

37 FERC P 62172 (F.E.R.C.), 1986 WL 79149

**1 Office Director Orders

Malacha Power Project, Inc.

Project No. **8296**-001

Order Issuing **License** (Major Project—Unconstructed)
(Issued December 2, 1986)

***63178** Richard T. Hunt, Director, Office of Hydropower **Licensing**.

Malacha Power Project, Inc. has filed a **license** application under Part I of the Federal Power Act (Act) to construct, operate, and maintain the Muck Valley Hydroelectric Project, located in Lassen County, California, on the Pit River. The project would occupy lands of the United States administered by the U.S. Bureau of Land Management.

Notice of the application has been published. No protests or motions to intervene were filed in this proceeding, and no agency objected to issuance of this **license**. Comments received from interested agencies and individuals have been fully considered in determining whether to issue this **license**, as discussed below.

Recommendations of Federal and State Fish and Wildlife Agencies

Section 10(j) of the Federal Power Act, as amended by the Electric Consumer Protection Act of 1986 (ECPA), [Pub. L. No. 99-495](#), requires the Commission to include **license** conditions based on recommendations of federal and state fish and wildlife agencies for the protection, mitigation and enhancement of fish and wildlife. The environmental assessment (EA) for the Muck Valley Project, which was prepared prior to ECPA, addresses the concerns of the federal and state fish and wildlife agencies, and makes recommendations consistent with those of the agencies.

The Resources Agency of California (RAC) by letters of April 25, 1986 and May 5, 1986 which conveyed the recommendations of the California Department of Fish and Game (CDFG) recommends a condition, not ***63179** discussed in the EA, that topsoil removed during construction should be stockpiled and replaced over areas designated for revegetation before reseeding. Implementation of such a procedure would assist in the reestablishment of vegetation on denuded areas, thereby minimizing overall adverse effects on vegetation. Article 410 requires the licensee to prepare and file for Commission approval a topsoil plan that provides for the removal and storage of topsoil from construction sites, including spoil stockpile sites, and the utilization of this topsoil on areas designated for revegetation.

Summary of Findings

An EA was issued for this project. Background information, analysis of impacts, support for related **license** articles, and the basis for a finding of no significant impact on the environment are contained in the EA attached to this order. Issuance of this **license** is not a major federal action significantly affecting the quality of the human environment.

The design of this project is consistent with the engineering standards governing dam safety. The project will be safe if constructed, operated, and maintained in accordance with the requirements of this **license**. Analysis of related issues is provided in the Safety and Design Assessment attached to this order.

The Commission issued a notice of intent to perform a cumulative impact assessment of the Pit River Basin on August 4, 1986.¹ A review of the agency comments regarding development of the proposed Muck Valley Project indicates that the Muck Valley Project would not contribute to any potential cumulative impacts within the basin.²

**2 No comprehensive plans of the type referred to in section 10(a)(2) of the Federal Power Act have been identified.

The Commission has reviewed the **license** application in relation to other state and federal plans, as follows:

1. Bureau of Land Management's Alturas Resource Management Plan - 1983
2. California Department of Parks and Recreation Plans 1981 - 1985
3. California Fish and Wildlife Plan - 1975
4. California Central Region Water Quality Control Board's Water Quality Control Plan - 1975
5. California Department of Water Resources, California Water Plan - 1983

Based upon the Commission's review of the above state and federal plans, agency and public comments, and the Commission's independent analysis, as discussed herein, it is concluded that the Muck Valley Project is best adapted to a comprehensive plan for the Pit River, taking into consideration the beneficial public uses described in section 10(a)(1) of the Federal Power Act.

The Director orders:

(A) This **license** is issued to Malacha Power Project, Inc. (licensee) for a period of 50 years, effective the first day of the month in which this order is issued, to construct, operate, and maintain the Muck Valley Hydroelectric Project. This **license** is subject to the terms and conditions of the Act, which is incorporated by reference as part of this **license**, and subject to the regulations the Commission issues under the provision of the Act.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, enclosed by the project boundary shown by Exhibit G:

Exhibit G-	FERC No. 8296-	Showing
1		40 Project Location
2		41 Project Boundary
3		42 Project Boundary

(2) Project works consisting of: (a) a 4.5-foot-high, 300-foot-long diversion dam at elevation 4,084 feet m.s.l.; (b) a 144-foot-long, 29.5-foot-high intake structure; (c) a 12-foot-diameter, 22,200-foot-long lined diversion tunnel; (d) a 9-foot-diameter, 4,000-foot-long, low pressure, underground conduit; (e) an 8-foot-diameter, 8,000-foot-long, penstock; (f) a powerhouse containing a single 29,900-kW generating unit; (g) a substation adjacent to the powerhouse containing a 12.^{47/115}-kV power transformer (h) a 16-mile-long, 115-kV transmission line interconnecting the project to the Pacific Gas and Electric Company's Pit No. 1 powerhouse; (i) a 1-mile-long access road; and (j) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of Exhibits A and F recommended for approval in the attached Safety and Design Assessment.

(3) All of the structures, fixtures, equipment or facilities used to operate or maintain the project and located within the project boundary, all portable property that may be employed in connection with the project and located within or outside the project boundary, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) The Exhibit G described above and those sections of Exhibits A and F recommended for approval in the attached *63180 Safety and Design Assessment are approved and made part of the **license**.

3 (D) This **license is subject to the articles set forth in Form L-2 (October 1975) (reported at 54 FPC 1808), entitled "Terms and Conditions of **License** for Unconstructed Major Project Affecting Lands of the United States," except article 20. The **license** is also subject to the following additional articles:

Article 201. The licensee shall pay the United States the following annual charge, effective the first day of the month in which this **license** is issued:

a. For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 39,900 horsepower.

b. For the purpose of recompensing the United States for the use, occupancy, and enjoyment of 81.21 acres of its lands, a reasonable annual charge as determined by the Commission in accordance with its regulations, in effect from time to time.

Article 202. Pursuant to Section 10(d) of the Act, after the first 20 years of operation of the project under **license**, a specified reasonable rate of return upon the net investment in the project shall be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. One half of the project surplus earnings, if any, accumulated after the first 20 years of operation under the **license**, in excess of the specified rate of return per annum on the net investment, shall be set aside in a project amortization reserve account at the end of each fiscal year. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year after the first 20 years of operation under the **license**, the amount of that deficiency shall be deducted from the amount of any surplus earnings subsequently accumulated, until absorbed. One-half of the remaining surplus earnings, if any, cumulatively computed, shall be set aside in the project amortization reserve account. The amounts established in the project amortization reserved account shall be maintained until further order of the Commission.

The annual specified reasonable rate of return shall be the sum of the annual weighted costs of long-term debt, preferred stock, and common equity, as defined below. The annual weighted cost for each component of the reasonable rate of return is the product of its capital ratio and cost rate. The annual capital ratio for each component of the rate of return shall be calculated based on an average of 13 monthly balances of amounts properly includable in the licensee's long-term debt and proprietary capital accounts as listed in the Commission's Uniform System of Accounts. The cost rates for long-term debt and preferred stock shall be their respective weighted average costs for the year, and the cost of common equity shall be the interest rate on 10-year government bonds (reported as the Treasury Department's 10-year constant maturity series) computed on the monthly average for the year in question plus four percentage points (400 basis points).

**4 *Article 203.* The licensee shall clear and keep clear to an adequate width all lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which result from maintenance, operation, or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All clearing of lands and disposal of unnecessary material shall be done with due diligence to the satisfaction of the authorized representative of the Commission and in accordance with appropriate federal, state, and local statutes and regulations.

Article 301. The licensee shall commence construction of project works within two years from the issuance date of the **license** and shall complete construction of the project within four years from the issuance date of the **license**.

Article 302. The licensee shall at least 60 days prior to start of construction of project structures, submit one copy to the Commission's Regional Director and two copies to the Director, Division of Inspections, of the final contract drawings and specifications for pertinent features of the project, such as water retention structures, powerhouse, and water conveyance structures. The Director, Division of Inspections, may require changes in the plans and specifications to assure a safe and adequate project.

Article 303. The licensee shall review and approve the design of contractor-designed cofferdams and deep excavations prior to the start of construction and shall ensure that construction of cofferdams and deep excavations is consistent with the approved design. At least 30 days prior to start of construction of the cofferdam, the licensee shall submit to the Commission's Regional Director and Director, Division of Inspections, one copy each of the approved cofferdam *63181 construction drawings and specifications and the letter(s) of approval.

Article 304. The licensee shall within 90 days of completion of construction file, for approval by the Commission, revised Exhibits A, F, and G to describe and show the project as built.

Article 401. The licensee, after consultation with the California Department of Fish and Game (CDFG), the California Regional Water Quality Control Board (RWQCB), and the Bureau of Land Management (BLM), and at least 60 days before starting any land-clearing or ground-disturbing activities, shall file with the Commission a plan to control erosion, sedimentation, turbidity, and instability of slopes resulting from excavation, spoil disposal activities, and other project construction and operation activities.

The plan shall include functional design drawings and topographic map locations of control measures, an implementation schedule, monitoring and maintenance programs for project construction and operation, and provisions for periodic review of the plan and for making any necessary revisions to the plan. The licensee shall document consultation with CDFG, RWQCB, and BLM on the plan and shall include copies of any agency comments or recommendations in the filing.

****5** If the licensee does not concur with agency comments or recommendations, the licensee shall provide a discussion of the reasons for not concurring, based on geological, soil, and groundwater conditions at the project site. The Commission reserves the right to require changes to the plan. Unless the Director, Office of Hydropower **Licensing**, directs otherwise, the licensee may begin land-clearing or ground-disturbing activities at the project 60 days after filing this plan.

Article 402. The licensee shall discharge from the Muck Valley Hydroelectric Project a continuous minimum flow of 50 cubic feet per second, as measured immediately downstream from the project diversion structure, or shall discharge the inflow to the diversion pool, whichever is less, for the protection of fish and wildlife resources in the Pit River. This flow may be temporarily modified if required by operating emergencies beyond the control of the licensee and for short periods upon mutual agreement between the licensee and the California Department of Fish and Game.

Article 403. The licensee, after consultation with the California Department of Fish and Game (CDFG), the U.S. Fish and Wildlife Service (FWS), and the Bureau of Land Management (BLM), shall design a diversion structure that allows the release of silt, sand, and gravel to downstream reaches of the Pit River to maintain aquatic habitat. The licensee, within 1 year of the date of issuance of this **license**, shall file the design plan for Commission approval along with comments on the design from CDFG, FWS, and BLM. The Commission reserves the right to require modifications to the design of the diversion structure to protect fish habitat.

Article 404. The licensee shall consult with the California Department of Fish and Game (CDFG) and U.S. Fish and Wildlife Service (FWS) on the final design of the trash racks, and within 1 year from the issuance date of this **license**, shall file with the Commission for approval, functional design drawings of the intake structure and trash racks. The filing shall include comments of the CDFG and FWS on the trash rack design. The licensee shall file as-built drawings with the Commission within 6 months after the completion of project construction.

Article 405. The licensee shall operate the project in an instantaneous run-of-river mode for the protection of fish and wildlife resources in the Pit River. The licensee, in operating the project in an instantaneous run-of-river mode, shall at all times act to minimize the fluctuation of the diversion pool surface elevation by maintaining a sufficient discharge from the project so that the sum of the flows in the Pit River, as measured immediately downstream of the diversion structure and the tailrace, approximates the instantaneous inflow to the project diversion pool. Instantaneous run-of-river operation may be temporarily modified if required by operating emergencies beyond the control of the licensee and for short periods upon mutual agreement between the licensee and the California Department of Fish and Game.

****6** *Article 406.* The licensee, after consultation with the California Department of Fish and Game, the U.S. Fish and Wildlife Service, and the Bureau of Land Management, shall develop a plan to minimize effects that construction activities and the

presence of the above-ground portion of the penstock may have on deer and pronghorn antelope migration. The plan shall include, but shall not be limited to, provisions for avoiding earth-moving activities during fall and spring migration periods and for installing wildlife crossings on the above-ground portions of the penstock. The Commission reserves the right to require changes to the plan. The plan shall be filed for Commission approval within 1 year from the date of the issuance of the **license**. Comments of the consulted agencies on the plan shall be included in the filing.

Article 407. The licensee, after consultation with the U.S. Fish and Wildlife Service, the California Department of Fish and Game, and the Bureau of Land Management, and within 1 year from the date of issuance of the **license**, shall file a transmission line design plan, prepared in accordance with guidelines set forth in the 1981 study, Suggested Practices for Raptor Protection on Power Lines, Raptor Research Report No. 4, published by the Raptor Research Foundation, Inc. The plan shall include detailed design drawings of the transmission line, clearly showing phase spacing, configuration and grounding practices, marking devices to minimize collisions by large raptors, a construction schedule, and comments of the consulted agencies on the adequacy of the design plan shall be included. The Commission reserves the right to require changes to the plan. Unless the Director, Office of Hydropower **Licensing**, instructs otherwise, the licensee may begin construction 60 days after filing the plan.

Article 408. The licensee, before starting any land-clearing or land-disturbing activities within the project boundaries, other than those specifically authorized in this **license**, and after consulting with the State Historic Preservation Office (SHPO) and the Alturas Resource Area of the Bureau of Land Management (BLM), shall file with the Commission a cultural resource management plan (plan). If the licensee discovers previously unidentified archeological or historic properties during the course of constructing or developing project works or other facilities at the project, the licensee shall stop all land-clearing and land-disturbing activities in the vicinity of the properties, and after consulting with the SHPO and the BLM, shall file a plan with the Commission. The plan shall be prepared by a qualified cultural resource specialist. The plan shall include these features: (1) a description of each discovered property, indicating whether it is listed on or eligible to be listed on the *National Register of Historic Places*; (2) a description of the potential effect on each discovered property; (3) proposed measures for avoiding or mitigating effects, on each discovered property; (4) documentation of the nature and extent of consultation with the SHPO and BLM; and (5) a schedule for mitigating effects and for conducting additional studies. The Commission may require changes to the plan. The licensee shall not begin land-clearing or land-disturbing activities, other than those specifically authorized in this **license**, and shall not resume such activities in the vicinity of a property discovered during construction, until informed by the Director of the Office of Hydropower **Licensing** that the requirements of this article have been fulfilled.

****7 Article 409.** The licensee, after consultation with the Bureau of Land Management (BLM), and within 5 years from the date of issuance of this **license**, shall upgrade existing access to the public lands managed by BLM, that are adjacent to the project area and shall construct trailhead parking facilities for recreational users of the BLM lands. Within 90 days after completing the public access and parking facilities, the licensee shall file with the Commission as-built drawings showing the type and location of the constructed facilities. In the filing, the licensee shall include documentation of consultation with the BLM and shall identify the entity responsible for maintaining and operating the facilities.

Article 410. The licensee, after consultation with the Bureau of Land Management and California Department of Fish and Game, and within 1 year from the date of issuance of the **license**, shall file for Commission approval a topsoil plan that provides for the removal, stockpiling, and replacement of topsoil on denuded and disturbed construction sites, including spoil stockpile sites. The plan shall include comments from the consulted agencies. The Commission reserves the right to require changes to the plan.

Article 411. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain other types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the uses and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a

conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action ***63183** includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The types of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) noncommercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings; and (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the uses and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

****8** (c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certificates or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from the edge of the project reservoir at normal maximum surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 45 days before conveying any interest in project lands under this paragraph (d), the licensee must submit a letter to the Director, Office of Hydropower **Licensing**, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G or K map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

****9** (e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

***63184** (1) Before conveying the interest, the licensee shall consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved Exhibit R or approved report on recreational resources of an Exhibit E; or, if the project does not have an approved Exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include covenants running with the land adequate to ensure that: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; and (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G or K drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised Exhibit G or K drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(E) The Commission reserves the right to assess the licensee fees pursuant to section 30(e) of the FPA.

(F) This order is issued under authority delegated to the Director and is final unless appealed under Rule 1902 to the Commission by any party within 30 days from the issuance date of this order. Filing an appeal does not stay the effective date of this order or any date specified in this order. The licensee's failure to appeal this order shall constitute acceptance of the **license**.

Environmental Assessment¹

Division of Environmental Analysis, Office of Hydropower **Licensing**

Federal Energy Regulatory Commission

Muck Valley Hydroelectric Project

FERC Project No. **8296**-001—California

October 6, 1986

I. Application

****10** On June 7, 1985, Malacha Power Project, Inc. (Malacha) applied for a **license** for the Muck Valley Hydroelectric Project, a major unconstructed project greater than 5 megawatts [MW]; Malacha supplemented the application on November 14, 1985, September 18, 1986, and September 30, 1986.

The proposed project would be located on the Pit River in Lassen County, California, approximately 11 miles east of Fall River Mills, California (figure 1).

The project would be located on both private and public lands. Private lands (about 43 acres) are owned, primarily, by Juniper Ridge Ranches, Inc. The public lands (81.21 acres) are federally owned and administered by the Bureau of Land Management (BLM).

II. Resource Development

A. Purpose

The proposed project would generate an estimated average of 90 million kilowatthours (kWh) of electric energy annually. The power would be sold to a utility in the region.

B. Need for Power

Available data show that growth in the demand for electric power and energy will *63185 continue. Given load growth and an existing generating resource base, a need for additional generating resources can be projected to exist in the future for any power system. Additional resources would have to be obtained for any system at some time in order to meet projected additional load requirements with the same degree of reliability required by an existing criterion for the system. The timing of the need would vary in different systems, depending upon such factors as rates of load growth, load characteristics, available existing power resources, and reliability criteria established for each system. A power generating facility may be added to a system before a generating resource deficit exists, however, if, over its operating life, the generating addition provides benefits that would not be available through operation of the system without the addition.

The proposed project is located in the California-Southern Nevada (Ca-SNV) area of the Western Systems Coordinating Council (WSCC) region. In April 1986, the Regional Reliability Council Coordinated Bulk Power Supply Program of the CA-SNV area projected average annual growth rates of 1.9 percent for summer peak demand and 2.4 percent for annual energy requirements. On January 1, 1986, existing generating resources in the Ca-SNV area included approximately 32,000 MW of thermal generating capacity. The CA-SNV systems project the installation of an additional 2,580 MW of thermal capacity in the next 10 years to meet load growth in the area.

Because of the small size of the proposed project in relation to the existing and projected generating capability in the Ca-SNV area, the traditional approach of linking project development with a forecasted need for a specific project is inapplicable to assessing need for the proposed project.

The small size of the project ensures that the power from the proposed project would be integrated into the existing resources base without the temporary overbuilding commonly associated with bringing large power projects on-line (beginning commercial operation). Moreover, in accordance with the Federal Power Act, Malacha can make the schedule accommodate uncertain market conditions to some extent by delaying the start of construction as much as 4 years after a **license** is issued.

**11 Power from the project would meet a small part of the need for power projected by WSCC for the Ca-SNV area. From the time the project goes on-line, it would be available to displace fossil-fueled power generation in the WSCC region, and thereby, conserving nonrenewable fossil fuels and reducing the emission of noxious byproducts caused by the combustion of fossil fuels.

Malacha has also established a need for the project by signing a power purchase agreement with the Pacific Gas and Electric Company (PG&E).

III. Proposed Project and Alternatives

A. Proposed Project

1. Project Description

The proposed project would consist of these features: (1) a 4.5-foot-high, 300-foot-long diversion dam, equipped with trash racks; (2) a 144-foot-long, 29.5-foot-high intake structure; (3) a 12-foot-diameter, 22,200-foot-long, lined diversion tunnel; (4) a 9-foot-diameter, 4,000-foot-long, low pressure, underground conduit; (5) an 8-foot-diameter, 8,000-foot-long, penstock, predominantly underground; (6) a 60-foot-wide by 66-foot-long powerhouse, containing one six-nozzle, vertical, Pelton wheel turbine and a vertical, synchronous generator; (7) a substation, situated near the powerhouse, containing a 12.^{47/115}-kilovolt (kV) power transformer; (8) a 16-mile-long, 115-kV transmission line; (9) 1 mile of new access road; and (10) supporting facilities (figure 2).

Maximum generating capacity is 29,900 kilowatts at an estimated net head of 665.5 feet. The diversion dam, to be located in the Northeast ¼ of the Southwest ¼ of Section 27, Township 37 North, Range 7 East of the Mount Diablo Meridian, would create a 6-acre impoundment, with a storage capacity of approximately 23 acre-feet. The powerhouse would be located in the Southwest ¼ of the Northwest ¼ of Section 11, Township 36 North, Range 6 East.

A 14.5-mile-long segment, about 90 percent, of the proposed 16-mile-long transmission line, would parallel an existing PG&E transmission line corridor. About 1,000 feet of the penstock would be constructed above ground, where rock outcroppings make it infeasible to bury the pipe.

2. Proposed Mitigative Measures

a. Soils and Water Quality

Before beginning project construction, Malacha proposes to obtain the approval of BLM, the California Department of Fish and Game (CDFG), and the California Regional Water Quality Control Board (RWQCB) for the following plans protecting soils and water quality: (1) erosion control plan; (2) construction area reclamation plan; (3) emergency spill contingency plan; and (4) a specific plan for the removal of silt and sediment from the diversion pool.

b. Fisheries

In order to maintain a level of aquatic habitat that exceeds the minimum habitat levels currently found in the Pit River, Malacha proposes to take the following actions: (1) maintain a year-round minimum instream flow of 50 cubic feet per second (cfs) below the diversion structure; (2) install trash racks to minimize the movement of fish into the project tunnel-penstock system; and (3) prepare a water quality control plan.

c. Wildlife

Malacha proposes to minimize the effects of the project on wildlife through the the following measures: (1) avoiding earthmoving activities in late November and early March during mule deer (*Odocoileus hemionus*) and pronghorn antelope (*Antilocapra americana*) migrations; (2) providing an animal crossing every 300 feet along the above-ground sections of the penstock to give large mammals unobstructed access to either side of the penstock; (3) marking (e.g., ribbons, streamers, flags, etc.) all transmission lines and aerial cables to minimize the chances of birds colliding with the lines; and (4) design and construct the transmission lines to avoid electrocution hazards to large raptors.

**12 d. Botanical Resources

To lessen the effects of the project on botanical resources, Malacha proposes: (1) to remove the minimum amount of riparian vegetation as possible for construction of the intake structure and powerhouse; and (2) to revegetate disturbed areas.

e. Cultural Resources

To protect and preserve cultural resources Malacha would do the following: (1) provide for a qualified archeologist to assess the potential adverse effects of project development on any prehistoric or historic materials discovered during construction; and (2) require an evaluation of any unsurveyed areas by a qualified archeologist with any realignment of the project facilities, expansion of the project, or project-related effects.

f. Aesthetic Resources

To minimize or to avoid the potential effect of the project on the aesthetic qualities of the area, Malacha proposes these measures: (1) revegetate with native species all temporary construction sites, including the buried pipeline and penstock rights-of-way, the berms of the diversion access road, and the areas surrounding the powerhouse; (2) painting of the powerhouse, the above-ground segments of the penstock, and the powerline towers with color tones that blend with the surrounding landscape; (3) using vegetative screening around project facilities to make facilities compatible with the natural surroundings; and (4) regrading temporary access roads and construction areas to conform to the contours of the surrounding landscape.

B. Federal Land Management Conditions

The Department of the Interior (Interior), commented on the application for **license** regarding the BLM lands, but did not provide **license** conditions for the proposed project. Interior indicates that the BLM lands to be occupied by this project do not constitute a federal reservation under Section 4(e) of the Federal Power Act.

C. Alternatives to the Proposed Project

Because Malacha is not an electric utility, the alternative is not to construct the project. If the **license** is not issued, the project would not be constructed, and the power of a renewable resource would be lost, although power might eventually be obtained from nonrenewable fuels.

D. Alternative of No Action

No action would prohibit Malacha from constructing the proposed project. No action would mean no alteration of the existing environment and no use of the potential hydropower that could be derived from the project.

IV. Consultation and Compliance

A. Agency Consultation

Commission regulations require prospective applicants to consult with appropriate resource agencies before filing an application for **license**. This consultation constitutes an initial step in compliance with the Fish and Wildlife Coordination Act, the Endangered Species Act, the National Historic Preservation Act, and other federal statutes. Prefiling consultation must be complete and must be documented in accordance with the Commission's regulations.

After the Commission accepts the application, concerned entities may submit formal comments during the public notice period. In addition, organizations and individuals may petition to intervene and to become a party to any subsequent proceedings. The comments provided by concerned entities are made part of the record and are considered during the review of the proposed project. The following entities filed comments after the Commission issued a public notice of the application on February 25, 1986.

***63186** *Commenting entity—Date of letter*

****13** U.S. Fish and Wildlife Service—May 16, 1986

Department of the Interior—May 15, 1986

Department of the Army, Sacramento District Corps of Engineers—April 14, 1986

The Resources Agency of California—May 5, 1986, April 25, 1986

California Regional Water Quality Control Board—May 5, 1986

North Cal-Neva Resource Conservation and Development Area—May 28, 1986

Bieber Chamber of Commerce—June 10, 1986

Fall River-Big Valley Cattlemen's Association, Inc.—April 16, 1986

Big Valley Lions Club—April 20, 1986

The Commission received no petitions to intervene.

B. Water Quality Certification

In a letter of May 5, 1986, the RWQCB advised Malacha that water quality certification for the proposed project had been waived under the provisions of the Clean Water Act.

V. Environmental Analysis

A. Proposed Project

1. General Description of the Locale

The proposed project is located in the Intermountain Region of Northeastern California. The Intermountain Region divides two major geographical areas, the Great Basin to the east, and the Southern Cascade Mountains to the west. In addition to the Pit River, major geographic features of the area include Big Valley, east of the project area, Fall River Valley, west of the project area, and the Big Valley Mountains, which extend northward from the project site (Malacha Power Project, Inc., 1985, application, exhibit E).

Topography in the project area ranges from 3,360 feet mean sea level (m.s.l.) to 4,250 feet m.s.l.

Precipitation in the project area falls primarily as rain and averages about 18 inches a year. The mean minimum January temperature in the project area is 18 degrees Fahrenheit (°F); the mean maximum July temperature is 88°F (Malacha Power Project, Inc., 1985, application, exhibit E).

Land within and next to the proposed project area has a variety of uses: it serves for grazing, watershed, and wildlife habitat, and supports agricultural and recreational activities (Malacha Power Project, Inc., 1985, application, exhibit E).

The proposed project would have no direct or indirect adverse environmental impacts on visual quality resources, because Malacha's proposed mitigative measures (discussed in the section on proposed mitigative measures) would adequately maintain the character of the area. No federally listed endangered or threatened species, no species proposed for listing as endangered or threatened, and no critical habitat for endangered or threatened species would be affected by the proposed project (letter from James J. McKeivitt, Field Supervisor, U.S. Fish and Wildlife Service, Department of the Interior, Sacramento, California, September 12, 1986). A discussion of resources that would be affected by the proposed action follows.

2. Geology and Soils

Affected Environment: The project is underlain by bedrock, composed primarily of vesicular basalt with a generally blocky structure. The series of basaltic flows, each ranging from 5 to more than 35 feet thick, are interlain with thin beds of pyroclastic material. Talus slopes, derived from overlying basaltic flows, are comprised of materials that vary from gravel and cobble to large angular blocks.

****14** The proposed diversion structure and powerhouse would be located in talus material. The diversion tunnel would be drilled and blasted through the basaltic bedrock. The low pressure conduit and penstock would be placed in a trench

excavated from bedrock or, if necessary, placed on supporting piers. Excavation for a portion of the low pressure conduit would be in soil material generally consisting of clay and silt, of low to high plasticity, which are generally weak and relatively impervious. In general, wind-blown silt deposits (loess) overlie the project's slopes and regional terrain. Loess is a fine sandy silt with little or no plasticity; loess deposits in the project area vary from shallow to about 10 feet thick.

Environmental Impacts and Recommendations: Construction and operation of the powerhouse and the diversion structure, and excavation of the low pressure conduit and penstock would increase erosion, sedimentation, turbidity, and instability of slopes in the project area. Construction and excavation activities and drilling of the diversion tunnel would produce spoil material requiring disposal. The California Department of Fish and Game (CDFG) calculates that 375,000 cubic yards (cy) of material would result from tunnel excavation instead of the 175,000 cy projected by Malacha. Malacha and CDFG have agreed to make a final ***63188** decision on the actual amount of spoil material that would be produced and to develop a plan for disposing of the spoil. In addition, CDFG recommends stockpiling topsoil for reuse during revegetation of spoil areas, and Malacha agrees. Malacha proposes to use silt fences and sediment basins to intercept turbid waters and to settle sediments caused by land-disturbing activities. Before starting any land-clearing or ground-disturbing activities, Malacha should file with the Commission a plan to control erosion, sedimentation, turbidity, and instability of slopes resulting from excavation, spoil disposal activities, and other project construction and operation.

Unavoidable Adverse Impacts: Temporary increases in erosion, sedimentation, and turbidity would be unavoidable during project construction.

3. Water Resources

Affected Environment: The Pit River is a major river flowing through the northeastern portion of California. Above the proposed point of diversion, the drainage area of the Pit River is 2,475 square miles. The characteristics of the river change several times throughout its course, varying from a relatively steeply graded stream enclosed by canyon walls to a broad, meandering, low gradient waterway. In the immediate vicinity of the proposed project diversion structure, the stream gradient is approximately 1.5 to 2.0 percent. Approximately 1.5 miles downstream, the gradient steepens to approximately 3 to 4 percent; for the next 7 miles, the gradient increases to about 6 to 10 percent. Near the powerhouse, the gradient is less severe, ranging from 2 to 3 percent (Malacha Power Project, Inc., 1985, application, exhibit E).

Water in the Pit River is used for irrigation and recreational purposes, industrial and domestic supplies, to sustain fish and wildlife resources, and for hydroelectric generation.

****15** Seasonal flows in the Pit River at the site of the proposed diversion structure fluctuate widely throughout the year. The mean annual flow at the site during a 23-year period of record (1952-1975) is 517 cubic feet per second (cfs). The annual median flow (the flow occurring 50 percent of the time throughout the year) is 160 cfs. The mean monthly flow from January to April is approximately 900 cfs; daily peak flows of 3,500 cfs also occur during these months. The median flow from December through February is 300 cfs; the median flow from March through May is 675 cfs.

Throughout the summer, low-flow period, from July through September, the Pit River at the diversion site frequently has no surface flow. This is due to upstream diversions for agricultural irrigation. The monthly mean flow during this period at the diversion structure site is 36 cfs, and the median flow is approximately 8 cfs. (Malacha Power Project, Inc., 1985, application, exhibit E).

Downstream of the proposed diversion structure site, the 12.7-mile-long reach between the proposed structure and powerhouse (the bypassed reach) is dry approximately 80 percent of the time during the low-flow period. The pools that occur sporadically throughout the reach during this period result from groundwater flows of 5 to 10 cfs. These groundwater flows reach the surface at locations where rock or boulder materials are shallow or absent. In addition to these subsurface flows, accretion flows from three Pit River tributaries, North Gulch, Spring Gulch, and Horse Creek, provide water to the bypassed reach during the summer period. Of the three tributaries, Horse Creek is the largest. Horse Creek drains approximately 210 square miles and provides approximately 34 percent of the summertime flow in this reach of the Pit River. During July, August, and September, monthly mean accretion flows from these tributaries are 30, 20, and 10 cfs, respectively. During the remainder of the year, high volume flows throughout the bypassed reach make the flows that these tributaries provide to the reach relatively insignificant (Malacha Power Project, Inc., 1985, application, exhibit E).

The water quality of the Pit River varies considerably throughout the year. During the summer, low flows produce very warm, clear conditions in the river. Throughout the autumn, the winter and the spring high flows, water in the river is cold and very turbid. The turbid conditions are caused by erosion from construction sites, grazing areas, and lava deposits that comprise much of the Pit River Basin. During most of the year, average turbidity levels in the Pit River range from 13 nephelometric turbidity units (NTU) to 93 NTU's; the average turbidity in most California streams is between 1 and 10 NTU's. The Pit River is one of the most turbid streams in the state (Malacha Power Project, Inc., 1985, application, exhibit E).

***63189** Water temperatures vary considerably throughout the year. During the summer, Pit River water temperatures range between 62° F and 86°F, and in winter temperatures range between 35°F and 45°F. Diurnal (daily) fluctuations in water temperatures of 15°F are common during spring and autumn (Malacha Power Project, Inc., 1985, application, exhibit E).

****16** During the summer, variations in the photosynthetic rates of algal communities in the river produce diurnal dissolved oxygen (DO) concentrations. DO supersaturation occurs daily throughout the summer afternoon hours, when high rates of photosynthesis maximize oxygen production; DO concentrations in the Pit River during the summer mid-day exceed 10 milligrams per liter (mg/l). Conversely, substantial reductions in DO occur at night from respiration of algae and aquatic resources; DO concentrations in the river during the night are approximately 3.5 mg/l. Throughout the spring, autumn, and winter, reduced temperatures and solar intensity maintain photosynthetic rates at lower, more constant levels and minimal diurnal fluctuations in DO concentrations occur. Saturated DO concentrations are also caused by aeration (oxygenation), which is a function of turbulence created by high-volume flows sweeping over the boulder-strewn Pit River channel (Malacha Power Project, Inc., 1985, application, exhibit E).

A seasonal variation also occurs with pH. Throughout much of the year, pH ranges between 7.5 and 8.5; during the summer growing season, however, runoff of irrigation flows from agricultural fields that contain leachates, fertilizers, and organic materials increases pH levels to 10 (Malacha Power Project Inc., 1985, application, exhibit E).

Environmental Impacts and Recommendations: Building the diversion structure and parts of the proposed intake and powerhouse within the stream channel would disturb a thin layer of the silt-gravel-sand overburden that covers the rock strata forming the river channel. Although the excavation would disturb the overburden, resuspending the sand and silt, construction-induced increases in sedimentation and turbidity would not be substantial, because most of the excavation would occur within the rock strata. Malacha could reduce the levels of sedimentation and turbidity that would result from the resuspension of the overburden and from streambank disturbance by implementing its plan for controlling erosion and sedimentation. Malacha's plan requires the construction of sand bag dikes to divert river flows around excavation sites (located in the stream channel) to allow construction in a dry environment. Constructing the dikes during the summer low-flow period would enable Malacha to control flows around the construction site and to minimize the contact between the disturbed areas and the flows. The plan would allow maintenance of downstream flows during construction; the plan also includes the construction of perimeter dikes and the installation of silt fences to filter suspended sediments contained in runoff from disturbed areas outside the stream channel.

Project operation would not adversely affect either ambient, summer DO concentrations or water temperatures occurring in the bypassed reach. There would be no effect on these water quality parameters during the low-flow period from July through September, because the 80-cfs flow needed to begin project operation is not present during this low-flow period; therefore, streamflow and water quality would not vary from ambient conditions during the summer low-flow period.

****17** There would not be changes in the DO concentrations and water temperatures within the reach of the Pit River that the diversion impoundment would occupy. Thermal and chemical stratification would not occur in the proposed diversion pool because residence time (the length of time water is retained behind the diversion structure) of water would be short. Assuming that the entire volume of the diversion pool would be replaced every 4.2 minutes when average flows of 517 cfs occur (Malacha Power Project, Inc., 1985, application, exhibit E), the amount of time required to replace the volume of water in the pool during the summer months, when the mean flow is 36 cfs, would be approximately 1 hour. This increase in residence time would not be long enough to affect DO concentrations or water temperature in the proposed diversion pool.

Project operation would decrease flows through the 12.7-mile-long bypassed reach during autumn, winter, and spring. DO

concentrations in this reach, would not be adversely affected, however, because Malacha would maintain a minimum flow release of 50 cfs, or inflow to the diversion impoundment, through the reach during project operation. A 50-cfs release would provide sufficiently deep flows through the steep, rocky bypassed reach to aerate the water and to maintain DO concentrations at saturation. This minimum flow release would also maintain ambient water temperatures in the bypassed reach during project operation.

Unavoidable Adverse Impacts: Project construction would produce minor, short-term increases in turbidity and sedimentation.

4. Fishery Resources

Affected Environment: During the past 80 years, the development of power generating facilities and of crop irrigation, flood control, and water supply systems has altered the physical, chemical, and hydrological characteristics of the Pit River. As a result, the compositions of the fish communities inhabiting various reaches of the river have also changed in response to altered riverine conditions. Reaches of the river upstream of the proposed project support fish communities that are much more diverse than the community inhabiting the Pit River in the proposed project reach. Maximum summer water temperatures of 86°F, diurnal DO concentrations ranging from 3.5 mg/l to 10.0 mg/l, and extremely low summer surface flows of 3 to 8 cfs limit the composition of the fish community in the project reach to those species able to withstand poor water quality conditions. Consequently, Sacramento suckers (*Catostomus occidentalis*), speckled dace (*Rhinichthys osculus*), and green sunfish (*Lepomis cyanellus*) dominate the fish community in the project area. Bluegill (*L. macrochirus*), large-mouth bass (*Micropterus salmoides*), brown bullhead (*Ictalurus nebulosus*), channel catfish (*I. punctatus*), Sacramento squawfish (*Ptychocheilus grandis*), and hardhead (*Mylopharodon conocephalus*) are also present, but in much smaller numbers. Although DO concentrations and thermal conditions in the Pit River improve during high-flow periods in spring, autumn, and winter, the high ambient turbidity levels resulting from the erosion of loose volcanic material, which comprises a large portion of the geology and soils along the river, limit the population size and diversity of fish species in the project reach throughout the year. Extreme variations in streamflows change fish habitats in the project reach and further limit the fish species present. During the summer low-flow period, for example, nonconnecting pools, fed by subterranean flows, occur intermittently in the canyon-walled, 5.5-mile-long segment of the upper portion of the bypassed reach. During the high-flow period, this 5.5-mile-long reach is a highly turbulent riffle area; as a result, the composition of the fish population in this reach varies as changes in streamflow volumes modify the habitat.

****18 Environmental Consequences and Recommendations:** Although construction of the project would increase turbidity and sedimentation in the Pit River, Malacha's plan to mitigate these increases would minimize the degradation of water quality. As a result, the increases in turbidity and sedimentation would be minor, compared to the highly turbid conditions that presently exist in the Pit River. Changes in water quality during the construction period, therefore, would not adversely affect fish resources inhabiting the reaches upstream or downstream of the project construction sites.

During portions of the project operating period from October through June, Malacha would divert a maximum volume of 700 cfs from the Pit River. Based on monthly flow data, spills over the diversion structure are expected during January, February, March, and April, because the mean flows occurring during these months (932 cfs, 1,114 cfs, 1,235 cfs, and 1,168 cfs, respectively) exceed the project's 700-cfs maximum hydraulic capacity. During periods of project operation when flows are less than 700 cfs and spillage does not occur, naturally, Malacha proposes to maintain a continuous minimum flow release of 50 cfs to protect the fish resources that inhabit the 12.7-mile-long bypassed reach. A release of 50 cfs also would enhance the reproduction of the warmwater fish species by maintaining and extending the areas of low-velocity flows that are necessary for fish to spawn (Breder and Rosen, 1966; Scott and Crossman, 1973). CDFG and BLM agree that a 50-cfs minimum flow release would adequately protect the fish resources inhabiting the bypassed reach. Project operation would not affect fish resources during the low-flow period from July through September, when high water temperatures and low DO concentrations occur, because mean monthly flows during these months (65 cfs, 10 cfs, and 33 cfs, respectively) are below the 80-cfs minimum flow needed to operate the turbine and to satisfy the 50-cfs minimum flow release.

In addition to maintaining a 50-cfs flow through the bypassed reach, Malacha proposes to design the diversion structure to transport natural bedload material that would maintain fish habitat (bottom substrate) in the bypassed reach. The downstream movement of silt, sand, and gravel that would accumulate behind the diversion structure is necessary to maintain the types of substrate that warmwater species require for spawning (Kimsey and Fisk, 1964; Breder and Rosen, 1966; Scott and Crossman,

1973). Malacha should consult with CDFG, U.S. Fish and Wildlife Service (FWS) and BLM on the design of the diversion structure.

Diverting water through the turbine would entrain and impinge some life history stages of fish that would be unable to escape the 0.33-foot-per-second intake velocity of project operation. Although most fishes would escape the intake velocity (Bell, 1973), some juvenile and fry near the intake would not be able to swim strong enough to avoid the flow into the project intake, and consequently would be subjected to turbine-related mortality. CDFG recommends that Malacha install trash racks having 0.5-inch spacing between the bars. Malacha's proposed trash rack design would reduce turbine-mortality of fish during project operation. Malacha should consult with CDFG on a trash rack design for minimizing fish impingement and entrainment. There would be some turbine-related mortality of fish resources during periods of project operation, but no substantial impact to the fish community *63191 would occur. The effect on recreational fishing success would be insignificant, because factors such as irrigation and water supply diversion, which are unrelated to the project, presently limit the number of game fish in the project area. Also, the adult game fish that anglers pursue would be able to escape the proposed intake velocity.

**19 CDFG agrees with Malacha's proposed run-of-river mode of operation for maintaining the natural streamflows downstream of the powerhouse. Malacha should operate the project in a run-of-river mode to ensure that project operation does not vary flows below the powerhouse and to minimize the magnitude of fluctuations in the elevation of the diversion impoundment. Minimizing fluctuations in elevation would prevent adverse effects on the fish and wildlife species that would use the proposed diversion impoundment.

Unavoidable Adverse Impacts: Impingement and entrainment would have minor, long-term adverse effects on fish resources.

5. Botanical Resources

Existing Environment: The project area lies within the Modoc Plateau of northeastern California. In the project area, six major vegetative cover types occur: pine forest, juniper woodland, sagebrush steppe, northern oak woodland, mixed grassland, and riparian corridor. Each cover type varies in species composition and habitat.

The yellow-pine forest occurs in the canyons, saddles, and foothills surrounding the project area and varies from dense to open stands. Dense forest stands occur on mesic sites where soils are not excessively rocky. Jeffrey pine (*Pinus jeffreyi*) is the dominant overstory species and ponderosa pine (*Pinus ponderosa*) is codominant. Incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis*), and black oak (*Quercus kelloggii*) occur as associate overstory species, however, where the stress of heat or moisture stress are reduced. Typical understory species are buckbrush (*Ceanothus cuneatus*), sagebrush (*Artemisia tridentata*), and mountain mahogany (*Cercocarpus ledifolius*).

The northern juniper woodland, extensive throughout northeastern California, occurs on volcanic ridges and mountain slopes, commonly in transitional zones between the yellow pine forest and the sagebrush steppe vegetative types. The northern juniper woodland generally occupies south-facing, well-drained slopes, and its characteristic appearance is that of open stands or scattered trees of western juniper. Two subspecies of western juniper (*Juniperus occidentalis* spp. *occidentalis* and *J. occidentalis* spp. *australis*) occur in association with Great Basin sagebrush (*Artemisia tridentata*). A grass groundcover occurs beneath dense stands of juniper.

Sagebrush steppe in northeastern California consists of a series of transitional communities that are situated near the margins of woodlands. Several species of sagebrush characterize the steppe of the Modoc Plateau; Great Basin sagebrush and *A. arbuscula* are most prevalent. The introduction of domestic livestock in the sagebrush steppe has reduced or eliminated natural perennial grass succession.

A distinctive oak woodland vegetative type occurs in the transitionally zone between the northern juniper woodland and the mixed grassland. The woodland generally occupies west aspects along exposed fault scarps. Slopes have gradients of 20 to 90 percent and are extremely rocky. Black oak and occasionally western juniper form the overstory of the northern oak woodland. The understory consists of a dense thicket of buckbush, white oak (*Quercus garryana*), greenleaf manzanita (*Arctostaphylos patula*), bitterbrush (*Purshia tridentata*), and California redbud (*Cercis occidentalis*).

****20** Soil types in the low-lying areas surrounding Muck Valley create seasonal lake beds and enable local land owners to construct small reservoirs for dry-season water storage. Moist soil conditions throughout most of the year permits the establishment of a dense to open grassland community. Numerous species grow in the mixed grassland type; species composition varies in response to cultivation practices, grazing and forage pressure, and climatic conditions.

The riparian corridor of the Pit River is characterized by a mixture of sedges (*Carex* spp.), grasses, willow (*Salix* spp.), and numerous other semi-aquatic and aquatic plants. Canyon walls and rims are vegetated by stands of ponderosa pine, Jeffrey pine, western juniper, oaks, and various shrubs and grasses (Malacha Power Project, Inc., 1985, application, exhibit E).

Environmental Impacts and Recommendations: Constructing the proposed project facilities would require the removal of 56.5 acres of vegetation. Each of the six vegetative communities would be affected, but the removal of the greatest amount of vegetation (33 acres or 56 percent) would occur within the mixed grassland (17 acres) and sagebrush steppe (16 acres) cover types. The removal of the remaining 23.5 acres would occur within the yellow pine forest (3 acres), juniper woodland (6 acres), northern oak woodland (6.5 acres), and riparian corridor (8 ***63192** acres). Construction of the 16-mile-long transmission line (affecting 21 acres), combined with the clearing of four construction staging sites and three tunnel spoil storage-disposal areas (affecting 17 acres), would account for the removal of the greatest amount of vegetation (38 acres or 67 percent) associated with project development (table 1).

After completing construction, Malacha proposes to revegetate 20 acres (35 percent of the effected area) in accordance with the requirements of the BLM. The remaining 36.5 acres would be subject to long-term impacts, either through displacement by the project powerhouse, diversion structure, and diversion pool or by vegetative maintenance along the transmission line corridor (table 1).

Diverting water from the bypassed reach from November through June would have no major adverse effects on vegetation in the riparian corridor. The minimum instream flow of 50 cfs proposed by Malacha would provide sufficient moisture to maintain riparian vegetation, particularly within the braided channel section of the bypassed reach, where the better-developed herbaceous riparian species occur.

The proposed project would not adversely affect the diversity or natural succession of the existing plant communities and would not disturb any unique or special vegetative species.

Unavoidable Adverse Impacts: Project construction would require the removal of 56.5 acres of vegetation.

6. Wildlife Resources

Affected Environment: Numerous wildlife species are known to inhabit the project area. Some of the more typical species are black-tailed deer (*Odocoileus hemionus columbianus*), Rocky Mountain mule deer (*Odocoileus hemionus hemionus*), pronghorn antelope (pronghorn), Nuttall's cottontail (*Sylvilagus nuttallii*), coyote (*Canis latrans*), yellow pine chipmunk (*Eutamias amoenus*), turkey vulture (*Cathartes aura*), sharp-shinned hawk (*Accipiter striatus*), red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), golden eagle (*Aquila chrysaetos*), prairie falcon (*Falco mexicanus*), mountain quail (*Oreortyx pictus*), mallard (*Anas platyrhynchos*), Canada goose (*Branta canadensis*), and great blue heron (*Ardea herodias*) (Malacha Power Project, Inc., 1985, application exhibit E).

****21** CDFG and BLM have identified areas in the project vicinity that provide such essential components of wildlife habitat as food, water, cover, and breeding grounds for one or more wildlife species. These include deer winter range, pronghorn winter range and kidding areas, waterfowl habitat, and raptor areas.

Table 1.

Expected effects of the proposed Muck Valley Project on plant communities, FERN No. 8296, California (Source: Malacha Power Project, Inc., application, exhibit E, as modified by the staff).

Acres affected in shortterm/longterm period¹

Project facility	Yellow pine forest	Juniper Woodland	Sagebrush steppe	No. Oak woodland	Mixed grassland	Riparian corridor	Totals
Intake and diversion structure.....	3/3					4/7	7/10
Tunnel Penstock.....			3/3	3/3	4/0		10/6
Powerhouse.....				1.5/1.5			1.5/1.5
Transmission line Corridor.....		1/10	8/0		8/0	4/0	21/10
Construction staging spoil disposal areas.....		5/3	5/3	2/0	5/3		17/9
Totals.....	3/3	6/13	16/6	6.5/4.5	17/3	8/7	56.5/36.5

***63194 Deer Winter Range**

The Day Bench deer herd, comprising approximately 2,500 to 4,000 mule and black-tailed deer, is recognized as the major deer herd in the project area. CDFG biologists estimate that the Muck Valley component of this herd includes more than 300 individuals. The mule deer is expected to be most common.

The project area provides winter browse and shelter for the herd. The mixed grassland provides nutritious spring browse and the oak woodland, with its layered shrub cover, provides winter cover and a succulent source of winter browse (Malacha Power Project, Inc., 1985, application, exhibit E).

Pronghorn Winter Range

The pronghorn occurs throughout the nonforested areas of the Modoc Plateau. For most herds, sagebrush is a staple, particularly during the fall and winter months. Studies indicate that the antelope’s diet in northeastern California consisted primarily of browse and, to a far lesser degree, forbs and grasses (Ackerly and Regier, 1956, as reported in Malacha Power Project, Inc., 1985, application, exhibit E).

There is suitable pronghorn winter range in the project vicinity. CDFG has identified two areas as potential pronghorn winter habitat, and estimates the population at about 40 head (Malacha Power Project, Inc., 1985, application, exhibit E). One pronghorn winter range is situated immediately south of the proposed tunnel-penstock alignment; the second area is located on the opposite side of the Pit River from the project.

Pronghorn Kidding Areas

In northeast California, the peak pronghorn birthing period is in late May. Potential kidding habitats consist of basins with low sagebrush (9 to 18 inches high) and other succulent plants and vegetation. Forage and predator protection are key elements of kidding areas. CDFG has identified an area about 1 mile south of the proposed diversion site as a potential significant pronghorn kidding area (Malacha Power Project, Inc., 1985, application, exhibit E).

Raptor Areas

Raptors (vultures, hawks, eagles, falcons, and owls) concentrate in areas where there is a good supply of prey species and where open flyways create suitable hunting habitat. BLM and CDFG identify Pit River Canyon as a populated raptor habitat.

Prairie falcons, golden eagles, and red-tailed hawks have been observed throughout the Pit River Canyon. These species are expected to breed and to winter in the project area (Malacha Power Project, Inc., 1985, application, exhibit E).

Waterfowl Habitat

CDFG has identified an area about 1 mile northeast of the proposed diversion site, within the Pit River floodplain, as a waterfowl nesting, resting and feeding area (Malacha Power Project, Inc., 1985, application, exhibit E). The mallard and Canada goose are typical species that use this site.

Environmental Impact and Recommendations: Project construction would require the removal of 56.5 acres of wildlife habitat. The greatest impacts on wildlife from loss of habitat would occur at the powerhouse, along the penstock right-of-way, and at the construction staging, spoil stockpile, and storage sites, where about 24 acres of sagebrush steppe, mixed grassland, and oak woodland would be lost. Removal of these habitats and the temporary increase in noise levels and in human activity associated with construction activities would have a short-term, minor effect on the use of winter range by deer, and a long-term, minor effect on resident non-game mammals and birds. Project construction would have little, if any, effect on the pronghorn kidding area and on the pronghorn winter range, and no effect on the raptor area or waterfowl habitat. Generally, the loss of habitat that would accompany project development would not significantly affect any specific wildlife species or populations, since habitat removal (of a total of 56.5 acres) would be spread over an expansive area and would represent a small amount of the total area available. In addition, the 20 acres that Malacha proposes to revegetate (35 percent of the total construction impact area) would mitigate, in part, for initial construction impacts.

****22** Project construction activities, particularly the construction of the penstock and tunnel, could hinder deer and pronghorn migrations during the spring and fall. To mitigate those potential impacts, Malacha proposes to avoid earthmoving activities in late November and early March. Location of a 1,000-foot-long section of the 8-foot diameter, above-ground penstock would create a barrier to migrating large mammals, particularly to deer and pronghorn. Malacha proposes to construct penstock crossings every 300 feet along the exposed sections of the penstock to give large mammals and other wildlife species unobstructed access to either side of the penstock. Malacha, after consulting with the appropriate resource agencies, should provide measures to minimize the effect that ***63195** construction activities and the above-ground portions of the penstock may have on deer and pronghorn migration.

The 16-mile-long transmission line may pose a collision or electrocution hazard to avian species, particularly to large raptors. Malacha recognizes this potential impact and proposes to mark all transmission lines and aerial cables to minimize bird collisions, and to design the transmission lines to avoid or to minimize electrocution hazards to large raptors. Malacha, after consulting with the appropriate resource agencies, should design and construct its transmission line to avoid or minimize electrocution and collision hazards to large raptors.

Unavoidable Adverse Impacts: Project construction would remove 56.5 acres of wildlife habitat, which would result in a minor, short-term, adverse impact on the use of winter range by deer from construction disturbance and a minor, long-term, adverse impact on resident non-game mammals and birds from loss of habitat.

7. Cultural Resources

Affected Environment: A cultural resources survey of the project area has been conducted. No properties were identified in the area as listed on or eligible for listing on the *National Register of Historic Places* (letters from Kathryn Gualtieri, State Historic Preservation Officer, California Department of Parks and Recreation, Sacramento, California, October 16, 1985; Garland Gordon, Chief, Interagency Archeological Services, National Park Service, Department of the Interior, San Francisco, California, July 3, 1985; and Richard Drehobl, Area Manager, Alturas Resource Area, Bureau of Land Management, Department of the Interior, Alturas, California, October 16, 1985).

Environmental Impacts and Recommendations: Land-clearing and land-disturbing activities could adversely affect archeological and historic properties not previously identified in the project area. Therefore, if Malacha encounters such properties during the development of project works or related facilities, Malacha should stop land-clearing and land-disturbing activities in the vicinity of the properties and should consult with the California State Historic Preservation

Officer (SHPO) and the Alturas Resource Area of BLM about the eligibility of the properties and about any measures needed to avoid or to mitigate effects on the properties. In addition, before beginning land-clearing or land-disturbing activities within the project boundaries, other than those specifically authorized in the **license**, Malacha should consult with the SHPO and BLM about the need to conduct an archeological or historical survey and about the need for avoidance or mitigative measures. In these instances, 60 days before starting such land-clearing or land-disturbing activities, Malacha should file a plan and a schedule for conducting the appropriate studies, along with a copy of the SHPO's and BLM's written comments on the plan and the schedule. Malacha should not start land-clearing or land-disturbing activities, other than those specifically authorized in this **license**, or resume such activities in the vicinity of an archeological or historic property discovered during construction, until informed by the Director, Office of Hydropower **Licensing**, that the requirements discussed here have been fulfilled.

****23 Unavoidable Adverse Impacts:** None.

8. Recreation and Other Land Uses

Affected Environment: Recreational use in the project area is low, because much of the area is remote and relatively inaccessible and because there are more attractive recreational opportunities in the general vicinity. In order of popularity, the recreational uses that do occur in the project vicinity include hunting, fishing, hiking, and whitewater boating. There are no recreational facilities in the proposed project area or in its immediate vicinity.

BLM has identified land immediately south of the project area as a Wilderness Study Area (WSA). Through the BLM planning process, the agency found 6,640 acres of the WSA suitable for wilderness designation because of its primitive qualities and opportunity for seclusion. The recommended area is known as the proposed Pit River Canyon Wilderness Area, and includes the Pit River Canyon and immediately adjacent lands (figure 3).

A 55-mile segment of the Pit River between Lake Britton and the town of Bieber is included in the Nationwide River Inventory for its outstanding scenic and wildlife values. This segment encompasses the 12.7 mile-long stretch of river that would be affected by the project. In addition to recreation, the land in the project area is used for livestock grazing, wildlife habitat, and timber production.

Environmental Impacts and Recommendations: Because of the minimal recreational use in the project vicinity, project construction and operation would not affect existing recreational opportunities. Construction of the proposed project would provide an opportunity to improve public access to the area. In this regard, BLM recommends that Malacha (1) establish public access to BLM lands located adjacent to the ***63196** project area, (2) develop a trailhead parking area for recreational users of the BLM lands, and (3) negotiate a land exchange to consolidate public and private lands for more efficient management. Through extended negotiations, Malacha and the BLM, have agreed to provide for public access in the future (Malacha Power Project, Inc., 1986). Malacha agrees to provide public access and trailhead parking facilities as soon as the United States Congress acts on the proposed Pit River Canyon Wilderness Area designation. Congressional action is anticipated by 1991. Malacha and BLM have also agreed in principle on the terms of a land exchange. A formal exchange document is expected. Implementation of the aforementioned measures, would enhance recreational opportunities in the project vicinity. Therefore, Malacha, after consultation with the appropriate agencies, should construct the proposed public access and parking facilities.

Improving the existing access road and constructing trailhead parking facilities would improve access to the BLM lands and could increase the use of the area. If the WSA is designated as a wilderness area, more users might be attracted to the area and the type of user that is attracted to the area might change. Reduced flows in the project reach of the Pit River might affect the limited whitewater boating use by altering the amount of use and the time of year when whitewater activities are possible. To ensure that future recreational use in the project area is adequately accommodated, Malacha should monitor recreational use in the project area. Malacha should be required to provide additional recreational facilities in the future, if a need is demonstrated.

****24 Unavoidable Adverse Impacts:** None.

9. Socioeconomic Considerations

Affected Environment: Lassen County has a relatively small population (24,400 residents as of July 1, 1985). The economy is primarily dependent upon lumber and wood products manufacturing. The population of Shasta County totaled 77,640 in 1970, and reached 130,700 persons on July 1, 1985. Growth resulted primarily from population immigration, which occurred in response to large employment gains in the section of retail trade, federal and state government, banking, and services. Most new jobs have been located in or near Redding. In contrast, rural portions of Shasta County have continued to be dependent on lumbering and irrigated farming (personal communication, Audrey Primas, Statistical Information Assistant, John Youngman, Statistician, County Business Patterns, and Doug Miller, Statistician, Census of Agriculture, Bureau of the Census, Department of Commerce, Suitland, Maryland, August 1, 1986).

Environmental Impacts and Recommendations: During the proposed 2-year construction period, onsite machinery and project-related vehicles would produce noise, dust, exhaust emissions, and additional traffic on California State Highway 299 between Redding and the site. The project would not displace any homes or business establishments.

Based on comparable projects, onsite employment would average 125. Most workers would commute daily from residences in Shasta and Lassen counties. Supervisory personnel and some highly skilled workers would be recruited from the Sacramento and San Francisco areas. These persons, who would total about 40, would commute to the site on a weekly basis (occupying trailers or motel rooms near the project during the week and spending weekends at their permanent residences). The project therefore would not induce the immigration of families with school-age children, and there would be only very minor impacts to local government services in Lassen and Shasta counties.

The earnings of local residents and the spending of all project personnel at lodging places, eating and drinking establishments, gasoline service stations, and other business establishments in Lassen and Shasta Counties would benefit the local economy. Moreover, the construction contractor undoubtedly would obtain some portion of the required machinery and materials from local establishments, further benefiting area employment and income.

After the project comes on-line, onsite employment would average three persons. More significantly, the completed project facilities would generate real property taxes totaling \$514,000 per year to local governmental entities in Lassen County.

Mitigative measures should not be required because the project's socioeconomic impacts would be primarily beneficial.

Unavoidable Adverse Impacts: Construction of the proposed project would produce noise, dust, exhaust emissions, and additional traffic in the project vicinity.

B. Cumulative Environmental Impact Analysis

1. Pit River Basin

The Pit River Basin, located in northern California, has an area of about 6,100 square miles (figure 4). Rising on the western slopes of the Warner Mountains, the North and South Forks of the Pit River join near Alturas, *63197 California, to form the mainstem Pit River, which flows 170 miles to the Sacramento River (Federal Energy Regulatory Commission, 1980). Other major tributaries to the Pit River are Montgomery Creek, Burney Creek, Hat Creek, Rattlesnake Creek, and Fall River.

**25 The Pit River Basin has two distinct hydrographic regions that are significant to hydropower development. The upper region of the basin, above Fall River, is deficient in water because of a lack of precipitation. The lower region receives ample precipitation and is supplemented significantly by accretion flows from natural springs. Because there is sufficient water for both irrigation and hydropower uses, the lower region of the Pit River Basin has been heavily developed for hydropower (figure 4).

2. Proposed and Existing Hydroelectric Development

As of September 1986, there were 11 licensed projects and 6 projects exempted from licensing in the Pit River Basin (figure 4). At present before the Commission, there are four license applications, one application for exemption from licensing, and one licensed project under appeal. The Grasshopper Flat, Lost Creek No. 1, and Lost Creek No. 2 Projects (FERC Project

Nos. 9029, 3863, and 5130, respectively) are proposals for minor unconstructed projects; the Muck Valley Project is a proposal for a major unconstructed project; the Burney Creek Project (FERC Project No. 8671) is an application for exemption from **licensing**; and the Hatchet Creek Project (FERC Project No. 5931) is a **licensed** project that has been appealed by CDFG. The Grasshopper Flat, Lost Creek No. 1, Lost Creek No. 2, Burney Creek, and Hatchet Creek Projects would be located in the lower region of the basin on small tributaries (figure 4). The Muck Valley Project would be the only **licensed** project located on the mainstem Pit River in the upper region of the basin.

3. Target Resources

The staff has determined that dispersed (as opposed to developed) recreation, the visual qualities of recreationally important areas, bald eagles, and Native American resources are target resources that could be adversely affected by two or more hydropower projects in the Pit River Basin. The staff based its selection of target resources on the following information: the pending application for the Muck Valley Project; applications for existing projects in the basin; studies on bald eagles; land management plans for the Lassen, Modoc, and Shasta-Trinity National Forests; comments from natural resource agencies; and telephone conversations (personal communication, Charles Row, Resource Officer, Hat Creek District, Forest Service, Department of Agriculture, Hat Creek, California, April 14, 15, and 16, 1986).

There is an abundance of dispersed recreational opportunities in the Lassen, Modoc, and Shasta-Trinity National Forests, which comprise more than half the acreage of the Pit River Basin. In recent years, dispersed recreation has accounted for 36 percent of the total recreational use in the Lassen National Forest, 80 percent in the Modoc National Forest, and 61 percent in the Shasta Trinity National Forest (Forest Service, 1986). Typical dispersed recreational activities in the Pit River Basin are hiking, fishing, hunting in the backcountry, camping at primitive sites, and picnicking at undesignated roadside areas. Since most of these activities occur along lakes and streams, multiple hydro power development could adversely affect dispersed recreational activities in the basin by reducing fishing success and by dewatering or impounding free-flowing streams.

****26** Studies have shown that visual quality and outdoor recreational satisfaction are closely related (Federal Energy Regulatory Commission, 1985). Visual quality in the Pit River Basin is important, because most recreationists visit the area to enjoy the views from canyon rims, roadsides, and backcountry areas. Of special importance is the view from the Pacific Crest National Scenic Trail, a part of the National Trails System, which traverses the basin (letter from Gary E. Cargill, Associate Deputy Chief, Forest Service, Department of Agriculture, Washington, D.C., July 10, 1983). Multiple hydropower development could adversely affect the visual quality of the basin by introducing man-made structures, which are not compatible with the natural setting, into areas that are highly visible to recreationists.

The bald eagle is a federally listed endangered species that is protected under the Endangered Species Act. The lower portion of Pit River Basin, primarily along the mainstem Pit River from its confluence with the Fall River to Shasta Lake (figure 4), supports a significant portion of California's limited number of bald eagles. In 1984, there were 67 bald eagle nesting territories in the Pit River Basin; it is one of the most important bald eagle nesting areas in the state (BioSystems Analysis, Inc., 1985). The development of multiple hydropower projects could adversely affect bald eagle habitat by increasing human disturbance, removing certain types of vegetation (i.e. trees used for perching, roosting, and nesting), reducing fish populations, and constructing above-ground ***63198** transmission lines that could cause electrocution and inflight collision mortality.

Many Native American groups live in the Pit River Basin, and there are resources in the basin that are important to their culture. These resources include: areas of religious, sacred, or ceremonial value; sites of past settlement; cemeteries; traditional fishing grounds; sites uniformly considered important by the entire Native American community; and sites where Native Americans gather certain plants for their diet. Multiple hydropower project development in the basin could adversely affect Native American resources by removing certain types of vegetation (i.e. vegetation utilized for food, shelter construction, and basket weaving) blasting or excavating sacred areas, dewatering religiously significant waterfalls, and allowing public access to religious sites.

4. Environmental Impacts to Target Resources

Dispersed Recreation and Visual Quality: The proposed project would not contribute to cumulative adverse effects on dispersed recreational activities or the aesthetics of the Pit River Basin, because it would be located primarily on privately

owned property and on lands administered by the BLM that receive little or no public use (Malacha Power Project, Inc., 1985, application, exhibit E). The project area is generally isolated and inaccessible, and is not visible from any public roads or recreational areas. In addition, the project area does not contain and is not visible from any trail within the National Trails System or lands designated under the Wilderness Preservation Act.

****27** The project, with the implementation of proposed mitigative measures (discussed in the recreation and other land uses section) would give recreationists easier access to the WSA near the project area. This would make additional dispersed recreational opportunities within the basin available to the public. The project would not be visible from the WSA, because it would essentially be concealed from view in a remote canyon area with steep vertical slopes, ranging from 400 to 700 feet in height. Malacha's proposal to provide a buffer zone around the project and to revegetate disturbed areas would further conceal the project from sight. BLM states that the project, with the addition of proposed mitigative measures, would not contribute to cumulative adverse environmental affects (letter from Richard J. Drehobl, Area Manager, Bureau of Land Management, Department of the Interior, Alturas, California, July 15, 1986).

Recreational fishing and hunting success depends on the availability of fish and wildlife. The quality of fishing in the project area is poor and would remain generally unchanged by the proposed project. The river, upstream of the project area, has been diverted for agricultural purposes and the fishery resources in the project area are limited to warm water nongame species (letter from A.E. Naylor, Regional Manager, California Department of Fish and Game, October 2, 1985). Hunting for pronghorn and deer in the project area occurs primarily in the fall months. Development of the Muck Valley project would not have a significant adverse effect on deer and pronghorn populations. The California Department of Fish and Game states that there should be no adverse cumulative impacts on fish and wildlife from the proposed Muck Valley Project (letter from A.E. Naylor, Regional Manager, California Department of Fish and Game, August 13, 1986). Malacha's proposed mitigative measures, discussed in the wildlife resources section, would adequately protect these game species during project construction and operation. Additionally, the improved access to the project area would enhance hunting access to BLM lands following project development.

Bald Eagles: The proposed project area does not provide essential bald eagle habitat; it is located about 20 miles upstream of the lower basin where the 67 bald eagle nesting sites occur. Project development would therefore not contribute to cumulative adverse effects on bald eagles. Further, the FWS states that the Muck Valley Project will not "have cumulative impacts upon any candidate, threatened, or endangered species" (letter from James J. McKeivitt, Field Supervisor, U.S. Fish and Wildlife Service, Department of the Interior, Sacramento, California, September 12, 1986).

Native American Resources: Native American resources would not be adversely affected by the proposed project. Resources of significant value to Native Americans were not identified in the cultural resources survey of the proposed project area. The SHPO has determined that the project would have no effect on cultural resources (letter from Kathryn Gualtieri, State Historic Preservation Officer, California, Department of Parks and Recreation, Sacramento, California, October 16, 1985; Garland Gordon, Chief, Interagency Archeological Services, National Park Service, Department of the Interior, San Francisco, California, July 3, 1985; and Richard Drehobl, Area Manager, Alturas Resource Area, Bureau of Land Management, Department of the Interior, Alturas, California, October 16, 1985). ***63199** Therefore, the Muck Valley Project would not contribute to cumulative adverse impacts on Native American resources in the Pit River Basin.

Conclusion

****28** The proposed Muck Valley Project would not contribute to cumulative adverse effects on dispersed recreation, visual quality, bald eagles and Native American resources in the Pit River Basin. Further, the BLM, CDFG, and FWS (letters previously cited), RWQCB (letter of September 2, 1986), and County of Shasta, CA, Planning Department (letter of August 7, 1986) have concluded that the project would not contribute to any potential cumulative impacts within the basin.

C. Alternative of No Action

Taking no action would leave the existing physical and biological conditions in the area unchanged. Electric power that would be generated by the proposed hydroelectric project would have to be generated from other available sources or offset by conservation measures.

D. Recommended Alternative

The proposed project is the preferred alternative, because electricity generated from a renewable resource would be supplied to the regional energy grid, thus lessening the use of existing fossil-fueled, steam-electric plants, and because the environmental effects that would result from constructing and operating the project could be adequately mitigated.

VI. Finding of No Significant Impact

Construction activities would cause temporary, localized increases in erosion, sedimentation, and stream turbidity that would have minor adverse impacts on existing Pit River water quality conditions. Noise, dust, exhaust emissions, and additional traffic would have a minor, short-term, adverse impact on the human environment. Project construction would cause the removal of 56.5 acres of vegetation producing minor, short-term, adverse impacts on wintering big game animals and minor, long-term, adverse impacts on small mammals and birds. Fish resources would suffer minor, long-term, adverse impacts from impingement and entrainment during project operation. The implementation of mitigative measures proposed by Malacha and by staff would ensure that the environmental effects of project construction and operation would be insignificant.

The staff prepared this environmental assessment for the Muck Valley Hydroelectric Project in accordance with the National Environmental Policy Act of 1969. On the basis of the record and of the staff's independent environmental analysis, issuance of a **license** for this project would not constitute a major federal action significantly affecting the quality of the human environment.

Further, the RWQCB prepared a Negative Declaration for the proposed project. This document concludes that the proposed project would not have a significant effect on the environment.

VII. Literature Cited

BioSystems Analysis. 1985. Bald eagle and fish study for Pacific Gas and Electric Company's Pit 3, 4, and 5 Project, FERC Project No. 233, California. Department of Wildlife and Fisheries Biology, University of California Press, Davis, California. April 1985.

Bell, M.C. 1973. Fisheries handbook of engineering requirements and biological criteria. Northwest Pacific Division Corps of Engineers, Department of the Army, Portland, Oregon. February 1973.

Breder, C.M., Jr., and D.E. Rosen. 1966. Modes of reproduction in fishes. T.F.H. Publications, Inc., Neptune City, N.J. 941 pp.

****29** Federal Energy Regulatory Commission. 1980. Pit River Basin: planning status report. Washington, D.C. August 1980.

Federal Energy Regulatory Commission. 1985. Final environmental impact analysis of small-scale hydroelectric development in selected watersheds in the Upper San Joaquin River Basin, California. FERC/EIA-0001. Washington D.C. September 1985.

Forest Service. 1986. Draft environmental impact statement for Lassen National Forest. Pacific Northwest Region, Forest Service, Department of Agriculture, Susanville, California. March 1986.

Kimsey, J.B. and L.O. Fisk. 1964. Freshwater non-game fishes of California. California Department of Fish and Game, Sacramento, California. 55 pp.

Malacha Power Project, Inc. 1985. Application for **license** for major unconstructed project, greater than 5 megawatts. Muck Valley Hydroelectric Project, FERC Project No. 8396, California, June 7, 1985.

Malacha Power Project, Inc. 1986. Supplement to the application for **license** for a major unconstructed project greater than 5 megawatts. Muck Valley Hydroelectric Project, FERC Project No. 8396, California. September 30, 1986.

***63200** Scott, W.B. and E.J. Crossman. 1973. Freshwater fishes of Canada. bulletin 184. Fisheries Research Board of Canada. 966 pp.

VIII. List of Preparers

Patrick Murphy—EA Coordinator, Vegetation and Wildlife Resources (Wildlife Biologist; M.S., Wildlife Management).

Angelo Colianni—Geology and Soils (Soil Conservationist; B.S., Agriculture, Range Management, Soil Science).

James Haimes—Socioeconomic Considerations (Economist; B.A., Economics).

Andrea Heintzelman—Cumulative Environmental Assessment (Archeologist; M.S. Applied Anthropology).

Ronald Kowalewski—Purpose (Civil Engineer, MSCE).

Edward Melisky—Water and Fishery Resources (Ecologist; M.S., Fisheries Biology).

Ann F. Miles—Recreation and Other Land Uses (Environmental Protection Specialist; M.A., Recreation Resource Management).

Brian Romanek—Cumulative Environmental Assessment (Outdoor Recreation Specialist; B.S., Recreation Resource Management).

Edward Slatter—Cultural Resources (Archeologist; Ph.D., Anthropology).

David Starkie—Visual Resources (Landscape Architect; B.L.A., Landscape Architecture).

Martin Thorpe—Need for Power, Alternatives to the Proposed Project (Electrical Engineer, BSEE).

Safety and Design Assessment

Muck Valley Project

FERC Project No. **8296**-001, CA

Dam Safety

The diversion dam for the Muck Valley Project would be 300 feet long and less than 5 feet high impounding approximately 23 acre-feet of storage in a rural undeveloped area. Failure of the dam and appurtenant structures would not pose a hazard to downstream property or human life.

Project Design

The concrete gravity weir would divert streamflow from the Pit River into a reinforced concrete intake structure at elevation 4,070 feet. A 12-foot-diameter, 22,200-foot-long, concrete-lined and horseshoe-shaped tunnel would be constructed from the intake structure to the pipeline conduit. A 9-foot-diameter, 4,000-foot-long, low pressure steel pipeline and a 8-foot-diameter, 8,000-foot-long, steel penstock would convey power flows to a vertical impulse turbine-generating unit housed in a reinforced concrete powerhouse. The turbine would discharge flow via a short tailrace back to the Pit River.

Economic Feasibility

****30** A proposed project is economically feasible so long as its projected levelized cost is less than the long-term levelized cost of alternative energy to any utility in the region that can be served by the project.

Staff has calculated the projected alternative energy cost in the region to be 112.2 mills per kilowatt hour. This cost is based upon the cost of natural gas, as projected by the Energy Information Administration. Staff has estimated the cost of energy from the project under the proposed 1986 tax revisions. The levelized cost of energy from the Muck Valley Project is 67.2 mills per kilowatt hour, therefore, the project is economically feasible.

The applicant plans to sell the power generated by the project to Pacific Gas and Electric Company (PG&E). A power purchase agreement was executed on May 2, 1985, between the applicant and PG&E based on their Standard Offer #4 energy rates. For a 30-year contract PG&E had established a weighted average levelized energy price of 88.5 mills per kilowatt hour for a project going on-line in late 1988. Therefore, the project would be potentially financially feasible to the applicant. Any further determination on the financial feasibility must be governed by the applicant's efforts to secure project financing.

Water Resource Planning

The proposed project would have a single generating unit with an installed capacity of 29,900 kilowatts. The powerplant would operate run-of-river under a net head of 665 feet and a hydraulic capacity of 600 cfs. The probability of occurrence of river flows 600 cfs or greater is approximately 0.24.

The applicant estimates that the project would generate about 90,000,000 kilowatt hours annually based on a proposed minimum continuous bypass flow release of 50 cfs or the natural flow, whichever is less. The staff finds that the applicant's estimate of annual generation is reasonable.

State and federal agency comments do not impact the safety, adequacy, or economic feasibility of the project. No specific comments or recommendations were made addressing *63201 flood control, navigation, water supply, or irrigation requirements in the basin.

The Commission staff's Upper Sacramento River Basin Planning Status Report includes no hydroelectric projects, either proposed or constructed on the Pit River that this project would impact and the project would not conflict with any pending applications for exemption, license, or preliminary permit. In addition, the Commission staff's Pit River Basin Water Resources Appraisal Report shows no existing or potential flood control or irrigation projects in close proximity to the Muck Valley Project site.

In summary, our study shows that the Muck Valley Project adequately develops the hydropower potential at the site and would not conflict with any existing or planned water resource developments in the basin.

Exhibits

The following parts of Exhibit A and the following Exhibit F drawings conform to the Commission's rules and regulations and are approved and made part of the license:

**31 Exhibit A; Table A-1, items entitled "Turbine and Generator"; section entitled "Project Structures", subsection h entitled "Powerhouse substation", paragraph 2; section entitled "Transmission Line and interconnection details", sentences 1,2,3,4, and 6 of the application for license filed June 7, 1985.

Exhibit F	FERC No. 8296—	Title
3		3 Intake/Diversion Structures-Site Layout Plan
4		4 Pit River Cross Sections at Intake
5		5 Spillway/Diversion Structures-Sections

6	6 Intake Structure Floor Plan and Section
7	7 Intake Structure Roof Plan and Section
8	8 Tunnel Plan and Profile
9	9 Schematic of Portal Excavation
10	10 Tunnel Support Assumptions
13	13 Penstock Plan and Profile
14	14 Penstock Plan and Profile
15	15 Penstock Plan and Profile
16	16 Miscellaneous Penstock Sections
17	17 Powerhouse-Proposed Site Layout
18	18 Generator Floor Plan
19	19 Powerhouse-Transverse Section
20	20 Turbine Floor Plan
21	21 Powerhouse-Longitudinal Section
22	22 Powerhouse-Northwest Elevation
23	23 Powerhouse-Southwest Elevation
24	24 Powerhouse-Southeast Elevation
25	25 Powerhouse-Northeast Elevation

35	35 115 kV Line Route
36	36 Substation Plan and Elevation
37	37 Typical 115 kV Structures
38	38 Interconnection Point at Pit No. 1 Powerhouse

Federal Energy Regulatory Commission

Footnotes

¹ Docket EL85-19-107.

² The California Department of Boating and Waterways (CDBW) by letter of October 1, 1986, commented on the whitewater kayaking on the Pit River and raised the issue of general boating safety. The Licensee is required, under section 12.42 of the Commission's regulations to provide warning and safety devices that may be necessary or desirable to warn the public of fluctuations in flow from the project or otherwise to protect the public in the use of project lands and waters.

¹ Shortterm applies to the project construction period; longterm relates to project operation and maintenance.

37 FERC P 62172 (F.E.R.C.), 1986 WL 79149