximately 65 feet long by 45 feet wide. Construction will be reinforced concrete. The powerhouse substructure will be supported by sound rock. The top of the powerhouse will be at the same elevation as the surrounding parking area. Therefore, no portion of the powerhouse will protrude above the existing ground line except for the access structure located at the southeast corner and the powerhouse perimeter parapet wall. Rock support will be available for construction of the powerhouse walls throughout their height.

The powerhouse will house one 6800kw hydraulic turbine-driven alternating current generator and associated equipment and controls.

Structural design data utilized for design of the project civil works facilities is as follows:

(d) Working Stresses

Concrete strength - fs' = 3000 psi @ 28 days
Steel reinforcement - fs = 20000 psi in flexure

(e) Miscellaneous

Seismic - 0.10 x g
Uplift: 100% over 100% of area
Maximum Static Water Pressure in Scrollcase (elev. 316.3 msl for flood) 76 psi
Maximum Water Pressure Including Water Hammer in Scrollcase - 81 psi

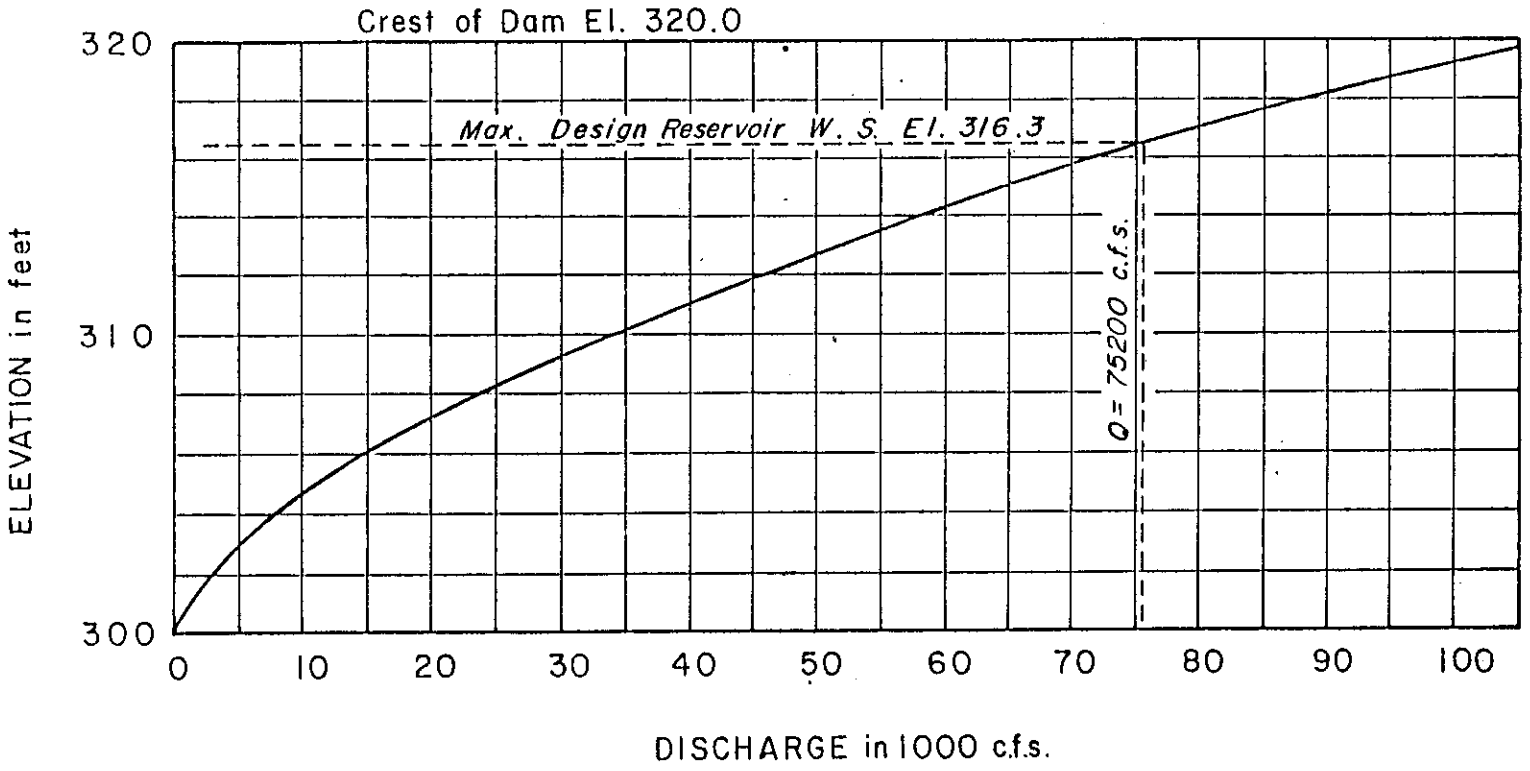
The following plate and drawings are included in this Exhibit:

Plate F-1 Spillway Discharge Curve

Drawings:

Exhibit F Sheet 1 Existing and Proposed Facilities

Exhibit F Sheet 2 Powerhouse Plan and Sections



SOUTH SUTTER WATER DISTRICT
CAMP FAR WEST DAM & RESERVOIR
WATER POWER PROJECT

SPILLWAY DISCHARGE CURVE

Parsons Brinckerhoff Quade & Douglas Inc.

Plate F-1

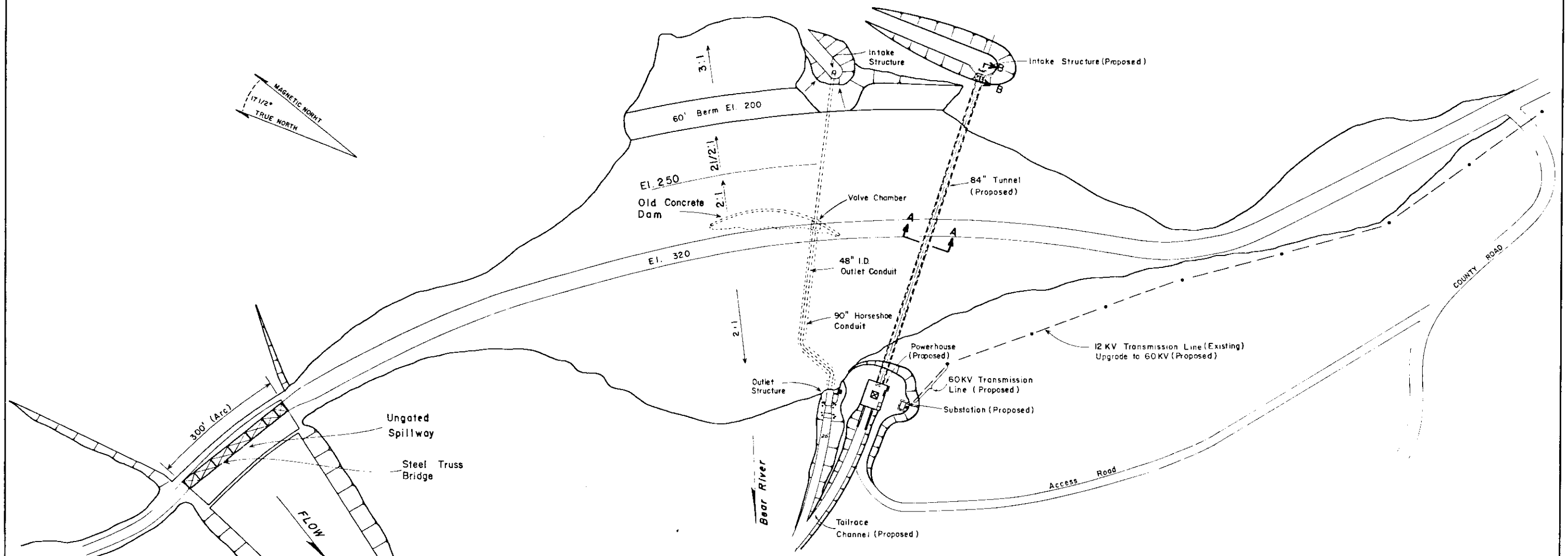
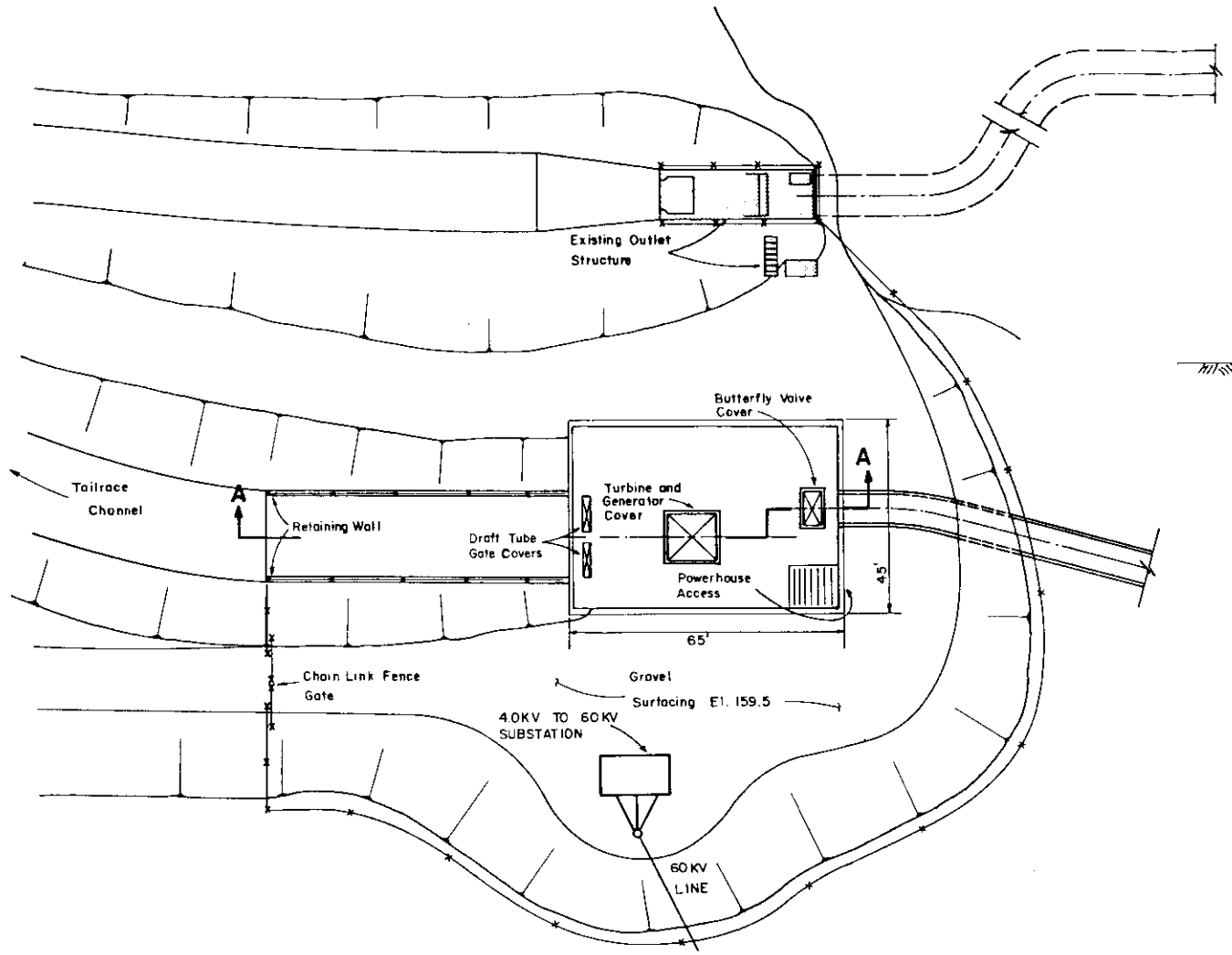


EXHIBIT F SHEET 1

EXISTING & PROPOSED FACILITIES

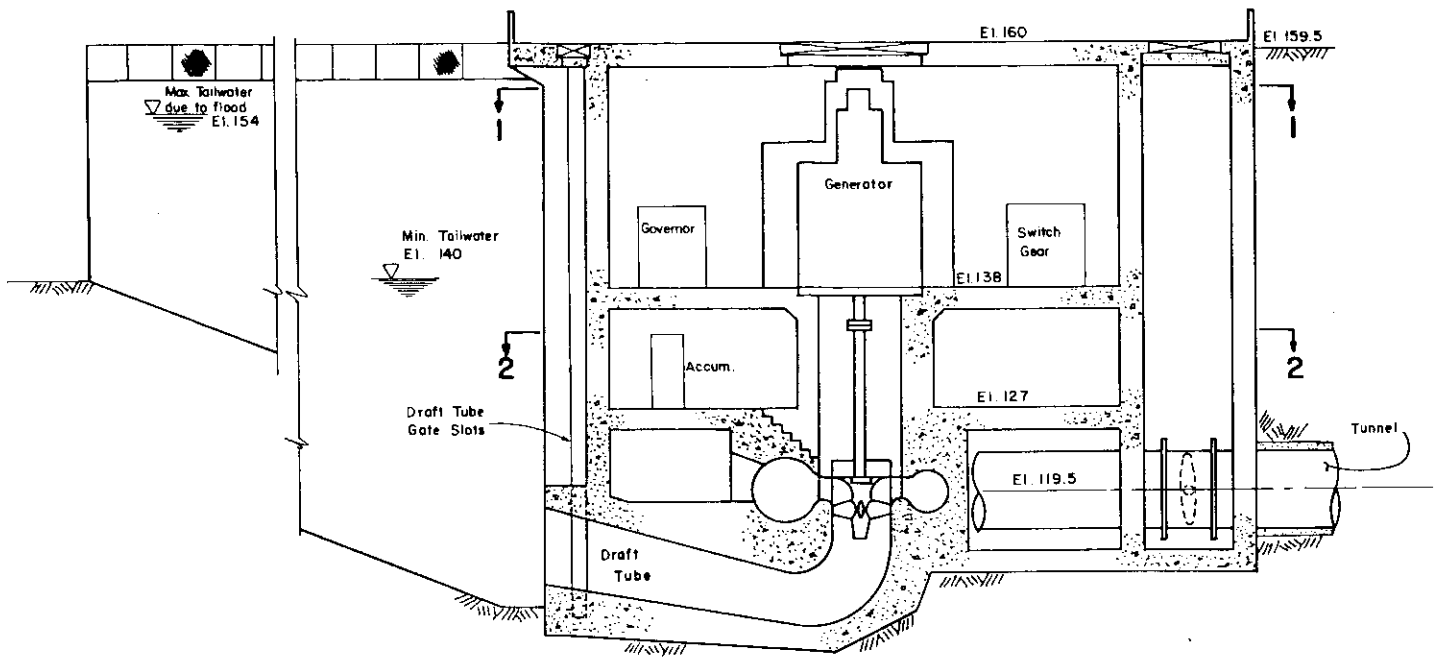
CAMP FAR WEST DAM & RESERVOIR
WATER POWER PROJECT

Owner:	Engineer:
SOUTH SUTTER WATER DISTRICT	PARSONS BRINCKERHOFF QUADE & DOUGLAS INC.



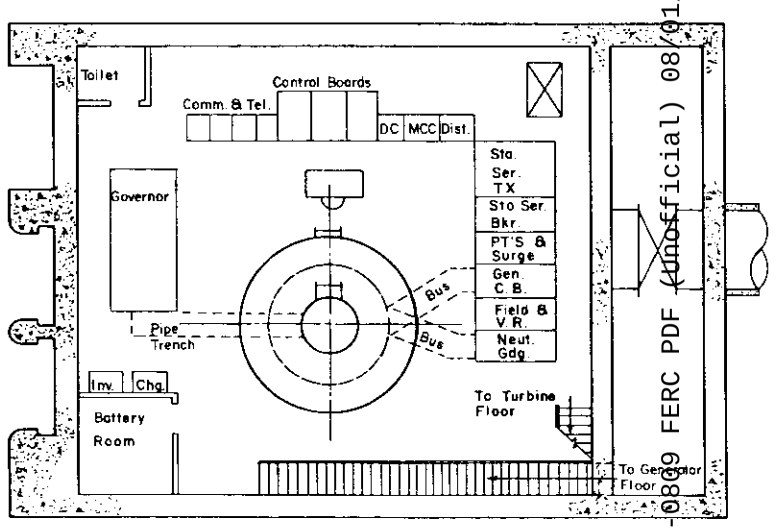
SITE PLAN

N.T.S.



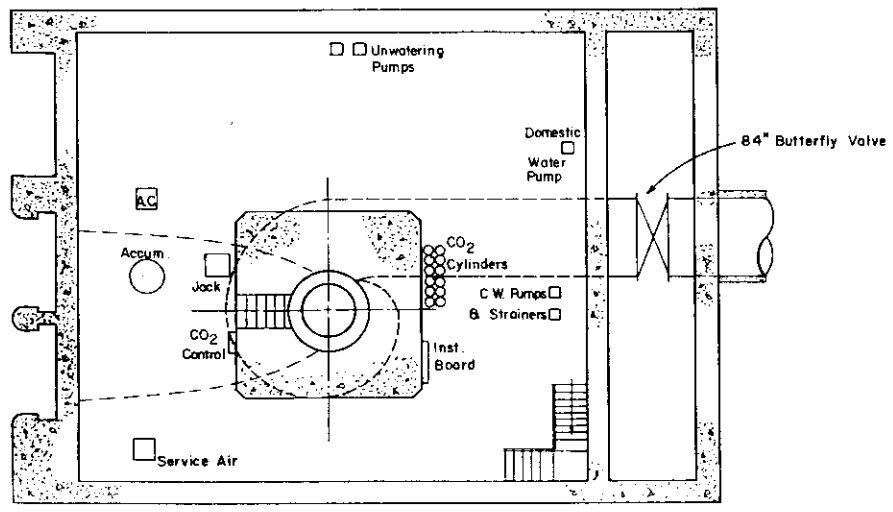
SECTION A-A

N.T.S.



GENERATOR FLOOR
SECTION 1-1

N.T.S.



TURBINE FLOOR
SECTION 2-2

N.T.S.

EXHIBIT F SHEET 2	
POWERHOUSE PLAN & SECTIONS	
CAMP FAR WEST DAM & RESERVOIR WATER POWER PROJECT	
Owner: SOUTH SUTTER WATER DISTRICT	Engineer: PARSONS BRINCKERHOFF QUADE & DOUGLAS INC.

EXHIBIT G

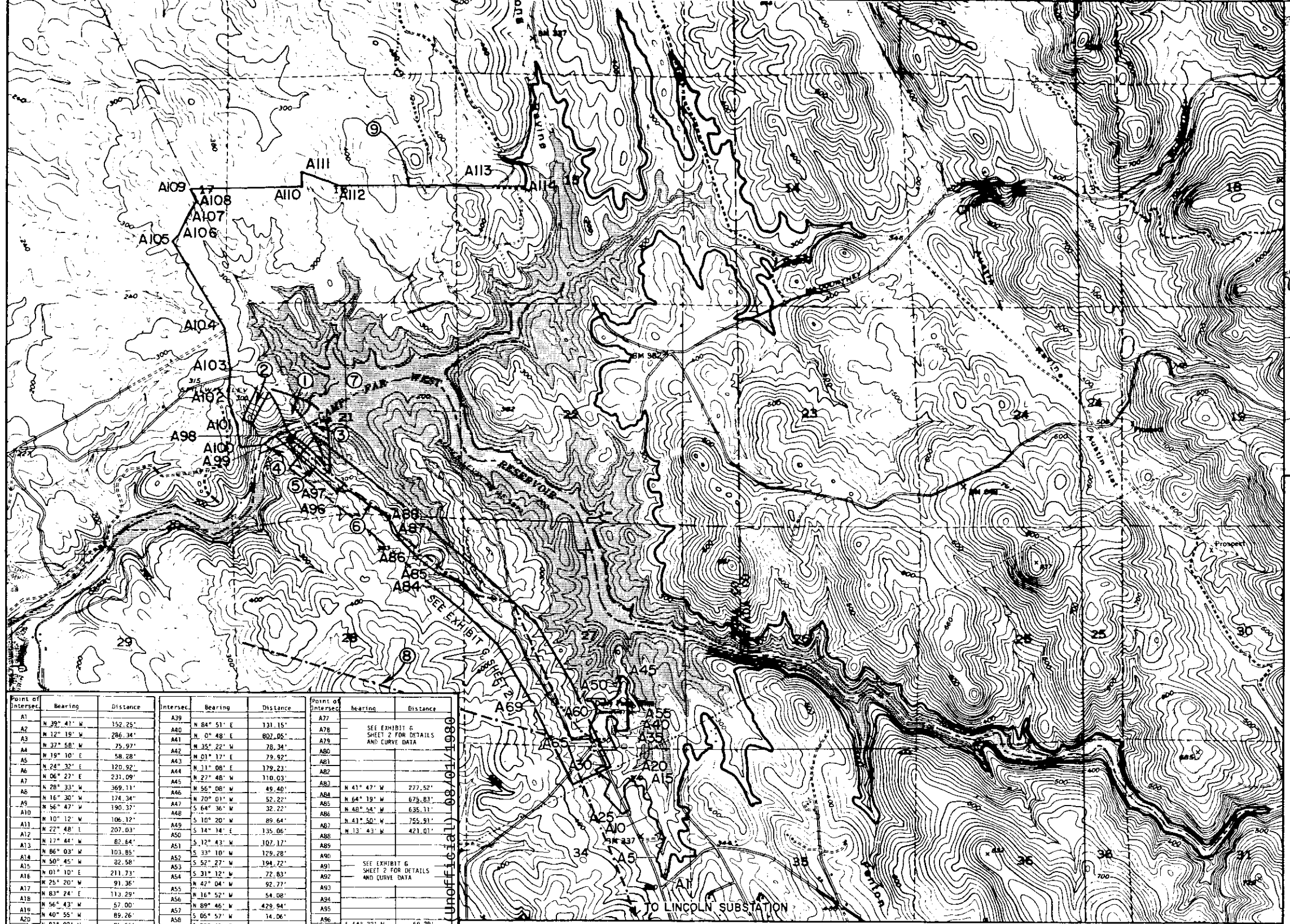
PROJECT MAPS

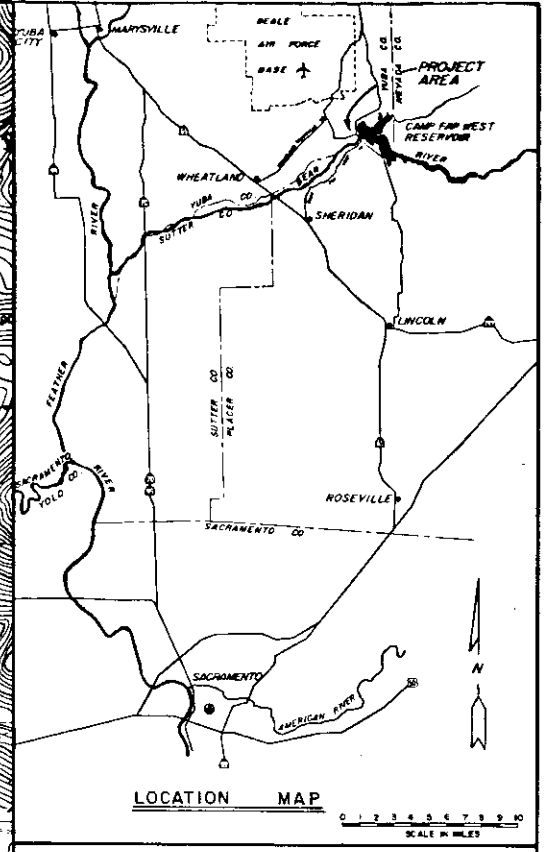
EXHIBIT G

PROJECT MAPS

The following drawings are included in this exhibit:

Exhibit G Sheet 1	General Map of Project Area
Exhibit G Sheet 2	Detail of Project Area





LOCATION MAP

SCALE IN MILES

LEGEND

1. Camp Far West Dam
2. Spillway
3. Outlet Works
4. Discharge Channel
5. Access Road to Outlet Works
6. 12 KV Transmission Line
7. Camp Far West Reservoir
8. 60 KV Transmission Line
9. Project Boundary

NOTE:

TOPOGRAPHY SHOWN ON THIS DRAWING WAS REPRODUCED FROM U.S.G.S. QUADRANGLE MAPS.

Point of Intersec.	Bearing	Distance
A1		
A2	N 39° 47' W	152.25'
A3	N 12° 19' W	286.34'
A4	N 37° 58' W	75.97'
A5	N 19° 10' E	58.28'
A6	N 24° 32' E	120.92'
A7	N 06° 27' E	231.09'
A8	N 28° 33' W	369.11'
A9	N 16° 30' W	174.34'
A10	N 56° 47' W	190.37'
A11	N 10° 12' W	106.12'
A12	N 22° 48' E	207.03'
A13	N 17° 44' W	82.64'
A14	N 86° 03' W	103.85'
A15	N 50° 45' W	82.58'
A16	N 01° 10' E	211.73'
A17	N 25° 20' W	91.36'
A18	N 83° 24' E	113.29'
A19	N 56° 43' W	57.00'
A20	N 40° 55' W	89.26'
A21	N 83° 02' W	85.66'
A22	S 32° 57' W	128.83'
A23	S 43° 47' W	72.37'
A24	S 01° 38' E	276.79'
A25	S 24° 40' E	280.49'
A26	S 56° 38' W	218.78'
A27	N 41° 25' W	608.42'
A28	N 20° 14' E	365.74'
A29	N 52° 36' W	428.99'
A30	N 63° 20' E	334.40'
A31	N 24° 40' W	385.06'
A32	S 89° 41' E	402.15'
A33	N 22° 28' W	456.87'
A34	N 07° 37' E	279.52'
A35	N 66° 09' E	86.18'
A36	S 44° 30' E	194.67'
A37	S 19° 00' W	138.00'
A38	S 24° 59' E	119.23'
A39	N 86° 50' E	122.18'

Intersec.	Bearing	Distance
A39		
A40	N 84° 51' E	131.15'
A41	N 0° 48' E	802.05'
A42	N 35° 22' W	78.34'
A43	N 01° 17' E	79.92'
A44	N 11° 08' E	179.23'
A45	N 27° 48' W	110.03'
A46	N 56° 08' W	49.40'
A47	N 70° 01' W	52.22'
A48	S 64° 36' W	32.22'
A49	S 10° 20' W	89.64'
A50	S 14° 14' E	135.06'
A51	S 12° 43' W	107.17'
A52	S 33° 10' W	129.28'
A53	S 52° 27' W	194.72'
A54	S 31° 12' W	72.83'
A55	N 42° 04' W	92.77'
A56	N 16° 52' W	54.08'
A57	N 89° 46' W	429.94'
A58	S 05° 57' W	14.06'
A59	S 28° 48' E	120.89'
A60	S 28° 46' E	200.33'
A61	S 04° 38' E	86.28'
A62	S 22° 37' W	426.70'
A63	S 63° 03' W	45.17'
A64	N 23° 53' W	269.90'
A65	N 82° 15' E	52.05'
A66	N 23° 53' W	95.52'
A67	S 87° 25' W	471.97'
A68	N 24° 27' W	966.63'
A69	N 41° 44' W	300.23'
A70	N 89° 48' W	80.00'
A71		
A72	SEE EXHIBIT G SHEET 2 FOR DETAILS AND CURVE DATA	
A73		
A74		
A75		
A76		
A77		

Point of Intersec.	Bearing	Distance
A77		
A78	SEE EXHIBIT G SHEET 2 FOR DETAILS AND CURVE DATA	
A79		
A80		
A81		
A82		
A83	N 41° 47' W	277.52'
A84	N 64° 19' W	673.83'
A85	N 48° 54' W	635.11'
A86	N 41° 50' W	755.91'
A87	N 13° 43' W	421.01'
A88		
A89		
A90		
A91	SEE EXHIBIT G SHEET 2 FOR DETAILS AND CURVE DATA	
A92		
A93		
A94		
A95		
A96		
A97	S 64° 22' W	69.29'
A98	N 47° 39' W	1938.60'
A99	S 53° 07' W	385.29'
A100	S 85° 51' W	356.03'
A101	N 08° 30' W	661.80'
A102	N 17° 18' W	595.10'
A103	N 06° 59' E	847.61'
A104	N 07° 45' W	825.30'
A105	N 23° 59' W	7334.82'
A106	N 44° 55' E	338.56'
A107	N 26° 50' E	536.27'
A108	N 29° 22' E	210.56'
A109	N 25° 33' W	573.24'
A110	N 89° 51' W	7610.57'
A111	N 02° 37' W	368.00'
A112	N 69° 20' W	1018.40'
A113	N 89° 51' W	2732.03'
A114	N 88° 06' W	1622.70'

1000' 50' 0 1000' 2000' 3000' 4000' 5000'

SCALE 1" = 1000'

17½°

TRUE NORTH

MAGNETIC NORTH

EXHIBIT G SHEET 1

GENERAL MAP OF PROJECT AREA

CAMP FAR WEST DAM & RESERVOIR
WATER POWER PROJECT

Owner:	Engineer:
SOUTH SUTTER WATER DISTRICT	PARSONS BRINCKERHOFF QUADE & DOUGLAS INC.

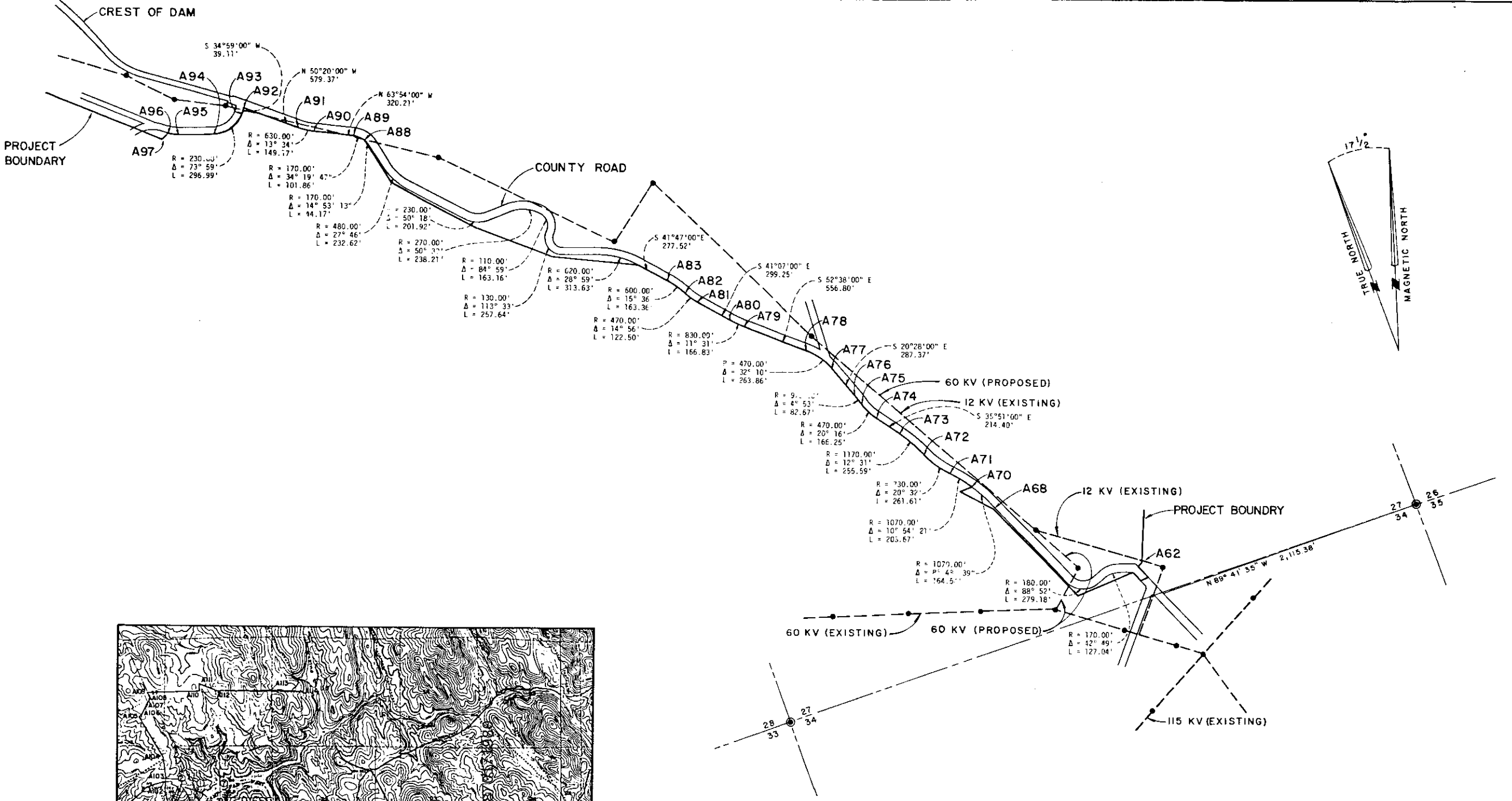


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EXHIBIT G SHEET 2	
DETAIL MAP OF PROJECT AREA	
CAMP FAR WEST DAM & RESERVOIR WATER POWER PROJECT	
Owner: SOUTH SUTTER WATER DISTRICT	Engineer: PARSONS BRINCKERHOFF QUADE & DOUGLAS INC.

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