

OPERATION & MAINTENANCE AGREEMENT

FOR

BRADLEY LAKE PROJECT

BETWEEN

HOMER ELECTRIC ASSOCIATION, INC.

AND

ALASKA ENERGY AUTHORITY

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OPERATION & MAINTENANCE AGREEMENT

FOR

BRADLEY LAKE PROJECT

THIS AGREEMENT dated this   11   day of February, 1994, is entered into by the HOMER ELECTRIC ASSOCIATION, INC. (HEA) ("Operator") and the ALASKA ENERGY AUTHORITY ("Authority").

WITNESSETH

WHEREAS, the Authority is a public corporation of the State of Alaska duly created, organized, and existing pursuant to AS 44.83, and authorized by law to sell electric power generated by the Bradley Lake Project ("Project");

WHEREAS, the Authority is authorized under AS 44.83.396 to enter into agreements for the operation and maintenance of power projects owned by the Authority with a "qualified utility";

WHEREAS, the Bradley Lake Project Management Committee ("BPMC") is authorized under its Bylaws adopted pursuant to the terms of the Bradley Lake Project Power Sales Agreement, to approve agreements for the operation and maintenance of Project facilities;

WHEREAS, the Operator has been identified in the "Bradley Lake Hydroelectric Project Agreement for the Wheeling of Electric Power and Related Services" (Services Agreement) dated June 29, 1989 by the participating utilities as one of the two appropriate entities to operate and maintain the Project (the other being the Alaska Electric Generation and Transmission Cooperative, Inc.);

WHEREAS, the Operator is both a qualified utility within the meaning of AS 44.83.425(5) and is authorized to operate and maintain a power project acquired or constructed by the Authority; and

WHEREAS, the Operator has agreed to operate and maintain the Project in accordance with the terms and conditions of this Agreement;

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

### Section 1 - Definitions

For purposes of this Agreement, the following definitions apply:

- (a) "Act" or references to AS 44.83, mean Title 44, Chapter 83 of the Alaska Statutes (1989), as amended.
- (b) "Agreement" means this Agreement.
- (c) "Authority" means the Alaska Energy Authority as established by the Act, and any successor agency thereto and, unless the context otherwise requires, such officers and agents of the Authority that may be delegated responsibilities and duties under this Agreement.
- (d) "BPMC" means the Bradley Lake Project Management Committee as established under the December 8, 1987 Power Sales Agreement and operating under the Bylaws adopted on October 19, 1988.
- (e) "Contract Year" means, except for the first and last Contract Years, the twelve month period starting July 1 of a calendar year through and including June 30 of the next succeeding calendar year. The first Contract Year shall be the period commencing with the effective date of this Agreement and extending through and including the succeeding June 30. The last Contract Year shall be the period commencing after the

last full (i.e., twelve - month) Contract Year and ending on the expiration of this Agreement.

- (f) "Dispatch" means to schedule daily and remotely monitor and control the voltage, frequency, and real and reactive power flow through the Project.
- (g) "Dispatch Agreement" means the Agreement for the Dispatch of Electric Power and for Related Services between Chugach Electric Association, Inc. and the Alaska Energy Authority dated February 19, 1992.
- (h) "Division of Risk Management" means an office which is part of the State Department of Administration and which is established pursuant to AS 44.21.020.
- (i) "FERC" means the Federal Energy Regulatory Commission, an agency of the United States Department of Energy, or its successor agency.
- (j) "Master Operating Agreement" means the Master Operating Agreement between the Authority and the BPMC to be executed by the BPMC and the Authority after approval by the BPMC.
- (k) "O&M" means operation and maintenance of the Project and includes the duties set forth in Section 4 of this Agreement.
- (l) "Operation and Maintenance Standards" means the Plant Operation and Maintenance Manual, and equipment installation, operation, and maintenance manuals.
- (m) "Operator" means Homer Electric Association, Inc. (HEA) or its assignee.
- (n) "Party" or "Parties" means each or all the signatories to this Agreement.
- (o) "Power" or "Electric Power" means electric energy or electric capacity, or both, except where the context requires a distinction, in which case electric energy is expressed in kilowatt hours, and electric capacity is expressed in kilowatts.

- (p) "Power Sales Agreement" means the Bradley Lake Power Sales Agreement, dated December 8, 1987, among the Authority; the Municipality of Anchorage (d.b.a. Municipal Light and Power (ML&P)); the City of Seward (d.b.a. Seward Electric System (SES)); the Chugach Electric Association, Inc. (Chugach); the Golden Valley Electric Association, Inc. (GVEA); the Alaska Electric Generation and Transmission Cooperative, Inc. (AEG&T), the Matanuska Electric Association, Inc. (MEA); and the Homer Electric Association, Inc. (HEA).
- (q) "Project" means the Bradley Lake power generation facility and the associated transmission and substation facilities described in Exhibit A.
- (r) "Project O&M Budget" means the budget for the operation and maintenance of the Project as adopted and amended pursuant to this Agreement.
- (s) "Purchaser" shall have the meaning given to that term by the Power Sales Agreement.

#### Section 2 - Term of Agreement

- (a) This Agreement shall take effect upon execution by the authorized representatives of all Parties.
- (b) The term of this Agreement shall be five (5) years from the date on which it takes effect and shall continue from year to year thereafter, except upon written notice to terminate. Notice of termination by the Operator shall be given one (1) year in advance, effective on July 1 of the next Contract Year. Notice of termination by the Authority shall be given one (1) year in advance, effective on July 1 of the next Contract Year; provided, however, if the Authority reasonably determines that termination is necessary to avoid substantial damage to the Project or endangerment to public health or safety, this Agreement may be terminated in accordance with subsection (c).

- (c) In the event the Authority reasonably determines that the Operator's performance of its obligations under this Agreement, without immediate remedial actions, could cause substantial damage to the Project or endanger public health or safety, the Authority shall promptly notify the Operator and shall identify the areas where performance must be remedied. The Operator shall submit to the Authority a plan for remedial action to correct its performance within twenty-four (24) hours of such notice. The Authority or its designee shall have the right to temporarily take over the duties of the Operator until a remedial action plan reasonably satisfactory to the Authority is agreed to by the Operator. If the Parties fail to agree to a remedial action plan within thirty (30) days of submission, the Authority may terminate this Agreement.

### Section 3 - Qualified Utility Status

The Authority has determined that the Operator is a qualified utility within the meaning of AS 44.83.425(5) and has met all the requirements thereof.

### Section 4 - Operator's General Duties

To the extent authorized by the Project O&M Budget or as otherwise funded in accordance with this Agreement and consistent with the provisions of Exhibit "D", the Operator shall:

- (a) Operate and maintain the Project so as to make power available to the Purchasers in an amount equal to the amount the Purchasers may schedule from the Project, within the limitations imposed by available Project capability, available water, and the scheduling procedures adopted by the BPMC;
- (b) Bring to the attention of the Authority Required Project Work (as defined in the Power Sales Agreement), and perform or cause to be performed such Required Project Work to the extent funds are made available for such purpose.

The Operator shall not perform or cause to be performed Optional Project Work (as defined in the Power Sales Agreement) unless such Optional Project Work is approved and funded by the BPMC and assigned to the Operator by the Authority.

#### Section 5 - Operator's Specific Duties

To the extent authorized by the Project O&M Budget or as otherwise funded in accordance with this Agreement, the Operator shall:

- (a) Coordinate operation, maintenance, repair and other work schedules with the Purchasers in accordance with the Bradley Lake Allocation and Scheduling Procedures;
- (b) Operate, maintain, and repair the Project in accordance with the Operation and Maintenance Standards. In addition the Operator shall use and update the Automated Maintenance Management System or such equivalent system as the Authority may direct. The Operation and Maintenance Standards shall be maintained at the Project site. Any revisions to the Operation and Maintenance Standards shall be effective within a period of time after notice having due regard to the nature of the revisions requested and necessary project budget revisions.
- (c) Provide all material, labor, engineering and other technical support, subcontract management, and training to operate, maintain, and repair the Project, and all tools, equipment, spare parts, materials, and supplies needed to perform work under this Agreement in accordance with the Operation and Maintenance Standards and written directives by the Authority.
- (d) Comply with all applicable federal, state, and local government laws, regulations and permits. If the Operator elects to contest an order issued by a local government, state or federal agency (other than the Authority), the Operator shall promptly notify the Authority and the BPMC.
- (e) Provide security and access in accordance with a mutually agreed plan;

- (f) Read, maintain, and operate all Project metering devices, record such readings, and maintain or forward data, forms, relevant graphs, and/or magnetic tapes as required by the Authority;
- (g) Make annual recommendations to the Authority and BPMC for:
  - (1) operation, maintenance, repair, replacement, and modification of Project facilities;
  - (2) installation of additional protective relaying, instrumentation, control systems, or other apparatus as necessary to maintain or improve the Project and interconnected system reliability, integrity, efficiency, and safety;
  - (3) a five (5) year schedule of estimated equipment modifications, replacements, additions, and disposals;
- (h) Prepare monthly and year-end operating and financial statements, in a form acceptable to the Authority relating to the performance of this Agreement;
- (i) Provide qualified personnel with the ability to perform the duties assigned to the Operator under this Agreement;
- (j) Prepare and conduct an annual training program that meets the minimum training standards established by the BPMC. The Authority may require the Operator to undertake additional training which the Authority deems necessary, however, funding for such additional training is the responsibility of the Authority;
- (k) Following a protective relay or alarm action, and upon observation or notification, interpret the cause, identify corrective measures, and take corrective action as the situation warrants. The Operator shall document any such actions within three (3) days of their accomplishment;
- (l) Take prudent measures to protect equipment, personnel, and the general public from hazards arising from equipment failure such as electrical faults, vandalism, and mechanical

failure and repair and report damaged facilities to the Authority, to the BPMC on behalf of the Authority and any appropriate law enforcement authority, as soon as possible following each occurrence;

- (m) Record the operating characteristics of the power plant equipment and machinery as required;
- (n) Maintain the Project living quarters, including expenses for utility services, as a cost of operation and maintenance;
- (o) Update, keep and make available to the Authority or any Purchaser the required Project documents, as-built drawings, and other records, including records to meet FERC license requirements and records required by any project related insurance agreements;
- (p) Perform water and power operation studies as required to integrate power from the Project into the Purchasers' systems with due regard for the capability limits of the Project, planned water reserves, and Purchasers' power needs;
- (q) Arrange for and administer subcontracts or agency agreements related to the O&M of the Project;
- (r) Conduct all technical, operation, and maintenance inspections of the Project in accordance with FERC and other permits or agency requirements, and submit inspection and other reports to the appropriate entities as directed by the Authority;
- (s) Support the Project by coordinating related technical and operating activities with the Purchasers; and
- (t) Perform such other additional duties related to the operation, maintenance and repair of the Project as may be included in the Project O&M Budget.

## Section 6 - Accounting and Records

In keeping any books of account required by Section 5, the Operator shall, to the extent that different rules are not prescribed by this Agreement or federal and state laws, follow the system of accounts prescribed for public utilities and licensees by FERC. Upon reasonable notice, the Operator and its contractors or subcontractors shall allow the Authority, BPMC, or their authorized representatives to audit books of account for the Project O&M and the supporting documents of the Operator and its contractors or subcontractors related to the Project O&M for a period of three (3) years following the close of a Contract Year. The audit shall be performed in such a manner that will not unreasonably interfere with the Operator's duties under this Agreement.

## Section 7 - Budget

- (a) After the effective date of this Agreement, and in accordance with schedules provided by the Authority, the Operator shall prepare and submit each year to the Authority and the BPMC a draft O&M budget for the Project for the following Contract Year.
- (b) The draft O&M budget shall be based upon prudent estimates and anticipated O&M requirements and expenditures, and reflect appropriate accounting and budgetary principles for utilities. The draft budget shall be prepared in a format and schedule provided to the Authority by the BPMC.
- (c) Not less than 30 days prior to the beginning of a Contract Year the BPMC or the Authority acting pursuant to Section 13 (c) of the Power Sales Agreement shall adopt a Project O&M Budget for the Contract Year.
- (d) The Operator shall perform its duties in a manner consistent with the Project O&M Budget except as provided in Sections 8 and 9 below. If the Operator makes a determination during any Contract Year that it cannot perform its obligations under this Agreement without an increase in the expenditures authorized under the Project O&M Budget, the Operator shall report such finding to the Authority and the BPMC and shall submit a revised budget for the Authority's and the BPMC's

review and approval. In the event the revised budget is not adopted by the BPMC and the Authority, or the Authority, pursuant to Section 13(e) does not authorize and agree to fund such expenditures, and the Operator determines that it cannot perform its obligations under this Agreement, the Operator may terminate this Agreement upon 90 days notice to the Authority."

#### Section 8 - Extraordinary Costs

- (a) Extraordinary costs are costs for operations, maintenance, repair or equipment replacement which were not anticipated to materialize in the Contract Year, and not provided for in the Project O&M Budget.
- (b) If the Operator learns of an event or other contingency which involves an extraordinary cost, the Operator shall promptly notify the Authority and the BPMC of the circumstances and request authorization to make such expenditures.
- (c) If required by the Authority, the Operator shall develop a scope, schedule, budget and proposed plan of work and deliver the same with a request to proceed as soon as practicable. The Authority shall respond in writing to the Operator's request as soon as practicable after the receipt of the plan. Upon approval by the BPMC and the Authority, or by the Authority alone, pursuant to Section 13(e) of the Power Sales Agreement, the Operator shall perform such work consistent with the plan. The Operator shall not incur any extraordinary costs without the written approval of the BPMC and the Authority, or by the Authority, pursuant to Section 13(e) of the Power Sales Agreement except as provided in Section 9 below.

#### Section 9 - Emergency Expenditures

- (a) An emergency is an unforeseen combination of circumstances or the resulting state that requires immediate action to protect or preserve the Project, Project personnel, or public health and safety.

- (b) The Operator shall take such actions as it reasonably believes are necessary in an emergency. If, in the reasonable judgment of the Operator, the emergency requires the Operator to incur costs prior to obtaining written approval from the Authority, the Operator shall notify the Authority and the BPMC of the emergency as promptly as practicable with due regard to the emergency.

#### Section 10 - Disbursement of Funds

- (a) The ordinary costs of performing under this Agreement shall be initially paid by the Operator.
- (b) The Operator shall prepare an invoice identifying the actual costs incurred in a format mutually agreeable to the Authority and Operator. The invoice shall be furnished to the Authority by the fifteenth (15) of the month following the month in which the costs are incurred. All such invoices shall be subject to audit and approval by the Authority, such approval shall not be unreasonably withheld.
- (c) Subject to the availability of funds, the Authority shall reimburse the Operator for all costs under this Agreement.
- (d) Any amounts owed by the Authority to the Operator shall be paid by the Authority within thirty (30) days of receipt of a bill from the Operator. Any amounts not paid within thirty (30) days shall accrue simple interest at the legal rate of interest at the time payment was due, and shall continue until paid by the Authority.

#### Section 11 - Access to Operator's Facilities

Authority and BPMC personnel or agents shall be granted reasonable access to the Project and the Project owned equipment and facilities on the Operator's premises upon reasonable notice and subject to security measures, for the purpose of inspection and testing.

## Section 12 - Use of Project Living Quarters

- (a) Use of living quarters is established by the Bradley Work Rules. Modification of the Work Rules requires the approval of the Authority and the BPMC.
- (b) The Operator shall schedule occupation of the Project living quarters in an efficient manner. The Operator shall include in such scheduling, quarters for visiting employees of the Operator, subcontractors, the Authority, and the BPMC as needed and available.
- (c) On-site operations and maintenance personnel shall have priority in the use of permanent residences at the Project.

## Section 13 - Insurance

- (a) General.
  - (1) Each Party shall be liable for the negligent, willful and grossly negligent acts of its officers, employees, agents and contractors with respect to the ownership, construction, operation, maintenance or repair of the Project. It is recognized that the project insurance does not cover the willful and grossly negligent acts of a party. Each Party shall be solely liable for the willful and grossly negligent acts of its officers, employees, agents and contractors.
  - (2) During the term of this Agreement, the Operator shall use its best efforts to maintain insurance satisfactory to the Authority and the BPMC covering injury to persons or property suffered by any Party or a third party, as a result of errors, omissions, or operations which arise both out of and during the course of this contract by the Operator or by any of its contractors. Such "Operator insurance" may be obtained either by the Operator or be provided by the Authority or the BPMC under insurance policies covering the Project.
  - (3) Such Operator's insurance shall be the primary coverage for the exposures delineated in subsection (2) above with respect to the State of Alaska, its officers, agents, and employees, the BPMC, its officers, agents, and employees, and the Operator, its officers, agents, and employees, as named insureds. Any additional insurance or self-insurance separately maintained by the State, except insurance

purchased on behalf of the BPMC, shall be in excess of the Operator's insurance and shall not contribute to it.

- (4) The Operator will bear the cost of the required insurance, which cost shall be included in the Project O&M Budget as an operating cost.
- (5) If the Operator elects to individually obtain the insurance required by subsection (2) above, it may be maintained as part of any other policy or policies of the Operator so long as the coverage of such policy or policies is substantially the same as if such coverage were maintained under a separate policy. The policy must be acceptable to the Division of Risk Management.
- (6) Policies maintained under this Agreement must provide that any cancellation, non-renewal or material change be upon thirty (30) days written notice to all named insureds. Insurance Companies shown on the certificate of insurance must be acceptable to the Authority. The Authority shall not unreasonably withhold approval of such Insurance Company.
- (7) The Operator shall, at least thirty (30) days prior to cancellation, non-renewal, or material change, provide the Authority with written evidence of insurance which replaces or reinstates the required insurance coverage.
- (8) A copy of the insurance policies required by this Section will be furnished to the Authority prior to beginning work under this Agreement. Prior to February 1 of each year thereafter, evidence of insurance shall be provided by the Operator.
- (9) The obligation to obtain and maintain insurance coverage pursuant to this Section shall be subject to the general availability of such coverage under reasonable terms and conditions. If one or more of the required insurance coverages is not available under reasonable terms and conditions, the Operator shall, under the guidance and direction of the BPMC and Division of Risk Management, use its best efforts to obtain substantively equivalent insurance coverage acceptable to the BPMC, the Authority, and the Division of Risk Management.
- (10) If, after utilizing its best efforts, the Operator is unable to obtain the required insurance coverage under reasonable terms and conditions, as reasonably determined by the Operator, the Operator shall request a waiver of the relevant insurance requirement. The request shall outline steps taken by the Operator to obtain such insurance and shall disclose quotations received for coverage. To the

extent the waiver will not materially affect the safe and prudent operation of the Project, the Authority, after consulting with the Division of Risk Management, will not unreasonably withhold approval of the requested waiver. Failure to furnish satisfactory evidence of insurance or failure to maintain the policy without complying with this subsection shall result in a material breach of this Agreement.

- (11) Any Party, before the expiration date of the existing policy, may reopen the insurance requirements on sixty (60) days notice.
- (12) The Authority shall annually, prior to February 1st each year, furnish evidence of insurance to the Operators and the BPMC.

(b) Workers' Compensation Insurance.

- (1) The Operator shall maintain, for all employees of the Operator engaged in work under this Agreement, workers' compensation insurance as required by AS 23.30.045. The Operator is responsible for workers' compensation insurance for any of its subcontractors who directly or indirectly provide services under this Agreement.
- (2) The insurer shall agree to waive all rights of subrogation against the State of Alaska, its officers agents, and employees for losses arising from operation of the Project.
- (3) Workers' compensation insurance policy must include:
  - (i) statutory coverage for states in which employees are engaging in work;
  - (ii) Employer's Liability Protection of not less than \$500,000 per occurrence;
  - (iii) Broad Form All States Endorsement; and
  - (iv) coverage as required by all State and Federal Acts where applicable.

(c) Comprehensive General Liability Insurance.

- (1) The Operator shall maintain comprehensive general liability insurance. The Authority, acting on behalf of the BPMC, has as of the effective date of this Agreement acquired general liability insurance which satisfies part of this

requirement. The Operator shall secure any additional insurance as required to meet its obligations under this subsection to the extent the insurance so acquired by the Authority is not sufficient to meet the Operator's obligations. The BPMC and the Authority shall be included as additional insureds as respects insurance required in this Section and shall not by their inclusion be responsible to the insurance carrier for payment of premium therefor. These insurance policies must also contain a provision providing for cross liability or severability of interest.

- (2) The comprehensive general liability insurance shall be subject to the following limits of liability:
  - (i) Bodily Injury and Property Damage Liability of a minimum \$5,000,000 Combined Single Limits each occurrence and affording insurance for Premises Operations, Owners and Contractors' Protective, Independent Contractors, Products/Completed Operations, Blanket Contractual Liability, Broad Form Property Damage, and personal Injury Liability;
  - (ii) Automobile Liability Insurance covering all vehicles. Such insurance shall provide coverage of not less than \$5,000,000 Combined Single Limit each occurrence for Bodily Injury and Property Damage Liability.

(d) Additional Liability Insurance.

The Operator shall maintain the following additional insurance, where applicable, for aircraft and watercraft owned or contracted for by the Operator.

- (1) Owned Aircraft and Non-Owned Aircraft with seating capacity of five seats or less, except commercial, scheduled flights, with limits of liability not less than: \$5,000,000 for Bodily Injury per occurrence; \$1,000,000 for Passenger Liability per seat; and \$5,000,000 for Property Damage Liability per occurrence. Coverage must include Slung Cargo exposures. If an aircraft with more than five seat capacity is used, special coverage and limits must be obtained and must be approved by the Authority; and
- (2) Owned Watercraft and Non-Owned Watercraft with limits of liability not less than \$5,000,000 per single occurrence as provided in the "in Rem Endorsement" under "Maritime Coverage B."

(e) Subcontractor's insurance.

Any contract entered into with a subcontractor, other than a Purchaser, by the Operator to perform part of its obligations hereunder shall include the indemnity and insurance provisions attached as Exhibit C. The Operator may request a waiver of part or all of such provisions where such waiver will not materially affect the Project and the Operator determines the waiver is necessary to its performance of this Agreement. The Authority will not unreasonably withhold approval of such waiver.

#### Section 14 - Dispute Resolution

Pending resolution of a disputed matter, the Parties will continue performance of their respective obligations pursuant to this Agreement. If the Parties cannot reach timely mutual agreement on any matter in the administration of this Agreement, the Operator shall, to the extent necessary for its continued performance, make a determination of such matter without prejudice to the rights of the other Parties. Such determination shall not constitute a waiver of any other remedy belonging to either Party.

#### Section 15 - Notices, Time and Holidays Computation, Designated Representatives

- (a) Any notice required to be given to any Party by this Agreement shall be effective when it is received by such Party. In computing any period of time from such notice, the period shall commence at 12:01 p.m. on the date of receipt of such notice. Notice to Operator required by this Agreement shall be in writing directed to the General Manager of Homer Electric Association, Inc., 3977 Lake Street, Homer, Alaska 99603. Notice to the Authority required by this Agreement shall be in writing addressed to the Executive Director of the Alaska Energy Authority, 480 West Tudor, Anchorage, Alaska 99503.
- (b) If the date for making any payment or performing any act is a day on which banking institutions are closed in the place where payment is to be made or a legal holiday, payment may be made or the act performed on the next succeeding day which is neither a legal holiday nor a day when banking institutions are closed.

- (c) Each Party shall designate a representative to act for it in matters not requiring formal action by its governing bodies. Either Party may at any time change its designated representative by giving written notice to the other Party.

#### Section 16 - Remedies Cumulative

No remedy conferred upon or reserved to the Parties under this Agreement is intended to be exclusive of any other remedy or remedies existing at law or equity.

#### Section 17 - Availability of Information

The Parties shall make available to each other, for inspection and copying during business hours, all books, records, plans and other information relating to any calculation or determination to be made under this Agreement.

#### Section 18 - Termination

- (a) Not less than 75 days prior to the date of any scheduled termination of this Agreement the parties shall meet for the purpose of discussing arrangements necessary for the orderly takeover of the duties of the Operator by the Authority. At or before the meeting the Operator shall submit to the Authority a takeover plan which sets forth the actions which in the opinion of the Operator are reasonably required to accomplish the takeover, and any budget amendments necessary to accomplish the plan. The Authority shall review and either approve or modify the plan and budget. The Operator shall perform in accordance with the approved plan, subject to any budgetary constraints.

The Authority shall secure funding for and pay any extraordinary costs reasonably incurred by the Operator in performing its duties hereunder, including close-out and demobilization costs.

- (b) Following termination of this Agreement for any cause, the Authority shall have the right and a reasonable amount of time, not to exceed six (6) months, to arrange disposition of Project-owned equipment on the Operator's premises.

#### Section 19 - Force Majeure

- (a) No Party to the Agreement shall be liable to other Parties for, or be considered to be in breach of or default under this Agreement on account of, any delay in performance or any delay or failure to deliver, receive or accept delivery of energy due to any of the following events:
  - (1) Any cause or condition beyond such Party's reasonable control which such Party is unable to overcome by the exercise of reasonable diligence (including but not limited to: fire, flood, earthquake, volcanic activity, wind, drought and other acts of the elements; court order and act of civil, military or governmental authority; strike, lockout and other labor dispute excluding those disputes wrongfully caused by the Operator; riot, insurrection, sabotage and war; breakdown of or damage to facilities or equipment; electrical disturbance originating in or transmitted through such Party's electric system or any electric system with which such Party's system is interconnected; and, any act or omission of any person or entity other than such Party, or Party's contractors or suppliers of any tier or anyone acting on behalf of such Party);  
or
  - (2) Any action taken by such Party which is reasonably necessary or prudent to protect the operation, performance, integrity, reliability or stability of the Project or of such Party's electric system or any electric system with which such Party's electric system is interconnected, whether such actions occur automatically or manually.

- (b) In the event of any delay excused under this section, the time for performance thereby delayed shall be extended by a period of time reasonably necessary to compensate for such delay. No cost adjustment will be allowed, only time extensions as appropriate. Nothing contained in this paragraph shall require any Party to settle any strike, lockout or other labor dispute. Each party shall give the other Parties prompt written notice of any delay which the Party giving notice considers to be an excusable delay of its performance.

#### Section 20 - Third Party Beneficiaries

This Agreement gives no rights or benefits to anyone other than the parties, the Operator and the Authority, and the BPMC as a third party beneficiary. The BPMC is the only third party beneficiary. In any action by the BPMC for damages the Operator shall have the right to assert against the BPMC any defense which it could have asserted against the Authority. The raising of any such defense by the Operator shall not affect any right of a purchaser or the BPMC under the Master Operating Agreement or Power Sales Agreement.

#### Section 21 - Assignment of Contract

HEA assignment of its rights and responsibilities under this agreement shall be subject to the approval of the Authority and BPMC. HEA expects to request approval to assign its rights and responsibilities under this Agreement to AEG&T. Approval of such assignment request is subject to a finding by the Authority that AEG&T is a qualified operator. No such assignment shall operate to relieve HEA of its obligations under this Agreement.

#### Section 22 - Exhibits

The provisions of the following exhibits attached hereto are incorporated by reference herein:

- |             |                                                         |
|-------------|---------------------------------------------------------|
| Exhibit A - | Project Facility Description;                           |
| Exhibit B - | Project Specific Federal and State Agency Requirements; |
| Exhibit C - | Insurance and Indemnification; and                      |

Section 23 - Multiple Copies

This Agreement shall be executed in several counterparts, each of which shall be an original, but all of which shall constitute one and the same instrument.

Section 24 - Entire Agreement; Priority of Power Sales Agreement

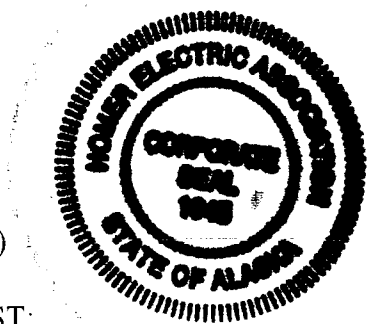
This Agreement in its entirety including the Exhibits and the Power Sales Agreement represent the entire Agreement of the Operator and the Authority. Nothing in this Agreement is intended to alter the rights and obligations of the Authority and the Purchaser(s) under the Power Sales Agreement. In the event the terms of this Agreement and the Power Sales Agreement are found to be in conflict, the terms of the Power Sales Agreement shall govern. In the event of a conflict between any provision in the body of this Agreement and any provision contained in an exhibit hereto, the former shall control. Any amendments to this Agreement shall be in writing.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed the day and year first above written.

HOMER ELECTRIC ASSOCIATION, INC.

By *G. J. Stoy*  
Title *General Mgr*  
Date *2-1-94*

(SEAL)



ATTEST:

*Serge Harrington*  
Commissioner 7-12-97

ALASKA ENERGY AUTHORITY

By William R. Small

Title Executive Director

Date February 11, 1994

(SEAL)

ATTEST:

## EXHIBIT A

### PROJECT DESCRIPTION

#### 1. PROJECT DESCRIPTION

##### 1.1 General

The Bradley Lake Hydroelectric Project is located on the Kenai Peninsula at the northeast end of Kachemak Bay about 27 miles from Homer. The project contributes to the electrical generating capacity of Alaska's Railbelt serving customers from the Kenai Peninsula to Fairbanks.

Major elements of the project include a concrete faced, rockfill dam, to raise the level of Bradley Lake about 100 feet, an ungated spillway having discharge capacity of 23,800 cfs at pool elevation 1190.6, a diversion tunnel which also serves as a low level outlet, a submerged intake leading to the power tunnel which, including the vertical shaft, is 19,152 ft. long, a surface powerhouse located on the shore of Kachemak Bay and a tailrace channel into the bay. All elevations given in this report are referred to Bradley Lake Project Datum, at which zero is equal to 13.63 ft. above MLLW at Bear Cove.

The two unit plant has a nominal generating capacity of 90 MW at 917 ft. net head. Each generating unit consists of a six jet, vertical shaft Pelton turbine driving a 63 MVA generator at 0.95 power factor. The penstock for a future third unit was also constructed as part of the initial project development.

Usable storage in Bradley Lake at full pool (El 1180) is about 280,000 acre ft. The project is connected to the existing Kenai Peninsula transmission line, consisting of two parallel 115 KV lines. The lines run through the Fox River Delta to connect with Homer Electric Association's Fritz Creek to Soldotna Transmission line. A summary of pertinent project data is given on Table 1.

##### 1.2 History of Development

The power generation potential of Bradley Lake was first studied by the U.S. Corps of Engineers and presented in a report dated March 1955. The project was authorized by Congress in 1962, but despite its feasibility federal funds were not available for its construction. The Alaska Energy Authority (then Alaska Power Authority) assumed responsibility for the project in 1982. Preliminary plans were developed and field investigations started in 1982. In April 1984, the Authority submitted an application for license to the Federal Energy Regulatory Commission (FERC). The license to construct the project was issued on December 31, 1985.

The first major contract, "Site Preparation" was let in 1986 and was completed in 1987. This contract included on-site access roads, barge dock, airstrip, permanent facilities, construction camp and diversion tunnel. Following a one year hold on project construction, the General Civil Construction and Transmission Line Clearing Contracts were awarded in June 1988. The Powerhouse Construction Contract was awarded in December 1988 and the Transmission Line Construction Contract was awarded in June 1989. The General Civil Construction and the Powerhouse contracts were completed in August 1991.

The Alaska Energy Authority issued a contract for supply of the turbines and generators in 1987, and issued a contract for supply of the SCADA control systems in July 1989. Smaller contracts were also issued for transmission line surveying, geotechnical surveys, and construction of the Middle Fork and Nuka Diversion structures.

The diversion tunnel was closed in October 1990, however all inflow to the reservoir was released through the fish water bypass lines. Actual storage in the lake started in Spring 1991 when enough water was available to meet downstream minimum flow requirements. A contract for Site Rehabilitation was issued in June 1991. Both units were released to dispatch in August 1991, and the Project was declared in commercial operation September 1, 1991. Construction of the project was completed on November 21, 1991, with the completion of the Site Rehabilitation work.

## **2. DESIGN**

### **2.1 Geology**

Except for the transmission line, all major elements of the project are founded on or in the bedrock. The geology of the site is composed of Upper Mesozoic Age metamorphic rocks of the McHugh Complex. Most probably this melange is composed of turbidites which have been slightly to moderately metamorphosed. Rock types encountered are graywacke, argillite, chert, dacite, metatuff, and greenstone. The graywacke, argillite and mixtures of these rocks are dominant. Chert occurs as nodules and lenses in the argillite and metatuff with some massive beds up to 15 ft thick. The diabase occurs as intrusive dikes generally 10 to 20 ft. in width with some dikes about 40 ft. thick. The metatuff is metamorphosed, volcanic pyroclastic debris. Frequently it is intermixed with the argillite but some layers up to 15 ft. thick were encountered. Over all it constitutes less than 5% of the rock mass. The greenstone is metamorphosed volcanics. It constitutes less than 3% of the rock mass.

Except where severely weathered, the argillite is moderately hard to hard. The graywacke, chert, dacite and greenstone are hard to very hard.

Foliation (cleavage) is poorly developed in the argillite and bedding, when identifiable, is poorly preserved. The graywacke is massive and displays neither bedding nor foliation. The chert, dacite and metatuffs are generally massive and show no foliation.

Jointing is well developed. It is widely spaced in the graywacke and moderately to widely spaced in the argillite. Generally three or more sets are observed resulting in blocky structures. There are some open joints in the abutment of the dam and spillway, especially in the rock knob between these structures. Hydrosplitting tests made along the tunnel alignment showed low in situ horizontal stresses ranging from 0.9 to 0.5 of overburden pressure at the depth tested. Open vertical joints striking about parallel to the tunnel (N60 W) were observed during tunnel construction at depths of rock cover of as much as 1200 ft.

## 2.2 Geologic Hazards

The Pacific Plate is subducting under the North American Plate south of the coast of Alaska. The Aleutian Arc trench marks the surface juncture of the two plates. This trench trends northeast-southwest and is located about 185 miles southeast of the site at its nearest approach. The Pacific Plate is moving north relative to the North American plate. The subduction zone dips northwest and the upper contact of the subduction plate, the Benioff zone, lies at a depth of about 30 miles beneath the surface at the site. The Benioff zone is the locus of great earthquakes.

Major faults in the general site area are the Border Ranges fault which lies under Kachemak Bay and the Eagle River Fault which crosses Bradley Lake near its head. Both faults trend NE-SW (about N45 E) parallel to regional structure. Three smaller faults lie within the site area crossing the power tunnel between the intake and the powerhouse. These are the Bull Moose Fault, the Bradley River Fault, and the Bear Cub Fault. These trend approximately north-south. The Bull Moose and Bradley River are the larger of these faults. Where crossed by the power tunnel they consisted of a series of gouge-filled anastomosing shears, a few feet to possibly 20 ft. wide, separated by sound rock and extending over a width of 300 to 400 ft. Lineations and minor shears parallel these faults.

Seismicity of the site was investigated by Woodward-Clyde Consultants, "Report on Bradley Lake Hydroelectric Project Design Earthquake Study," 1981. They recommended an MCE earthquake spectrum normalized to zero period horizontal acceleration of 0.75g with a duration of 25 seconds for design of critical, water retaining structures. Vertical acceleration was taken at 2/3 horizontal. This spectrum has been the basis of investigation and design of the dam, spillway and powerhouse. Dynamic analyses of the dam and spillway were made using Finite Element analyses. The time-

history used an accelerogram whose spectrum envelopes the Woodward-Clyde spectrum. This was constructed by combining two appropriate shorter earthquake records. This hybrid earthquake has a duration of 28 seconds.

The nearest active volcanoes are Mt. St. Augustine and Mt. Redoubt which are more than 100 miles from the site across Cook Inlet. Renewed activity poses no direct threat to the project other than possible development of a tsunami due to large mud flows or slides from Mt. St. Augustine and ash falls from both.

The cost of Alaska has been subjected to tsunami generated by uplift due to offshore earthquakes. This hazard was investigated by Stone & Webster Engineering Corporation in a report presented to this Board (September 1987). This report indicated an annual probability (combined earthquake and volcanic activity) of about 0.007 for a wave height at the powerhouse reaching El 25 BLP Datum (El 38.63 MLLW datum). The powerhouse is designed to withstand water to this level without damage.

The hazards of seiche in Bradley Lake due to earthquake and the possibility of a wave generated in the lake by a liquefaction generated slide in the Bradley Glacier delta were investigated. It was concluded waves from these sources would not damage the dam or spillway. The mountain sides surrounding Bradley Lake are bare rock which has been scoured by late Pleistocene and recent glaciation. Minor rockfalls may result from earthquake but slides which could cause overtopping are not a hazard. The Kachemak and Nuka glaciers are sufficiently far from the lake that ice falls or slides which might result from earthquake would not reach the lake.

### 2.3 Main Dam

The dam is a concrete faced, rockfill structure. Top of the embankment is El 1190. A parapet wall at the upstream face extends to El 1194. Normal full pool (crest of the spillway) is El 1180 and pool level under PMF is El 1190.6. The parapet wall is designed to provide wave protection during floods. The face slab is 12 inches thick, constant top to bottom. The toe plinth varies in width along its contact with the rock from 10.5 ft. to 13.3 ft. Minimum thickness varies from 3 ft. to 2.25 ft. depending on location and head. The face slab is underlain by a 12 ft. wide zone of crushed rock grading from fines (passing No. 200 mesh) to 3 inch size.

The toe plinth is founded on rock for its full length. General rock level in the river bottom is about El 1065 giving a nominal dam height to the top of the embankment of 125 ft. However, a narrow channel was found along the right side of the river bottom. This was excavated to bedrock, at its

lowest point at El 1032, over a length of 28 ft. centered on the toe plinth and backfilled with concrete. Thus the dam is actually 158 ft. high above the lowest point in the bedrock. The rock surface drops slightly south of the left abutment under the gate shaft bench. In this area the rock is covered by overburden and some rock fill. A concrete wall was constructed across this bench. This extends down to rock for its full length of about 175 ft. A single line grout curtain is located along it.

The single line ground curtain extends the full length of the toe plinth and into the abutments. Maximum hole depth is 110 ft. In general the rock was tight and takes were small. However several open joints were found in the abutments. These were grouted to refusal and check holes drilled and grouted.

Alternative types of dams considered in selecting a concrete face rock fill included a thick arch structure, a concrete gravity dam or a central core embankment dam. The concrete face rockfill was selected because of its excellent resistance to earthquake, relative cost, lack of suitable earth core material, and topographic constraints, especially space for the upstream cofferdam. Slopes upstream and downstream were established at 1.6H to 1V to restrict deformation under the MCE 90.75 g horizontal) to acceptable limits.

## 2.4 Spillway

The spillway is an ungated concrete gravity section with side slopes of 3H to 10V upstream and 8H to 10V downstream.

Crest length is 175 ft. at elevation 1180.00. Overall length of the spillway is 275 ft. Spillway discharge at PMF would be 23,800 cfs at a lake level of El 1190.6. A drainage and grouting gallery extends the full length of the spillway at or just above rock level. Access to this gallery is from the left abutment. A single line grout curtain having a depth of 30 to 50 ft. below rock surface inclined 20° upstream and fanning into both abutments was constructed. Drain holes are 3 inches diameter, five feet on centers, and 30 ft. deep except at the right abutment where a fan of holes 50 ft. to 60 ft. long were drilled. All seepage from the spillway drainage system is collected and discharged over a vee notch weir to permit monitoring.

Ice loading causes some tension in the upstream face at about El 1170. Accordingly reinforcing was placed in the upstream face. Dynamic analyses using the hybrid accelogram confirmed that stresses are within allowable and no lateral displacement of the spillway would occur under the MCE.

The spillway was model tested at Colorado State University. The model extended from well upstream of the power tunnel intake to well downstream of the main dam. Water velocities along the toe of the main dam were measured and riprap along the downstream tow sized to prevent erosion in the event of spillway operations.

## 2.5 Power Tunnel & Intake

The power tunnel system consists of an upper tunnel 738 ft. long extending from the intake through the upper elbow, a vertical shaft 647 ft. deep and a lower elbow and lower tunnel with a total length of 17,767 ft. The lower tunnel is on a 1.67% grade. The intake channel is about 350 ft. long, and the bottom at the intake is at El 1030. Dual high-pressure gates are installed in the upper tunnel about 520 ft. downstream of the tunnel portal in a vertical drywell. The gates are hydraulically actuated. An accumulator bank rides on the hydraulic system. This is sized to permit closing each gate without recharging even in the event of complete loss of power.

Provision is made for stoplogs at the intake portal. The same stoplogs can also be used at the intake portal of the diversion tunnel. A rock trap is provided just upstream of the intake portal.

The downstream 435 ft. of the lower tunnel is designated the manifold section. This section contains three wye-branch penstocks which extend to the powerhouse. Two are in service and one is closed by a hemispherical head to be used for a future third unit. The downstream end of the manifold is closed with a hemispherical head which can be removed as necessary for access to the tunnel. The manifold-penstock section and downstream portion of the tunnel for 2725 ft. upstream of the manifold are steel liner encased in concrete. Inside diameter of this section is 11 ft. Four drain pipes are located outside of the steel liner in the concrete encasement. Drain holes extend from these drains into rock at intervals of 10 and 20 ft. Seepage from these drains is collected and passed through the powerhouse where it can be measured. The remainder of the lower tunnel is 13 ft. ID with a 12 inch thick concrete lining. The vertical shaft and upper tunnel are 11 ft. ID lined with concrete.

The manifold-penstock section was pressure tested at 960 psi (1.9 times static head) for 1 hour before encasing it in concrete. There were no indications of distress, and distortions were very small and acceptable.

In situ horizontal stresses in the rock are low. To protect against possible hydro-splitting of the rock by leakage from the tunnel, the steel lining was carried to Sta. 31+58 where rock cover was equal to 0.8 of the static head. The concrete lining was reinforced to Sta. 38+60. From Sta. 31+60 to Sta.

35+60 the rock was high pressure grouted (500 psi) using squeeze grouting procedures. Selected areas of the remainder of the lower tunnel were also reinforced. High pressure grouting (250 psi) was done from Sta. 35+60 to Sta. 38+60 and at selected areas to Sta. 64+00 to ensure that open joints intersecting or close to the tunnel were filled with high strength grout. The tunnel was first filled to the then reservoir level, El 1076, in May 1991. A falling head test for a 12 hour duration was made in late May which showed an average leakage of only 58 gpm.

## 2.6 Powerhouse

The powerhouse has a concrete substructure with steel framed superstructure. It is founded entirely in rock, and the tailrace excavation is in rock for a modest distance away from the powerhouse. The powerhouse has been designed for safety against excessive structural stresses, sliding, overturning or flotation. Loading conditions include MCE, (0.75g) DBE (0.35g), high tides, storm high tide, tsunami, and various plant conditions such as in operation, servicing, and construction including appropriate factors of safety.

## 2.7 Diversion Tunnel

The diversion tunnel is approximately 407.5 ft. long and is located in the high rock spur between the spillway and the main dam. It has been converted to a low level outlet which is normally closed by a dual system of high pressure slide gates located in a deep dry well shaft. The tunnel is lined with concrete from the upstream portal to downstream of the gate shaft. Gate operation is by hydraulic actuators. There is a bank of accumulators which can open each gate completely in the event of loss of all power. The gates discharge through a steel penstock 10.5 ft. in diameter which extends past the downstream portal of the tunnel. Two 28 inch diameter steel pipes encased in concrete extend through the entire length of the tunnel. these discharge through a system of 7 motor operated valves of different sizes so arranged that fish water releases can be made from the reservoir as necessary to maintain a flow in the Lower Bradley River of 100 cfs at Riffle Reach.

## 2.8 Diversions into Bradley Lake

As a part of the development of the Project, the Middle Fork of the Bradley River, a portion of the outflow from the Nuka Glacier, and a small tributary of Battle Creek were diverted into the reservoir.

### 2.8.1 Middle Fork Diversion

The Middle Fork Diversion is located approximately one mile north of Bradley Lake in an adjacent drainage at elevation 2160 on the Middle Fork Tributary of the Bradley River. The Diversion consists of a small intake basis and two reaches of open channel approximately 760 feet and 483 feet long, separated by a stilling basin which is located in a natural bog area, all of which were established by excavation. The Diversion conveys water from the Middle Fork of the Bradley River to Marmot Creek, a tributary to Bradley Lake, and operates in all seasons.

### 2.8.2 Nuka Diversion

Glacial melt forms a pond called Nuka Pool at the terminus of the Nuka Glacier. Nuka Pool lies on the divide between two drainage's, discharging water both into the Upper Bradley River and into the Nuka River. Water discharged into the Upper Bradley River flows to Bradley Lake and that which is discharged to the Nuka River flows to the Kenai Fjords National Park.

The purpose of the Nuka Diversion is to cause the glacial melt water flowing through the Nuka Pool to flow in the upper Bradley River, except of an initial increment of flow which must be provided to the Nuka River in accordance with the June 1986 Contract between the Alaska Energy Authority and the U.S. Department of Interior. In compliance with this Contract, the design must assure that when flows are available in the Nuka Pool, 5 cfs will be diverted to the Nuka River prior to any diversion of water to the Upper Bradley River.

To accomplish this, flow from the Nuka Pool to the Upper Bradley River passes over a long, uniform weir constructed by modifying the naturally occurring rock weir at the pool outlet. At the Nuka River outlet of the pool, water is constrained to flow through a 12-inch steel pipe in a gabion dike. This pipe has been sized such that it will discharge 5 cfs when the Nuka Pool level is at the elevation of the Bradley-side weir crest and flow is about to commence to the Upper Bradley River. No flow is allowed to enter the Upper Bradley River from the Nuka Pool until 5 cfs enters the Nuka River. A second, identical pipe is also provided. This second pipe ensures flows if the first pipe becomes inoperative and needs to be repaired. It may also be used to augment flows.

### 2.8.3 Upper Battle Creek Diversion

The Upper Battle Creek Diversion is located at elevation 1342 approximately 0.7 miles south-southeast of Bradley Lake Dam and

diverts a small tributary of Battle Creek into the reservoir adding 0.9 square miles of drainage area to the Project.

Diversion is accomplished by emplacement of a small, talus dike across the tributary at the base of a waterfall. An intake basin 25'x25' by 3 feet deep was constructed near the bottom of the falls and flow is directed through three interconnected ponds. Approximately 300 feet of ditch was excavated between the ponds to reverse the direction of the flow into the reservoir.

## 2.9 Permanent Facilities

To accommodate for the needs of on-site personnel, the project is provided with two 32'x82' duplex living quarters, a 43'x50' office/transient worker residence building, a 50'x160' shop-warehouse and a fenced storage yard which also contains an unheated storage/incinerator building.

## 2.10 Project Airstrip

The project airstrip is incorporated into the permanent project road system between the barge dock and permanent facilities.

The strip is 2400 ft. long and 75 ft. wide and is equipped with plane lights, a taxi and parking apron, weather building and warning lights.

The airstrip is designed for VFR use only and is not open to the public.

## 2.11 Barge Dock

Water access to the project is from a dock facility consisting of five (5) 53 ft. diameter sheet pile cells placed out into the tidal flats of Kachemak Bay. A rockfill, gravel-surfaced causeway extending some 700 ft. from the shoreline connects the barge dock cells to the project access road at the bay shore. Use of this facility is available only during half tides and greater.

A small, aluminum floating dock is attached to the sheet pile cells to provide mooring for skiffs belonging to the public. This small dock is removed each winter to prevent it from being damaged by ice.

## 2.12 Transmission Line

Two parallel and separate single circuit 115 kV transmission lines, each about 20 miles long, connect to the substation at the powerhouse and carry the power generated to the Fritz Creek-Soldotna 115 kV

Transmission Line owned by Homer Electric Association, Inc. The point of connection for these two lines is designated as the Bradley Junction.

The Bradley Lake transmission line towers are guyed, X-configuration towers manufactured of Corten type steel. The conductor is 556 kcmil, 42/19 Aluminum/Steel "Special Dove."

### 2.13 Roads

About 10.8 miles of gravel surface access roads have been constructed and connect the powerhouse, permanent facilities, airstrip, dam site and other project areas.

### 2.14 Instrumentation

Settlement and deflection of the main dam are monitored by two rows of monuments set on the upstream face at approximately mid-height of the face and just below the parapet; and three monuments set in the rock fill along the upstream side of the El 1077 berm. Three monuments are set in the crest of the spillway. Instrument pedestals were established along these several lines of monuments. The instrument pedestals are referenced to four primary survey monuments set in rock.

Seepage into the spillway drainage gallery is collected and discharged over a vee notch weir. Main dam leakage is estimated by deducting fishwater releases and spillway seepage from the flow recorded at the USGS gaging station just downstream of the dam.

Four exploratory borings along the line of the tunnel have been converted to open standpipe piezometers to measure groundwater levels above the tunnel.

A strong motion seismograph has been installed on rock at the dam. This is linked by telephone to the Geophysical Institute of the University of Alaska at Fairbanks. All monitoring of earthquake vibration is done by the Institute. Seepage flow from the drain system around the steel lining in the tunnel is monitored in the powerhouse.

## 3. INITIAL FILLING OF RESERVOIR

Filling of the reservoir started October 30, 1990, but was suspended shortly thereafter to meet the fisheries minimum flow requirements. As the hydrograph began to rise the following spring, filling was resumed. The initial rate of filling was slow but accelerated during the summer of 1991. Water level reached full pool during a severe storm in late September 1991. Spilling started on September 27 and continued for 8 days with about 0.5 ft. depth passing over the

spillway. The winds during this storm were heavy. Waves splashed over the spillway and to some extent over the parapet wall of the dam. These caused no damage.

Measured deflections and settlements of the main dam during filling were very small, maximum displacements being:

crest settlement	0.02 ft.	
displacement	0.03	downstream
upstream face settlement	0.04	
displacement	0.02	downstream
downstream bench settlement	0.07	
displacement	0.01	

The settlement and deflection of the crest are only about 0.03% of the dam height. There was no detectable seepage through the dam.

#### **4. POWER HOUSE STARTUP**

The units were turned over for pre-operational testing in March 1991. Unit 2 was first rotated on May 15, 1991, and Unit 1 on May 18, 1991. The units were released to Chugach Electric Association in Anchorage, Alaska for dispatch on August 1, 1991, and the plant declared in Commercial Operation on September 1, 1991.

## 5. PROJECT LANDS

On the basis of the project boundary shown in Exhibit G, the acreage of the lands belonging to the United States and State of Alaska are tabulated below.

Asterisks (\*) denote transmission line ROW acreage only.

<u>Description</u>	<u>BLM Area Acres</u>	<u>State Area Acres</u>	<u>Other Acres</u>	<u>Water Acres</u>	<u>Subtotal Acres</u>
T.3S., R.10W.					
Tract A*		263.62			
Total Per Tp		263.62			263.62
T.3S., R.11W.					
Section 23		26.15			
Section 25		42.48			
Section 26		20.78			
Tract B*		129.34			
Total Per TP		218.75			218.75
T.4S., R.9W.					
Section 30*	45.74			2.79	
Section 31*	0.33				
Tract A*		182.13			
U.S. Surv. 2937			12.73		
Total Per TP	46.07	182.13	12.73	2.79	240.93
T.4S., R.10W.					
Section 35	149.14				
Section 36	75.94			4.00	
Section 36*	40.17				
Tract A*			14.36		
Total Per TP	265.25		14.36	4.00	279.61
T.5S., R.8W.					
Section 19	388.74				
Section 20	93.63				
Section 29	6.04				
Section 30	139.40				
Section 31	316.24				
Total Per TP	944.05				944.05
T.5S., R.9W.					
Section 3	40.00				
Section 6	5.64				
Section 7	121.12				
Section 8	267.30			100.71	
Section 9	29.21			166.96	
Section 10	210.59			170.10	

<u>Description</u>	<u>BLM Area Acres</u>	<u>State Area Acres</u>	<u>Other Acres</u>	<u>Water Acres</u>	<u>Subtotal Acres</u>
Section 11	5.67			0.94	
Section 14	168.73			232.80	
Section 15	32.28			548.73	
Section 16	69.46	23.21		145.42	
Section 17	31.37	84.35		16.63	
Section 18	3.97				
Section 22	66.32			67.64	
Section 23	513.20			35.77	
Section 24	558.08				
Section 25	372.53				
Section 26	15.07				
Section 36	15.46				
Total Per TP	2,425.17		208.39	1,485.70	2,633.56
T.5S., R.10W.					
Section 1	26.81				
Section 2	128.83				
Section 3	384.89				
Section 9	127.87	139.39			
Section 10	398.57				
Section 11	222.79				
Section 12	64.41				
Section 13	41.59				
Section 14	1.56				
ATS 1418					
Total Per TP	1,397.32	139.39			1,536.71
T.6S., R.8W.					
Section 6	320.00				
Total Per TP	320.00				320.00
Total Proj. Area Including Transmission Line	5,498.69	925.81	12.73	1,492.49	
Transmission Line Area Only	86.24	407.32			

Table A-1  
Bradley Lake Hydroelectric Project Data

Dam:	Concrete-faced rockfill, 600 feet long, 125 feet high, 360,000 cubic yards rockfill, and 10,800 cubic yards concrete	Annual Firm Energy:	329 gigawatt hrs
		Average Annual Energy:	376 gigawatt hrs
Spillway:	Ungated concrete ogee section, 175 feet long (11,000 cubic yards concrete)		
Power Tunnel:	13-foot nominal diameter, fully concrete lined, approximately 19,152 feet in length	Transmission Line:	115 kilovolt, two
Diversion Tunnel:	21-foot horseshoe concrete lines/penstock tunnel, 407.5 feet long	Barge Dock:	Sheet pile cells granular fill
Penstock: Steel, 9-foot diameter with 6 1/2 foot diameter branches		Access Roads:	10.8 miles, gravel
Middle Fork Diversion:	1517 foot diversion includes upper and lower channels with intake basin and stilling basin	Powerhouse:	Surface, steel superstructure, 160 feet long, 80 feet wide, 92 feet high
Nuka Diversion:	2 diversion and control dikes, pilot channel and outlet weir	Turbines:	2 each Pelton, vertical shaft, 90,170 horsepower max.
Battle Creek Diversion:	300 foot diversion channel with intake basin, talus diversion weir	Generators:	2 each Rated output at max. operating pool is 63 MVA.
Airstrip:	Gravel surface airstrip 2,400 ft. long by 75 feet wide incorporated into access road	Governors:	2 each Woodward digital

**EXHIBIT "B" BRADLEY LAKE PROJECT SPECIFIC  
FEDERAL AND STATE AGENCY REQUIREMENTS**

Dept. of Environmental Conservation (DEC)	Approval to Operate Class "C" Water System Permit date 11/4/88	Approval to operate permanent facilities -- Public water system and wastewater disposal system.
	Permit date 04/3/89	Approval to operate permanent facilities -- Powerhouse Creek Source.
	Waiver Approval 5/23/91	Waiver Approval, Class "C" Water Well.
Dept. of Environmental Conservation (DEC)	Certificate to Construct Class "C" Water System	Certificate to construct potable water system at Bradley Lake Powerhouse.
		Approval to Operate was requested 2/4/92 -- No response as of yet.
Corps of Engineers (COE)	Land Use License DACW85-3-91-88	COE land use license to construct and operate the upper Battle Creek Diversion Dam.
Corps of Engineers (COE)	Land Use License DACW85-2-90-24	Land use license for gauging station electrical distribution line.
Corps of Engineers (COE)	Dredge and Fill Permit #071-OYD-2-850502 Plus seven modifications	Section 10 - Perform work in or affecting U.S. navigable waters. Section 404 - Discharge dredged or fill material into U.S. waters.
Corps of Engineers (COE)	Land Use License DACW85-3-86-55	Extension of land use license to allow for material extraction.
Corps of Engineers (COE)	Land Use License DACW85-3-86-73	Extension of land use license for area used as access road and construction landfill.
Corps of Engineers (COE)	Land Use License DACW85-3-86-101	Land use license to conduct studies and design project.
Dept. of Fish & Game (DFG)	Critical Habitat Area FG 88-II-0077	Road Construction Kachemak Bay Critical Habitat Area
Dept. of Fish & Game (DFG)	Special Area Permit FG 86-II-0824	Airstrip Construction and Operation
Dept. of Fish & Game (DFG)	Anadromous Fish Stream, Critical Habitat Area FG 86-II-0416 Plus Amendment IV	Transmission Line Construction

Dept. of Fish & Game (DFG)	Critical Habitat Area FG 86-II-0115	Powerhouse to Lower Camp Access Road
Dept. of Fish & Game (DFG)	Critical Habitat Area FG 86-II-0114 Plus Amendment I	Airstrip to Powerhouse Access Road
Dept. of Fish & Game (DFG)	Anadromous Fish Stream Critical Habitat Area FG 86-II-0113 Plus two amendments	Martin River material site access road, Battle Creek.
Dept. of Fish & Game (DFG)	Critical Habitat Area FG 86-II-0112 Plus Amendment II	Spoil Disposal/Waterfowl Nesting Area
Dept. of Fish & Game (DFG)	Anadromous Fish Stream FG 86-II-0110 Plus Amendment II	Martin River material site, Martin
Dept. of Fish & Game (DFG)	Critical Habitat Area FG 86-II-0108	Barge dock and staging area.
Dept. of Fish & Game (DFG)	Critical Habitat Area FG 86-II-0107 Plus Amendment I	Powerhouse and switchyard construction and operation.
Dept. of Fish & Game (DFG)	Anadromous Fish Stream FG 86-II-0106 Plus Amendment II	Bradley River Dam, Bradley.
Dept. of Fish & Game (DFG)	Critical Habitat Area FG 85-II-0824 Plus one amendment	Airstrip construction and operation.
Dept. of Natural Resources(DNR)	Water Rights LAS 13370	Water rights for Upper Battle Creek Diversion Project.
Dept. of Natural Resources(DNR)	Permanent Water Rights LAS 6998	Permit to use permanent facilities Well No. 4 for 5 additional years.
Dept. of Natural Resources(DNR)	Water Rights Application LAS 14316	Bradley Lake Waterfowl Nesting Area
Dept. of Natural Resources(DNR)	Permanent Water Rights LAS 2837	Appropriate water for waterfowl nesting area.
Dept. of Natural Resources(DNR)	Public and Charitable Lease ADL 225142	Lease of State Lands near Fritz Creek for Moose Mitigation.
Dept. of Natural Resources(DNR)	Permanent Water Rights LAS 2836	Appropriate water from Middle Fork and Nuka Glacier Pool

Dept. of Natural Resources(DNR)	Right-of-Way ADL 223192	Final documents issued.
Dept. of Natural Resources(DNR)	Uplands Lease ADL 222656	Final documents issued.
Dept. of Natural Resources(DNR)	Tidelands Lease	Final documents issued.
Dept. of Interior (DOI)	Contract	Provisions for water from Nuka Glacier Pool.
Federal Energy Regulatory Commission (FERC)	FERC License Amendment	To construct and operate Upper Battle Creek Diversion Project.
Federal Energy Regulatory Commission (FERC)	FERC License Amendment	To adopt modified flow regime during reservoir filling.
Federal Energy Regulatory Commission (FERC)	FERC License Amendment	For relocation of permanent landing strip
Federal Energy Regulatory Commission (FERC)	FERC License Amendment	To adopt modified operational flow regime to be consistent with ADF&G flow regime.
Federal Energy Regulatory Commission (FERC)	FERC License	FERC order issuing license
Federal Energy Regulatory Commission (FERC)	FERC License Amendment	Order granting extension until January 1, 1992 to complete project construction

## EXHIBIT "C"

### INSURANCE

1. Contractor to purchase/maintain insurance for duration of agreement, plus one year following final payment.
2. Specified limits are minimum levels. If the policy contains higher limits, contracting agency is entitled to coverage of higher limits.
3. Certificate of insurance must be furnished to contracting agency.
  - Must provide for 30-day prior notice to the contracting agency of cancellation, reduction in liability.
  - Failure to furnish constitutes material breach and grounds for termination.

#### Types of Insurance

Worker's Compensation: Contractor responsible for subcontractors. Coverage must include statutory coverage for states where employees are engaging in work and employer's liability protection not less than \$100,000 per person, \$100,000 per occurrence. Where applicable, coverage for all federal acts must also be included.

Comprehensive of Commercial General Liability Insurance: Covers all operations of contractor providing insurance for bodily injury and property damage liability including coverage for:

- Premises and Operations
- Products and Completed Operations
- Broad Form Damage; and
- Personal Liability

Comprehensive Policy: Minimum combined single limit of liability is \$300,000 per occurrence, \$300,000 aggregate for bodily injury, property damage and personal injury.

Commercial Policy: Minimum limits of liability are \$300,000 per occurrence (combined single limit) for bodily injury and property damage, \$300,000 per occurrence for personal injury, \$300,000 aggregate for products-completed operations, and \$300,000 general aggregate.

Comprehensive Automobile Liability Insurance: Covers all owned, hired, and non-owned vehicles with coverage limits not less than \$100,000 per occurrence bodily injury and \$50,000 property damage.

Professional Liability Insurance: Covers all negligent errors, omissions which the contractor, subcontractor or their employees make in the performance of the agreement which results in financial loss to the contracting agency.

Minimum Limits:

<u>Contract Amount</u>	<u>Combined Single Limit Occurrence and Annual Aggregate</u>
Under \$100,000	\$100,000
\$100,000 to \$499,999	\$250,000
\$500,000 to \$999,999	\$500,000
\$1,000,000 and up	NEGOTIABLE

Contracting agency reserves right to implement an Owner Controlled Insurance Program with option of obtaining Professional Liability Insurance, contractor isn't required to carry Professional Liability Insurance.

EXHIBIT "D"

EXHIBIT A OF THE MASTER OPERATING AGREEMENT

To be added after approval of the Master Operating Agreement  
by the BPMC and its execution by the BPMC and the Authority.