

UNITED STATES OF AMERICA 54 FERC ¶ 62,060  
FEDERAL ENERGY REGULATORY COMMISSION

Norman Ross Burgess

Project Nos. 6062-000  
and 10882-000  
California

ORDER ISSUING LICENSE  
Minor Project  
(Issued January 28, 1991)

Norman Ross Burgess (applicant) filed a license application under Part I of the Federal Power Act (Act) to construct, operate, and maintain the Three Forks Water Power Project, located on Bluford, Rock, Middle, and Mud Creeks in Trinity County, California. 1 The project would affect the interests of interstate commerce.

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.

Public Utility Regulatory Policies Act of 1978

Mr. Burgess intends to seek benefits under the Public Utility Regulatory Policies Act of 1978 (PURPA). Section 210(j) of PURPA establishes three requirements that projects located at non-federal new dams or diversions must satisfy in order to be considered for PURPA benefits. 2

1 The applicant currently holds an exemption from licensing (20 FERC ¶62,124) for a portion of the project, which will be incorporated into the license. We are providing that the exemption will terminate upon the commencement of operation of the licensed project.

2 The Commission must find that: (1) the project will not have substantial adverse effects on the environment, including recreation and water quality; (2) at the time the application for license is accepted by the Commission such project is not located on either of the following: (a) any segment of a natural watercourse which is included in (or designated for potential inclusion in) a state or national wild and scenic river system, or (b) any segment of a natural watercourse which the state has determined in accordance with applicable state law to possess unique natural, recreational, cultural, or scenic attributes which would be adversely affected by hydroelectric development; and (3) the project meets the terms and conditions set by fish and wildlife agencies under the same procedures provided for under section 30(c) of the Act.

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We find in the attached Environmental Assessment (EA) under section H, Environmental Impacts, that minor and short term impacts would occur during project construction, and that impacts to fish would be minimal. These impacts are unavoidable until disturbed land surfaces and river banks are stabilized. The impacts described under section H in the EA are not substantial, and are not adverse to maintenance of the overall integrity of the fishery, water quality, recreational, and terrestrial resources at the project site. The project would reduce ongoing sedimentation and would thereby have minor benefits to the resident fish population. We find the project satisfies requirement no. 1.

The State of California, by letter dated May 18, 1990, advised us that the project is not subject to the provisions of either the California or the Federal Wild and Scenic Rivers Act. The State also advised that the watercourses involved have not been designated as having unique natural, recreational, cultural, or scenic attributes that would be adversely affected by hydropwer development. We find the project satisfies requirement no. 2.

The U.S. Department of the Interior, Fish and Wildlife Service (DOI) and the California Department of Fish and Game (CAFG), provided terms and conditions for this project. The

measures provided by DOI and CAFG are mandatory pursuant to section 210(j)(3) of PURPA. These mandatory conditions are included as articles 401 through article 409 and L-Form article 11. We find that the project satisfies requirement no. 3.

We find the project meets the requirements of section 210(j) of PURPA.

#### Comprehensive Development

Section 4(e) of the Act states that in deciding whether to issue a license, the Commission, in addition to considering the power and developmental purposes of the project, shall give equal consideration to (1) the purposes of energy conservation, (2) the protection, mitigation of damage to, and enhancement of fish and wildlife, (3) the protection of recreational opportunities, and (4) the preservation of other aspects of environmental quality. We (the staff) consider these purposes in the comprehensive development section of the attached environmental assessment (EA) of this project.

Further, section 10(a)(1) states that the project adopted shall be such that in the judgement of the Commission will be best adapted to a comprehensive plan for improving or developing a waterway for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water power development, for the adequate protection, utilization, and

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enhancement of fish and wildlife (including related spawning grounds and habitat), and for other beneficial public uses, including irrigation, flood control, water supply, recreation, and other purposes discussed in section 4(e).

Section 10(a)(2) of the Act also requires the Commission to consider the extent to which a project is consistent with comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. Under section 10(a)(2), federal and state agencies filed 30 comprehensive plans that address various resources in California. Of these, we identified and reviewed five plans relevant to this project. 3

No conflicts were found.

Based on our review under sections 4(e) and 10(a), the Three Forks Project is best adapted to a comprehensive plan for improving and developing the Eel River.

#### Recommendations of Federal and State Fish and Wildlife Agencies

Section 10(j) of the Act 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. Our EA for the Three Forks Project, dated December 6, 1990, addresses these concerns and this license provides conditions consistent with these recommendations.

#### 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

3 (1) The California Water Plan: Projected Use and Available Water Supplies to 2010, 1983, California Department of Water Resources; (2) California Water: Looking to the Future, 1987, California Department of Water Resources; (3) Recreation needs in California, 1983, Department of Parks and Recreation; (4) Inyo National Forest Land and Resource Management Plan, 1988, Forest Service, Department of Agriculture; and (5) Inyo National Forest-Environmental Impact Statement for the Land and Resource Management Plan, 1988, Forest Service, Department of Agriculture.

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provided in the Safety and Design Assessment (S&DA) attached to this order.

The Director of the Office of Hydropower Licensing concludes that the project would not conflict with any planned or authorized development and would be best adapted to comprehensive development of the waterway for beneficial public uses.

The applicant for this license has not fully complied with the terms and conditions and articles of its exempted Project No. 6062. The applicant constructed a 4.3-mile-long transmission line instead of the approximately 300-foot-long line described in its exemption application. The applicant failed to consult with the California State Historic Preservation Officer before constructing the transmission line and also failed to design and construct the transmission line so that raptors are protected from electrocution. We address these concerns in the EA and in Ordering Paragraph F and articles 408 and 409 of this license.

Because the development this license authorizes constitutes a more comprehensive use of the waterway than the exemption now held by the applicant, the exemption is terminated effective upon the commencement of operation of the licensed project. This will allow the applicant to continue operation of the exempted project during construction of the new project works.

The Director orders:

(A) This license is issued to Norman Ross Burgess (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 Three Forks Water Power Project. This license is subject to the terms and conditions of the Act, which is incorporated by reference as part of this license, and to the regulations the Commission issues under the provisions 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. 10882-	Showing
1	27	Project Map

(2) Project works consisting of: (a) a 12-foot-high, 83-

foot-long diversion structure on Mud Creek at elevation 2,530 feet msl; (b) a 15-inch-diameter, 1,100-foot-long conduit leading to the Middle Creek junction box where water from Mud Creek and Middle Creek is combined; (c) a 12-foot-high, 35-foot-long diversion structure on Middle Creek at elevation 2,446 feet msl,

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diverting stream flows through a 10-inch-diameter, 55-foot-long conduit leading to the Middle Creek junction box; (d) an 18-inch-diameter, 540-foot-long conduit leading from the Middle Creek junction box to the Rock Creek junction box where the combined water from Middle Creek and Mud Creek is combined with water from Rock Creek; (e) a 17-foot-high, 49-foot-long diversion structure on Rock Creek at elevation 2,480 feet msl; (f) an 18-inch-diameter, 635-foot-long conduit leading to the Rock Creek junction box; (g) a 21-inch-diameter, 3,123-foot-long conduit carrying all diverted water to an 11.5 acre-foot impoundment created by a 28-foot-high, 88-foot-long earthen-fill dike; (h) a 28-foot-high, 48-foot-long earthen-fill dike, creating a 4.1 acre-foot impoundment with an intake structure that includes an emergency penstock isolation slide gate and overflow pipe; (i) a 24-inch-diameter, 6,500-foot-long penstock leading from the 4.1 acre impoundment to the Bluford Creek penstock where it is tied into the Bluford Creek penstock at elevation 1,535 feet msl; (j) an existing intake box on an unnamed stream and 500 feet of 12-inch-diameter steel pipe, releasing water 40 feet upstream of the Bluford Creek diversion; (k) an existing 8-foot-high, 35-foot-long diversion structure; (l) an existing 8-foot-wide, 8-foot-high, 32-foot-long cement intake box; (m) an existing 24-inch-diameter, 6,618-foot-long penstock; (n) an existing powerhouse containing a generating unit with a rated capacity of 1,300 kW; (o) a 20-foot-high "U" shaped dike creating a 10.3 acre-foot pond in the tailrace of the existing powerhouse; (p) an existing 12.5 kV, 22,900-foot-long overhead transmission line; and (q) 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 S&DA.

(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 S&DA are approved and made part of the license.

(D) The following sections of the Act are waived and excluded from the license for this minor project:

4(b), except the second sentence; 4(e), insofar as it relates to approval of plans by the Chief of Engineers

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and the Secretary of the Army; 6, insofar as it relates to public notice and to the acceptance and expression in the license of terms and conditions of the Act that are waived here; 10(c), insofar as it relates to depreciation reserves; 10(d); 10(f); 14, except insofar as the power of condemnation is reserved; 15; 16; 19; 20; and 22.

(E) This license is subject to the articles set forth in Form L-15, (October 1975), entitled "Terms and Conditions of License for Unconstructed Minor Project Affecting the Interests of Interstate or Foreign Commerce," except article 15, and 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.

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 1,730

horsepower.

Article 202. 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 that result from maintenance, operation, or alteration of the project works. In addition, all trees along the periphery of project reservoirs that 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 begin construction of the project works within 2 years from the issuance date of the license and shall complete construction of the project within 4 years from the issuance date of the license.

Article 302. At least 60 days before starting construction, the licensee shall submit one copy to the Commission's Regional Director and two copies to the Director of the Division of Inspections and Dam Safety of the final contract drawings and specifications for such pertinent features of the project as (1) water-retention structures, (2) all necessary transmission facilities, (3) the powerhouse, and (4) water conveyance structures. The Director of the Division of Inspections and Dam Safety may require changes in the plans and specifications.

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Article 303. The licensee shall review and approve the design of contractor-designed cofferdams and deep excavations before the start of construction and shall ensure that construction of coffer-dams and deep excavations is consistent with the approved design. At least 30 days before starting construction of the cofferdam, the licensee shall submit to the Commission's Regional Director and to the Director of the Division of Dam Safety and Inspections, one copy each of the approved cofferdam construction drawings and specifications and the letters of approval.



Article 304. Within 90 days after constructing the project, the licensee shall file for Commission approval revised exhibits A, F, and G to describe and show the project as built.

Article 401. The erosion control and slope stability plan filed on January 20, 1990, consisting of 15 pages, is approved and made part of the license, with the following modifications, and shall be implemented. The plan shall provide for means and measures to prevent erosion of exposed soil as soon as possible following cessation of active construction or other work at specific project sites and provide for the maintenance of permanent erosion control devices for the life of the project. The erosion control measures shall be in place before October 1, with an exception that land-disturbing activities can occur between October 1 and November 15, provided exposed work areas are protected with applicable erosion control measures by the end of each working day. Final drawings and specifications for the plan, including map locations of control measures, shall be filed along with final plans and specifications required by article 302. The Commission reserves the right to make changes to the plan to ensure adequate protection of the environmental, scenic, and cultural values of the project area.

Article 402. The licensee shall refrain from construction activities in the streambed except during the period from July 1 to November 15. Any instream construction after October 1 shall require written notification and concurrence of the California Department of Fish and Game and the U.S. Fish and Wildlife Service and shall be monitored on a daily basis by the project erosion control inspector.

Article 403. The licensee shall implement the water quality plan contained in exhibit E, appendix G, of the application, filed on February 1, 1990, with the following modifications: (1) monitor stream water temperatures continuously from June through September, in (a) the bypassed reaches of Mud, Middle, and Rock Creeks, and (b) Dobbyn Creek 100 yards above and below the confluence with Mud Creek; and (2) monitoring of water quality shall be conducted for at least 1 year prior to project operation, and continue for at least 3 years after project operation. Based on the results of the monitoring plan, the

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licensee shall, after consultation with the U.S. Fish and Wildlife Service and the California Department of Fish and Game, determine if any additional measures are needed to maintain water temperatures at acceptable levels to protect the fishery resources of Mud, Bluford, and Dobbyn Creek. The licensee shall file with the Commission, annual study results starting 1 year prior to project operation and continued for 3 years after project operation, along with comments from U.S. Fish and Wildlife Service and the California Department of Fish and Game, by December of each year, along with recommendations for eliminating any identified impacts. No project-related land-clearing, land-disturbing, or spoil-producing activities shall begin until the licensee is notified that the plan complies with the requirements of this article. The Commission reserves the right to modify project operations to protect fishery resources.

Article 404. The licensee shall release from each of the Three Forks Project diversion structures the following continuous minimum flows: Bluford Creek: 2.0 cubic feet per second (cfs); Mud Creek: 0.5 cfs; Rock Creek: 0.2 cfs; Middle Creek: 0.1 cfs, or the inflow to each of the diversion structures, whichever is less, for the protection of fish and wildlife resources in the bypass reaches of each stream. These flows may be temporarily modified if required by operating emergencies beyond the control of the licensee or for short periods upon mutual agreement between the licensee and the California Department of Fish and Game.

Article 405. The licensee shall design each project diversion to automatically and continuously release the minimum flows required in Article 403. The rating curve for each minimum flow bypass orifice shall be determined in accordance with the standards and methodology of the U.S. Geological Survey. The orifices shall be operative and calibrated prior to any project water diversions. The licensee shall provide a copy of the rating curves, and a description of the operating conditions necessary at each diversion to ensure that minimum flows are being released, to the California Department of Fish and Game and the U.S. Fish and Wildlife Service for comment. At least 90 days before the start of project operation, the licensee shall file the rating curves, along with agency comments, with the Commission.

Article 406. The licensee, after consultation with the U.S. Fish and Wildlife Service and the California Department of Fish and Game, and at least 90 days prior to any project-related land-

clearing, land-disturbing, or spoil-producing activities, shall file for Commission approval a detailed stream habitat and fish population monitoring plan to assess stream habitat and fish populations in the bypass reaches of each diverted stream.

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The plan shall include: (1) provisions to monitor trout populations and habitats in Mud Creek during project construction and operation, beginning at least 1 year prior to project construction along any watercourse and continuing for 3 years after project operation; (2) provisions to monitor stream habitats at specific transects in the diverted reaches of Mud, Middle, and Rock Creeks to ensure minimum flows required by article 403, maintain the stream wetted perimeter for aquatic organisms from June 15 to September 30; (3) a detailed description of the proposed methods to be used to include visual documentation of each wetted perimeter transect; and (4) monthly monitoring of stream wetted perimeter during the first year of project operation and annual monitoring of the wetted perimeter to occur at the same time in late summer for the following 2 years. No project-related land-clearing, land-disturbing, or spoil-producing activities shall begin until the licensee is notified that the plan complies with the requirements of this article.

Article 407. The licensee shall limit the maximum rate of change in stream flow (the ramping rate) below the Bluford Creek dam, so as not to exceed 30 percent of the existing stream flow per hour, for the protection of fishery resources at the Three Forks Project. The ramping rate may be temporarily modified if required by operating emergencies beyond the control of the licensee or for short periods upon mutual agreement between the licensee and the California Department of Fish and Game. The Commission reserves the right to require the same ramping rate below the Mud, Middle, and Rock Creek diversions in the future if improvements to the fishery resources in these bypass reaches are determined by the results of the monitoring plan required by article 405.

Article 408. The licensee shall monitor the amount and kind of riparian vegetation in the bypassed reaches of Mud, Rock, and

Middle Creeks. To accomplish monitoring, the licensee shall do the following:

1. After consulting with the U.S. Fish and Wildlife Service (FWS) and California Department of Fish and Game (CDFG), select three monitoring sites on Mud Creek and one site each on Rock and Middle Creeks, and define the dimensions of the riparian zone to monitor at each site.

2. Record the height, density, and species composition of vegetation at the five sites once during the year before starting construction of the new facilities and again during the first, fourth, and seventh years following initial operation. Monitoring shall occur at approximately the same time each year, near the end of the growing season.

3. Photograph the monitoring sites once each year before the new facilities start operations and once each year thereafter for 7 years. The licensee shall take the photographs at

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approximately the same time each year, near the end of the growing season, and from the same points each year with the same field of view.

4. File reports describing the results of the monitoring activities in requirements 1 through 3 within 6 months following the second, fifth, and eighth anniversaries of new facilities start-up. The first report shall include scaled maps showing the location of the monitoring sites. Each report shall qualitatively and quantitatively describe cumulative changes in riparian vegetation. If the monitoring shows net losses of riparian vegetation, the licensee shall (a) estimate the total amount of riparian vegetation lost in the project area, (b) propose measures to replace an equivalent or greater amount of riparian vegetation on- or off-site, (c) address the need for altering minimum flows, and (d) address the need for further monitoring.

5. Include the comments of FWS and CDFG regarding each report in 4 above.

The Commission reserves the right to require (1) changes to the monitoring program, and (2) modification of project operations or measures to mitigate the effects of project

operation on riparian vegetation.

Article 409. The licensee shall modify the existing 4.3-mile-long transmission line to conform to the guidelines in Suggested practices for raptor protection on power lines: the state of the art in 1981. The licensee shall complete modifications to the transmission line within 1 year after this license is issued. The licensee shall file as-built drawings within 90 days of completion of the modifications to the transmissions line. The Commission reserves the right to require further modifications to the line if the initial modifications do not conform to the raptor protection guidelines.

Article 410. The licensee, after consulting the California State Historic Preservation Officer (SHPO), shall conduct a cultural resources survey of the 4.3-mile-long transmission line corridor for the project, and prepare a cultural resources management plan for Commission approval to avoid or mitigate impacts to any archeological or historic sites located within the corridor. The report on the survey and the management plan shall be filed within 1 year of the date of issuance of this license, and all work shall adhere to the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation. The filing shall include the written comments of the SHPO on the survey, the report, and the plan. The Commission reserves the right to direct changes in the work required to satisfy this article.

Article 411. The licensee, before starting any future land-clearing, land-disturbing, or spoil-producing activities

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associated with the project, shall consult with the California State Historic Preservation Officer (SHPO) and shall conduct a cultural resources survey of the affected areas. Further, the licensee shall file a report containing the survey results; for Commission approval a cultural resources management plan to avoid or mitigate impacts to any significant archeological or historic sites identified during the survey; and, the written comments of the SHPO on the report and the plan. If the licensee discovers any previously unidentified archeological or historic sites

during the course of constructing or developing project works or other facilities at the project, the licensee shall stop all land-clearing, land-disturbing, or spoil-producing activities in the vicinity of the sites, shall consult with the SHPO, and shall file for Commission approval a cultural resources management plan to avoid or mitigate impacts to significant resources, together with the written comments of the SHPO on the plan. Upon Commission approval the licensee shall implement the plan. The survey and the plan shall be based on the recommendations of the SHPO, shall be conducted and prepared by a qualified cultural resources specialist, and shall adhere to the Secretary of the Interior's Guidelines for Archeology and Historic Preservation.

The report and plan shall contain the following: (1) a description of each discovered site, indicating whether it is listed or eligible to be listed on the National Register of Historic Places; (2) a description of the potential effect on each discovered site; (3) proposed measures for avoiding or mitigating the effects; (4) documentation of the nature and extent of consultation with the SHPO; and (5) a schedule for mitigating effects and conducting additional studies. The Commission may require changes to the plan.

The licensee shall not implement a cultural resources management plan or begin any land-clearing, land-disturbing, or spoil-producing activities until informed by the Commission that the requirements of this article have been fulfilled.

Article 412. (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 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 also shall have continuing responsibility to supervise and control the use and occupancies for which it grants permission and to monitor the use of and to ensure compliance with the covenants of the instrument of conveyance for any interests that it conveys under this article. If a permitted use and occupancy violates any condition of this article or any

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other condition imposed by the licensee for the 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 includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any noncomplying structures and facilities.

(b) The types of use and occupancy of project lands and water for which the licensee may grant permission without prior Commission approval are these: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where the facility is intended to serve single-family 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 also shall ensure to the satisfaction of the Commission's authorized representative that the use 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 do the following: (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, among other things, may establish a program for issuing permits for the specified types of use and occupancy of project lands and waters that 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.

(c) The licensee may convey easements or rights-of-way

across or leases of project lands for these purposes:

(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) nonproject overhead electric transmission lines that do not require erection of support structures within

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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 1 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 that briefly describes 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 the following: (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 certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) nonproject overhead electric transmission lines requiring 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 that are located at least one-half mile from any other private or public marina; (6) recreational development consistent with an approved exhibit R or an approved report on recreational resources of an exhibit E; and (7) other uses, if these conditions exist: (i) the amount of land conveyed for a particular use is 5 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 shall submit a letter to the Director, Office of Hydropower Licensing, stating the licensee's intent to convey the interest and briefly describing the type of interest and the 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.

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

(1) Before conveying the interest, the licensee shall consult with appropriate federal and state fish and wildlife or



recreational agencies and with 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 an approved report on recreational resources of an exhibit E or if the project does not have an approved exhibit R or an approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance shall include covenants running with the land adequate to ensure the following: (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 occur in a manner that protects 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 shall be excluded from the project only on 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 the preservation of 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 are 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.

(F) Approval of this license application does not affect the Commission's ability to take action pursuant to section 31 of the Act for violations of the order granting exemption for Project No. 6062, or the Commission's regulations, that may have

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occurred prior to the issuance of this license. The licensee for the Three Forks Project will assume the compliance record for Project No. 6062.

(G) The exemption from licensing issued July 23, 1982, for Project No. 6062 is terminated upon the commencement of operation

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of the licensed project. Within 30 days from the commencement of project operation, the licensee shall notify the Commission, in writing, of the date that project operation started.

(H) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to the Commission filing. Proof of service on these entities must accompany the filing with the Commission.

(I) This order is issued under authority delegated to the Director and constitutes final agency action. Request for rehearing by the Commission may be filed within 30 days of the date of issuance of this order, pursuant to 18 C.F.R. § 385.713.

Fred E. Springer  
Director, Office of  
Hydropower Licensing

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ENVIRONMENTAL ASSESSMENT  
FOR HYDROPOWER LICENSE

Three Forks

FERC Project No. 10882-000

California

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Federal Energy Regulatory Commission  
Office of Hydropower Licensing  
Division of Project Review  
825 N. Capitol Street, NE  
Washington, D.C. 20426

December 6, 1990



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ENVIRONMENTAL ASSESSMENT

FEDERAL ENERGY REGULATORY COMMISSION  
OFFICE OF HYDROPOWER LICENSING  
DIVISION OF PROJECT REVIEW

Date: December 6, 1990

Project name: Three Forks

FERC Project No. 10882 - 000

A. APPLICATION

1. Application type: minor license
2. Date filed with the Commission: 2/01/90
3. Applicant: Norman Ross Burgess
4. Water body: Mud, Middle, & Rock Creeks. River basin: Eel
5. Nearest city or town: Zenia (See figure 1.)
6. County: Trinity State: California

B. PURPOSE AND NEED FOR ACTION

1. Purpose

Norman Ross Burgess, the applicant, proposes to incorporate the existing facilities of the exempted Bluford Creek Project (FERC No. 6062), along with additional new facilities, into the proposed Three Forks Project. The Three Forks Project would divert additional streamflow through the existing powerhouse and provide 7.2 gigawatthours (GWh) of electrical energy a year compared to 3.2 GWh generated by the existing Bluford Creek Project. Burgess would sell the power to Pacific Gas and Electric Company (PG&E).

2. Need for Power

The power from the project has been useful in meeting a small part of the need for power projected by the Western Systems Coordinating Council (WSCC) for the California-Southern Nevada area of the WSCC region. From the time the project became commercial, it has helped displace fossil-fueled electric power generation in the WSCC region, conserving nonrenewable fossil fuels and reducing the emission of noxious byproducts caused by the combustion of fossil fuels.

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### C. PROPOSED PROJECT AND ALTERNATIVES

#### 1. Description of the proposed action. (See figure 2)

As stated above, the proposed Three Forks Project would include the existing Bluford Creek Project.

The existing Bluford Creek Project consists of the following:

- è An intake box, on an unnamed stream, diverting flows through a 12-inch-diameter, 500-foot-long penstock to Bluford Creek
- è An 8-foot-high diversion structure on Bluford Creek
- è A 3-foot-wide, 4-foot-high, 12-foot-long metal flume, carrying stream flows to an intake structure
- è An 8-foot-wide, 8-foot-high, 32-foot-long concrete intake box structure
- è A 24-inch-diameter, 6,618-foot-long steel penstock, carrying Bluford Creek diverted flows to a powerhouse
- è A 24-foot-wide, 27-foot-long concrete and cinder block powerhouse with a 1.3 megawatt (MW) turbine-generator unit.
- è 4.3 miles of 12.5-kV overhead transmission line.

The Three Forks Project would consist of the Bluford Creek Project with these added features:

- è A 12-foot-high, 83-foot-long diversion structure on Mud Creek, diverting stream flows through a 1,100-foot-long conduit to the Middle Creek junction box where flows diverted from Mud Creek are combined with flows from Middle Creek
- è A 12-foot-high, 35-foot-long diversion structure on Middle Creek, diverting stream flows through a 55-foot-long conduit leading to the Middle Creek junction box
- è A 540-foot long conduit leading from the Middle Creek junction box to the Rock Creek junction box where flows diverted from Rock Creek are combined with flows diverted from Mud and Middle Creeks
- è A 17-foot-high, 49-foot-long diversion structure on Rock Creek, diverting stream flows through a 635-foot-long conduit to the Rock Creek junction box

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- è A 3,123-foot-long conduit carrying all diverted flows to an 11.5 acre-foot impoundment formed by a 30-foot-high, 83-foot-long earth fill dam
- è A 4.1 acre-foot impoundment formed by a 35-foot-high, 45-foot-long earth fill dam with an intake structure that includes an emergency penstock isolation slide gate and overflow pipe
- è A 24-inch-diameter, 6,500-foot-long penstock, extending from the intake structure to join the existing Bluford Creek Project penstock at elevation 1,535 feet
- è A 10.3 acre-foot afterbay in the tailrace of the existing powerhouse to reregulate flows from the project

Burgess proposes to operate the proposed Three Forks Project



using daily peaking. The Bluford Creek Project now generates about 3.2 gigawatthours (GWh) of electrical energy annually; after adding the new features, Burgess estimates that the Three Forks Project would generate about 7.25 GWh annually. The additional energy would come from the additional diverted flows.

Rock Creek, Middle Creek, and Bluford Creek are tributaries of Mud Creek, which flows into Dobbyn Creek (a tributary of the Eel River) less than 1 mile downstream of the existing powerhouse located on Mud Creek.

2. Applicant's proposed mitigative measures.

a. Construction. Burgess would implement an erosion, sediment, and slope stability control plan. Streambed construction would occur from July 1 to November 15; after October 1, Burgess would need a construction permit from the California Department of Fish and Game (CDFG). Burgess proposes to bury the penstock and to recontour and revegetate the penstock route after installation.

b. Operation. Burgess would screen all intakes.

3. Federal lands affected.

No.

4. Alternatives to the proposed project.

a. No reasonable action alternatives have been found.

b. Alternative of no action. Because Burgess isn't an electric utility, if the Commission denies the license, the only alternative is to continue project operation under the present exemption. If the Commission denies the license, the additional



annual generation that would have been produced from a renewable resource would be lost and would have to be provided by consuming nonrenewable fuels, which would increase air pollution.

D. CONSULTATION AND COMPLIANCE

1. Fish and wildlife agency consultation (Fish & Wildlife Coordination Act).

- a. U.S. Fish & Wildlife Service (FWS)           X Yes.           No.
- b. State(s):                                       X Yes.           No.
- c. National Marine Fisheries Service:       X Yes.           No.

2. Section 7 consultation (Endangered Species Act).

- a. Listed species:   X None.           Present:
- b. Consultation:    X Not required.

Remarks: In a letter of July 5, 1989, FWS notified Burgess that the following species may occur in the project area (present status given in parenthesis):

Animals   peregrine falcon (endangered)  
          northern spotted owl (threatened)  
          Pacific western big-eared bat (candidate)  
          California red-legged frog (candidate)

Insects   Siskiyou ground beetle (candidate)  
          Trinity ground beetle (candidate)

Plants    Tracy's sanicle (candidate)  
          beaked tracyina (candidate)

Burgess surveyed the project area for these species and found none. Burgess's survey report concludes that the proposed project would not likely affect the six species, even if they were present. In a letter of November 15, 1989, FWS stated that the surveys were adequate and agreed with Burgess's conclusions.

3. Section 401 certification (Clean Water Act).

X Required; applicant requested certification on 7/1 /89.

Status : X Waived by the certifying agency on 7/12/89.

4. Cultural resource consultation (Historic Preservation Act).

- a. State Historic Preservation Officer:       X Yes.           No.
- b. National Park Service:                    X Yes.           No.





California Water Resources Control Board	5/18/90
California Department of Fish and Game	6/13/90
U.S. Department of the Interior	6/11/90
U.S. Fish and Wildlife Service	6/18/90

Motions to intervene	Date of motion
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None.

- 2. X The applicant did not respond to the comments or motion(s) to intervene.



F. AFFECTED ENVIRONMENT

- 1. General description of the locale.

- a. Description of the Eel River Basin.

The Eel River originates in the Northern Coast Ranges and flows northwest to the Pacific Ocean. The basin's climate is generally maritime. In 1981, the Secretary of the Interior made the lower part of the Eel River and parts of the North, South, and Middle Forks a component of the National Wild and Scenic Rivers System (National Park Service, 1982).

Within the Eel River Basin, virgin redwood groves occur in the valley near the mouth of the Eel River and in Humboldt Redwood State Park; giant old-growth Douglas fir stands occur in Elder Creek National Landmark along the South Fork. Important anadromous fish runs are salmon and steelhead. The Middle Fork and North Fork are used for whitewater boating; the mainstem Eel River offers one of the longest continuous river runs in the state (National Park Service, 1982).

- b. Existing licensed projects and exempted projects in the basin, as of 12/01/90. (Exempted projects have an " \* " after the FERC Project No.)

Project No.	Project name
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77	Scott Dam
4627	Baker Creek
5955*	Burgess Creek
6062*	Bluford Creek
7120	Kekawaka Creek
9878	Rock Shadow

Note: The Bluford Creek Project (FERC No. 6062) would be incorporated into a license issued for the Three Forks Project.

c. Other pending license applications and exemption applications in the basin, as of 12/01/90 .

None.

d. Target resources.

A target resource is an important resource that may be cumulatively affected by multiple development within the basin. On the basis of the regional significance of the resources and the geographic distribution of hydropower projects within the basin, we selected old growth forest, anadromous fish, and white water boating as target resources for the Eel River Basin. Impacts to target resources are discussed below.

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e. Cumulative Impacts.

A cumulative impact is the effect on the environment that results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR, section 1508.7).

There are no old-growth forests or anadromous fish within the Three Forks Project area. Old growth forests occur to the northwest near the mouth of the Eel River and to the south along the South Fork. While anadromous fish are present in Dobbyn Creek downstream of the project, no anadromous fish have been

found in Mud Creek and its tributaries. Because the streams are so small, there is no potential whitewater boating that could be affected by the proposed project. Therefore, the proposed Three Forks Project would not contribute to cumulative impacts on the target resources in the Eel River Basin.

2. Descriptions of the resources in the project impact area  
(Source: Three Forks Hydro Project, application,  
exhibit E, unless otherwise indicated).

a. Geology and soils: The project area is underlain by predominantly marine sedimentary bedrock. Large areas of ancient slope failure dominate the geomorphology of the mountainous terrain surrounding the project area. Within these large, ancient landslide areas, smaller slides are locally active. The bedrock tends to weather deeply, giving rise to a clayey soil and an intensely weathered zone about 20 feet thick that is susceptible to shear failure and landsliding.

The new sections of pipeline would cross shallow slides, less than 10-feet-thick, at these points: just below the intake for the Rock Creek diversion; 100 feet north of the intake for the Middle Creek diversion; 300 feet south of the Mud Creek intake; on the east and west sides of Stockton Creek; east of the silt ponds; and on the west side of the regulation release reservoir. Large active landslides and debris slides occur along Mud Creek, Rock Creek, and Middle Creek that are being undercut by streamflow and contributing large quantities of sediments to the creeks.

b. Streamflow: Rock Creek

low flow: 0.7 cfs; flow parameter: August, September  
monthly average.

high flow: 35.0 cfs; flow parameter: February monthly  
average.

average flow: 8.25 cfs.



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low flow: 0.1 cfs; flow parameter: August, September  
monthly average.

high flow: 6.0 cfs; flow parameter: January, February  
monthly average.  
average flow: 2.75 cfs.

Streamflow: Mud Creek

low flow: 1.2 cfs; flow parameter: September monthly  
average.

high flow: 60.0 cfs; flow parameter: February monthly  
average.  
average flow: 17.6 cfs.

Streamflow: Bluford Creek

low flow: 2.5 cfs; flow parameter: exceeded 70 percent  
of the time.

high flow: 50.00 cfs; flow parameter: exceeded 5  
percent of the time.

average flow: 11.0 cfs.

c. Water quality: Because of high levels of naturally occurring sediment, water quality in Rock, Middle, and Mud creeks is very poor. Bluford Creek also has high levels of naturally occurring sediment. Most of the erosion is the result of seasonal high stream flows eroding and over-steepening the toe of the stream banks along large active landslides and debris slides, which contributes substantial quantities of sediments to the creeks. Water temperatures recorded during three days in July at different locations of each stream were between 59°F and 70°F.

d. Fisheries:

Anadromous: X Absent. Present.

Resident: Absent. X Present.

Remarks: Very few fish exist in the three streams proposed for diversion (Mud, Rock, and Middle Creeks). Each stream was electrofished during July 1987, when a total of 14 sites were surveyed. Of the 14 sites sampled, 11 sites were located above the confluence of Mud and Bluford Creeks (above the existing powerhouse site). Fish population estimates could not be made because resident rainbow trout were collected in only 3 of the 11

sites above the existing powerhouse on Bluford Creek in Rock, Mud, and Middle Creeks.



In addition to resident rainbow trout, CDFG has documented that steelhead trout spawn and rear in Dobbyn Creek, less than 1 mile downstream from the existing powerhouse site. Trout fry observed during electrofishing surveys in Dobbyn Creek were not identified as steelhead or rainbow; however a large salmonid carcass was seen at the Dobbyn Creek site. There are no anadromous fish barriers between Dobbyn Creek and the Three Forks project area. Water quality is believed to be the reason that steelhead trout have avoided Mud Creek and its tributaries (Burgess 1990).

e. Vegetation:

Cover type	Dominant species
Mixed conifer-hardwood forest	Douglas fir, gray oak, black oak, California laurel, Pacific madrone.
Riparian forest	white alder, bigleaf maple, willows.
Grassland	Introduced brome and fescue grasses.

f. Wildlife:

The mixture of forest and grassland cover types in the project area provides habitat for a variety of wildlife species. Mammals in the area include black bear, black-tailed deer, bobcat, gray fox, gray squirrel, mountain lion, and raccoon. Birds in the area include band-tailed pigeon, great horned owl, red-tailed hawk, and valley quail.

g. Cultural:

X National Register (listed and eligible) properties



have not been recorded.

h. Visual quality: The area is attractive and mostly natural looking. The landforms are rugged; steep slopes are vegetated with shrubs and trees. The area soils are very erodible and contribute to the constantly dirty appearance of the stream flows.

i. Recreation: Recreational opportunities in the project area include fishing and hunting. Fishing is limited to the lower sections of Bluford Creek and a reach of Mud Creek next to the existing powerhouse. Because the entire existing project is on private land, public access to the project area is limited; however, a county road (Zenita Bluff Road) gives access to both Mud and Bluford Creeks.

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j. Land use: Land in the project vicinity is used for cattle grazing and timber production. The project land is presently zoned as an agricultural preserve by Trinity County.

k. Socioeconomics: The local economy is based on agriculture.

#### G. ENVIRONMENTAL ISSUES AND PROPOSED RESOLUTIONS

There are 8 issues addressed below.

1. Erosion, Sedimentation, and Slope Instability. Constructing the proposed diversion structures, pipelines, and upgrading existing access roads would cause minor erosion. Constructing 400 feet of new access road to the Rock Creek diversion site would occur in an unstable area, which could activate the slide and cause slope failure that could deliver sediment directly to Rock Creek. Pipeline rupture during project operation could also cause erosion and slope failure that could deliver sediment to the creeks.

FWS and CDFG recommend that the applicant develop and implement a detailed erosion, sediment, and slope stability control plan based on actual site conditions, and they identify

specific measures that should be in the plan. These measures include an automatic water diversion shutoff system that would function if the pipeline ruptures or there is any other failure of the water conveyance facilities that would cause the uncontrolled release of diverted water to out-of-stream areas of the project. The Soil Conservation Service (SCS) recommends that all disturbed areas be seeded and mulched according to SCS specifications and that rolling dips (waterbars) with energy dissipators be used on the access roads.

On January 20, 1990, Burgess filed an erosion, sediment, and slope stability control plan. This plan was developed in consultation with CDFG, FWS, SCS, and California Division of Mines.

The plan includes: (1) protecting fill and streambanks with riprap and armoring spillways; (2) endhauling excess excavated materials to designated spoil areas; (3) providing curtain drains, ditches, culverts and waterbars with energy dissipators for access roads; (4) limiting steepness of cut slopes and compacting fill slopes; (5) diverting streamflow around construction areas; (6) collecting and filtering runoff using sediment ponds and straw bales; (7) preventing petroleum products and cement washings from entering streams; (8) suspending the pipeline over stream crossings; (9) revegetating disturbed areas as soon as possible; (10) stockpiling topsoil, recontouring slopes, fertilizing, seeding, and mulching areas to be revegetated, including spoil disposal and laydown areas; (11)

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limiting instream construction to the time between July 1 and September 31; (12) surfacing roads with gravel; and (13) providing slide gates at the diversions that would stop flow to the pipelines if a rupture occurs.

The plan also includes provisions for implementing the plan, maintaining the control measures, and identifies emergency procedures for slope or pipeline failure. An engineering geologist would be present to inspect excavations in unstable areas. Burgess also proposes to develop a long term resource enhancement plan to reduce mass soils wasting along Mud Creek to

reduce the sediment load and improve anadromous fish habitat downstream of the powerhouse in Dobbyn Creek. Burgess identifies a potential enhancement area about 500 feet upstream of the Rock Creek diversion site.

Installing curtain drains in unstable areas crossed by existing access roads would stabilize these areas by providing improved drainage. Constructing the new access road across the slide area near the Rock Creek diversion site, activation of the slide or a pipeline rupture, however, could cause erosion or slope failure that would cause soil materials to enter Rock Creek directly. Burgess proposes to stabilize the slide area by placing riprap along the creek to buttress the slope and prevent undercutting by the creek. Burgess also proposes to use automatic shut-off devices at the diversions to stop the flow of water if a pipeline rupture occurred.

The erosion control plan Burgess proposes includes all of the specific measures recommended by the agencies except (1) functional design drawings and map locations of control measures, and (2) specifications for having erosion control measures for protecting disturbed land surfaces during the winter in place before October 1 (Burgess could perform land-disturbing activities between October 1 and November 15, if exposed work areas are protected with applicable erosion control measures by the end of each working day). The measures recommended by the agencies should be made part of the final erosion control plan.

Implementation of Burgess's proposed erosion control plan with modifications we and the agencies recommend, would ensure that erosion during construction would be minor. Lower flows during project operation would substantially reduce the undercutting of mass wasting deposits next to the stream banks; the lower flows, and Burgess's implementation of the resource enhancement plan, would decrease the sediment load of the affected creeks. Intakes include a vortex tube-type sediment ejector and 2 automatic slide gates to allow sediment to be transported past the diversion structure.

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The project has the potential to increase water temperature as a result of diverting flow from the bypass reaches of Mud, Middle, and Rock Creeks, and storing water in the project's settling ponds, forebay, and afterbay. Water temperatures taken during a 3 day sampling period during July at several sites in Mud, Middle, Rock and Bluford Creeks indicate daily variations between 59°F and 70°F. These temperatures are within the range suitable for trout habitat. If water temperatures below the project increase substantially as a result of project operation, impacts to trout spawning, incubation, hatching of eggs, rearing of young, and adult growth and metabolism could occur. FWS is concerned that increased water temperatures could adversely impact downstream fish populations (growth and spawning success). CDFG and FWS recommend that Burgess monitor water temperature for changes that would affect the resident fish populations of Mud Creek below the Bluford Creek powerhouse.

During project operation, Burgess proposes to monitor temperature continuously from June through September at the following five sites:

1. At the head of the sediment pond where water diverted from Mud, Middle, and Rock Creeks first enters
2. At the outlet of the forebay after water has passed through the two ponds and before it mixes with Bluford Creek water
3. In Mud Creek above the confluence with the afterbay,
4. In the outlet of the afterbay
5. In Mud Creek below the confluence with the afterbay.

Burgess proposes additional weekly spot checks of water temperature in Mud and Bluford Creeks just above their confluence.

FWS recommends additional water quality monitoring sites, with at least one site in both Rock Creek and Middle Creek. FWS also recommends that all monitoring be conducted at least 1 year before, and 3 years after project completion.

Diverting flow from Mud, Middle, and Rock Creeks into the proposed penstock would result in the significant reduction of flow in each stream's bypass reach, a total of about 2.75 miles. This reduction in flow, along with solar heating, may result in increased water temperature in the bypass reaches.

Burgess proposes to store water in the settling ponds and forebay during periods of low power demand, and generate during

daily periods of high power demand. Storing water in the ponds would increase the retention time of water in these ponds, but not for more than 24 hours under Burgess's proposal.

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In addition, Burgess plans to store water in the afterbay to comply with CDFG's recommended ramping rate. Storing water in the afterbay could increase water temperature if water is stored for a prolonged period of time. Changes in water temperature in the afterbay would be greatest during late summer (July 15-September 15). The retention time may need to be adjusted based on the results of the temperature monitoring plan.

Results of the temperature monitoring plan at the end of the proposed time period (1 year prior to construction and continued for 3 years after project operation) would enable staff and the agencies to identify (1) the project's effects, if any, on water temperature and the downstream fishery, (2) the need for extending or discontinuing water temperature monitoring, and (3) any additional measures that should be taken to prevent impacts to the downstream fishery. Staff and the agencies could identify if changes from pre-project conditions occur below the Bluford Creek powerhouse discharge that would affect trout spawning and growth in Dobbyn Creek.

Burgess's proposed water quality monitoring plan is generally adequate; but it does not include identifying temperature changes in the bypass reach of Mud, Middle and Rock Creeks under the proposed minimum flow regimes. Burgess's plan should include monitoring water quality and temperature at each of the five sites Burgess proposes, and additional monitoring sites in the bypass reaches of Middle Creek, Rock Creek, and Mud Creek, for at least 1 year before construction begins, and should continue for 3 years after project operation. Annual results of the monitoring should be sent to the FWS, CDFG, and the Commission, along with agency comments. Final results of the monitoring, along with agency comments, and any recommendations for additional measures to protect the fishery resources from increased water temperature should be provided to the Commission after completion of the monitoring.

3. Stream flow:

a. Minimum flows: The proposed project would reduce annual flows in the bypass reach of each stream (Mud Creek: a 10,240 foot-long diversion; Middle Creek: a 1,040 foot-long diversion; Rock Creek: a 3,200 foot-long diversion). In addition, the Bluford Creek 6,440 foot-long bypass, would be included in the license for the proposed Three Forks Hydroelectric Project.

High seasonal stream flow currently erodes the toes of large landslides and debris slides along the stream banks, and affects water quality by introducing large amounts of sediment into the stream. During extreme high flow conditions it is believed that more than one-half of the mass in motion is eroded soil and rock (Burgess 1990). The proposed project would reduce seasonal high flows. Erosion of the stream bank would therefore decrease under

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the reduced flow regime, and water quality in each stream would improve as the sediment load decreased.

CDFG and FWS recommend annual minimum flows for the bypass reach of each stream: Mud Creek: 0.5 cfs; Middle Creek: 0.1 cfs; Rock Creek: 0.2 cfs. Burgess agrees to all of these flows. In addition, FWS recommends that each of the project diversions automatically and continuously release the recommended minimum flows.

We calculated the potential reductions in flows in Mud, Rock, and Middle Creeks using Burgess's synthesized natural flows data, the proposed intake capacities, and the proposed minimum flows (table 1). We found that the projects proposed minimum flow regime would reduce average monthly stream flows each month. In most months, average monthly flows would be reduced between 55 and 95 percent (see below). This reduction in streamflow would reduce erosion potential as discussed in section G.1. above.

Table 1. Estimated streamflow reductions (in percent) under Three Forks Project operations, from the average monthly high and low flows (in cubic feet per second) for Mud, Rock, and Middle Creeks, based on synthesized 1955-1988 records.

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Month	Mud Creek		Rock Creek		Middle Creek	
	High	Low	High	Low	High	Low
Jan	48	98	44	98	33	95
Feb	40	98	43	98	33	95
Mar	44	86	48	94	40	67
Apr	56	97	63	98	50	95
May	96	92	97	94	92	80
Jun	94	87	96	91	88	80
Jul	90	72	93	82	80	50
Aug	76	62	83	71	50	0
Sep	80	58	86	71	67	0
Oct	93	64	95	75	86	50
Nov	89	90	99	93	67	90
Dec	53	98	58	98	50	95

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Although these are significant reductions in stream flow, these reductions would benefit the aquatic environment by reducing erosion and corresponding high sediment load transport through the stream bed. Provided water temperatures do not reach lethal levels for trout, the result would be improved water quality and aquatic habitat for trout and invertebrates below the diversion in each of the streams. In addition, receiving waters of Mud Creek below the powerhouse would be more suitable for trout and aquatic invertebrates with erosion and sediment reduced



by the project. This reduction in sediment from the Mud Creek drainage would benefit Dobbyn Creek's trout population.

Burgess therefore, should provide the proposed minimum flows (Mud Creek: 0.5 cfs; Middle Creek: 0.1 cfs; Rock Creek: 0.2 cfs) in each of the bypassed reaches. The minimum flow of 2.0 cfs in Bluford Creek should continue as required under the exemption.

An automatic bypass structure at the intakes, as recommended by FWS, that is appropriately designed and calibrated would ensure that the recommended minimum flows are bypassed at

all times. Staff agrees. Therefore, Burgess should design, construct, and install an automatic bypass device at the intake of each diversion to bypass recommended minimum flows.

b. Monitoring plan: To ensure that the recommended stream flows maintain stream wetted perimeters for aquatic organisms during the low-flow period, from June 15 to September 30, FWS recommends that Burgess monitor stream habitats in the diverted reaches of Mud, Middle, and Rock Creeks. In addition, CDFG and FWS recommend that Burgess conduct a detailed fish population monitoring plan to determine impacts from project construction and operation on resident trout in Mud Creek. The result of decreased flow in the bypass reach would be improved quality of aquatic habitat that trout could move in to. The fish population monitoring plan would identify this usage. Burgess agrees to this plan.

We agree with CDFG (letter dated June 13, 1990) and FWS (letter dated June 11, 1990) that the stream habitat monitoring plan would provide a way to document that wetted perimeter is maintained. The fish population monitoring plan would detect if aquatic habitats and trout are adequately protected during the low flow time of year in the bypassed reaches of each stream. If not, results from the monitoring plan would provide sufficient information to recommend changes to minimum flow releases that would ensure protection of trout populations and aquatic habitats in each stream diverted by the project and document usage by trout. Therefore, Burgess should prepare and implement the monitoring plan to include the assessment of fish population and stream habitat. Monitoring should be conducted for 1 year before and for 3 years after project operation according to CDFG and FWS specifications.

4. Ramping rates. Starting project operation would suddenly decrease the amount of water in the bypass reaches of each diverted stream and could strand some fish, especially juveniles, in small, shallow pools.

Although fish populations are considered minimal in the streams proposed for diversion, electrofishing samples taken in the proposed bypass reaches did produce a few resident rainbow





trout in Mud Creek, just below the confluence of Rock Creek. To prevent stranding fish, CDFG and FWS recommend that when altering the volume of streamflow diverted, Burgess should not alter the instream flow regime downstream of the powerhouse at a rate greater than 30 percent of the existing streamflow per hour. Burgess agrees to these conditions.

Experience at other projects has shown this rate to be acceptable in most cases. We agree with the agencies that Burgess should adopt a ramping rate of 30 percent of the existing streamflow below the project powerhouse and in the bypass reach of each stream.

#### 5. Riparian vegetation-effects of reduced flows:

Reduced flows in the bypassed reaches of Mud, Middle, and Rock Creeks (approximately 1.9, 0.2, and 0.5 miles, respectively) could reduce the density and width of the riparian corridor by reducing the amount of water reaching the root zones of established stream-side vegetation. Such changes could adversely affect many species of wildlife dependent upon riparian habitat. In most months, average monthly flows would be reduced between 55 and 95 percent (table 1).

The acreage of riparian habitat in the bypassed reaches is not available. If each stream is bordered by 20 feet of riparian vegetation on each bank, up to about 13 acres could be affected by project operation. It is likely that a 55 to 95 percent reduction in average monthly flows would cause changes in the riparian vegetation, because plant communities respond to changes in available moisture; however, the nature and extent of these changes is difficult to predict.

In letters to Burgess dated November 15, 1989, and December 19, 1989, the FWS recommends Burgess monitor riparian habitat in the bypassed reaches of the three creeks to determine whether the proposed minimum flows are sufficient to (1) prevent the streams from drying up; (2) maintain riparian vegetation; and (3) provide a year-round water source for aquatic and terrestrial animals. Without specifying methodologies, FWS recommends measurements of the condition of riparian vegetation and of stream wetted perimeter for at least 1 year before and 3 years following project construction.

In response to the recommendations from FWS, Burgess submitted to the Commission a monitoring plan that separately

addresses fish populations, water temperature, and riparian conditions (Norman R. Burgess, January 1990).

Burgess says the purpose of the riparian monitoring plan is to "assess the stability of riparian vegetation and persistence of wetted stream perimeter under project flow diversion



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conditions." Burgess proposes to take bimonthly photographs and water surface elevation measurements at two sites each in Mud, Middle, and Rock Creeks and would submit annual progress reports with comments from the fish and wildlife resource agencies.

Burgess's proposed photographs and water surface elevation measurements alone would not provide sufficient information to assess impacts to riparian vegetation. Photographs can be difficult to interpret and water surface elevation measurements provide no information about vegetation. More detailed measurements of stream and riparian zone characteristics are necessary. Further, changes in the riparian zone may not become apparent within the 3 years of monitoring recommended by the FWS and a longer time period is probably necessary.

Burgess should monitor riparian vegetation, using the methods described below, at three sites on Mud Creek and one site each on Rock and Middle Creeks. Greater effort is required on Mud Creek because the project would affect a greater length of Mud Creek than the other creeks. Burgess should consult the FWS and CDFG regarding monitoring site selection and definition of monitoring site dimensions, and file scaled maps showing the location of the five sites selected.

Burgess should record the height, density, and species composition of vegetation at the five sites once during the year before starting operation of the new facilities and again during the first, fourth, and seventh years following initial operation. He should monitor the vegetation at approximately the same time each year, near the end of the growing season.

Burgess should photograph the monitoring sites once each year before the new facilities start operations and once each

year thereafter for 7 years. He should take the photographs at approximately the same time each year, near the end of the growing season, and from the same points each year with the same field of view.

Burgess should file reports describing the results of the monitoring activities within 6 months following the second, fifth, and eighth anniversaries of new facilities start-up. The first report should include scaled maps showing the location of the monitoring sites. Each report should qualitatively and quantitatively describe cumulative changes in riparian vegetation.

If the monitoring shows net losses of riparian vegetation, the Burgess should (a) estimate the total amount of riparian vegetation lost in the project area, (b) propose measures to replace an equivalent or greater amount of riparian vegetation on- or off-site, (c) address the need for altering minimum flows, and (d) address the need for further monitoring. Burgess should

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include the comments of FWS and CDFG regarding each monitoring report.

6. Forest and grassland vegetation:

Building the proposed project would require clearing 10 acres of forest and 7 acres of grassland vegetation. An additional 1 acre of unvegetated abandoned stream channel would become an afterbay reservoir below the existing powerhouse on Bluford Creek. The forest and grassland areas that would be affected by project construction provide habitat for a variety of wildlife species.

Burgess proposes to revegetate all cleared areas according to recommendations the SCS made in an August 9, 1989, letter to Burgess. These guidelines call for planting a mixture of grasses and clover; therefore only the 10 acres of forest and the 1 acre of abandoned channel would be converted to a different habitat type.

The conversion of 10 acres of forest to grassland as a result of project construction would probably have little effect on local wildlife populations because the entire project area has been logged since the 1950's, and grassland openings are common. Revegetating areas disturbed by construction would speed the restoration of the wildlife habitat value of the area and would minimize the potential for erosion. Burgess should implement SCS's revegetation recommendations in all areas cleared for project construction.

7. Raptor electrocution:

Improperly designed transmission lines can pose an electrocution hazard to raptors and other large birds. Hawks, owls, and other large birds are found in the project vicinity. The existing Bluford Creek Project, which would become a part of the proposed Three Forks Project, includes a 22,900-foot-long transmission line. This line was not built according to raptor protection guidelines. Building the Three Forks Project would require additional power and communications lines to connect the existing powerhouse and the new diversion structures, but these lines would be buried with the new penstocks.

To ensure that birds are unable to make simultaneous contact with energized wires and ground wires or metal hardware, Burgess should modify the existing transmission line, using the design guidelines of the Raptor Research Foundation, Inc. (1981).

8. Archeological or historic sites along the 4.3-mile-long transmission corridor:

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Archeological or historic sites may have been damaged by placement of the transmission line poles in the ground, and sites may be damaged by future maintenance work on the poles and the line. A cultural resources survey should be conducted of the 4.3-mile-long transmission line corridor within 1 year of the date of any issuance of a license for the project to determine whether any archeological or historic sites eligible for inclusion in the National Register of Historic Places are located within the corridor. A cultural resources management plan should

be prepared for any eligible sites located in the corridor to avoid or mitigate impacts from construction or maintenance of the transmission line. The survey and plan should be based on the recommendations of the SHPO, and adhere to the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation. The survey report and the plan should be filed, together with the written comments of the SHPO on the report and the plan, within 1 year of the date of any issuance of a license for the project.



H. ENVIRONMENTAL IMPACTS

1. Assessment of impacts expected from the applicant's proposed project (P), with the applicant's proposed mitigation and any conditions set by a federal land management agency; the proposed project with any additional mitigation recommended by the staff (Ps); and any action alternative considered (A). Assessment symbols indicate the following impact levels:

O = None; 1 = Minor; 2 = Moderate; 3 = Major; A = Adverse; B = Beneficial; L = Long-term; S = Short-term.

Resource	P	Ps	A	Resource	P	Ps	A
a. Geology-Soils	1	A	3	f. Wildlife	1	A	3
b. Streamflow	1	A	3	g. Cultural: Archeological	1	A	3
c. Water quality: Temperature	1	A	3	h. Visual quality	1	A	3
Dissolved oxygen	1	B	L	i. Recreation	1	A	3
Turbidity and sedimentation	2	B	L	j. Land use	0	3	3
d. Fisheries: Anadromous	0	3	3	k. Socioeconomics	0	3	3
Resident	1	B	L				



surfaces have been stabilized. Reducing flows in 2.6 miles of Mud, Rock, and Middle Creeks would be unavoidable, and could adversely affect up to 13 acres of riparian vegetation. Wildlife's use of the 10 acres of forest and 7 acres of grassland habitat that Burgess would clear during project construction would be disrupted until replanted grass and clover are established. The permanent conversion of 10 acres of forest habitat to grassland habitat would be unavoidable. Minor temporary adverse effects to recreationists in the project area from noise and increased traffic would be unavoidable during project construction. Minor long-term effects to visual quality from adding man-made features to a predominantly natural landscape would be unavoidable.

#### J. COMPREHENSIVE DEVELOPMENT

Section 4(e) of the Federal Power Act (Act) states that in deciding whether to issue a license, the Commission, in addition to considering the power and development purposes of the project, shall give equal consideration to (1) the purposes of energy conservation, (2) the protection, mitigation of damage to, and enhancement of fish and wildlife, (3) the protection of recreational opportunities, and (4) the preservation of other aspects of environmental quality.

Further, in section 10(a), the Act says the Commission shall adopt a project that in its judgment will be best adapted to a comprehensive plan for improving or developing a waterway for (1)



the use or benefit of interstate or foreign commerce, (2) the improvement and utilization of water power development, (3) the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat), and (4) other beneficial public uses, including irrigation, flood control, water supply, and recreation, and other purposes discussed in section 4(e).

In this environmental assessment, the staff evaluated the effects of project operation on the environmental resources of the project area and discussed the mitigative measures that

should be implemented to protect and enhance these environmental resources.

The staff also evaluated the need for power in the general project vicinity and determined that the power from the project would continue to be useful in meeting a small part of the need for power projected for the California-Southern Nevada area of the WSCC region.

In the staff's safety and design assessment, the staff looked at economic effects of licensing the project and requiring Burgess to provide minimum streamflows in the bypassed reaches of Mud, Middle, Rock, and Bluford Creeks. The staff finds that with a levelized net annual benefit of 31 mills/kWh and rate of return of 29.5%, operating the project with these environmental measures would still be an attractive investment for Burgess, and the benefits to fish resources justify the costs of providing minimum flows.

The project, if licensed, would generate an estimated average 7.25 gigawatthours of electrical energy per year without significantly affecting environmental resources.

Under section 10(a) of the Act, the staff finds that this project would be best adapted to a comprehensive plan for improving a waterway.

#### K. CONCLUSION

1. X Finding of No Significant Impact. Approval of the recommended alternative [H(3)] would not constitute a major federal action significantly affecting the quality of the human environment; therefore, an environmental impact statement (EIS) will not be prepared.

Intent to Prepare an EIS. Approval of the recommended alternative [H(3)] would constitute a major federal action significantly affecting the quality of the human environment; therefore, an EIS will be prepared.





2. X Pursuant to Section 10(j) of the Act, this EA addresses the concerns of the Federal and state fish and wildlife agencies and makes recommendations consistent with those of the agencies.

Pursuant to Section 10(j) of the Act, we find that the recommendations of the Federal and state fish and wildlife agencies may be inconsistent with the purpose and requirements of Part I of the Act or other applicable law. We will attempt to resolve the inconsistency through further consultation with the agencies.

L. LITERATURE CITED

Burgess, Norman R. 1990. Application for license for the Three Forks Hydroelectric Project, Trinity County, California. January 1990.

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National Park Service. 1982. The nationwide rivers inventory. Department of the Interior. Washington, D.C. January 1982.

Raptor Research Foundation, Inc. 1981. Suggested practices for raptor protection on power lines: the state of the art in 1981. Raptor research report No. 4.

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SAFETY AND DESIGN ASSESSMENT  
THREE FORKS PROJECT No. 10882-000  
CALIFORNIA  
JULY 18, 1990

Project Design and Operation

Norman Ross Burgess, the applicant, proposes to combine the existing Bluford Creek Exemption Project No. 6062, into a new development, the Three Forks Project. The existing Bluford Creek Project consists of:

- ù An intake box, on an unnamed stream diverting flows through a 12-inch-diameter, 500-foot-long penstock to Bluford Creek
- ù An 8-foot-high diversion structure on Bluford Creek
- ù A 3-foot-wide, 4-foot-high, 12-foot-long metal flume, carrying stream flows to an intake structure
- ù An 8-foot-wide, 8-foot-high, 32-foot-long cement intake box structure
- ù A 24-inch-diameter, 6,618-foot-long steel penstock, carrying Bluford Creek diverted flows to a powerhouse
- ù A 24-foot-wide, 27-foot-long cement and cinder block powerhouse with a 1.3 megawatt (MW) turbine-generator unit

The Three Forks Project would consist of the Bluford Creek project and these proposed features:

- ù A 12-foot-high, 83-foot-long diversion structure on Mud Creek, diverting stream flows through a 1,100-foot-long conduit to a junction box south of Middle Creek
- ù A 12-foot-high, 35-foot-long diversion structure on Middle Creek, diverting stream flows through a 55-foot-long conduit to the Mud Creek/Middle junction box
- ù A 540-foot-long conduit leading from the Mud Creek/Middle Creek junction box to the Rock Creek junction box

- ù A 17-foot-high, 49-foot-long diversion structure on Rock Creek, diverting stream flows through a 635-foot-long conduit to the Rock Creek junction box to combine with flows diverted from Mud and Middle Creeks



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- ù A 3,123-foot-long conduit carrying all diverted flows to an 11.5 acre-foot impoundment created by a 28-foot-high by 88-foot-long earthen-fill dike
- ù A 28-foot-high by 48-foot-long earthen-fill dike, creating a 4.1 acre-foot impoundment with an intake structure that includes an emergency penstock isolation slide gate and overflow pipe
- ù A 24-inch-diameter, 6,500-foot-long penstock, extending from the intake structure to join the existing Bluford Creek Project penstock at elevation 1,535 feet
- ù A 20-foot-high "U" shaped dike creating a 10.3 acre-foot pond in the tailrace of the existing powerhouse

Burgess estimates the Three Forks Project would produce an average annual generation of 7.25 gigawatthours (GWh).

The project structures would be low hazard and wouldn't affect the safety of the existing structures.

#### Determination of Licensable Transmission Facilities

Any license the Commission issues for the Three Forks Project should include the primary transmission line segment extending from the project generator, through voltage transformation, to a connection with a Pacific Gas and Electric Company's (PG&E) distribution system. The segment would include about 4.3-miles of 12.5-kV overhead transmission line between the project and PG&E's distribution system and other electrical facilities.

Water Resource Planning and Comprehensive Development

As we said, the proposed Three Forks Project would include the existing Bluford Creek Project. The powerhouse, containing the 1.3 MW turbine-generator unit with a hydraulic capacity of 29 cubic feet per second (cfs) under a gross head of 886 feet, would not change.

The Bluford Creek Project now generates about 3.2 GWh of electrical energy annually; after adding the new features, Burgess estimates the Three Forks Project would generate about 7.25 GWh annually. We find this estimate reasonable. The additional energy would come from the additional diverted flows.

Burgess would maintain minimum flows of 2 cfs in Bluford Creek, 0.5 cfs in Mud Creek, 0.2 cfs in Rock Creek, and 0.1 cfs in Middle Creek. He plans to operate the project modified

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run-of-river, using available flows equal to or less than the hydraulic capacity.

On a combined flow duration curve, the combined flows at the project site exceed the hydraulic capacity of the proposed project about 32 percent of the time.

Section 10(a)(2) of the Federal Power Act requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project.

Federal and state agencies filed 30 comprehensive plans addressing various resources in California. Two plans are relevant to the engineering aspects of the development.<sup>4</sup>

We reviewed the relevant plans, our Planning Status Report for the Northern California Coastal Basin, and our Hydroelectric Site Data Base: we found no conflicts with flood control, navigation, water supply, power development, or irrigation needs for the site.

We believe the Three Forks Project would properly develop the hydropower potential of the site.

#### Economic Evaluation

If the projected levelized cost of a project is less than the long-term, levelized cost of alternative energy to any utility in the region that can be served by the project, the proposed project is economically beneficial.

We estimate the levelized power value in the region would be 85 mills per kilowatthour (kWh). We base our estimate on the Energy Information Administration's projected electric utilities alternative energy cost for natural gas, published in its October 1988 service report, "Regional Projection of End Use Consumption Prices Through 2000." We assume the project would be operational in October 1991, and the cost of money at 11 percent.

The project's levelized cost of energy would be about 53.8 mills/kWh; the project would be economically beneficial with a levelized net annual benefit of 31 mills/kWh.

4/ (1) The California water plan: projected use and available water supplies to 2010, 1983, California Department of Water Resources; (2) California water: looking to the future, 1987, California Department of Water Resources.

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Burgess would sell the additional power to PG&E under a current power purchase agreement for the existing Bluford Creek Project, which would expire in 2004. The current agreement has a fixed schedule of power values for energy and capacity till 1994.

The current agreement would base the power value on the market value after the year 1994. Therefore, in our financial feasibility analysis we used the projected regional power value for the 50-year license period instead of the power purchase agreement value. The project would be financially attractive with an equity rate of return of 29.5 percent.

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 a part of the license:

Exhibit A: Section 1: parts (i), (ii), and paragraphs 3 through 7 of part (viii) on page A-3.

Exhibit F:

Exhibit	FERC No. 10882-	Showing
1	1	General Index
2	2	Mud Creek Intake Structure
3	3	Rock/Middle Creek Intake Structure
4	4	Pipeline Plan & Profile
5	5	" "
6	6	" "
7	7	" "
8	8	" "
9	9	" "
10	10	" "
11	11	" "
12	12	" "
13	13	Upper & Lower Settling Ponds



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14	14	Afterbay
15	15	Bluford Creek Cable Span
16	17	Mud Creek Cable Span
17	17	Detail Sheet
18	18	Detail Sheet
19	19	Diversion Intake Site Plan
20	20	Pipeline Plan & Profile
21	21	Penstock Plan & Profile
22	22	Diversion/Intake Plan & Details
23	23	Fish Screen Plan & Details
24	24	Powerhouse Plans & Elevation
25	25	Powerhouse Plans & Sections
26	26	Powerhouse Plans & Details

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