

SB

42

<TARGET><BILL>SB 42</BILL><SUBJECT>SB
42</SUBJECT><COMM>SFIN27</COMM></TARGET>

SENATE FINANCE COMMITTEE REPORT

DATE: 3/22/11

FURTHER:

DATE TURNED
IN TO OFFICE: _____

Finance Committee considered SENATE BILL NO. 42

SB 42-POWER PROJECT; ALASKA ENERGY AUTHORITY

"An Act relating to the procurement of supplies, services, professional services, and construction for the Alaska Energy Authority; establishing the Alaska Railbelt energy fund and relating to the fund; relating to and repealing the Railbelt energy fund; relating to the quorum of the board of the Alaska Energy Authority; relating to the powers of the Alaska Energy Authority regarding employees and the transfer of certain employees of the Alaska Industrial Development Export Authority to the Alaska Energy Authority; relating to acquiring or constructing certain projects by the Alaska Energy Authority; relating to the definition of 'feasibility study' in the Alaska Energy Authority Act; and providing for an effective date."

and recommends:

- be replaced with CS SB 42 (FIN) [] Same Title [X] New Title
- [] adopt previous CS _____ (_____) [] Same Title [] New Title
- [] attached amendment(s)
- [] adopt _____ Letter of Intent
- [] further referral to _____ Committee

| Dept Abbr. | |
|------------|-----|
| ADM | LEG |
| CED | LAW |
| COR | LWF |
| CRT | MVA |
| EED | DNR |
| DEC | DPS |
| DFG | REV |
| GOV | DOT |
| DHS | UA |

| NEW FISCAL NOTE(S) | | | | |
|--------------------|--------|--------|------|------|
| Dept. | Fiscal | Indet. | Zero | FN # |
| CED | X | | | |
| CED | X | | | |
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| PREVIOUS FISCAL NOTE(S) | | | | |
|-------------------------|--------|--------|------|------|
| Dept. | Fiscal | Indet. | Zero | FN # |
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[] APPROPRIATION - no fiscal note

| SIGNATURES AND RECOMMENDATIONS: | PRINTED LAST NAME | DO PASS | DO NOT PASS | NO REC | AMEND |
|---------------------------------|-------------------|-------------------------------------|-------------|-------------------------------------|-------|
| | Thomas | <input checked="" type="checkbox"/> | | | |
| | E. Conner | <input checked="" type="checkbox"/> | | | |
| | ELLIS | <input checked="" type="checkbox"/> | | | |
| | OLSON | | | <input checked="" type="checkbox"/> | |
| CO-CHAIR: | Hoffman | <input checked="" type="checkbox"/> | | | |
| CO-CHAIR: | Stedman | <input checked="" type="checkbox"/> | | | |

CS FOR SENATE BILL NO. 42(FIN)

IN THE LEGISLATURE OF THE STATE OF ALASKA

TWENTY-SEVENTH LEGISLATURE - FIRST SESSION

BY THE SENATE FINANCE COMMITTEE

Offered:

Referred:

Sponsor(s): SENATE RULES COMMITTEE BY REQUEST OF THE GOVERNOR

A BILL

FOR AN ACT ENTITLED

1 **"An Act relating to the quorum of the Alaska Energy Authority; relating to the powers**
 2 **and duties of the Alaska Energy Authority; relating to the acquisition or construction of**
 3 **a Susitna River power project by the Alaska Energy Authority; relating to the definition**
 4 **of 'feasibility study' in the Alaska Energy Authority Act; providing legislative approval**
 5 **for certain loans from the power project fund; and providing for an effective date."**

6 **BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:**

7 * **Section 1.** AS 44.83.040(a) is amended to read:

8 (a) The chair and vice-chair of the Alaska Industrial Development and Export
 9 Authority shall serve as officers of the Alaska Energy Authority. The powers of the
 10 Alaska Energy Authority are vested in the directors, and **four** [THREE] directors of
 11 the authority constitute a quorum. Action may be taken and motions and resolutions
 12 adopted by the Alaska Energy Authority at a meeting by the affirmative vote of a
 13 majority of the directors. The directors of the Alaska Energy Authority serve without

1 compensation, but they shall receive the same travel pay and per diem as provided by
2 law for board members under AS 39.20.180.

3 * **Sec. 2.** AS 44.83.080 is amended to read:

4 **Sec. 44.83.080. Powers of the authority.** In furtherance of its corporate
5 purposes, the authority has the following powers in addition to its other powers:

6 (1) to sue and be sued;

7 (2) to have a seal and alter it at pleasure;

8 (3) to make and alter bylaws for its organization and internal
9 management;

10 (4) to adopt regulations governing the exercise of its corporate powers;

11 (5) to improve, equip, operate, and maintain power projects and bulk
12 fuel, waste energy, energy conservation, energy efficiency, and alternative energy
13 facilities and equipment;

14 (6) to issue bonds to carry out any of its corporate purposes and
15 powers, including the establishment or increase of reserves to secure or to pay the
16 bonds or interest on them, and the payment of all other costs or expenses of the
17 authority incident to and necessary or convenient to carry out its corporate purposes
18 and powers;

19 (7) to sell, lease as lessor or lessee, exchange, donate, convey, or
20 encumber in any manner by mortgage or by creation of any other security interest, real
21 or personal property owned by it, or in which it has an interest, when, in the judgment
22 of the authority, the action is in furtherance of its corporate purposes;

23 (8) to accept gifts, grants, or loans from, and enter into contracts or
24 other transactions regarding them, with any person;

25 (9) to deposit or invest its funds, subject to agreements with
26 bondholders;

27 (10) to enter into contracts with the United States or any person and,
28 subject to the laws of the United States and subject to concurrence of the legislature,
29 with a foreign country or its agencies, for the construction, financing, operation, and
30 maintenance of all or any part of a power project or bulk fuel, waste energy, energy
31 conservation, energy efficiency, or alternative energy facilities or equipment, either

1 inside or outside the state, and for the sale or transmission of power from a project or
 2 any right to the capacity of it or for the security of any bonds of the authority issued or
 3 to be issued for the project;

4 (11) to enter into contracts with any person and with the United States
 5 [,] and, subject to the laws of the United States and subject to the concurrence of the
 6 legislature, with a foreign country or its agencies for the purchase, sale, exchange,
 7 transmission, or use of power from a project, or any right to the capacity of it;

8 (12) to apply to the appropriate agencies of the state, the United States,
 9 and a foreign country and any other proper agency for the permits, licenses, or
 10 approvals as may be necessary, to acquire, construct, maintain, and operate power
 11 projects in accordance with the licenses or permits, and to obtain, hold, and use the
 12 licenses and permits in the same manner as any other person or operating unit;

13 (13) to enter into contracts or agreements with respect to the exercise
 14 of any of its powers, and do all things necessary or convenient to carry out its
 15 corporate purposes and exercise the powers granted in this chapter;

16 (14) to recommend to the legislature

17 (A) the pledge of the credit of the state to guarantee repayment
 18 of all or any portion of revenue bonds issued to assist in construction of power
 19 projects;

20 (B) an appropriation from the general fund

21 (i) for debt service on bonds or other project purposes;

22 or

23 (ii) to reduce the amount of debt financing for the
 24 project;

25 (15) to carry out the powers and duties assigned to it under AS 42.45;

26 (16) to make grants or loans to any person and enter into contracts or
 27 other transactions regarding the grants or loans;

28 (17) to promote energy conservation, energy efficiency, and alternative
 29 energy through training and public education;

30 (18) to acquire a Susitna River power project, whether by
 31 construction, purchase, gift, or lease, including the acquisition of property rights

1 and interests by eminent domain under AS 09;

2 (19) to perform feasibility studies and engineering and design with
3 respect to power projects.

4 * **Sec. 3.** AS 44.83 is amended by adding a new section to read:

5 **Sec. 44.83.085. Susitna River power project annual report.** The authority
6 shall prepare, not later than the first day of each regular session of the legislature, an
7 annual report summarizing the status of the Susitna River power project and shall
8 notify the legislature that the report is available.

9 * **Sec. 4.** AS 44.83.396(a) is amended to read:

10 (a) A power project that was acquired or constructed under AS 44.83.080(18)
11 or as part of the former energy program for Alaska is owned, and shall be
12 administered, by the authority.

13 * **Sec. 5.** AS 44.83.990(3) is amended to read:

14 (3) "feasibility study"

15 (A) means a study conducted for the purpose of establishing the
16 economic and environmental practicality of completing a proposed power
17 project [UNDER FORMER AS 44.83.181];

18 (B) includes engineering and design work to meet the
19 requirements for submission of a license application for a proposed new
20 project to the Federal Energy Regulatory Commission;

21 * **Sec. 6.** The uncodified law of the State of Alaska is amended by adding a new section to
22 read:

23 **LEGISLATIVE APPROVAL OF LOANS FROM THE POWER PROJECT FUND.**

24 (a) Provided the Alaska Energy Authority approves a loan for the Haida Energy, Inc.,
25 Reynolds Creek hydroelectric project, the legislature authorizes the Alaska Energy Authority
26 to loan an amount not to exceed \$11,000,000 from the power project fund (AS 42.45.010) for
27 the Haida Energy, Inc., Reynolds Creek hydroelectric project in addition to the loan
28 authorized by sec. 6, ch. 70, SLA 2010.

29 (b) Provided the Alaska Energy Authority approves a loan for the Cordova Electric
30 Cooperative Humpback Creek hydroelectric project, the legislature authorizes the Alaska
31 Energy Authority to loan an amount not to exceed \$5,000,000 from the power project fund

1 (AS 42.45.010) for the Cordova Electric Cooperative Humpback Creek hydroelectric project.

2 (c) Subsections (a) and (b) of this section constitute legislative approval under
3 AS 42.45.010(j) for a loan from the fund that exceeds \$5,000,000.

4 * **Sec. 7.** This Act takes effect immediately under AS 01.10.070(c).

FISCAL NOTE

STATE OF ALASKA
2011 LEGISLATIVE SESSION

BILL NO. CSSB 42(FIN)

Analysis

This legislation expands the Alaska Energy Authority's powers to allow AEA to acquire a Susitna River power project.

This fiscal note reflects the costs to AIDEA for the increase in personal services related to AEA's establishment of a project office in pursuit of constructing and owning the Susitna Hydro project.

PERSONAL SERVICES: \$1,125.0 - Increased to include 8 staff for the first year as follows:

Project Manager Rg 27

Environmental Manager Rg 26

Administrative Assistant Rg 12

Project Accountant Rg 18

Financial/Budget Analyst Rg 24

Public Outreach/Legislation Liaison Rg 23

Procurement Manager Rg 24

Data System Specialist Rg 20

The funding source is an increase to I/A receipts from the Alaska Energy Authority.

See also the related Fiscal Note for the costs to AEA Statewide Project Development component to establish a project office for the Susitna Hydro project.

FISCAL NOTE

STATE OF ALASKA
2011 LEGISLATIVE SESSION

Fiscal Note Number _____
 Bill Version CSSB 42 (FIN)
 () Publish Date _____

Identifier (file name) SB42-CCED-AEA-04-15-11
 Title Powers of Alaska Energy Authority
 Sponsor Rules by Request of the Governor
 Requester Senate Finance Committee
 Dept. Affected DCCED
 Appropriation Alaska Energy Authority
 Allocation Statewide Project Development
Alternative Energy and Efficiency
 OMB Component Number 2888

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

| | Appropriation Required | Information | | | | | | |
|-------------------------------|---------------------------|-------------|----------------|----------------|----------------|----------------|------------|---------|
| | | FY 2012 | FY 2012 | FY 2013 | FY 2014 | FY 2015 | FY 2016 | FY 2017 |
| OPERATING EXPENDITURES | | | | | | | | |
| Personal Services | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *** |
| Travel | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *** |
| Services | 1,350.0 | | 1,413.5 | 1,476.1 | 1,538.1 | 1,606.8 | *** | |
| Commodities | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | *** | |
| Capital Outlay | 413.0 | | 5.0 | 5.0 | 5.0 | 5.0 | *** | |
| Grants | | | | | | | | |
| Miscellaneous | | | | | | | | |
| TOTAL OPERATING | 1,763.0 | 0.0 | 1,418.5 | 1,481.1 | 1,543.1 | 1,611.8 | *** | |

| | | | | | | | | |
|-----------------------------|--|--|--|--|--|--|--|--|
| CAPITAL EXPENDITURES | | | | | | | | |
|-----------------------------|--|--|--|--|--|--|--|--|

| | | | | | | | | |
|---------------------------|--|--|--|--|--|--|--|--|
| CHANGE IN REVENUES | | | | | | | | |
|---------------------------|--|--|--|--|--|--|--|--|

FUND SOURCE (Thousands of Dollars)

| | | | | | | | | |
|-------------------------|----------------|------------|----------------|----------------|----------------|----------------|------------|--|
| 1002 Federal Receipts | | | | | | | | |
| 1003 GF Match | | | | | | | | |
| 1004 GF | | | | | | | | |
| 1061 CIP Receipts | 1,763.0 | | 1,418.5 | 1,481.1 | 1,543.1 | 1,611.8 | *** | |
| 1037 GF/Mental Health | | | | | | | | |
| Other (please identify) | | | | | | | | |
| TOTAL | 1,763.0 | 0.0 | 1,418.5 | 1,481.1 | 1,543.1 | 1,611.8 | *** | |

Estimate of any current year (FY2011) cost _____

POSITIONS

| | | | | | | | |
|-----------|--|--|--|--|--|--|--|
| Full-time | | | | | | | |
| Part-time | | | | | | | |
| Temporary | | | | | | | |

Why this fiscal note differs from previous version (if initial version, please note as such)

This Fiscal Note estimates employee costs for Susitna Project Office and assumes that new staff are AIDEA employees contracted to the Alaska Energy Authority.

Prepared by Amy Adler
 Division Alaska Energy Authority
 Approved by Susan K. Bell, Commissioner
Commerce, Community, and Economic Development

Phone 771-3013
 Date/Time 4/15/11 4:00 PM
 Date 4/15/2011

FISCAL NOTE

STATE OF ALASKA
2011 LEGISLATIVE SESSION

BILL NO. CSSB 42 (FIN)

Analysis

This legislation expands the Alaska Energy Authority's powers to allow AEA to acquire a Susitna River power project.

This fiscal note reflects the costs to AEA to establish a project office in pursuit of constructing and owning the Susitna Hydro project.

CONTRACTUAL: \$1,350.0

\$1,125.0 Contractual Services for 8 staff (AIDEA employees) for the first year as follows:

- Project Manager - Rg 27
- Environmental Manager - Rg 26
- Administrative Assistant - Rg 12
- Project Accountant - Rg 18
- Financial/Budget Analyst - Rg 24
- Public Outreach/Legislation Liaison - Rg 23
- Procurement Manager - Rg 24
- Data System Specialist - Rg 20

Note: Personal Services Costs are reflected in the related Fiscal Note for the AIDEA component.

\$225.0 Contractual Services for Building lease, and G&A costs for Project Office. Cost estimates include a cost associated with contract labor personnel.

\$ 189.0 Annual Lease - 4,500 sq. ft. (250'/pp x 14 +1000') x \$3.50 per sq. ft./mo. x 12 mo.'s.
\$ 36.0 G&A Expense: \$3.6 per person - \$3.6 x 10 (8 staff + 2 contractors).
\$ 225.0

EQUIPMENT/FURNITURE: \$413.0 - Increase for first year Project Office set up costs. This cost estimate assumes all equipment and furniture purchases in the first year as well as one time only moving expenses and tenant improvements.

\$ 28.0 IT Equipment \$2.0 per person x 14 (8 staff + 6 contractors). Assumes all equipment purchases in first year for project office (including contract labor needs).
\$ 385.0 Tenant Improvement \$315.0 (\$70 x 4,500 sq. ft.); Moving Expenses \$21.0; and Furniture \$49.0
\$ 413.0

Note: Tenant Improvement costs will vary depending on building configuration and may also be negotiated as part of a long term lease.

*** Costs for FY 2017 indeterminate

CS SB 42(FIN) Work Draft E
April 15, 2011
Sectional Analysis

Section 1: Would increase from 3 to 4 the quorum requirement for meetings of the AEA board of directors in reaction to statutory amendments made in 2010. Those amendments increased the size of the AIDEA board from 5 to 7. The AIDEA board serves as the board of AEA. The proposed amendment would correct the quorum for meetings of AEA's board of directors.

Section 2: Would expand AEA's powers to allow AEA to apply for permits and licenses to acquire and construct new projects, to construct or otherwise acquire a power project on the Susitna River, to conduct feasibility studies of new power projects. This authority would enable AEA to initiate the FERC licensing process for the Watana hydroelectric project on the Susitna River. Authorizes AEA to acquire property rights by eminent domain under AS 09.

Section 3: Would require AEA to submit to the legislature an annual report summarizing the status of the Susitna River power project.

Section 4: Would provide that AEA must exercise for new power projects, existing statutory authority regarding the management of AEA owned power projects. AS 44.83.396 addresses how AEA administers the power project and contracts for operators, and includes provisions providing for AEA to contract with qualified utilities for the operation of a power project. The statutory provisions are currently limited to power projects from the pre-1993, "former energy program for Alaska."

Section 5: Would amend the definition of "feasibility study" under AS 44.83.990(3) so that the term is not limited to only pre-1993 power projects.

Section 6: Would provide legislative approval for AEA to make two power project loans. The first loan is for up to \$11,000,000 for the Haida Energy, Inc. Reynolds Creek hydroelectric project. This authorization would be in addition to the legislative approval given for a \$9,000,000 loan for the project under sec. 6, ch. 70, SLA 2010; for a total approved power project loan of up to \$20,000,000. The second loan is for \$5,000,000 for the Cordova Electric Cooperative Humpback Creek hydroelectric project. Under AS 42.45.010(j), the legislature must approve the project and power project loan amount if the cumulative state monetary support from loans, grants, and bonds for the project equals or exceeds \$5,000,000.

Section 7: Would provide for an immediate effective date.

Adopted 4/16/11

27-GS1822E

Kane

4/15/11

CS FOR SENATE BILL NO. 42(FIN)

IN THE LEGISLATURE OF THE STATE OF ALASKA

TWENTY-SEVENTH LEGISLATURE - FIRST SESSION

BY THE SENATE FINANCE COMMITTEE

Offered:
Referred:

Sponsor(s): SENATE RULES COMMITTEE BY REQUEST OF THE GOVERNOR

A BILL

FOR AN ACT ENTITLED

1 "An Act relating to the quorum of the Alaska Energy Authority; relating to the powers
2 and duties of the Alaska Energy Authority; relating to the acquisition or construction of
3 a Susitna River power project by the Alaska Energy Authority; relating to the definition
4 of 'feasibility study' in the Alaska Energy Authority Act; providing legislative approval
5 for certain loans from the power project fund; and providing for an effective date."

6 **BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:**

7 * **Section 1.** AS 44.83.040(a) is amended to read:

8 (a) The chair and vice-chair of the Alaska Industrial Development and Export
9 Authority shall serve as officers of the Alaska Energy Authority. The powers of the
10 Alaska Energy Authority are vested in the directors, and four [THREE] directors of
11 the authority constitute a quorum. Action may be taken and motions and resolutions
12 adopted by the Alaska Energy Authority at a meeting by the affirmative vote of a
13 majority of the directors. The directors of the Alaska Energy Authority serve without

1 compensation, but they shall receive the same travel pay and per diem as provided by
2 law for board members under AS 39.20.180.

3 * **Sec. 2.** AS 44.83.080 is amended to read:

4 **Sec. 44.83.080. Powers of the authority.** In furtherance of its corporate
5 purposes, the authority has the following powers in addition to its other powers:

6 (1) to sue and be sued;

7 (2) to have a seal and alter it at pleasure;

8 (3) to make and alter bylaws for its organization and internal
9 management;

10 (4) to adopt regulations governing the exercise of its corporate powers;

11 (5) to improve, equip, operate, and maintain power projects and bulk
12 fuel, waste energy, energy conservation, energy efficiency, and alternative energy
13 facilities and equipment;

14 (6) to issue bonds to carry out any of its corporate purposes and
15 powers, including the establishment or increase of reserves to secure or to pay the
16 bonds or interest on them, and the payment of all other costs or expenses of the
17 authority incident to and necessary or convenient to carry out its corporate purposes
18 and powers;

19 (7) to sell, lease as lessor or lessee, exchange, donate, convey, or
20 encumber in any manner by mortgage or by creation of any other security interest, real
21 or personal property owned by it, or in which it has an interest, when, in the judgment
22 of the authority, the action is in furtherance of its corporate purposes;

23 (8) to accept gifts, grants, or loans from, and enter into contracts or
24 other transactions regarding them, with any person;

25 (9) to deposit or invest its funds, subject to agreements with
26 bondholders;

27 (10) to enter into contracts with the United States or any person and,
28 subject to the laws of the United States and subject to concurrence of the legislature,
29 with a foreign country or its agencies, for the construction, financing, operation, and
30 maintenance of all or any part of a power project or bulk fuel, waste energy, energy
31 conservation, energy efficiency, or alternative energy facilities or equipment, either

1 inside or outside the state, and for the sale or transmission of power from a project or
2 any right to the capacity of it or for the security of any bonds of the authority issued or
3 to be issued for the project;

4 (11) to enter into contracts with any person and with the United States
5 [,] and, subject to the laws of the United States and subject to the concurrence of the
6 legislature, with a foreign country or its agencies for the purchase, sale, exchange,
7 transmission, or use of power from a project, or any right to the capacity of it;

8 (12) to apply to the appropriate agencies of the state, the United States,
9 and a foreign country and any other proper agency for the permits, licenses, or
10 approvals as may be necessary, to acquire, construct, maintain, and operate power
11 projects in accordance with the licenses or permits, and to obtain, hold, and use the
12 licenses and permits in the same manner as any other person or operating unit;

13 (13) to enter into contracts or agreements with respect to the exercise
14 of any of its powers, and do all things necessary or convenient to carry out its
15 corporate purposes and exercise the powers granted in this chapter;

16 (14) to recommend to the legislature

17 (A) the pledge of the credit of the state to guarantee repayment
18 of all or any portion of revenue bonds issued to assist in construction of power
19 projects;

20 (B) an appropriation from the general fund

21 (i) for debt service on bonds or other project purposes;

22 or

23 (ii) to reduce the amount of debt financing for the

24 project;

25 (15) to carry out the powers and duties assigned to it under AS 42.45;

26 (16) to make grants or loans to any person and enter into contracts or
27 other transactions regarding the grants or loans;

28 (17) to promote energy conservation, energy efficiency, and alternative
29 energy through training and public education;

30 (18) to acquire a Susitna River power project, whether by
31 construction, purchase, gift, or lease, including the acquisition of property rights

1 **and interests by eminent domain under AS 09;**

2 **(19) to perform feasibility studies and engineering and design with**

3 **respect to power projects.**

4 * **Sec. 3.** AS 44.83 is amended by adding a new section to read:

5 **Sec. 44.83.085. Susitna River power project annual report.** The authority
6 shall prepare, not later than the first day of each regular session of the legislature, an
7 annual report summarizing the status of the Susitna River power project and shall
8 notify the legislature that the report is available.

9 * **Sec. 4.** AS 44.83.396(a) is amended to read:

10 (a) A power project that was acquired or constructed **under AS 44.83.080(18)**
11 **or** as part of the former energy program for Alaska is owned, and shall be
12 administered, by the authority.

13 * **Sec. 5.** AS 44.83.990(3) is amended to read:

14 (3) "feasibility study"

15 (A) means a study conducted for the purpose of establishing the
16 economic and environmental practicality of completing a proposed power
17 project [UNDER FORMER AS 44.83.181];

18 (B) includes engineering and design work to meet the
19 requirements for submission of a license application for a proposed new
20 project to the Federal Energy Regulatory Commission;

21 * **Sec. 6.** The uncodified law of the State of Alaska is amended by adding a new section to
22 read:

23 **LEGISLATIVE APPROVAL OF LOANS FROM THE POWER PROJECT FUND.**

24 (a) Provided the Alaska Energy Authority approves a loan for the Haida Energy, Inc.,
25 Reynolds Creek hydroelectric project, the legislature authorizes the Alaska Energy Authority
26 to loan an amount not to exceed \$11,000,000 from the power project fund (AS 42.45.010) for
27 the Haida Energy, Inc., Reynolds Creek hydroelectric project in addition to the loan
28 authorized by sec. 6, ch. 70, SLA 2010.

29 (b) Provided the Alaska Energy Authority approves a loan for the Cordova Electric
30 Cooperative Humpback Creek hydroelectric project, the legislature authorizes the Alaska
31 Energy Authority to loan an amount not to exceed \$5,000,000 from the power project fund

- 1 (AS 42.45.010) for the Cordova Electric Cooperative Humpback Creek hydroelectric project.
- 2 (c) Subsections (a) and (b) of this section constitute legislative approval under
- 3 AS 42.45.010(j) for a loan from the fund that exceeds \$5,000,000.
- 4 * **Sec. 7.** This Act takes effect immediately under AS 01.10.070(c).

*Hydroelectric Project Risk Analysis &
the Bradley Lake Funding Model*
Summary Report

SNW

1420 Fifth Avenue, Suite 4300
Seattle, Washington
98101

Phone: (206) 628-2882

Fax: (206) 343-2103

11/15/2010

INTRODUCTION

The State of Alaska is analyzing the Susitna and Chakachamna hydroelectric projects for possible development. Both projects would require the investment of substantial resources and capital to move to the construction phase, including time and costs associated with an environmental review and the Federal permitting and licensing process. As part of the information gathering process, SNW has been asked to perform the following specific work tasks:

1. List and, if possible, assess the potential risks from an investor's perspective of the Susitna and Chakachamna hydroelectric projects.
2. Research, compare and contrast the Bradley Lake project and its original funding mechanisms to a potential similar project today.

Context for the Risk Assessment Component of This Report

Currently, there are several large hydroelectric facilities being constructed around the world. Many of these projects are being built in the BRIC nations (Brazil, Russia, India and China), where there are fewer permitting and environmental challenges to overcome. Nearly all projects of the size and scope of Susitna and Chakachamna currently being developed internationally are structured with some amount of government assistance or government guaranty, and many also include an equity investor participant. Some examples include China's Three Gorges, BC Canada's Toba Montrose, BC Canada's Waneta Expansion, Thailand/Laos' Pak Chom and Ban Koum projects (similar size/costs), and Brazil's Santo Antonio. The Waneta Expansion project financing is typical of the structures used to develop large hydro electric facilities; a more detailed description follows:

Waneta Expansion Project Description

Fortis Inc., an electric utility holding company, has entered into a partnership with Columbia Basin Trust (CBT) and Columbia Power Corporation (CPC), both 100% owned corporations of the Government of British Columbia, to construct a \$900 million 335 megawatt hydroelectric generating facility on the Pend d'Oreille River, near Trail, British Columbia. The partnership calls for Fortis to own and operate 51% of the non-regulated portion of the facility and the CBT/CP group to own and operate the other 49% of the Waneta Expansion Project. The energy generated by the project will be sold to BC Hydro under a long-term power purchase contract. The surplus capacity will be sold to FortisBC under a long-term capacity purchase agreement. Fortis' portion of the initial financing costs are expected to be covered through credit facilities and then through long-term debt and equity take-out financing. The CPC portion is being funded through a \$500 million commitment to be used as equity funding for joint venture power projects. Construction on the Waneta Expansion Project is expected to last four and a half years.

One important distinction between the large generation projects being constructed globally and the projects under consideration in Alaska is that the projects being built globally have access to large populations via transmission grids. This ability to both serve the immediate power consumption needs within the facility's service area and have access to other markets via a transmission system improves the baseline feasibility of a power generation facility and creates the option to develop excess capacity, which can be sold at market rates. Without state or federal support, Alaska's isolated geographic location eliminates the ability to build capacity which, when added to the current generation capabilities within the railbelt, exceeds existing demand.

It is the isolated geographic location of the railbelt customer base, in combination with the scope and complexity of the Chakachamna and Susitna projects, that lead us to conclude that neither of these facilities can be completed through a project finance vehicle (i.e., the security for the financing would be exclusively revenue from the sale of project-generated power). In our view, these projects will require State funding, which could be directly via capital investment and/or indirectly through some form of credit support or backstop, in order to obtain securities market access. It is also our view that it is reasonable for the State to consider investing in railbelt generation assets with the objective of developing a long-term stable source of base load power at a cost that will promote economic stability and growth within the railbelt region. Nevertheless, the process the State should go through in determining whether to invest additional time and resources into either the Susitna or Chakachamna project is analogous to the diligence that an equity investor would perform prior to the commitment of capital.

The following section identifies many of the risks inherent to an investment in either the Susitna or Chakachamna project. SNW is not qualified to advise AEA on the susceptibility of Susitna or Chakachamna to most of the risks identified. Many of these risks are focused on engineering or geological elements specific to the projects, and we are not an engineering firm. For this reason, we have confined our work to just the identification and explanation of risks, and for the most part have withheld any opinion as to whether either of the projects is more or less susceptible to a particular risk. The State, with its engineering and geotechnical resources and significant history with each of these proposed facilities, is in the best position to risk-weight the projects. Our objective is to help to identify as many of the project risks as possible and provide some framework to assist AEA with its risk assessment.

FINANCING CRITERIA: DISTINGUISHING RISK

Through a review of publicly available websites and documents footnoted or sourced throughout this report, we have evaluated and categorized some of the different risks associated with the two selected projects. As with the analysis of any project finance type structure, an investor will rely on a project feasibility study to outline the various engineering risk factors and risk mitigation efforts that are being undertaken throughout the stages of project development. SNW has not specifically studied nor are we suited to evaluate the two projects with respect to the different types of geological, volcanic, environmental risks, etc. from an engineering perspective. However, it is these risks that primarily distinguish Susitna and Chakachamna from one another.

Some potential risk factors are discussed below:

Overall Project Timeline

Both Susitna and Chakachamna are expected to take multiple years to permit and construct. The phased execution of the projects over multiple years has the effect of amplifying the elements of construction risk and reducing the overall confidence in project feasibility. Specifically with regard to Susitna and Chakachamna, the remote location of the projects will also be a factor in timely completion of the projects and therefore project feasibility. A large risk factor associated with either project is the unknown site or geological issues that could materialize during the construction phase. All other factors being equal, a shorter project permitting process and construction timeline is likely to result in less project risk.

Permitting and Licensing

There will be significant permitting risk, at both the Federal and local/State level. Projects of this scope and size would expect strong environmental opposition to the facility, transmission lines, roads (even if only

temporary), and/or railroads. Any project financing would occur only after all permits/licenses were issued and all court challenges were exhausted, so investment of capital leading to the permitting of either project will be substantial. Any risk assessment of the projects under consideration based on permitting and licensing should be done while simultaneously considering the feasibility of construction and the long-term operating viability of the project.

Development/Pre-construction

There is a significant portion of pre-construction development work that needs to be completed, at a sizable cost. These expenditures are rarely risks that investors will carry. Pre-construction costs would have to be paid by the State or an independent developer.

Construction Risk

Both the Chakachamna and Susitna projects are subject to a variety of construction risks. The three primary credit concerns relating to construction include (1) the cost of the project, (2) the schedule for the project, and (3) the quality of the completed project. Each can negatively impact the availability of funding and/or the date that the project comes on-line and begins producing revenue.

Project cost risk is influenced by a whole host of risks inherent to both projects in various degrees. As noted above, the duration of construction can amplify the risk of many of these cost factors. Some of the risk elements that can influence project cost are:

Inflation Risk. The risk that the future cost of materials and/or labor will exceed estimates.

Supply Risk. The risk that materials required for construction will be unavailable due to competing construction demand and/or the inability to deliver materials to the job site due to a remote location or problems along the supply route.

Labor Risk. The risk that there will be either a shortage of the labor required to move the project forward on schedule or a work stoppage delaying completion.

Engineering Risk. The risk that the project will encounter unanticipated and/or under-estimated construction challenges. While we are not an engineering firm, it is our understanding that many large project cost overruns are caused by unforeseen underground conditions. The scope and nature of underground work at both Susitna and Chakachamna should be carefully assessed and factored into overall project feasibility.

Contractor Risk. The risk that a contractor will fail to perform on its contractual obligations. This risk can be mitigated by allocating construction risks among the various project participants through the use of design/build contracts and the implementation of fixed price/fixed schedule agreements, and by including price incentives and disincentives in construction contracts. Nevertheless, it is impossible to completely insulate a project from contractor risk, and the overall complexity of the project including project sighting and engineering should be factored into the risk assessment.

Geological Risk Factors

There are significant potential geological risks associated with the two projects, which have been identified and discussed in the following documents:

Susitna Project, Watana and High Devil Canyon – RCC Dam Cost Evaluation, prepared by R&M Consultants, Hatch Acres, and Jack Linnard Consulting (which sourced two other studies including *1982 Feasibility Study* (Acres), and *1983 License Application* (Harza Ebasco 1983)).

Chakachamna Hydroelectric Project – Interim Feasibility Assessment Report, prepared by Bechtel Civil & Minerals Inc., 1983.

Both projects entail significant project risk and it is our opinion that the risks associated with both projects would require substantial financial backing in the form of credit support from the State to be feasible. For Chakachamna, the potential implications of Mt. Spurr volcanic activity, the close proximity of the Castle Mountain fault, and the geological nature of the lake tap would be significant areas of concern for investors. From a capital markets perspective, and not based on any engineering expertise, it is our opinion that the seismic and geological risk factors connected to the Susitna project seem to be considerably less than Chakachamna, nevertheless Susitna will demand extensive seismic and geological analysis prior to obtaining outside capital funding.

Environmental (Fish, Plant, Wildlife) Risk Factors

Both projects will incur environmental issues in the form of fish passage, changes in water quality and temperature, vegetation removal, wildlife habitat loss or alteration, and reservoir fluctuations. These risks may not be limited to the construction period. Post-construction environment risk could materialize due to an unanticipated environmental impact. Again, based solely on our capital markets perspective, the design of the Chakachamna project, which will necessitate the diversion of water flow from one drainage to another, appears to have the increased potential for environmental risk, particularly the potential for post-construction environmental damage and possible corresponding operating risk.

Regulatory/Legal Risk Factors

While there are significant federal hurdles associated with the permitting of a hydro project (of any size), there have been some recent positive legal developments out of Washington, D.C. The U.S. Department of Energy, Department of Interior, and the Army Corps of Engineers recently signed a Memorandum of Understanding intended to promote the development of hydropower in the United States. The MOU is intended to increase cooperation among the different agencies and to integrate policies and procedures at the federal level. This potentially creates efficiencies through the regulatory approval process and an improvement in the time frame in which required approvals are obtained.

Notwithstanding the above, it would be a mistake to proceed with either project under the assumption that there is no political risk. While politically stable, the United States has a long history of changing rules and regulations due to a political shift in governance or general public sentiment.

Technology Risk

Hydro is a tried and true technology capable of providing very stable base load power, but it is capital-intensive. The possibility of technological improvements in other sources of base load power leading to greater output, lower environmental impact, and reduced generation and transmission costs would be a factor for any investor. This risk factor can be mitigated through the structure of the Power Purchase Agreement.

BRADLEY LAKE COMPARISON ANALYSIS

Description and History

The Bradley Lake Hydroelectric Project is located in south-central Alaska at the southern end of the Kenai Peninsula. The project includes a 610-foot-long, 125-foot-high concrete-faced and rock-filled gravity dam, a 3.5-mile power tunnel and a steel-lined penstock. The project has 126 megawatts of installed capacity. Two

20-mile, 115-kilovolt transmission lines connect the project to a transmission system on the Kenai Peninsula. The project provides electric power to the most populous areas of Alaska, including the Kenai Peninsula, the Municipality of Anchorage, the Matanuska-Susitna Borough, and the Fairbanks area. Under a Power Sale Agreement, AEA has sold 100% of the capacity to the following purchasers:

- Chugach Electric Association, Inc. (30.4%);
- Municipality of Anchorage (25.9%);
- Alaska Electric Generation & Transmission Cooperative, Inc. (25.8%) acting on behalf of Homer Electric Association, Inc. (12.0%) and Matanuska Electric Association, Inc. (13.8%);
- Golden Valley Electric Association, Inc. (16.9%); and
- City of Seward (1.0%).¹

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 and field investigations started in 1982. In April 1984, AEA submitted a license application to the Federal Energy Regulatory Commission. The FERC license is the primary regulatory approval governing project development. The license to construct the project was issued on December 31, 1985, under the Energy Program for Alaska. In addition to the FERC license, AEA applied for and received 170 federal, State and local permits and licenses required to support construction and operations. A number of studies and investigations were performed to ascertain the geologic and geotechnical conditions of the site and structures. Seismic design considerations and the results of the investigations were reviewed and found prudent by the projects' technical review board and the FERC board of consultants.² In addition, a number of environmental studies were done, including studies of the effects of the project on wildlife, fish and winter ice conditions.³ Construction of the project commenced on June 17, 1986, with site preparation work. Construction was suspended, however, after the completion of Phase I in May 1987 due to the pending negotiations of a satisfactory power sales agreement. In December 1987, AEA and the railbelt utilities entered into a Power Sales Agreement, and legislation was introduced in January 1988 to exempt the Bradley Lake power sales agreements from review by the Alaska Public Utilities Commission.⁴ Construction of the project resumed on March 12, 1988, and the project was declared in commercial operation on September 1, 1991. From the project's completion in 1991 through 2009, the project has had an average annual output of 386.4 million kilowatt hours.

Original Financing

Project cost in the amount of \$357.2 million (including reserves, capitalized interest, and cost of debt issuance) was funded long-term by (1) appropriations from the State in the initial aggregate amount of \$175 million (later reduced to \$163.6 million), (2) proceeds from the sale of AEA's bonds issued in the amount of \$165.3 million, and (3) approximately \$28.3 million of interest earnings during construction. A portion of the

¹ Alaska Energy Authority Bradley Lake Hydroelectric Project Fact Sheet (2010)

² Alaska Energy Authority Power Revenue Bonds, Second Series Official Statement (1990)

³ "Throwing the switch at Bradley Lake," Alaska Business Monthly (1991)

⁴ "Throwing the switch at Bradley Lake," Alaska Business Monthly (1991)

State appropriations funding was provided by the Railbelt Energy Fund, which was established from the Power Development Fund and seeded with appropriations for the canceled Susitna Hydroelectric Project.⁵

AEA issued approximately \$267.5 million of Variable Rate Demand Bonds during the project construction phase to be used for construction cost. The Variable Rate Demand Bonds were sized in an amount that, together with interest earnings, would be sufficient to completely cover construction of the project. This approach created the ability to earn the maximum amount of interest earnings during construction. The Variable Rate Demand Bonds were general obligations of AEA and were secured by bank letters of credit and a capital reserve fund under an Indenture of Trust from AEA to the Bank of New York. Following construction, the Variable Rate Demand Bonds were redeemed using a combination of State-appropriated funds and the proceeds of long-term, fixed rate bonds issued in the amount of \$165.3 million. The initial bond sales were issued in very flat yield curve environments, with interest rates ranging from 6.1% on the short end to 7.25% on the long end.⁶ The original financing plan for the project is outlined in the table below:

FINANCING PLAN FOR BRADLEY LAKE

| <i>Available Funds</i> | |
|------------------------------|-----------------------|
| Long-Term Bond Issuances | \$ 165,260,157 |
| State Appropriations | 163,605,157 * |
| Interest Earnings from VRDBs | 28,375,379 |
| Total | \$ 357,240,693 |
| <i>Application of Funds</i> | |
| Project Construction | \$ 312,500,000 |
| Capitalized Interest | 17,418,182 |
| Capital Reserve Fund | 13,392,890 |
| Renewal and Contingency Fund | 5,000,000 |
| Bond Insurance Premiums | 1,302,839 |
| Bond Issuance Expenses | 3,339,175 |
| Operating Reserve Account | 625,000 |
| Net Original Issue Discount | 3,662,607 |
| Total | \$ 357,240,693 |

* The original appropriation was in the amount of \$175,080,000, but \$11,474,843 was refunded to the State after construction.

⁵ "Allure of the Railbelt Energy Fund," Alaska Business Monthly (1990)

⁶ Electronic Municipal Market Access and Alaska Energy Authority Power Revenue Bonds, Second Series Official Statement (1990)

The Variable Rate Demand Bonds were refunded through two long-term issuances, the first in 1989 in the amount of \$105 million and the second in 1990 in the amount of \$60,259,015. The sources and uses for the permanent financing of the project are outlined in the table below.

| | 1st Series Revenue Bonds | 2nd Series Revenue Bonds | Total |
|---|-----------------------------|-----------------------------|-----------------------|
| Sources | | | |
| Principal Amount of Bonds | \$ 105,001,142 | \$ 60,259,015 | \$ 165,260,157 |
| Existing Funds* | 100,000 | 227,848,767 | 227,948,767 |
| Total | \$ 105,101,142 | \$ 288,107,782 | \$ 393,208,924 |
| Uses | | | |
| Redemption of Variable Rate Demand Bonds | \$ 76,600,000 | \$ 190,900,000 | \$ 267,500,000 |
| Deposit to Construction Fund | - | 82,300,919 | 82,300,919 |
| Deposit to Interest Account | 12,245,356 | 3,840,138 | 16,085,494 |
| Deposit to Capital Reserve Fund | 8,423,148 | 4,969,742 | 13,392,890 |
| Deposit to Renewal and Contingency Reserve Fund | 1,524,466 | 3,475,534 | 5,000,000 |
| Deposit to Operating Reserve Account | - | 625,000 | 625,000 |
| Bond Insurance Premium | 798,839 | 504,000 | 1,302,839 |
| Underwriting Discount and Costs of Issuance | 2,030,445 | 1,308,730 | 3,339,175 |
| Net Original Issue Discount | 3,478,888 | 183,719 | 3,662,607 |
| Total | \$ 105,101,142 | \$ 288,107,782 | \$ 393,208,924 |

Comparison of Current Financing Environment

The project was an innovative deal at the time that it was originally built and financed, and was the first instance of a state agency financing a power project on a long-term basis.⁷ While the current financing environment is very different from that of 25 years ago, when the project was developed, the size, scope and success of the project makes it a relevant standard to analyze when considering a comparable large scale hydroelectric project. For this comparison, we have focused on highlighting the key components of the original financing relative to what could be expected in today's market. These components include:

- Arbitrage and investment earnings
- Rate environment and pricing
- Equity
- Security
- Power sales agreement
- Regulatory review and waivers
- Financing terms and conditions

Arbitrage and Investment Earnings: During the construction phase of the Bradley Lake project \$267.5 million of Variable Rate Demand Bonds were utilized as interim funding and were later repaid through the

⁷ Alaska House Judiciary Committee, Action Narrative, January 26, 1988. Tape 88 Side 1.

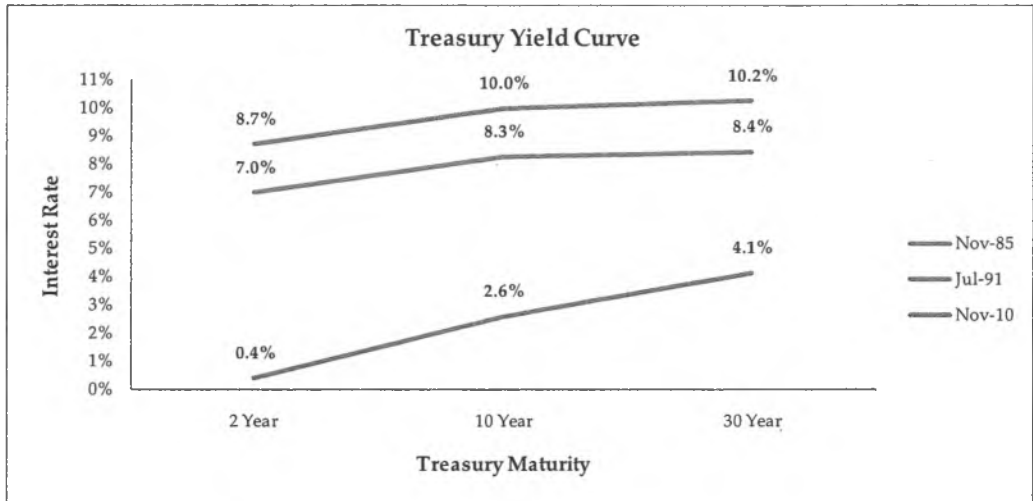
combination of State appropriations, which, in effect, acted as equity in the transaction, and long-term fixed rate revenue bonds, which would be backed by the power sale agreement. One significant aspect of variable rate demand bonds issued at the time is that, because they were issued prior to the Tax Reform Act of 1986, unspent proceeds from the bonds could be invested at a higher, taxable rate of interest. This interest rate arbitrage was used as additional source of capital for the project. Investment earnings on this arbitrage over the life of the Bradley Lake variable rate demand bonds equaled \$28.3 million or approximately 9.0% of the total project costs. The 1986 Tax Act eliminated any ability to use tax-exempt bond proceeds to earn interest arbitrage, so interest rate arbitrage would not be available for a similar transaction today.

Rate Environment and Pricing: The 1980s saw a declining interest rate environment with relatively flat yield curves. While rates did not decrease in a linear fashion, due to some volatility in the decade, the overall rate decrease was fairly dramatic. For example, the 10-year treasury rate went from almost 15% in 1981 to around 8% in 1989, while the 2-year treasury rate went from almost 16% to around 8% over the same period. Long-term rates were in the 10% range in 1985 when the variable rate demand bonds were issued. The permanent take-out bonds were issued on a serial basis, with interest rates ranging from 6.10% on the short end to 7.25% on the long end. This environment is very different from the one we are currently experiencing, with historically low rates and a very steep yield curve. Rates on the 2-year treasury are currently 0.38%, while the 30-year treasury is around 4.12%.

The combination of historically high long-term tax exempt interest rates and a declining interest rate environment made variable rate bonds during the construction phase of Bradley Lake a good choice. As noted above, prior to being expended on the project, proceeds of bonds issued during the construction phase were invested above the variable rate cost of capital, creating interest earnings that exceeded the interest cost of the construction financing. The Bradley Lake funding structure took full advantage of the arbitrage strategy by borrowing for the full amount of the project, including the amount that was expected to be loaned by the State.

Additionally, the use of variable rate bonds served to minimize borrowing cost during construction. As bond proceeds were expended and therefore no longer able to be invested to create arbitrage earnings, the cost of interest was minimized since, in the typical upward-sloping yield curve environment, short-term variable rates were lower than long-term fixed rates. The combination of arbitrage earnings and low rates once bond proceeds were spent served to lower the funding cost of the project during the construction phase.

The Bradley Lake funding cost was additionally benefitted by falling rates during the construction period. As construction wrapped up, the variable rate bonds were refinanced with long-term fixed rate bonds in a lower interest rate environment than the long-term rate environment that existed when the project was started, as illustrated in the table below.



Interest rate risk is always a concern for project feasibility. Rising rates during project construction can substantially jeopardize project feasibility. By utilizing variable rate funding during the construction phase of the project, Bradley Lake was exposed to rate risk; however, this was a calculated risk, since the project was started in a high interest rate environment. Variable rate funding could also be a tool utilized to finance either Susitna or Chakachamna to provide extremely low-cost capital during the construction phase. Of course, the projects would be exposed to interest rate risk until the long-term fixed rate funding is secured. Contrary to 1985, today's long-term interest rates are historically low, creating an incentive to use fixed rate funding during the construction phase and eliminate the risk of rising rates.

While eliminating rate risk, fixed rate funding would likely result in additional cost in the form of negative arbitrage, or the inability to invest construction proceeds at or above the long-term borrowing rate, during the construction phase. Since negative arbitrage would only exist during the construction phase, it should be considered as an additional cost that, at least in the current rate environment, is outweighed by the risk of rising rates.

Equity: Another key component of the Bradley Lake funding structure was the large percentage of equity that was provided through appropriations from the State. State appropriations for the project ended up accounting for approximately 50% of the total project costs. The State's participation in the Bradley Lake project allowed the substantial capital cost of the project to be spread over a period of time that exceeded what would have been available through the bond market.

Security: The Variable Rate Demand Bonds were backed by a letter of credit as well as a general obligation of AEA. The permanent take out bonds were backed by revenues of the power sale agreement, the general obligation and full faith and credit of AEA as well as a moral obligation of the State. In today's environment, an investor would expect to see at least this level of credit support for a deal of this size and complexity.

Power Sales Agreement: The power sale agreement is simply the business deal between the power generator and the power purchaser and can be used to shift risk from the generator/developer to the power purchaser. The power sale agreement in the Bradley Lake project was heavily negotiated by the various parties and at one point was actually the cause of a significant construction delay on the project.⁸ As the main source of payment and security, the power sale agreement was integral in arranging the permanent financing. A unique attribute

⁸ Throwing the Switch at Bradley, Alaska Business Monthly (1991)

of the Bradley Lake power sale agreement was that the agreed payments continued for an additional 20 years after bonds used to fund the project were scheduled to be retired. This structure was designed to repay the State for the considerable capital that was contributed to the project but also served to extend the time frame for amortizing the cost the project.⁹ SNW believes that this aspect of the Bradley Lake contract has applicability to future generating projects within the railbelt.

Regulatory Review and Waivers: While no one would argue that the Bradley Lake project was fast tracked, given the time spent on analysis and the rigorous regulation process that was required, two key waivers were obtained in the process. The first was a special federal exemption that allowed the project to use tax-exempt financing despite the fact that it would serve three contiguous counties. Normally, private activity bonds for electric facilities are exempt only if the facilities are used by a utility serving no more than two contiguous counties. Secondly, the sale and purchase agreement was exempt from APUC review, which removed a great deal of uncertainty within the investor community and seems to have been instrumental in moving the project forward at a critical juncture in time.¹⁰ While these specific waivers may not be necessary for a similar project in today's environment, it is important to remember that a project of this size and scope has the potential to require various agencies and levels of the public sector to work together to achieve success.

Financing Terms

The tables below outline the key terms and conditions achieved in the Bradley Lake financings compared to what might be achievable for a similar project today.

⁹ Alaska House Judiciary Committee, Action Narrative, January 26, 1988; tape 88 side 1

¹⁰ Alaska House Judiciary Committee, Action Narrative, January 26, 1988; tape 88 side 1

INITIAL CONSTRUCTION FINANCING

| FUNDING MECHANISMS | ORIGINAL BRADLEY LAKE PROJECT | POTENTIAL PROJECT TODAY |
|----------------------------------|---|--|
| Construction Costs | \$312,500,000 | Dependent on project |
| Equity (State Allocation) | \$175,000,000 | Likely to be greater than 50% or more of total project cost |
| Interim Financing | Variable Rate Demand Bonds | State funding potentially in combination with conventional bond funding |
| Amount of Bonds | \$267,500,000 | Dependent on project |
| Date Issued | 11/20/1985 | Dependent on project |
| Use of Funds | Construction | Permitting, licensing, construction |
| Security | General Obligation of the Authority, Letter of Credit and Capital Reserve | Dependent on project; however, for a large scale project, investors would expect to see significant credit support |
| Financing Costs | | Dependent on project |
| Interest Rate | Variable Rate | Dependent on security, interest rate environment, tax-status, size, credit rating |
| Letter of Credit | Required | Possible requirement |
| Capital Reserve | Required | Necessary requirement |
| Completion Bonds | Allowed without compliance | - |

PERMANENT TAKE-OUT FINANCING

| FUNDING MECHANISMS | ORIGINAL BRADLEY LAKE PROJECT | POTENTIAL PROECT TODAY |
|---------------------------------|--|---|
| Bond Resolution | Maximum of \$175,000,000 | - |
| Par Amount Issued | \$165,260,157 \$105,001,142 Series 1 \$60,259,015 Series 2 | - |
| Credit Rating | Moody's Aaa (enhanced) S&P AAA (enhanced) | - |
| Type | Negotiated / Tax Exempt | - |
| Underwriters | John Nuveen & Co; Goldman Sachs; Merrill Lynch; Paine Webber; and Lehman Brothers | - |
| Dates Issued | 9/1/1989 Series 1 7/15/1990 Series 2 | - |
| Use of Funds | Refund VRDB and capitalize reserve funds | - |
| Financing Costs | | - |
| Interest Rate | | - |
| Security for Bonds | Direct and general obligations and full faith and credit of the Authority and revenues received from operation of the project under Power Purchase Agreement | - |
| Insurance | Yes and provided by MBIAC | - |
| Power Purchase Agreement | Five utilities purchase 100% of Annual Project Costs, including debt service and annual reserves | Likely different structure than Bradley Lake, but there will need to be a strong PPA in place between the project owner and the railbelt utilities |
| Power Purchase Default | If insufficient funds available because of payment default of Power Purchaser, ADA may increase each other Power Purchaser's share of costs up to 25% | Step-up provision in the PPA will be a necessary security structure feature; however, it could be structured differently than Bradley Lake |
| Capital Reserve Fund | Equal to Maximum Aggregate Debt Service | Required, but could be structured differently than Bradley Lake |
| State Obligation | Moral obligation of the State to restore Capital Reserve Fund | Will depend on PPA structure, but State pledge of any kind would benefit the credit |
| Completion Bonds | Allowed on parity | Yes, typically up to 10% of original bonds issued to fund the project |
| Additional Bonds | May be issued on parity for the cost of acquisition and construction of any capital improvement related to the project with approval from the project | Dependent upon type of debt. It is not typical to allow additional bonds for a project revenue bond structure however system debt would permit additional bonds |

| | | |
|---|---|---|
| | management committee as well as proof that the additional bonds will not hinder debt service payments on the original bonds | subject to meeting certain financial thresholds. Bradley Lake is a hybrid additional bonds provision. |
| Consultant Engineer | Report estimating the projected costs and revenue requirements for a 10-year period as well as opinions on the project | Required |
| Renewal and Contingency Reserve Fund | Yes | Required |
| Operating Reserve Account | Yes | Required |
| Optional Redemption | 102% (7/1/00-6/30/01) 101% (7/1/01-6/30/02) 100% (7/1/02 – thereafter) | Will depend on debt type. Taxable bonds would typically not permit optional redemption, while tax-exempt bonds would allow for optional redemption. |
| Notice of Redemption | At least 30 days but no more than 60 days | - |

State Financial Assistance

As identified in previous reports¹¹ discussing potential financing structures for large generation assets, State financial assistance in a form similar to the Bradley Lake project model will be a necessary tool for either of the potential hydroelectric projects being evaluated. State financial assistance offers a number of advantages not available through traditional utility enterprise bond funding or project finance. State funding, whether in the form of a grant or loan, can be utilized to defer higher cost conventional revenue bond funding. Obviously a grant from the State provides the cheapest form of capital, but even when structured as a loan, State assistance can dramatically lower the overall cost of capital. State funding in the form of a loan has three significant advantages when compared to revenue bonds or a loan from a commercial lender:

Repayment flexibility. State funding can be utilized to extend debt repayment beyond the terms available in the public or commercial debt capital markets. Additionally, a State loan can easily be restructured or deferred to achieve system rate objectives.

Credit support/risk mitigation. State funding can be used to mitigate project construction risk to investors. This is particularly relevant for projects with extended construction timelines, such as the Susitna or Chakachamna hydro projects. Risk mitigation is also relevant in situations where permitting is an issue or a new technology is being used. As discussed earlier, investors will not accept the significant construction and permitting risks inherent with large-scale projects without some form of support from the State.

Potential interest cost benefit. State funding can provide a lower cost source of capital. The State's high investment grade credit rating allows it to borrow for less than even the most secure utility enterprise, and this lower borrowing cost can be passed on to the project. Alternatively, the State can use cash reserves to invest in a large-scale generation project like Susitna or Chakachamna. By using a funding model similar to Bradley Lake's, this capital investment can be returned to the State over an extended period of time. Extending the return of capital to a term that more closely matches the useful

¹¹ Regional Integrated Resource Plan – Financial Analysis Summary Report, 2/3/2010

life of the asset lowers the rates and charges for utility customers and spreads the capital cost of the project over a larger customer base.

CONCLUSION

In conclusion, SNW does not believe that it is possible to differentiate between the Susitna and Chakachamna projects on the basis of capital markets access. As we have underscored in this report, the scope of both projects, combined with the unique nature of the railbelt region, will necessitate a funding structure for either project that is supported by State credit or a State capital commitment. We think that it is likely that we would reach this same conclusion for any project with similar complexity and cost developed within the railbelt. There are engineering, geotechnical and seismic factors specific to each of the projects that would be relevant for the State to consider in risk weighting the projects prior to investing additional time and resources in further development. We've highlighted some of those risks in this report but do not have the technical expertise to advise AEA on the importance of these risks.

Finally, we believe that elements of the Bradley Lake funding model have applicability to funding new large hydroelectric facilities within the railbelt. Market conditions and the legal constraints under which any new project would be funded are dramatically different than when Bradley Lake was funded, so the Bradley Lake structure cannot be replicated as a whole. However, the ability to collaborate with the State to mitigate certain risks and spread the capital cost over an extended period of time will be critical to funding a multi-billion dollar project.

Public Involvement Opportunities in the FERC Licensing ILP and ALP Hydroelectric Licensing Processes

Licensing a hydroelectric project under the Federal Energy Regulatory Commission's (FERC) licensing procedures is a multi-year process that provides considerable opportunity for public input and participation. The licensing process is based on federal laws and regulations that require several years worth of extensive planning, environmental studies, resource agency and native American consultation, community meetings and opportunities for public comment. There are numerous opportunities for engaging the public in this lengthy process of studying, preparing, and evaluating a licensing proposal.

Of the Commission's three available licensing processes, both the Integrated Licensing Process (ILP) and Alternative Licensing Process (ALP) mandate specific requirements for informing and consulting with members of the public, citizen groups and other non-governmental organizations (NGOs). Increased public involvement is one of the goals of the ILP and ALP processes over the earlier "Traditional" Licensing Process (TLP) that had been in place for many decades. The ALP and TLP require written support from agencies and NGO's to get approval from FERC, while the ILP is the default process that requires no special approvals. While the TLP offers some flexibility in terms of stakeholder outreach it would not be a good fit for a Project like Watana because it would not provide the opportunities for stakeholders to participate in the study process and the ability for the public to participate are less than those of the ILP or ALP. Because the ILP provides a structured formal sequence for all licensing steps, all participants are enabled to play key roles from the very beginning of the process. The ALP is a bit more informal, but has similar steps to the ILP in allowing opportunities for public participation; the only real difference is that the timeframes for each step can vary and will not necessarily be known in advance to the public and other potential interested parties. Both the ILP and ALP were designed by the Commission to involve a wider range of participants at an earlier stage in the licensing process versus the previous TLP.

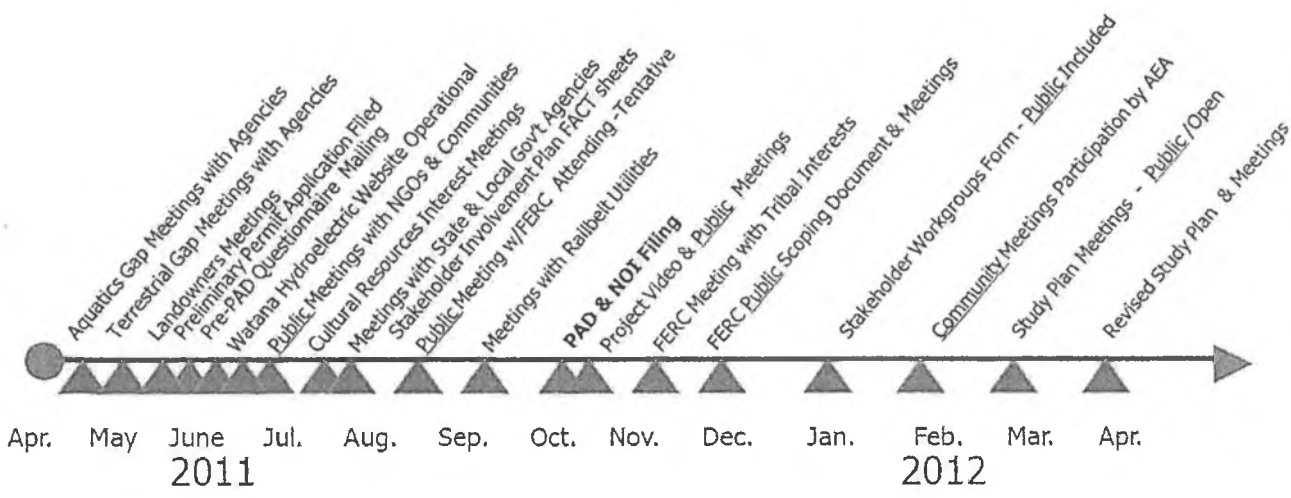
In general, the public has tremendous opportunities for input from the outset of any of the FERC licensing processes, beginning with consultation that takes place before the licensee publishes its Notice of Intent (NOI) to even file for a license. For the Watana Hydroelectric Project, some of the main pre-PAD public activities that would be important are outlined in the following timeline that assumes filing of a NOI and PAD in fall of 2011.

| <u>Timeframe:</u> | <u>Activity:</u> |
|-------------------------|---|
| April – June 2011 | Landowner meetings AEA Web site operational (to be update regularly) Pre-PAD Questionnaire mailings Hydro mailing list Community and interest organization informational meetings |
| July – September 2011 | Public meetings with FERC (to describe process) Stakeholder Involvement Plan – Communication plan Project Fact Sheet AEA Web site (continually update) |
| October – December 2011 | PAD & NOI filed Public information sheets |

FERC meeting with Tribal Interests
 FERC Public Scoping Document & Meetings
 FERC website, mailing list, written comments
 AEA Web site (continually updated)

January – March 2012

Stakeholder workgroups formed
 Community meetings
 Study Plan meetings
 Revised Study Plan & meetings
 FERC website, mailing list, written comments
 AEA Web site (continually update)



Public Participation Opportunities Common to all FERC Licensing Processes

In general, all of FERC’s licensing processes involve two distinct parts: Pre-Application activities, which can be divided into other phases; and Post-Filing activities which are led by FERC. The first Pre-Application activity phase includes preparation and filing with FERC by the applicant of a NOI to file an application for a license and a Pre-Application Document (PAD). As part of the PAD, applicants are required to not only consult with the public and all interested parties, but also to develop and maintain licensing mailing lists of all interested parties who wish to receive information regarding the Project licensing. Under any of the FERC processes, anyone who wishes to be included can add their name and contact information to the mailing lists that will eventually be used for a variety of required notifications by the applicant, FERC, and other agencies. In both Pre-Application and Post-Filing phases license applicants, agencies and FERC and any member of the public can access FERC’s web-based e-library system that will hold the Commission’s complete records filed under a specific FERC Project number (or docket number). Any party can search and download documents, write and file letters and other documents themselves. Interested parties can even subscribe to an email service that will inform them of new filings as they come in. Lastly, any interested party can formally intervene in a Project proceeding through FERC’s e-library if they wish to be able to seek formal rehearing or ultimately appeal the Commission’s findings in a Federal court.

Most all modern licensing efforts also include a Project specific website hosted by the applicant where documents, meeting notices and other information are made available. AEA is currently in the final

stages of developing a new Website specifically for the Watana Project complete with listserv capabilities where interested parties can sign up for emails to stay abreast of current activities in the licensing process. Additionally, the PAD and license application filings are required to be sent to public libraries under any of the FERC licensing processes. All of FERC processes require applicants and FERC to place public notices in regional newspapers at the time of most major filings and prior to public meetings. In summary, members of the public can:

- Get placed on mailing lists and access licensing information through each stage of the process.
- Provide written comments to FERC and all other parties at any time documenting concerns with, or support for the Project.
- Provide oral comments and ask questions of Commission staff and the applicant at public scoping meetings, site visits, and in other meetings.
- Submit study requests and participate in workgroups during study plan development (varies by FERC licensing process).

Public Involvement Opportunities under the ILP and ALP

The PAD provides FERC and potential interested parties with existing, relevant and reasonably available information pertaining to the Project to help identify potential impacts, issues and related information needs, to develop study requests and study plans.

Under the ILP regulations, within 120 days of the date the NOI is filed, FERC holds initial meetings with all potentially-affected tribes or other Native American interests; issues a public notice that the NOI and PAD have been filed; prepares and issues a Scoping Document 1 (SD1) that discusses the project and related issues; and holds public meetings and site visit. FERC scoping meetings are typically held over a several day period with daytime and evening meetings in several locations in the Project area. Each meeting provides the opportunity for the public to view formal presentations and learn more about the Project plans and licensing process. The meetings provide opportunities for interested parties to give verbal testimony that is transcribed by a court recorder. The transcribed comments are made available to the public on FERC's eLibrary. Written comments may also be submitted during the scoping meetings or at any time in the licensing proceeding. Thirty days after the last scoping meeting, all interested parties may file comments with FERC on the NOI, PAD, and SD1.

FERC's scoping process in an ALP will normally take place later than under the ILP unless requested by the applicant and stakeholders, in which case it would be similar to the ILP process although the requirement for meeting with the potentially-affected tribes and other Native American groups is not set on a specific timeline under the ALP regulations. The advantage of the ILP for the public is that all parties will have certainty they can participate at a set point, early in the process and that will allow them a chance to get engaged in all of the subsequent licensing stages rather than entering the process after most decisions regarding studies and other commitments have been made.

Under the ILP, within 195 days after the PAD is filed, the applicant must file a Proposed Study Plan that includes detailed plans for each study it proposes to perform. Within 90 days, the applicant must hold at least one study plan meeting open to all interested participants, and interested parties may file comments on the Proposed Study Plan. Thirty days later, the applicant must file a Revised Study Plan, and 30 days after that FERC must issue a Study Plan Determination, which orders the applicant to perform the studies described by FERC in the Determination. The process for the ALP is less formal and does not have the pre-determined, prescribed steps and timelines, so it is often more difficult for interested parties to know when they can participate. In an ALP the public can provide similar input to study plans

and get involved in the process and would have the best chance for involvement if they join into the ALP collaborative licensing groups that are set up early in the process.

The ILP and ALP generally provide for two seasons of field studies. At the conclusion of both field seasons under the ILP, the applicant files a Study Report with FERC that describes the applicant's progress in performing the studies, and identifies any variances and modifications, including new studies. All interested parties have an opportunity to meet with the applicant to discuss each report and file comments with FERC before FERC makes a determination regarding the proposed modifications. The final Pre-Application activity phase commences when the applicant files either a Draft License Application (DLA) or a Preliminary Licensing Proposal (PLP), which must be filed no later than 150 days before the applicant must file its Final License Application (FLA). The ALP follows a similar sequence but may include an applicant-prepared Environmental Assessment also available for public comment. Interested parties have 90 days to file comments on the DLA or PLP under either process. Lastly, a Final License Application is prepared under both ILP and ALP that documents how the applicant has collaborated with federal and state agencies, tribes and the public regarding the measures.

Post-Filing activities commence once the applicant files its Final License Application. During the Post-Application activities FERC will: 1) determine if the application is complete and request additional information from the applicant if needed; 2) prepare an Environmental Assessment or Environmental Impact Statement (EIS) consistent with the National Environmental Policy Act once the application is complete; and 3) make a decision on issuance of the license, including license terms and conditions. In this process the public is notified and allowed participation through direct mailings from the applicant's mailing list, through posting in FERC's e-library, and through public meetings and newspaper notices.

Development of a Stakeholder Involvement Plan

While not specifically required under an ALP or ILP, a stakeholder involvement plan is essential to successful licensings as it is widely known that it is better to engage potentially interested parties early, rather than have them join into the process late with their concerns. A stakeholder involvement plan is developed prior to filing of the PAD and typically addresses the following items:

- A Communications Plan that clearly describes the procedures for information sharing including:
 - Providing comments
 - Public & working meetings (notices, minutes, etc)
 - Document distribution protocols
 - Study requests procedures
- Identifies potential stakeholders early on
- Develops a Strategic/Media Relations Plan
- Provides means to get early conversations going with key stakeholders
- Provides potential "polling" opportunities (PAD questionnaire)
- Develops a framework to obtain rapport with all stakeholders
- Benchmark potential mitigation measures and highlights Project benefits
- Provides framework for how a Web page should be structured
- Lays out a plan for how public meetings, open houses, and site visits should be organized and ran.
- Describes when and how direct mailings should be used.
- Lays out a plan for engaging the media to get newspaper & other media outlet coverage
- Addresses the need and outlines how Project managers can attend and participate in other regular community or agency meetings



Railbelt Large Hydro Evaluation Preliminary Decision Document

November 23, 2010

Prepared By
Alaska Energy Authority



November 23, 2010

Executive Director's Statement:

The Alaska Energy Authority (AEA) has been appropriated \$10 million in State funds to start planning and designing a large hydroelectric project. Our first goal has been to identify the project to pursue that would give the State the best chance of success to be built and meet the State's goal to produce 50% of Alaska's electrical energy from renewable resources by 2025. It has been generally understood that a multi-billion dollar hydroelectric project will require State participation and financial assistance.

In the Preliminary Decision Document AEA has focused its efforts on the Susitna River and Chakachamna hydroelectric projects. This document provides a risk analysis comparison of the two projects by summarizing the known information and risks of the two projects and identifies the Susitna Hydroelectric project as the recommended primary project for the State to pursue. The Chakachamna project is recommended to be studied as an alternative to Susitna. Alternative projects need to be evaluated as part of the FERC licensing process, unless or until it is determined that there is reason to reject it as an alternative. As an alternative project, AEA recommends allocating the minimum necessary State funds to study the Chakachamna project thereby using the maximum amount available to further advance the Susitna project.

AEA will hold public workshops in February to educate and receive input from the public on the Preliminary Decision Document and the recommended approach to meet the Alaska's 50% renewable energy goal by 2025. After December, please refer to our webpage, www.akenergyauthority.org for workshop schedule. In the meantime, I encourage interested parties to submit written comments to AEA by the any of the following methods:

Email: largehydro@aidea.org

Fax: 907-771-3044 Attn: Large Hydro Project

Address: Large Hydro Project
Alaska Energy Authority
813 West Northern Lights Blvd
Anchorage, AK 99503

AEA looks forward to your comments on the Preliminary Decision Document.

Sincerely,

ALASKA ENERGY AUTHORITY

A handwritten signature in black ink that reads "Michael C. Harper".

Michael C. Harper
Acting Executive Director

Railbelt Large Hydro Evaluation

Preliminary Decision Document

November 23, 2010

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Terms and Acronyms

| | |
|---------------------|--|
| AEA | Alaska Energy Authority |
| ALP | Alternative License Process |
| APA | Alaska Power Authority |
| cfs | cubic feet per second |
| Chakachamna Project | Chakachamna Hydroelectric Project |
| FERC | Federal Energy Regulatory Commission |
| FPA | Federal Power Act |
| GWhrs | Gigawatt hours |
| HB | House Bill |
| ILP | Integrated License Process |
| IRP | Integrated Resource Plan |
| KWhrs | Kilowatt hours |
| MW | Megawatt |
| NOI | Notice of Intent |
| NP | National Park |
| PAD | Preliminary Application Document |
| Railbelt | The region of Alaska served by the railroad, stretching from Seward to Fairbanks |
| RIRP | Regional Integrated Resource Plan |
| SNW | Seattle Northwest Securities |
| Susitna Project | Susitna Hydroelectric Project, Low Watana Non-expandable Alternative |
| TBM | tunnel boring machine |
| TLP | Traditional License Process |

Executive Summary

There are two proposed major hydroelectric projects in the Alaska Railbelt Region: the Susitna Hydroelectric Project, Low Watana Non-expandable Alternative (Susitna Project) and the Chakachamna Hydroelectric Project (Chakachamna Project). The purpose of this document is to identify which of these is most likely to successfully meet the long term energy needs of the railbelt at reasonable cost. This preliminary evaluation also considers the possibility to permit a project in its presently proposed configuration and to be able to do so in a reasonable time frame.

The 2010 AEA Regional Integrated Resource Plan (RIRP) is a 50-year long range plan that identifies combinations of generations and transmission capital improvement projects in the railbelt region (Black and Veatch 2010). The RIRP documented the need for a large amount of new annual generation for the railbelt within the next 10 to 15 years. The type of generation constructed will be influenced by declining Cook Inlet natural gas production, legislative environment, financing, and ability to permit or license and construct a project in a timely manner.

The 2010 Alaska legislature passed House Bill (HB) 306 which declares a State energy policy. This bill directs the State to receive 50 percent of its electrical generation from renewable and alternative energy sources by 2025. The only way to achieve this goal is for a new large hydroelectric project to be built in the railbelt region. The project sites, one on the Susitna River at Watana and one at Lake Chakachamna, are shown on Figure 1-1. The energy generated by one of these two projects would provide roughly one fourth (Chakachamna) to roughly one half (Susitna) of the current electrical energy demand.

Alaska Energy Authority received funding from the Alaska Legislature in 2010 for the preliminary planning, design, permitting and field work for the Susitna and Chakachamna Projects, as well as Glacier Fork Hydroelectric Project and other hydroelectric projects along the Railbelt. Most of the funds were allocated to the Susitna and Chakachamna Projects. There are a variety of alternatives on the Susitna River as documented in the HDR Report (2009). The Susitna Project chosen for this comparison is the Low Watana Non-expandable alternative. It was chosen because it offers a combination of greater winter storage capacity while still maintaining a low overall cost and low cost of power generated.

Permitting and licensing of a large hydroelectric project is regulated by the Federal Energy Regulatory Commission (FERC) and is a lengthy, complex and costly process. For this reason, the two projects must be evaluated at an early stage to determine if either has a fault that would prevent it from being licensed and constructed. As substantial research has already been done on each project, this document summarizes existing information on the projects, and uses this information for evaluation and comparison. Additional detailed information is available in the referenced documents. By using existing information to choose a primary project, resources can be concentrated on its development, with the goal of satisfying future railbelt energy demand and compliance with the legislative intent that the State receives 50 percent of its electric generation from renewable and alternative energy sources by 2025.

The ultimate goal of developing a project is to provide a cost-effective and long-term energy source to the railbelt region. Therefore, the cost, potential environmental impact, engineering issues and energy production potential of both projects were evaluated. This evaluation highlights key elements of each project that affect the cost of resulting energy, timeliness of energy contribution, and long term environmental and the projects' socioeconomic operational effects.

The results of this comparison show that the Susitna Project should be the Alaska's primary hydroelectric project; the Chakachamna Project should be considered as an alternative. Although the design, permitting and construction of the Susitna Project would cost approximately 50 percent more than it would for the Chakachamna Project the Susitna Project would produce more than twice the annual amount of energy as the Chakachamna Project. In addition, risk of cost overruns with the Chakachamna Project would be much greater than with the Susitna Project because of the extensive underground work required and its location in steep terrain.

The environmental impact of the Chakachamna Project would also be greater because it would require a cross-basin water transfer in a river system with salmon migration. Significant salmon runs travel to and through Lake Chakachamna. To allow enough environmental flow to protect fisheries, energy from the Project would have to be substantially reduced.

Additional conclusions that can be drawn from the comparison of the two projects include:

- As indicated above, in terms of energy production, the Susitna Project would produce more than two times the amount of the Chakachamna Project. The Susitna Project would have the added advantage of sufficient storage for significant energy production in the winter.
- The licensing, permitting and construction process for the Chakachamna Project would take roughly 3.5 years longer than for the Susitna Project because of the complex environmental studies required for the cross basin transfer and the time for the tunnel construction.
- The State would need to contribute substantial equity and be the licensee for either project. The ability to finance the projects is equal in either case.
- There are relatively less long term operational uncertainties for the Susitna Project.
- Both projects have some seismic risk; however the dams and powerhouses could be designed to withstand major seismic events as long as a fault does not pass through the structure. The Chakachamna Project has a relatively greater risk of damage to the power tunnel or fish passageway during a seismic event or volcanic eruption.
- The Susitna Project would be a larger construction project and have greater impacts on electrical rates than the Chakachamna Project along the railbelt and Statewide, in the form of lower rates in the long term.

- The Susitna Project would allow the State to achieve the State Energy policy goal of 50 percent renewable by 2025. The Chakachamna Project would not accomplish this goal by itself.

Overall, the Susitna Project would have a relatively lower cost of energy, fewer likely environmental effects, could start sooner, a reduced licensing/permitting schedule, less construction and long term operational risk, and greater positive impacts on the Alaskan economy than the Chakachamna Project.

A year of field studies at Lake Chakachamna would not be sufficient to determine an definitive environmental flow, would not predict project energy outcomes, or substantially change the economic factors that make the Susitna Project more desirable. Thus, Chakachamna Project field work should not proceed in 2011. Instead it may be prudent to perform some additional studies to confirm conceptual size optimization and cost.

Much of the information in this document came from reports prepared by HDR (HDR 2010), R&M Consultants/Hatch Associates Consultants (R&M Consultants/Hatch Associates Consultants 2010), and Seattle-Northwest Securities Corporation (SNW 2010). In addition, R&M Consultants/Hatch Associates provided Operational Uncertainty evaluation in Chapter 9. The referenced documents should be read for the full assumptions. Referenced documents and other important documents regarding these projects are available on the Alaska Energy Authority's Railbelt Large Hydro webpage.

Chapter 1

Project Descriptions

Each of the potential projects is described in the following section.

1.1 Susitna River Hydroelectric Project (Low Watana Non-expandable Alternative)

A two dam scheme was developed for the Susitna River Hydroelectric Project initially by the Corps of Engineers in the late 1970's for which a feasibility study was completed by Acres American Inc. for the Alaska Power Authority (APA) in 1982 (Acres 1982) and a license application was filed with FERC. An amended license was prepared in 1985 (Harza Ebasco 1985) and the project was cancelled in early 1986. Extensive site work including surveying, deep rock drilling as well as soil drilling and sampling was conducted at the Watana site. In addition environmental studies including fish and wildlife studies were conducted throughout the basin and included instream flow studies in the side channel sloughs downstream of Portage Creek.

In the two dam scheme developed in the Acres feasibility study (Acres 1982) the upper dam was at Watana (Figure 1-1) and was to be an 885 foot high earthfill embankment with a 1040 MW underground powerhouse. It was to be constructed first. The amended license (Harza Ebasco 1985) proposed to develop the project in three stages instead of two with an expandable 700 foot high embankment at Watana as the first phase with an installed capacity of less than 500 MW.

A number of hydroelectric generation alternatives were studied recently on the Susitna River ([HDR 2009](#)), of which the Low Watana Non-Expandable Alternative is the selected Susitna Project discussed in this document. The Low Watana Alternative, a 700 foot high dam with a 600 MW powerhouse was chosen because the best combination of winter storage, less environmental impact and low overall cost in addition to meeting the 50 percent renewable goal by 2025. The expandable version of a dam at this location was not chosen because it is more expensive initially relative to power output and the ultimate raised dam would have more environmental impacts related to terrestrial habitat as well as other technical challenges. The location of the Susitna Project as chosen for this review is the same location as the Watana dam in the two dam scheme as proposed in the 1980's (Acres 1982, Harza Ebasco 1985).

The Susitna Project would be located approximately half-way between Anchorage and Fairbanks. It would create a dam on the Susitna River at river mile 184 above the mouth of the Susitna River. The dam would be located within a steep sided river valley approximately 15 miles upstream of Devil's Canyon. The 700 foot high dam would have a 557 foot difference between tail water and maximum pond elevation, with a maximum pond level of 2014 feet. The reservoir would be 39 miles long and a maximum of 2 miles wide. Installed capacity would be 600 MW with the average annual generation determined to be 2600 GWhrs (HDR 2009). A final decision has not been made on the type of dam or the type of powerhouse (underground or surface) that would be used. The location of the Project is shown in Figure 1-1.

1.2 Chakachamna Hydroelectric Project

The Chakachamna Project was studied in detail in the 1980's as reported in the Bechtel report (Bechtel 1983). The project developed in that report consisted of an intake under the lake, and a 12 mile tunnel to an underground powerhouse on the McArthur River. At that location, the best alternative had a small regulating dam on the Chakachatna River and was estimated to produce 1,300 GWhrs of electricity annually although the report indicated that the maximum power could be generated by eliminating environmental flows and producing 1664 GWhrs of electricity annually with an installed capacity of 400MW. This latter alternative was identified to have adverse impacts on the fishery resources which use the Chakachatna River. Chapter 4 of this document; Preliminary Energy Estimate, further addresses the energy potential of the Chakachamna Project in light of environmental flows in the Chakachatna River.

The 1983 report (Bechtel 1983) also included an extensive environmental study which included environmental hydrology, aquatic biology, terrestrial vegetation and wildlife as well as human resources.

The Chakachamna Hydroelectric Project (Chakachamna Project) currently has a Preliminary Application before FERC (FERC No. 12660). In its Pre-Application Document (PAD) filed with FERC, the applicant, TDX Power described the Project to have 300 MW installed capacity and generate 1300 GWhrs hours of annual energy (TDX Power 2009).

The Chakachamna Project is located approximately 85 miles west of Anchorage at the south base of Mt. Spurr. Chakachamna Lake drains into the Chakachatna River, which flows downstream through a complicated system, ultimately flowing into Cook Inlet. That flow is partially joined to the McArthur River flow by way of the Noaukta Slough. The Chakachamna Project is essentially the same as the original scheme in the Bechtel study and involves diverting water from Chakachamna Lake through an 11 mile tunnel to an underground power plant near the McArthur River. The power plant would discharge its tailrace flow to the McArthur River and the flow would not rejoin the Chakachatna River until a point much further downstream, reducing flow in a portion of the Chakachatna River, and the Noaukta Slough and Middle River as well. The location of the Project is shown in Figure 1-1. The Project and vicinity are shown in Figure 1-2. The current scheme does not have a dam on the Chakachatna River as it exits the lake.

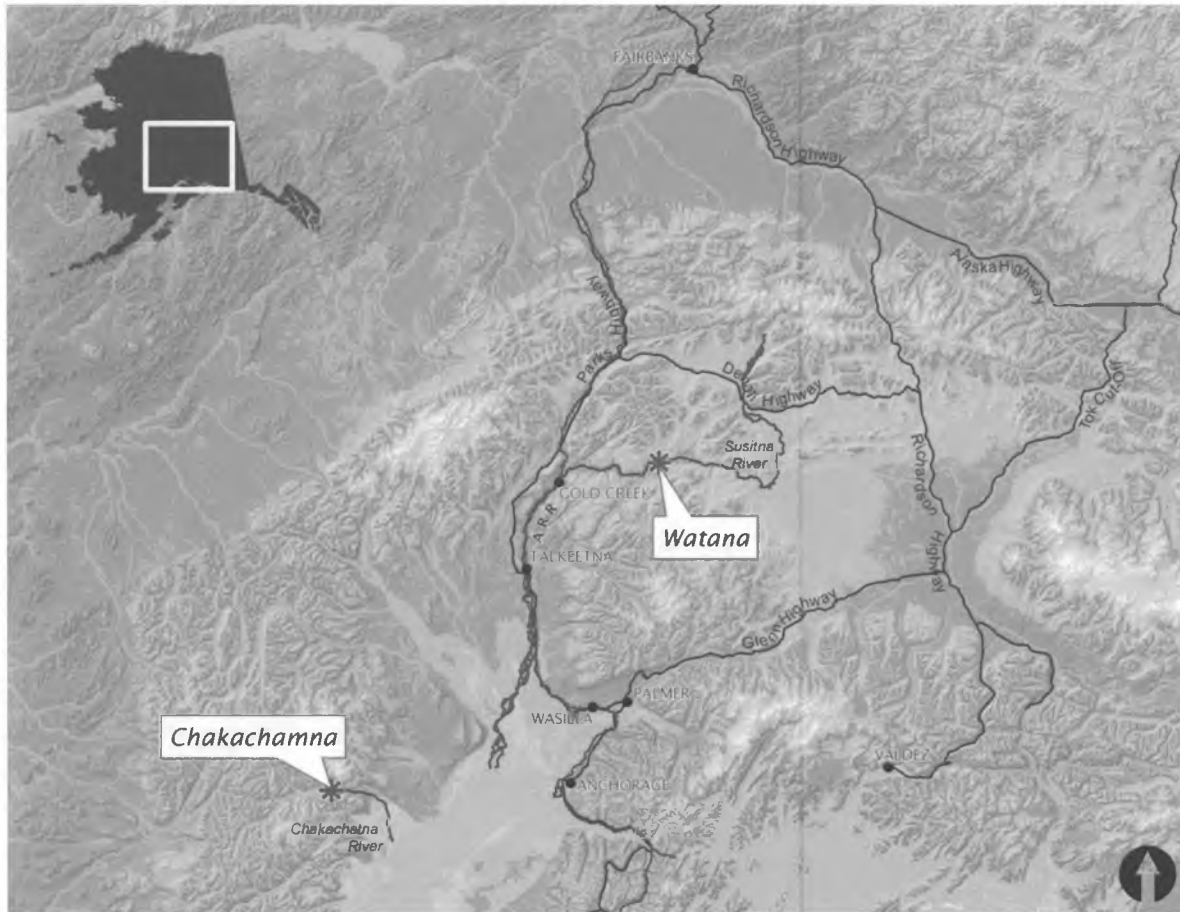


Figure 1-1 Locations of the Susitna Project (Low Watana Alternative) and the Chakachamna Project

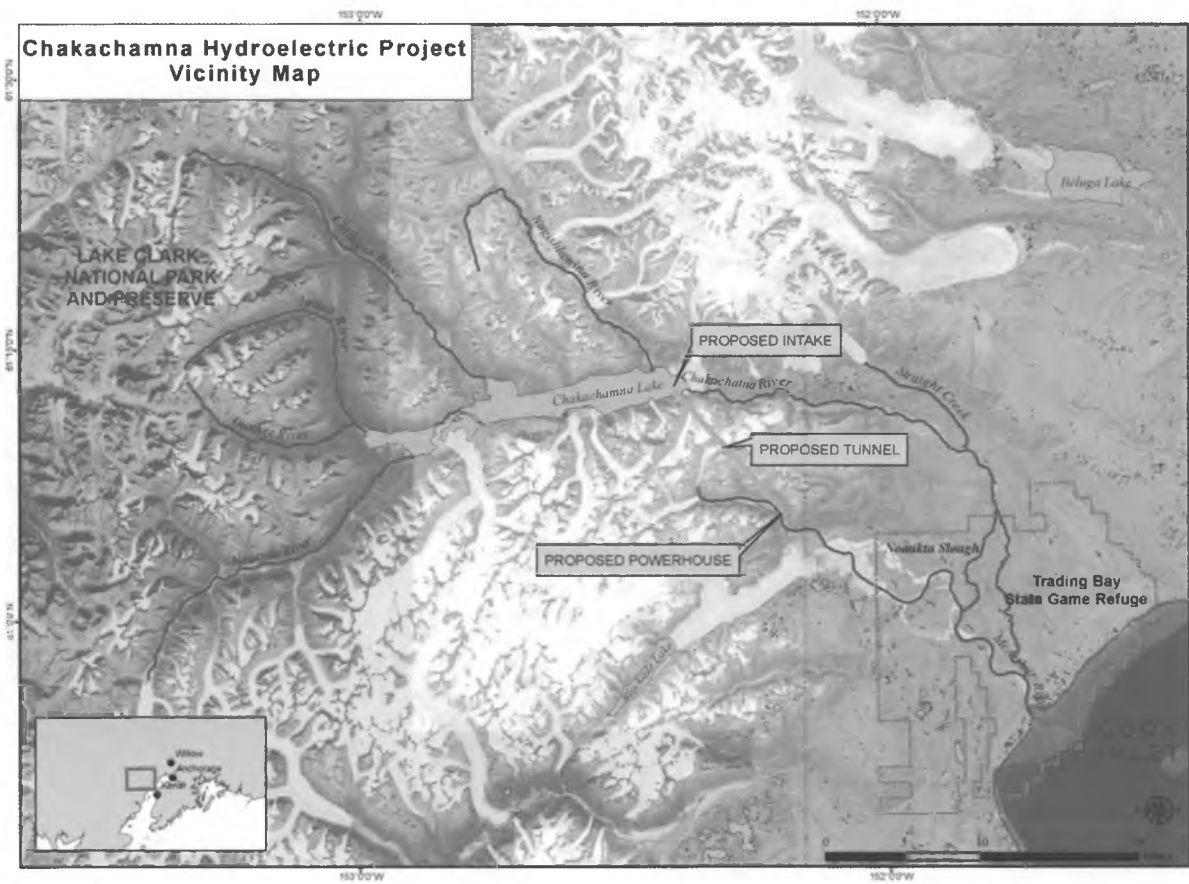


Figure 1-2 Vicinity of the Chakachamna Project

Chapter 2

Engineering Issues

Engineering issues associated with each potential project are discussed in the following section.

2.1 Access

2.1.1 Susitna Project

The Susitna Project could be accessed both from the Denali Highway by a new road and from Gold Creek (existing railroad bridge over the Susitna River) by a new rail line. Access via two modes of transportation provides the Project with advantages; the most significant of which is that the road could be built quickly, allowing early on site construction work. The rail link would allow materials from outside the State to be transported directly to the site by rail without having to off load to trucks.

2.1.2 Chakachamna Project

The Chakachamna site requires access from tidewater to the lake, the tunnel adits, and the McArthur River powerhouse location. Construction of a large dock to handle heavy equipment at Tyonek would be necessary. Access routes needed for construction and operation would be challenging. The construction access road could not cross the Trading Bay Game Refuge, and would therefore require crossing the braided Chakachatna River delta and wetland, as well as traversing high on steep mountain slopes to access the area near the lake

2.1.3 Access Comparison

Both projects would require roads and/or railroad to be constructed to handle very large and heavy equipment. Constructing access into both projects is likely to require two years. The advantages of access to the Susitna Project are that a major bridge is not required and that the routes cross less steep terrain compared to the Chakachamna Project. The bridge (or two) over the Chakachatna River will be large, expensive structure(s) with capacity to handle the heavy equipment. It is questionable whether a road built to handle heavy equipment could be constructed to the fish passageway location. If a road could not be constructed to handle a tunnel boring machine, drill and blast construction of the fish passageway would be required.

2.2 Transmission

2.2.1 Susitna Project

The Susitna Project would connect to the north-south intertie near Gold Creek. The cost of that transmission from the Susitna power plant to the intertie is included in the Susitna Project cost

estimate. A conceptual study of the transmission needs in the railbelt if the Susitna Project was constructed was completed by EPS (EPS 2009). Upgrades to the existing intertie and substations would be required to transmit energy to Anchorage and Fairbanks.

2.2.2 Chakachamna Project

The Chakachamna Project transmission costs were estimated in today's dollars based on the original 1980's scheme. The cost of the transmission from the power plant to the Beluga Power plant was included in the cost estimate. It is believed a triple circuit would be required for the segment of the powerplant to Beluga, as well as additional changes in the railbelt transmission system. If the Chakachamna Project was constructed, transmission upgrades from Beluga plant to the intertie and an upgrade of the intertie upgraded would likely be necessary.

2.2.3 Transmission Comparison

Transmission line construction beyond the two projects will be needed. Because the Susitna Project will be located centrally between Anchorage and Fairbanks, it will require less total length of new line construction, but because of the larger power output will require more actual circuits. Chakachamna Project will likely require some new line construction from Beluga to Anchorage and changes if energy is to be transmitted north to Fairbanks. Overall there is not a significant difference between the two projects due to transmission needs.

2.3 Geologic Hazards

2.3.1 Susitna Project

The design earthquake for the Susitna Project would likely be based on consideration of a Denali fault event somewhere in the range of magnitude 8.0, a local crustal earthquake and a subduction zone earthquake with a magnitude of roughly 8.5. The original Project design considered all of these earthquakes in the design. Excellent recent data exist on the Magnitude 7.9, 2002 Denali fault earthquake. A review of the earthquake design requirements for a Susitna Project was made by R&M Consultants (R&M 2009).

Subsurface conditions at the Susitna Project site are well known due to considerable rock drilling in the 1980's at the site. At the time, it was considered feasible to construct both diversion tunnels, power tunnels and an underground powerhouse.

There have been recent earthfill dams designed for large earthquakes, the most significant being the Seven Oaks Dam in Orange County, California, which is designed for a magnitude 8 earthquake from a distance of 1.2 miles away.

2.3.2 Chakachamna Project

The design earthquake for the Chakachamna Project would likely be from the Castle Mountain fault, which is approximately 6 miles from the power plant location. Proximity to the fault would likely mean that smaller connecting faults would be encountered during tunneling, which

could cause delays and increased cost during construction. Subsurface geologic conditions along the tunnel alignment are not known. The frequency of any significant faulting and associated zones of fractured rock are not known, and could affect tunnel construction.

The Chakachamna Project also has other geologic hazards due to its proximity to Mount Spurr and Barrier Glacier. The most recent eruption at Mount Spurr was in 1992. If the volcano were to erupt again, ash fall and mud flows have the potential to block or partially block the powertunnel intake, fish passageway, or natural outflow of the lake. Facilities would need to be located or designed to minimize risk from an eruption. Also, at Lake Chakachamna, Barrier Glacier, which partially dams the lake, is a geologic risk. The glacier does not appear to be currently moving, is covered with debris, and has an ice core. A partial release of the lake occurred in 1971 when the outlet was eroded. The lake level dropped 10 to 15 feet. Facilities would need to be designed to accommodate a change in the glacier, which could cause the lake level to go up or down and substantially affect Project energy production and fish passage.

2.3.3 Geologic Hazards Comparison

Overall geologic hazards are somewhat greater at the Chakachamna site due to the close proximity of the castle Mountain fault and Mount Spurr.

2.4 Estimates of Probable Project Development Costs

A comparison of cost estimates for development of both project are provided in the following Section.

2.4.1 Susitna Project

2.4.1.1 *Cost Estimate History*

In 1982 to 1983, a detailed cost estimate to develop the complete Watana/Devil Canyon project was prepared. This estimate was revised in 1985 to 1986, and again in March 2009. The latest estimate, prepared in November, 2009, is for a Low Watana Non-Expandable alternative. The estimate for this project in 2008 dollars is \$4.5 billion as detailed in Table 2-1 below.

Table 2-1 Susitna, Low Watana Project Cost Summary

| FERC Line # | Line Item Name | Low Watana (2008 Dollars Millions) |
|-------------|---|--|
| 71A | Engineering, Environment, and Regulatory (7%) | \$ 236 |
| 330 | Land and Land Rights | \$ 121 |
| 331 | Power Plant Structure Improvements | \$ 115 |
| 332.1-4 | Reservoir, Dams and Tunnels | \$ 1,538 |
| 332.5-9 | Waterways | \$ 590 |

Table 2-1 Susitna, Low Watana Project Cost Summary

| FERC Line # | Line Item Name | Low Watana (2008 Dollars Millions) |
|---|--------------------------------------|--|
| 333 | Waterwheels, Turbines and Generators | \$ 297 |
| 334 | Accessory Electrical Equipment | \$ 41 |
| 335 | Misc Power Plant Equipment | \$ 21 |
| 336 | Roads, Rails and Air Facilities | \$ 232 |
| 350-390 | Transmission Features | \$ 224 |
| 399 | Other Tangible Property | \$ 16 |
| 63 | Main Construction Camp | \$ 180 |
| 71B | Construction Management, 4% | \$ 135 |
| Total Subtotal | | \$ 3,746 |
| Total Contingency | | \$ 749 |
| Total (Millions of Dollars, rounded) | | \$ 4,500 |

2.4.2 Chakachamna Project

2.4.2.1 *Cost Estimate History*

In 1982, a detailed cost estimate was prepared for developing the Chakachamna Project. In 2008 and 2009, re-evaluations of this original estimate were made to take into account potential new alternative arrangements. In 2010, the detailed 1982 was updated with unit prices modified to be consistent with the estimated costs for the Susitna Project. The estimate for the Chakachamna Project in 2008 dollars is \$2.9 billion, as detailed in Table 2-2 below.

Table 2-2 Chakachamna Project Cost Summary Table

| FERC Line # | Line Item Name | Chakachamna (2008 Dollars Millions) |
|-------------|---|---|
| 71A | Engineering, Environment, and Regulatory (7%) | \$ 151 |
| 330 | Land and Land Rights | \$ 75 |
| 331 | Power Plant Structure Improvements | \$ 105 |
| 332.1-4 | Reservoir, Dams and Tunnels | \$ 1,147 |
| 332.5-9 | Waterways | \$ 123 |
| 333 | Waterwheels, Turbines and Generators | \$ 181 |
| 334 | Accessory Electrical Equipment | \$ 20 |

Table 2-2 Chakachamna Project Cost Summary Table

| FERC Line # | Line Item Name | Chakachamna (2008 Dollars Millions) |
|---|---------------------------------|---|
| 335 | Misc Power Plant Equipment | \$ 15 |
| 336 | Roads, Rails and Air Facilities | \$ 172 |
| 350-390 | Transmission Features | \$ 232 |
| 399 | Other Tangible Property | \$ 0 |
| 63 | Main Construction Camp | \$ 90 |
| 71B | Construction Management, 4% | \$ 86 |
| Total Subtotal | | \$ 2,400 |
| Total Contingency | | \$ 480 |
| Total (Millions of Dollars, rounded) | | \$ 2,880 |

2.4.3 Cost Comparison

Although capital cost is greater for the Susitna Project, the evaluation in Chapter 9 will show that the cost to repay the financing of the project relative to energy production will be lower for the Susitna Project. Since the financing cost is a major portion of the energy cost, and since operation and maintenance and utility cost will be roughly equal regardless of the power source, overall, the Susitna Project cost per unit of energy will be relatively lower.

Detailed Susitna costs can be found at Susitna Hydroelectric Project Alternatives Design Report 2009 located on the AEA Railbelt Large Hydro webpage.

Detailed Chakachamna costs can be found at Susitna and Chakachamna – Preliminary Decision Document 2010 located on the AEA Railbelt Large Hydro webpage.

Chapter 3

Environmental Issues

Development of a hydroelectric project would face a variety of issues over the design lifetime. The design lifetime for a modern hydroelectric facility is anticipated to be greater than 100 years. The following discussion is not all inclusive but highlights the likely major areas of concern regarding both projects. Botanical and cultural resource issues are not discussed in this document since they have not been fully explored and tend to have less overall impact on whether a project is licensed and constructed.

3.1 Fisheries

3.1.1 Susitna Project

Fish resources have the highest potential to be impacted by the project. Most of the potential impacts would occur in the reservoir and the middle Susitna River downstream of the reservoir. There would be impacts due to changes in water quality, thermal regime, suspended sediment load, reservoir draw-down fluctuations, impoundment zone inundation, flow regime, and fish habitat. Not all impacts to fish populations would be negative. For example, an increase in winter water temperatures could lead to the enhancement of overwintering habitat and thus greater fish survival; however, the cooler spring water temperatures could slow fish growth.

The majority of the salmon production occurs in tributaries outside the area of anticipated effects. Devil Canyon acts as an effective passage barrier to upstream migration of salmon. Radio telemetry studies of Susitna drainage conducted by ADF&G (Yanusz et. al., 2007) observed no sockeye salmon moving above Portage Creek near the entrance to Devils Canyon. A few (less than 100) adult Chinook salmon have been observed above the Devil Canyon dam site (FERC Amend Nov 1985). Electrofishing surveys conducted by ADF&G in 2003 (Johnson, 2010) documented Chinook salmon rearing in Kosina Creek and the Oshetna River, both located above the Watana Dam site.

In the Watana impoundment zone, approximately 40 river miles of the Susitna River would be inundated and transformed into reservoir habitat. An additional 15 miles of four named tributary streams (including Kosina Creek) and numerous smaller unnamed tributaries and eight small lakes would be inundated. There are nine species of fish occurring in the proposed impoundment zones: Arctic grayling would lose approximately nine miles of spawning habitat and would not likely populate the impoundment zone (ENTRIX 1985). River habitat would be transformed into lake/reservoir habitat that may be occupied by a different array of fish species. Lake drawn down may limit spawning of species dependent upon these areas for reproduction. Table 3-1 shows the possible fisheries impact of the Susitna Project.

3.1.2 Chakachamna Project

Chakachamna Project has fish issues of concern to resource agencies. Since this document is a summary, only the three that most affect project economics and licensing ability will be discussed.

3.1.2.1 Lake Level Fluctuations

Chakachamna Lake and the surrounding tributaries support abundant salmon and freshwater fisheries resources. Five significant tributaries and numerous minor drainages empty from the surrounding mountains into Kenibuna and Chakachamna Lakes. Of these, the Chilligan and Igitna Rivers provide significant sockeye salmon spawning habitat. The lake tributary streams also provide habitat for Dolly Varden.

Studies in 1982 showed significant numbers of adult sockeye salmon milling along the north shore of Chakachamna Lake and spawning was suspected but not confirmed. Chakachamna Lake also provides habitat for resident lake trout, Dolly Varden, and round whitefish. Life histories of lake trout, Dolly Varden, and whitefish have not been investigated in Chakachamna Lake.

Under the proposed operational structure (base case), the lake level would fluctuate approximately 60 feet from the normal maximum pool elevation of 1,142 feet to the normal minimum pool elevation of 1,082 feet. If sockeye salmon spawn along lake shoals, it is likely that their spawning timing would coincide with the maximum pool elevation. The resulting eggs might subsequently be exposed and killed when the lake level drops to the minimum pool elevations in March or April. Similarly, lake trout spawning areas may be affected by the winter lake drop in lake level.

An additional impact relating to lake level drop is the potential for down-cutting of the channel between Kenibuna and Chakachamna Lakes and the fluvial fans of lake tributaries such as the Chilligan River. If down cutting occurs and as a result effects the level of Kenibuna lake (within Lake Clark National Park) then project can not be licensed by FERC. Down cutting may also effect fish passage into the tributaries particularly during periods of low lake level.

3.1.2.2 Reduced Flows into the Chakachatna River

The proposed operation of the Chakachamna Hydroelectric Project involves diverting a portion of the natural flow out of Lake Chakachamna to the powerhouse located in the McArthur River valley. In the base case, the average flow in the Chakachatna River will be reduced by approximately 50 to 80 percent from June through November.

The Chakachatna River provides a migration corridor, spawning habitat, and rearing habitat for salmon. The lower Chakachatna River splits into three branches: Middle River, which flows southeast to Cook Inlet, the Chakachatna River, which flows south and joins the McArthur River near its mouth, and a third braided section called Noaukta Slough which joins the middle part of the McArthur River. Hydrologic ties to the Chakachatna and McArthur rivers appear important in supporting the lower elevation wetlands north of Noaukta Slough and in the Trading Bay State

Game Refuge. Reduced river flow may cause floodplains, wetlands, and riparian habitats to dry. Drying of these wetland would effect fish populations in the Trading Bay State Game Refuge.

3.1.2.3 False Attraction

Transfer of water from Chakachamna Lake to the upper McArthur River may cause false attraction of adult salmon to the powerhouse tailrace during their spawning migration. The tailrace is proposed to be located approximately 15 miles up the McArthur River from the Noaukta Slough (Chakachatna River) confluence. The mixture of Chakachamna Lake water from the tailrace may confuse salmon migration and could prevent or delay the movement of salmon to spawning areas in Chakachamna Lake and its tributaries.

Critical months for salmon passage into and out of the lake occur between May and September, when a majority of the lake’s discharge will be diverted to the upper McArthur River. Adult salmon return to their natal spawning areas by using olfactory cues (chemical “smells”). For Lake Chakachamna sockeye salmon, these cues are imprinted at the smolt stage when juvenile salmon migrate from spawning and rearing areas in the lake out the Chakachatna River to salt water. Because the majority of the Lake Chakachamna water is being discharged from the powerhouse into the McArthur River a substantial number of the adult salmon may be falsely attracted to the powerhouse in the McArthur River.

3.1 Wildlife Impacts

3.1.1 Susitna Project

There are currently no known listed endangered species in the project area. The most significant effect on wildlife would be on the species that live in the spruce forested valley walls. Impacts on each species would be different based on species abundance and use of the habitat; however, major threats common to most species have been identified. Downstream of the Watana reservoir there may be an increase in preferred moose browse, thus increasing the moose population (Harza Ebasco 1985b). The Susitna Project development would impact mink and otter in the middle river by increasing the winter turbidities which would reduce the value of the mainstem as feeding habitat. Open water in the winter would have a positive effect on mink and otter (Harza Ebasco 1985b). Other impacts to animals downstream of the reservoir would be negligible (Harza Ebasco 1985b).

A summary of the potential environmental impacts of the Susitna Project is provided in Table 3.1 below.

| Table 3-1 Potential Environmental Impacts of the Low Watana Hydroelectric Project on the Susitna River | |
|---|---|
| Impacts | Issues |
| Reservoir - Impacts | |
| River Habitat & Fisheries Impacts | Approximately 40 river miles of the main stem of the Susitna River and 15 miles of tributary streams will be converted from riverine to reservoir environment. Arctic grayling are the most abundant fish species in the impound zone and will have the greatest |

| | |
|-----------------------------|---|
| | <p>impacts with the loss of approximately nine miles of spawning habitat.</p> <p>A significant portion of lower Kosina Creek used by rearing Chinook salmon will be lost to inundation.</p> |
| Fish passage | Fish passage may be blocked for a small number of Chinook salmon that travel above the site. |
| Drawdown impacts | The annual drawdown and refilling of the reservoir will affect an estimated 10 miles of river that will alternate between river and reservoir habitat. |
| Terrestrial Impacts | An estimated 20,000 acres of habitat will be flooded. Reservoir may alter traditional migration routes. |
| Downstream Impacts | |
| Flow change impacts to fish | <p>Lower summer flows may reduce access to side channel fish habitats and reduce the amount of rearing habitat for salmonids.</p> <p>Increased winter time flows may provide more rearing habitat benefiting overwinter survival.</p> <p>Dampening of flows may alter streambed movement and affect side channel habitats.</p> |
| Temperature impacts to fish | <p>Lower than natural water temperatures in spring/early summer may cause a delay in the onset of favorable summer rearing conditions for salmonids.</p> <p>Warmer than normal fall water temperatures may extend the summer rearing period later into fall.</p> <p>Overwinter survival for salmonids may be benefited by warmer water temperatures and a delay in ice formation.</p> <p>Higher main stem discharges in winter may maintain higher rates of warm groundwater upwelling in side sloughs affecting incubation of salmon eggs.</p> |

3.1.2 Chakachamna Project

Wildlife impacts from the Chakachamna Project have not been studied in detail. Reduction of salmon traveling to Lake Chakachamna tributaries would reduce the food source for bears and eagle in Lake Clark National Park. Drying of Trading Bay State Game Refuge would potentially alter wildlife habitat effecting birds and mammals in the refuge.

Increased flow down the McArthur River may cause some increased flooding and wetlands south of Trading Bay State Game Refuge. The net effect of the changes in food source and habitat over a large area (Lake Clark NP, Trading Bay, and McArthur River) has not been studied.

3.2 Environmental Flow

3.2.1 Susitna Project

Environmental flow requirements are met by water being used for energy production passing through the generating units and then being released into the natural stream channel. The effect of environmental flows is to change the timing of the energy production but not necessarily the average annual amount of generation.

A preferred environmental flow regime in the 1980's was developed to have high late summer flows for maintenance of rearing habitat for Chinook salmon juveniles. However, peak summer flows would be reduced and winter flows (within limits) would be increased to generate more power. A comparison of the 1980 selected environmental flow and of the existing Susitna River flows are shown in Figure 3-1 below.

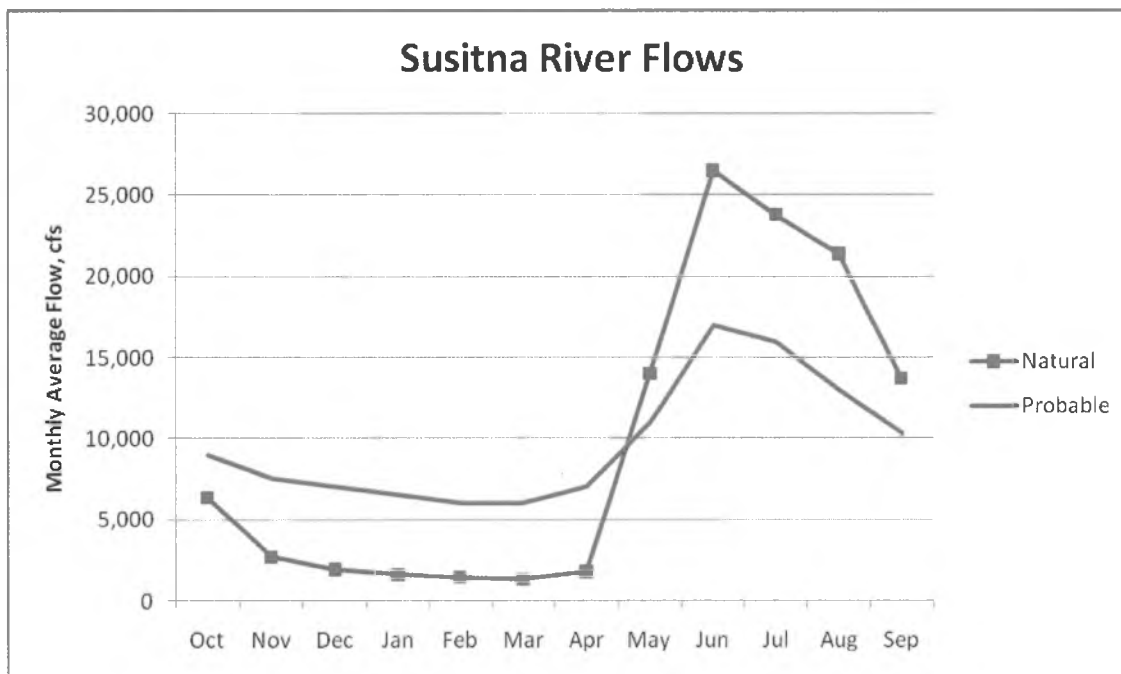


Figure 3-1. Susitna River monthly mean flow at Gold Creek.

3.2.2 Chakachamna Project

The preliminary environmental flow recommendations suggested for the Chakachamna River in the PAD are based on the Montana Method (Tennant 1972) as presented in the Bechtel report on the project in 1983. The Bechtel report assumed environmental flows during the months of April to September of 1094 cfs or lake inflow, whichever was less. During the months of October through March, the minimum environmental flow was assumed to be 365 cfs or lake inflow, whichever was less. These amounts of discharge are rated as “fair to degrading” flows in the Montana Method. This method was developed for and has primarily been used on rivers in the lower 48 states, which show little similarity to the glacially driven and highly seasonal flows of the Chakachamna River. Winter time flows using this method drop below historic average monthly flows, potentially resulting in freeze-out of spawning beds located outside the main river or in side channel areas. Summertime flows provided may not be sufficient to attract adult spawners confused by the discharges into the McArthur drainage or to provide for upstream passage through the canyon area located below Chakachamna Lake. Additionally, this environmental flow method does not take into consideration the groundwater hydrology feeding wetlands of the Trading Bay Game Refuge.

While it is outside of the scope of this document to complete the environmental flow analysis needed to adequately address all of the environmental issues in the Chakachamna watershed, Table 3-2 below provides an estimate of environmental flows that may be more likely to be viewed favorably by permitting agencies. It should be noted, however, that these flows have not been reviewed or endorsed by any permitting agencies. Determination of environmental flows for the project will ultimately be the result of a detailed analysis of instream flow data by conducted by a multiagency review team over a multi year time period.

Table 3-2 Estimate of Probable Environmental Flows

| Month | Historic Natural Flow (cfs) | Base Case Flow (cfs) | Minimum Probable Flow (cfs) | Notes |
|-----------|-----------------------------|----------------------|-----------------------------|---|
| October | 2468 | 402 | 1,250 | 50% of mean monthly flow: provides water to Noaukta Slough to attract adult coho spawners and protect historic side channel spawning habitats. |
| November | 1206 | 365 | 600 | 50% of mean monthly flow: provides water to Noaukta Slough to attract adult coho spawners and protect historic side channel spawning habitats. |
| December | 813 | 363 | 600 | 75% of mean monthly flow: protects incubation in Chakachatna/Noaukta Slough spawning beds. |
| January | 613 | 365 | 500 | 100% of mean monthly flow: protects incubation in Chakachatna/Noaukta Slough spawning beds. |
| February | 505 | 357 | 500 | 100% of mean monthly flow: protects incubation in Chakachatna/Noaukta Slough spawning beds. |
| March | 445 | 358 | 500 | 100% of mean monthly flow to protect incubation in Chakachatna/Noaukta Slough spawning beds. |
| April | 441 | 582 | 500 | 100% of mean monthly flow: protects incubation in Chakachatna/Noaukta Slough spawning beds. |
| May | 1042 | 1,094 | 750 | 75% of mean monthly flow: protects juvenile rearing in Chakachatna/Noaukta Slough areas and provides for outmigration of smolts from lake. |
| June | 5,875 | 1,094 | 2,000 | 33% of mean monthly flow: provides water for outmigration of smolts from lake and feeds groundwater to Trading Bay Refuge wetlands. |
| July | 11,944 | 1,421 | 4,000 | 33% of mean monthly flow: provides water to attract spawning adults to Chakachatna/Noaukta as opposed to McArthur, provides adequate flow for adult passage through canyon below lake outlet, and feeds groundwater to Trading Bay Refuge wetlands. |
| August | 11,996 | 5,599 | 4,000 | 33% of mean monthly flow: provides water to attract spawning adults to Chakachatna/Noaukta as opposed to McArthur, provides adequate flow for adult passage through canyon below lake outlet, and feeds groundwater to Trading Bay Refuge wetlands. |
| September | 6,042 | 2,164 | 2,000 | 33% of mean monthly flow: provides water to attract spawning adults to Chakachatna/Noaukta as opposed to McArthur, provides adequate flow for adult passage through canyon below lake outlet, and feeds groundwater to Trading Bay Refuge wetlands. |

3.2.3 Environmental Flow Analysis

To evaluate the effect of increased minimum environmental flow requirements in the Chakachatna River and/or the effect of lake level fluctuations, two alternatives to the base case were also evaluated. Environmental issues surrounding project operations generally revolve around three main issues: 1) habitat affected by flows in the bypass reach; 2) upstream and downstream fish passage; and 3) habitat affected by lake level fluctuations. The alternatives to the Base case evaluated were:

- **Alternative #1 – Base case with probable environmental flow.** Alternative 1 is the same as the base case except that:
 - Environmental flow requirements are revised as described in Table 3-2 above.
 - The lake level fluctuations are not restricted.
- **Alternative #2 – Base case with probable environmental flow & minimization of lake fluctuation.** Alternative 2 is the same as the base case except that:
 - Environmental flow requirements are revised as described in Table 3-2 above.
 - The maximum lake level fluctuation would be 15 feet below the weir outlet.

A comparison of potential environmental impacts resulting from each alternative are presented in Table 3-3.

Table 3-3 Comparison of Potential Environmental Impacts Resulting from Chakachamna Lake Hydro Alternatives

| Issue | Base Case | Alternative 1 | Alternative 2 |
|---|---|---|--|
| Lake Level Fluctuation | | | |
| Impacts to shoal spawning areas for sockeye salmon and lake trout | Significant impacts to incubating eggs due to draw down | Significant impacts | Least significant case but impacts may still occur |
| Access to inlet streams (Chilligan and Igitna) for sockeye spawners | Not likely to be impacted | Could be impacted due to drawn down | Not likely to be impacted |
| Adult salmon passage into lake | Minor to moderate, passage via natural outlet 87% of time | Significant, dependent upon using fish tunnel 91% of the time | Minor to moderate passage via natural outlet 87% of time |
| Smolt outmigration from lake | Unknown, smolts 100% dependent on fish passage tunnel | Unknown, smolts 100% dependent on fish passage tunnel | Unknown, smolts 100% dependent on fish passage tunnel |
| Chakachatna / McArthur Issues | | | |
| False attraction of Chakachamna sockeye spawners to the McArthur powerhouse | Likely to occur | Least likely case but may still occur | Least likely case but may still occur |
| Noauktna Slough and Chakachatna side channel spawning and rearing habitats | Moderate impacts possible from winter freeze-out | Lower impacts than Base Case | Lower impacts than Base Case |
| Trading Bay Wildlife Refuge | | | |
| Groundwater fed wetland habitats | Moderate impacts | Lower impacts than Base Case | Lower impacts than Base Case |

Under the Base Case and Alternative 1 the lake level would fluctuate approximately 60 feet from the normal maximum pool elevation of 1,142 feet to the normal minimum pool elevation of 1,082 feet. Spawning of adult salmon and Lake Trout may be effected and down cutting to tributaries may occur.

Lake level affects adult salmon passage into the lake in Alternative 1, where the natural outlet is not available to spawning adults 91 percent of the time. In this alternative, fish will be dependant upon using the two mile long fish passage tunnel. There is uncertainty whether fish will be willing to use the tunnel. In all cases the fish passage tunnel will be required for smolt outmigration.

In Alternative 2, the lake level is minimized to 15 feet below the outlet. While this amount of drawdown may exceed natural lake level fluctuation, it is the scenario offering the least impact to lake habitats.

For Chakachamna, limiting lake fluctuation (Alternative 2) to minimize the affect on upstream spawning will decrease the amount of runoff that can be captured, thereby decreasing the average annual generation. Figure 3-2 shows the post-project lake elevation by month for the base case and the two alternatives.

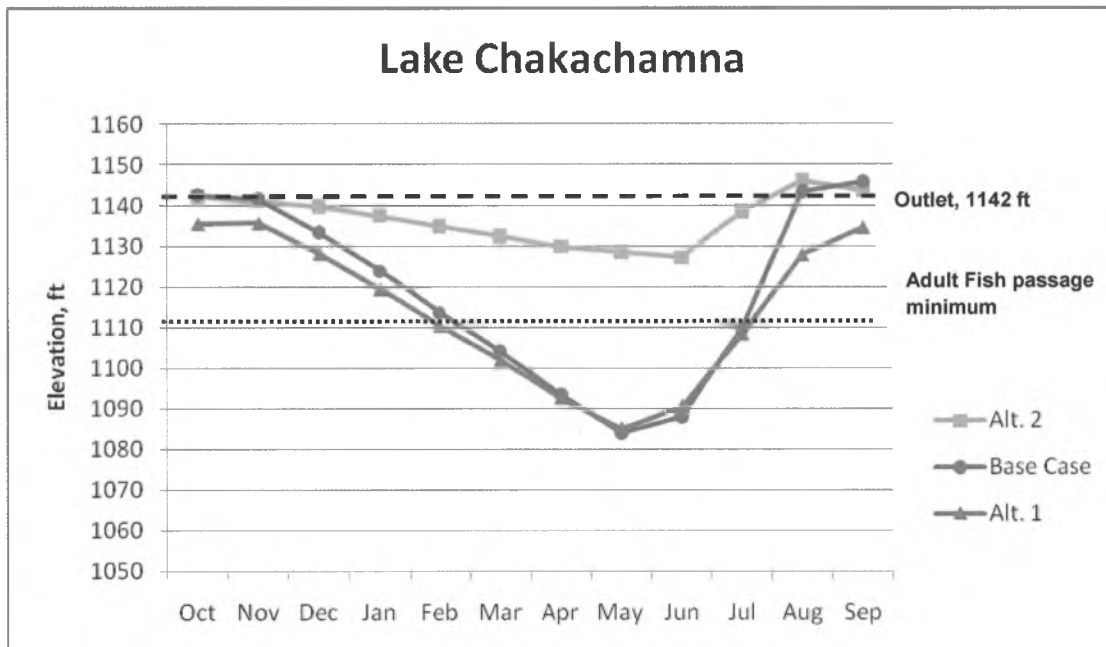


Figure 3-2 Chakachamna Lake Elevation by Month

Flows in the Chakachatna River during Project operation will be comprised of environmental flow releases and spill as shown in Figure 3-3. Since the powerhouse discharges return to the McArthur River, the net flows in the Chakachatna River are reduced in all cases.

Detailed Chakachamna environmental discussion can be found at [Susitna and Chakachamna – Preliminary Decision Document, Environmental-Energy-Cost November 12, 2010](#) located on the AEA Railbelt Large Hydro webpage.

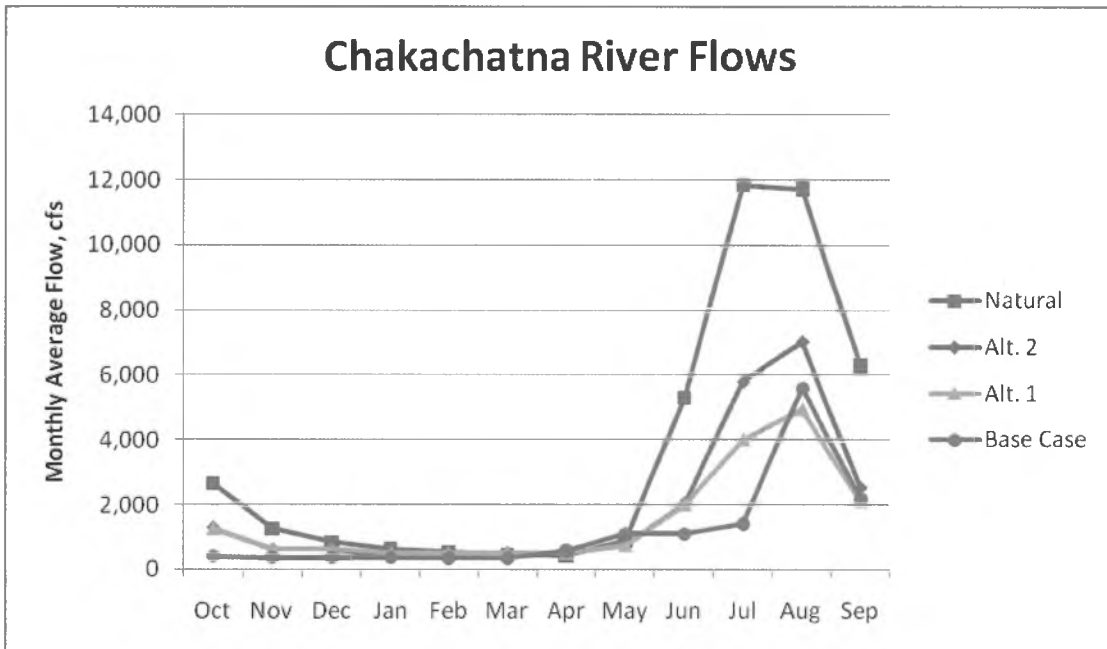


Figure 3-3 Chakachatna River Flows (Downstream of Lake) by Month

Preliminary Energy Estimate

4.1 Evaluation of Average Annual Energy and Firm Winter Capacity

The amount of energy that can be produced from hydroelectric projects is a function of the amount of available water and, in the case of storage projects, how the available water can be regulated (systematically released). In addition to the average annual energy, the firm capacity attainable during winter months is of particular importance. For hydroelectric projects, the firm capacity is almost always lower than the installed generation capacity for a project. For the purposes of this study work, firm capacity is defined as:

“The amount of power the project can generate on a continuous basis from November 1 through April 30 with 98 percent reliability.”

It should be noted that this is only one manner of regulation. The water can be regulated in a variety of different means in order to achieve other objectives, such as peaking, spinning reserve, or backup capacity. Major assumptions used to develop the estimates average annual energy and winter plant capacity are presented below.

4.1.1 Susitna Model Assumptions and Data Sources

This potential project consists of the construction of a large storage reservoir on the Susitna River at the Watana site with a 700-foot-high dam and a four-unit powerhouse with a total installed capacity of 600 MW. This “Low Watana non-expandable” alternative is described in detail in *Susitna Hydroelectric Project, Conceptual Alternative Design Report* (HDR Alaska 2009b).

4.1.2 Chakachamna Model Assumptions and Data Sources

This potential project consists of the inter basin transfer of water from a lake tap near the outlet of Chakachamna Lake through an approximately 10.8-mile-long tunnel to an underground powerhouse that would discharge to the McArthur River. The powerhouse would have a total generating capacity of 300 MW. The Base case (as proposed) and two alternatives were evaluated. Alternatives, described in Section 3.1.3, show how alternative operational constraints on the project would affect project energy. These alternatives are as follows:

- **Base Case** for analysis was the project as described in the PAD (TDX Power 2009). This project used environmental flow recommendations for the Chakachamna River based on the Montana Method (Tennant 1972).
- **Alternative #1 – Base Case with Probable Environmental Flow.** Alternative 1 is the same as the Base Case except that higher environmental flows are required.

- **Alternative #2 – Base Case with Probable Environmental Flow & Minimization of Lake Fluctuation.** Alternative 2 is the same as the Base Case except that higher environmental flows are required and lake level drop would be limited.

4.2 Results

Firm capacities and average annual energy estimates are presented in Table 4-1.

Table 4-1 Firm Capacity and Average Annual Energy Estimates

| Alternative | 98% Winter Capacity (MW) | Average Annual Energy Production (GWhrs) |
|----------------------------|--------------------------|--|
| Susitna | 245 | 2,600 |
| Chakachamna, Base Case | 170 | 1,300 |
| Chakachamna, Alternative 1 | 140 | 1,100 |
| Chakachamna, Alternative 2 | 30 | 860 |

The energy distribution by month for each of the above alternatives is shown in Figure 4-1 below.

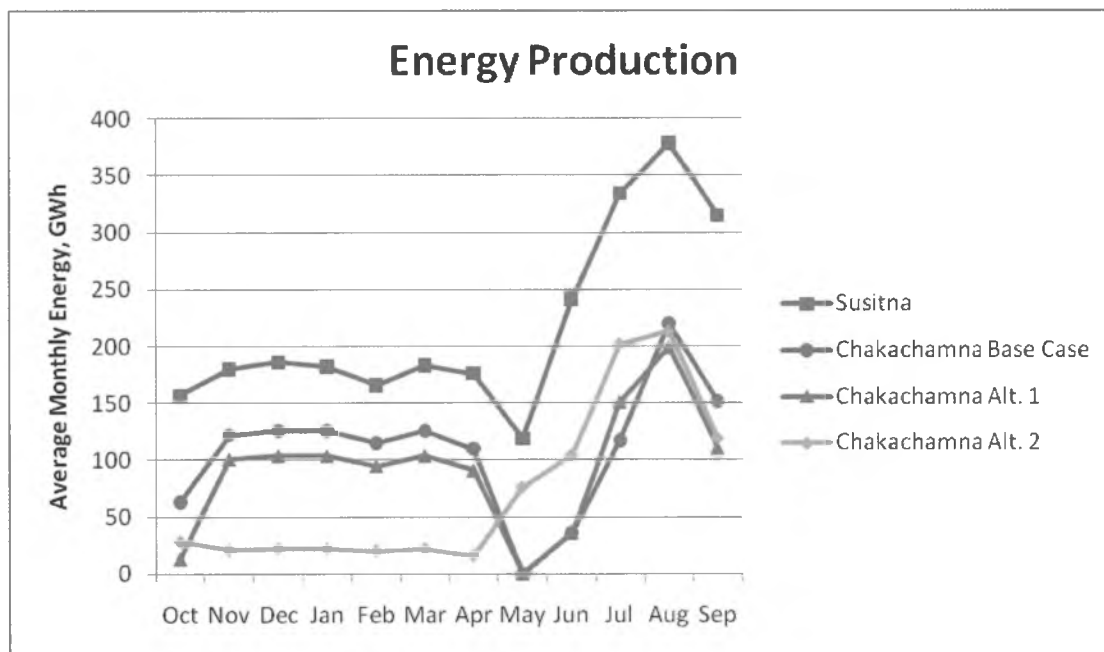


Figure 4-1 Energy Distribution by Month

As can be seen by these results, the firm winter capacity and average annual energy production estimates can vary significantly based upon the assumed environmental constraints placed upon the project. For the Chakachamna Project, increased environmental flow requirements (Alternatives 1 and 2) reduce the amount of water that is available for generation, thereby

lowering the annual energy. Reduced use of reservoir storage greatly limits the amount of energy that can be produced during the winter months (Alternative 2).

Detailed Chakachamna environmental discussion can be found at [Susitna and Chakachamna – Preliminary Decision Document, Environmental-Energy-Cost November 12, 2010](#) located on the AEA Railbelt Large Hydro webpage.

For the Susitna Project, environmental flow requirements are met by water passing through the generating units and then being released into the natural stream channel. The effect of changed environmental flows is to change the timing of the energy production but not necessarily the average annual amount of generation.

Chapter 5 **Permitting**

5.1 Overview – Regulatory Processes

While pursuant to the Federal Power Act (FPA), the Federal Energy Regulatory Commission (FERC) has exclusive authority to issue licenses for most non-federal hydropower projects, there are several federal and state agencies that are authorized under several federal statutes to submit mandatory and recommended terms and conditions to be included in a FERC-issued license.

- **FERC’s licensing process options** – Applicants may propose to use one of three options: the Integrated (ILP), Alternative (ALP), or Traditional (TLP). The default is the ILP, unless FERC approves use of either the ALP or TLP.
- **Pre-filing consultation** – extensive pre-filing meetings and exchange of information required.
- **Federal Energy Regulatory Commission – Application for License** required; Draft submitted for review & comments; Final filed.
- **Federal and State resource agencies consultation & terms & conditions** – File mandatory & recommended terms and conditions; most become License Articles and require compliance.
- **Numerous other State & Federal approvals & permits are required** – Applicants are required to provide evidence of consultation with agencies in an Application for License, and provide copies of permits and/or approvals.

Please also see R&M Consultants/Hatch Associates Consultants report (2010) for a detailed presentation of the various agencies and their authorities who would shape the content of any issued license.

5.2 Regulatory Issues – Chakachamna Project

TDX received its first Preliminary Permit on November 14, 2006. The purpose of a Preliminary Permit is to reserve priority to conduct studies for a period of three years, and if the effort results in filing an Application for License. A successive (second) permit was issued on February 25, 2010. This permit expires on January 31, 2013. FERC noted in issuing the permit that “a successive permit can warrant a greater standard of Commission oversight.” “If the permittee fails to make significant progress toward developing a license application, the permit may be subject to cancellation.”

On July 17, 2009, TDX filed its Notice of Intent to File an Application for License (NOI), Request to Use a Traditional Licensing Process (TLP), and Pre-Application Document (PAD). By letter dated July 27, 2009, FERC requested that they consider which licensing process it wishes to use and to refile its request noting that there would not be a need to refile the PAD. TDX met with FERC on August 5, 2009 to discuss the proceeding. On September 21, 2009, TDX requested to rescind its PAD. TDX stated that “this Project may be best served by an Integrated Licensing Process (ILP). TDX stated its intent to implement a field season in 2010 and to hold a study plan review and workshop in February 2010. TDX has a website for the Project and there is no evidence that work is proceeding as noted in their September 21, 2009, correspondence to the FERC. Nor has any further information been filed with the Commission. Under TDX’s current development schedule, a third FERC Permit would be necessary.

5.2.1 Licensing Schedule

Once the pre-filing process restarts the schedule could be:

- Prepare and File Final Application for License – 4.5 years
- FERC Processing and License Issuance – 2.5 years

5.3 Regulatory Issues – Susitna / Low Watana Project

At present, there is no FERC Preliminary Permit in effect. While a FERC Permit is not required, it would be prudent for an entity representing the State to secure priority to study the Project. As discussed above, the Alaska Power Authority (APA), now known as AEA prepared and filed an application for license in February 1983. That application was withdrawn and APA revised the Project schedule to realize benefits identified with a three, as opposed to two-year construction schedule in 1985. In 1986, APA abandoned pursuit of a FERC license for numerous reasons, including financial feasibility.

In 2008, AEA began an update of the project, including preparation of the Railbelt IRP to evaluate the ability of the Susitna Project, and other resources, to meet long term demand in the Railbelt Region.

5.3.1 Licensing Schedule

Table 5-1 shows a Licensing, Engineering and Construction Schedule Comparison for the two projects. For the Susitna Project, based on information available at this time, the FERC schedule could be:

- Prepare and File Final Application for License – 3.5 years
- FERC Processing and License Issuance – 2 years

5.4 Total Project Development Timeline

Table 5-1 provides a Development Schedule Comparison for the two projects. Based on information available at this time, the comparative total schedule from start of the FERC process, in the case of the Chakachamna a restart of their pre-filing process, could be:

Table 5-1 Development Schedule Comparison

| Major Task | Chakachamna | Susitna Low Watana |
|-------------------------------|-------------------|--------------------|
| FERC Pre-filing Process | 4.5 years | 3.5 years |
| FERC Processing – DC | 2.5 years | 2.0 years |
| FERC Processing - Portland | 2.0 years | 1.0 years |
| Construction through Start up | 5.5 years | 4.5 years |
| TOTALS | 14.5 YEARS | 11 YEARS |

Detailed Susitna and Chakachamna Licensing and permitting information is found at [Susitna-Low Watana & Chakachamna Projects, Large Hydro Evaluation of Two Projects, Preliminary Decision Document, Environmental & Regulatory Issues November 14, 2010](#) located on the AEA Railbelt Large Hydro webpage.

Chapter 6

Development Schedule

The following tables (Table 6-1 and Table 6-2) show the major tasks associated with hydro project development, and the estimated preliminary schedule for completion for the Chakachamna Project compared to the estimated preliminary schedule for completion for the Susitna Project. Special considerations and assumptions for each are listed below.

Table 6-1 Considerations / Assumptions

| Chakachamna Project | Susitna Project |
|--|--|
| <ul style="list-style-type: none"> ▪ TBM est. 14-16 months to order and deliver to site ▪ 4.5 year pre-filing process assumes studies underway in 2011 (one year behind schedule in TDX PAD, 2009) ▪ 2.5 years for FERC Processing and License Issuance, and 5.5 year construction schedule based on PAD (Appendix 2-1) ▪ FERC-PRO processing and some procurement must be accomplished before field work can begin ▪ Longer construction schedule due to significant underground work, with higher risk profile and greater uncertainty ▪ Project "access" to require 2 yrs to construct ▪ Chakachamna has higher risk that the schedule to Project Startup will extend beyond 14.5 years. | <ul style="list-style-type: none"> ▪ Significant, extensive and valid environmental studies performed in 1980's to be updated and used to develop FERC documents ▪ Significant geotechnical investigations performed previously ▪ FERC-PRO processing and some procurement must be accomplished before field work can begin ▪ More surface features and work carries more schedule certainty, less risk ▪ Project "access" to require 2 yrs to construct ▪ Engineering schedule based on "Low Watana Non-Expandable Development" (HDR, 2009) ▪ Susitna has lower risk that the schedule to Project Startup will extend beyond 11 years. |

Table 6-2 Licensing, Engineering, and Construction Schedule Comparison

| | Regulatory / Environmental Major Tasks | | | Engineering / Construction Major Tasks | | |
|-----------------------------------|--|--------------|----------------|--|--------------------|-----------------|
| | | Chakachamna | Susitna | | Chakachamna | Susitna |
| Pre-License Issuance | Preliminary Permit | | | | | |
| | Scoping | | | | | |
| | Draft Application | 4.5 yrs | 3.5 yrs | Feasibility | | |
| | Final Application | | | Engineering Design | | |
| | FERC Processing (DHAC) | 2.5 yrs | 2 yrs | Specifications, Drawings & Bid Documents | | |
| | License Order Issued | | | ↓ | | |
| Post-License Issuance | | | | FERC Processing (Portland Regional Office) | 2 yrs | 1 yr |
| | | | | Procurement | | |
| | License & Permits Compliance | | | Construction | | |
| | | | | Testing & Commissioning | 5.5 yrs | 4.5 yrs |
| | | | | Project Startup | | |
| Reg/Env Estimated Schedule | | 7 yrs | 5.5 yrs | Eng/Const Estimated Schedule | 7.5 yrs | 5.5 yrs |
| | | | | ESTIMATED TOTAL TO STARTUP | 14-15 years | 11 years |

Chapter 7

Financial

Based on project risk for investors, the two projects, Susitna and Chakachamna, are similar. Project financing for either project, where the costs of the project is paid for solely by the sale of power produced from the project, is assumed to be unavailable. Without State participation these project are unlikely to proceed. State participation of whatever form it takes place will enable these projects to occur and lower the cost of the energy to ratepayers.

Large projects have financing that is structured on some amount of government participation. Government participation is normally required because of the following risks generally associated with large hydroelectric projects make project financing unattainable:

- **Timeline:** Project may take 10-20 years prior to first power sales. Private investors do not like to spend substantial funds for an extended time when the payoff is a long time or may not occur.
- **Licensing and Permitting Risk:** Significant funds can be spent only for the project to have long delays in licensing and in operation constraints placed on project.
- **Construction Risk:** Estimating the cost of a project many years out has risk of the prices changing for materials and labor. In addition, the demand for a product can change.

The “Bradley Model” has been discussed as a way that a new large hydroelectric facility can be financed for construction with State assistance. Licensed and constructed in the 1980’s and early 1990’s it is Alaska’s largest hydroelectric project. Bradley Lake Hydroelectric Project (Bradley Project) is located southeast of Homer, Alaska and is a 125-foot high concrete faced rock filled gravity dam. The project has 126MW of installed capacity and produces approximately 9 percent of the railbelt’s annual energy. The state paid for licensing and much of the cost of the project. Approximately 50 percent of the project’s licensing and construction cost was paid by the State. The railbelt utilities purchase all the power for the projects and pay all the costs of the project (bond financing, Operations and maintenance). Once the debt service is retired then the utilities will continue to pay the State the same amount as the debt service.

Detailed information on State participation and Bradley financing is available at [Hydroelectric Project Risk Analysis & the Bradley Lake Funding Model Summary Report, November 15, 2010](#) located on AEA’s website at the Railbelt Large Hydro webpage.

Chapter 8

Cost of Power

The cost of power from the Susitna and Chakachamna Projects is addressed in this chapter. A simple calculation of the cost of power, which assumes 50 percent State equity in either project, a financing rate of 6 percent, and annual energy from sections above results in the generation costs shown in Table 8-1 below.

Table 8-1 Cost of Power Comparison

| Project | Finance Amount (50%) | Rate | Term (years) | Annual Energy (GWhrs) | Cost per kWh |
|-------------------|----------------------|------|--------------|-----------------------|--------------|
| Susitna | 2,250,000,000 | 6% | 30 | 2600 | \$0.063 |
| Chakachamna Alt 1 | 1,440,000,000 | 6% | 30 | 1100 | \$0.09 |
| Chakachamna Alt 2 | 1,440,000,000 | 6% | 30 | 860 | \$0.12 |

This simple table gives an idea of how the two projects compare in the cost of power. Interest during construction is excluded from this comparison.

The estimated construction cost of Chakachamna Alternative 1 would need to decrease by 30 percent to have a comparable cost of power with the Susitna Project. Or, assuming no changes in the cost the energy of the Chakachamna Project, annual energy would need to be 1600 GWhrs. This could only be achieved by having zero environmental flow.

An alternative way of analyzing cost comparisons is to estimate State contributions needed if generation costs are held at \$0.06 kWh. From this perspective, the State required contribution would be \$2.35 B for the Susitna Project (2,600 GWhrs) and \$1.96 B for the Chakachamna Project (1100 GWhrs) or \$2.17 B (860 GWhrs). Assuming state participation would be based on providing \$.06 cost per kWh, the Susitna project would cost 20% more than Chakachamna project Alternative 1; however, it will provide approximately 136% more energy and compared to Alternative 2, an 8% greater cost with 200% more energy.

Chapter 9

Operational Uncertainty

Table 9-1 presents a summary of the comparative operational uncertainties associated with developing the Chakachamna and Susitna Projects.

Table 9-1 Operational Uncertainties Issue Comparison

| Issue and likelihood of occurrence within next 100 years | Chakachamna Project | Susitna Project |
|--|--|--|
| | Issue Notes/Requirements | Issue Notes/Requirements |
| Earthquake Risk | | |
| <p>Immediate damage due to fault movement</p> <p>Studies show 700-year return period for significant earthquakes (magnitude 6 to 7), last such earthquake approximately 650 years ago.</p> | <p>Castle Mountain fault, approximately 11 miles from the lake, magnitude 7+, displacements of up to 6 ft, only 4500 ft from powerhouse site.</p> <p>Infrastructure near the fault include; powerhouse and bridge over Chakachamna River.</p> <p>Power tunnel intersects numerous smaller faults. Seismic event may cause localized collapse in the fault zone if not lined. Lack of information about whether movement could occur on any of these smaller faults.</p> | <p>Castle Mountain Fault located 65 miles from powerhouse, intake, lake, magnitude 7+;</p> <p>Denali Fault located 45 miles, magnitude 8.0,</p> <p>Inter-plate subduction zone located 40 miles, magnitude 9.2</p> <p>Dam could experience high seismic loads (known seismic zone, EQ design case should consider loading)</p> |
| Secondary effects | Landslide and avalanche potential into lake and onto access road. | Potential landslides and avalanches along access roads. |
| Hydrological Risk | | |
| Generation | <p>USGS record at site 11 years of data, correlation with 4 streams.</p> <p>Understanding of the hydrology</p> <p>There is potential during events such as floods or glacial activity for down cutting of the glacial moraine at the end of the lake which could reduce head and storage in the project</p> <p>Smaller basin will cause greater deviations from average hydrological flow and energy generation.</p> <p>Drought (Not sure if needed, see above)</p> <p>Tunnel roughness may increase with time due to wear which will reduce generation.</p> | <p>USGS record at site 54 years of data on Susitna River.</p> <p>Understanding of the hydrology vis a vis climate change effects.</p> |
| Climate Change | | |
| Glacier recession | Increase in flows as the glaciers melt (>100 yrs), followed by reduced and more "flashy" flows at the project. | Increase flow for a period with glacier recession (>100 yrs) followed by decreased flow. |
| Volcanism | | |

Table 9-1 Operational Uncertainties Issue Comparison

| Issue and likelihood of occurrence within next 100 years | Chakachamna Project | Susitna Project |
|--|--|--|
| | Issue Notes/Requirements | Issue Notes/Requirements |
| Effects on Project Facilities and Features | <p>Mt Spurr is located immediately adjacent to the project, Redoubt volcano is approx. 50 miles to the west.</p> <p>Explosive eruption at Mt. Redoubt 2009</p> <p>Previous eruption on Mt. Spurr was a side blowout.</p> <p>Debris flows similar to those that occurred in 1953 and 1992 eruptions of Crater Peak could dam Chakachamna River. The debris dams might erode progressively or may burst abruptly.</p> <p>Lava flows could dam the Chakachamna River and raise Chakachamna Lake.</p> <p>Large floods would be produced by surging and melting of glacial ice during an eruption.</p> <p>Glacier movement (melting at base) is probable. Ice flow on Barrier Glacier may surge, dam the lake, raise water level and erode through, typically below the glacier in material.</p> <p>Access road may become blocked or destroyed by mud or erosion (high flows in river from melting glacier or glacial dam breakout).</p> <p>Effects on river bridges from debris flow</p> <p>Ash effects on transmission</p> <p>Poison gas cloud could affect the powerhouse (unlikely with distance & powerhouse location)</p> <p>Communications may be disrupted by volcano.</p> | <p>Mt Wrangell is located to the more than a hundred miles to the East and is closer to Watana. Mt Wrangell is in a non-eruptive active state at present but with history of 9 reported possible eruptions since 1760, most recently 1930; steaming at present. Ash could reach the Watana project and transmission lines depending on wind conditions. Pyroclastic flows are unlikely to affect Watana due to distance and intervening terrain.</p> |
| Tunnelling and Foundation Conditions | | |
| Dam | <p>Small structure on rock foundation.</p> <p>Material of the natural dam, believed to be moraine, could contain significant quantities of ice, lahar material, or volcanic ash that could affect the permanence of the natural dam.</p> | <p>Geotechnical exploration indicates favorable foundation conditions on bedrock.</p> <p>Foundation (permafrost). Melting permafrost in the rock could lead to increased permeability of foundation that may require additional grouting associated with project site.</p> |

Table 9-1 Operational Uncertainties Issue Comparison

| Issue and likelihood of occurrence within next 100 years | Chakachamna Project | Susitna Project |
|--|---|---|
| | Issue Notes/Requirements | Issue Notes/Requirements |
| | | River diversion tunnels. Large spillway. |
| Power tunnel(s) | Extensive underground construction will be expensive to shut down for inspection and repair if necessary. Very hard rock along tunnel alignment – more than 35,000 psi, which is extremely hard and could present difficulty for a tunnel boring machine resulting in slow progress. | Competent rock conditions for dam and tunnel construction, studies date to 1982. Very short power tunnel(s) – 1.0 mile max, and shallow and surface power tunnel, therefore less risk of delay in construction. Limited number of geotechnical fault zones to pass through, due to location and short length of tunnels, provided "Fingerbuster" and "Fin" zones are avoided. |
| Glacier Activity | | |
| Dam and Intake | Unpredictability regarding the interaction of glaciers with the volcanic activity, including possible melting at the base of the ice that would cause glacial pulses or surges. An advance of Barrier Glacier at the Chakachamna Lake outlet, initiated by heat from below the ice, could dam the outlet and raise the lake level. When the ice nose decayed, a large volume of water would be released that could erode the lake outlet and lower the lake below its present level. There is potential during events such as floods, glacial activity for down cutting of the glacial moraine at the end of the lake which could reduce head and storage in the project. Lowering the lake would reduce the submergence of the power inlet below what is acceptable. Breakout in 1971 one of Alaska's largest recorded floods. | N/A |
| Powerhouse | Blockade Glacier has been identified as a source of outburst floods on McArthur River | N/A |
| Surging Glaciers | Four glaciers in the Chakachamna study area have been identified as surging glaciers. They include Pothole Glacier and Harpoon Glacier in the Nagishlamina River Valley and Capps Glacier on the eastern slope of Mt Spurr. | N/A |

Table 9-1 Operational Uncertainties Issue Comparison

| Issue and likelihood of occurrence within next 100 years | Chakachamna Project | Susitna Project |
|--|---|--|
| | Issue Notes/Requirements | Issue Notes/Requirements |
| Outburst Glaciers | Glacier damming of the Nagishlamina Valley by a surging glacier may result in outburst conditions at the outlet from Chakachamna Lake. A sudden influx of water into Chakachamna Lake could produce significant changes including lowering of the lake outlet. | N/A |
| Other | | |
| Intake | Lake tap would need fish screens Volcano eruption may affect power tunnel intake. | N/A |
| Access Road | Landslide, avalanche danger part of the route. | Avalanche danger over a portion of the route. |
| Transmission Line | 42 miles of new transmission line to Beluga Sub Station. Submarine cable across Cook Inlet subject to marine environment risks such as currents, scour, dragging anchors. | 58 miles of new transmission line. |
| Operation & Maintenance | | |
| Operations & Maintenance | Long tunnel intersecting numerous faults susceptible to rock-falls over time and maintenance requirements Rock entrained in tunnel flow could damage turbines Long tunnel has higher risk of collapse, blockage Long tunnel will require planned outages for inspection and maintenance over life of project, higher risk of interruption. | Multiple short tunnels allows for more regular inspection and maintenance without prolonged outages and impact to operations |
| Load Stability | | |
| Powerhouse location with respect to load centers | Off the end of the railbelt load center, not easy to stabilize (brown-out/black-out). | Location between Anchorage and Fairbanks means project is closer to center of load, easier to stabilize grid using reactive potential. |
| Hydrological Risk - Water Shortage | | |
| Drought | Small catchment mainly fed by meltwater from glaciers, which make this site more susceptible to water shortages and less dependable as a source of energy. | Catchment is less susceptible to drought. |

Chapter 10

Summary and Conclusions

This document compared two large hydroelectric projects to determine which would better meet the needs of the railbelt population and the State of Alaska now and into the future. The following table shows a comparison summary of the two projects.

Table 10-1 Comparison Summary

| Criteria | Susitna (Low Watana) Project | Chakachamna Project |
|-------------------------|---|---|
| Engineering (Cost) | \$4.5B | \$2.9 |
| Environmental | Same basin, modified flows, little to no salmon present. | Cross basin drainage, substantial concern regarding fisheries and Trading Bay State Game Refuge. |
| Energy | 2,600 GWhrs annual average. About 50% of existing railbelt annual electrical energy. Meets and exceeds State energy policy without other projects. | Most likely to be less than 1,100 GWhrs annual average. About 20% of existing railbelt annual electrical energy. Does not provide substantial winter power. |
| Start-up Date | Approximately 11 years | Approximately 15 years |
| Licensing/Permitting | Substantial site knowledge likely to reduce licensing/permitting delays. | Significant unknowns on environment, geology, and hydrology likely to slow process |
| Finance | Requires State financial support | Requires State financial support |
| Cost of Energy | Simple calculation using cost & energy numbers above, 50% State equity, and 6% interest yields \$0.06 /khr | Simple calculation using cost & energy numbers above, 50% State equity, and 6% interest yields \$0.09-0.12 /khr |
| Operational Uncertainty | Less long term operational risk from seismic. Central location helps to stabilize grid. | Greater long term operational risk from seismic events, volcano eruption, & glacial changes. Energy more variable on an annual basis. Harder to stabilize. |
| Notes | River system has potential to expand generation by going upstream, downstream, or raise dam height. Transmission lines could connect to other areas of the State. | |

The Susitna Project would produce more energy and at a lower cost per MW. Historically the flow has varied little year to year so that the amount of energy can be better estimated. Most of the Project is anticipated to be above ground so that geotechnical unknowns that influence construction cost risk are minimized. Produced energy during summer would be greater than desired so that flows would remain high for salmon downriver. However, the reservoir area would give the Project the ability to still generate substantial power during the winter critical months.

The Chakachamna Project would not be able to divert flow as was used for estimating energy in the early 1980's. The reduced flow would have substantial effects on the Trading Bay State Game Refuge down river and would cause false attraction to return adult salmon so that they are not able to find their way to the lake. In addition, the smolt salmon in the lake need substantial outlet flow to enable them to find the exit to the lake. Drawing down the lake during the winter would cause mortality of shallow spawners and may prevent salmon from ascending up the rivers at the head of the lake during early summer. If the Project is operated to provide significant environmental flows and restrict the lake drawdown then the cost of energy increases significantly and would produce minimal energy during the critical winter months. Because of the complex two drainage system hydrology and rich fisheries determining the environmental flow and conditions will require many years and millions of dollars. The substantial number of multi-year studies would delay the licensing and start-up date.

The Susitna Project is thought to be a licensable project without a fatal flaw. Geotechnical information indicates bedrock is suitable for construction. Environmental information indicates that impacts would be minimal. The Chakachamna Project has many fisheries concerns that will restrict the Project operation, increase the cost, and decrease the energy output of the Project. Some of the issues may not be able to be mitigated.

The Susitna Project provides a lower cost per unit of energy, the least environmental impact, a greater total amount of energy, and the anticipated startup date is sooner.

Based on the projects economics and impacts Susitna Project (Low Watana non-expandable alternative) should be the primary Project to pursue with Chakachamna Project as the alternative.

Chapter 11

Recommendations

We recommend that field studies and engineering evaluations be conducted on the Susitna Project preparing for a Final Decision Document scheduled to be released on November 15, 2011. In addition, we also recommend that a FERC license application be initiated on January 1, 2012 for the selected Project. In order for the process to move forward it is recommended that a Preliminary Permit be filed with FERC for the selected Project by December 31, 2011.

Specific studies to be completed in 2011 include:

- A complete review of the 1985 Susitna environmental study plan and the conduct of critical studies from that plan. Changes to the river system and the environment need to be documented.
- Field work to verify Susitna environmental conditions.
- A detailed cost estimate of the Chakachamna Project including changes to the Project introduced by environment constraints such as downstream flow releases (size optimization).
- A final determination of the type dam to be used at the Susitna site and the access plan and a revised cost estimate of the overall scheme.
- Detailed engineering studies on transmission needs, design drawings, and geotechnical review.

It is anticipated based on the schedule discussion in preceding Section 6.0 that the data gathered in the 2011 field season can be used for both the primary and alternative project. The FERC Preliminary Permit for the Susitna Project should be filed by December 2011.

Chapter 12

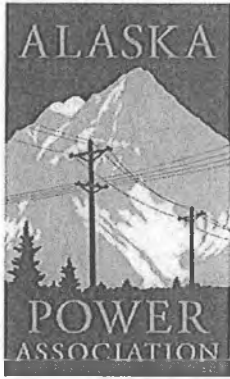
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ALASKA POWER ASSOCIATION R E S O L U T I O N

A Resolution in Support of Expanded Powers for the Alaska Energy Authority

The Alaska Legislature has adopted a goal of 50 percent renewable energy by 2025. The only way this goal can be met is with the construction of a major hydropower facility for the Railbelt or other very large generation projects, the cost of which would be well beyond the financial ability of any of the individual Alaska electric utilities.

Therefore, the state will need to be an integral partner in the funding and construction of any such projects. The logical state entity for this partnership is the Alaska Energy Authority (AEA), but it is, at present, limited by its statutory authority.

Alaska Power Association supports the expansion of statutory powers of the AEA that would, at a minimum, allow the agency to acquire, construct or own any interest in an electric project or any right to capacity of an electric project or to perform feasibility studies, design and engineering with respect to power.

(Adopted Feb. 2011)

Association Members

Alaska Electric and Energy Co-op
Alaska Electric Light & Power
Alaska Power & Telephone
Alaska Railbelt Energy Authority JAA
Alaska Village Electric Cooperative
Anchorage Municipal Light & Power
Aurora Energy
Barrow Utilities & Electric Co-op
Chugach Electric Association
Copper Valley Electric Association
Copper Valley Telephone Co-op
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Kwan Electric Transmission
Interie Cooperative
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OTZ Telephone Cooperative
City of Seward
Southeast Alaska Power Agency
Tanalian Electric Cooperative
Tanana Power Company
TDX Power
Unalakleet Valley Electric Co-op
Yakutat Power

Anchorage office

703 W. Tudor Road,
Suite 200
Anchorage, Alaska
99503

907-771-5700
1-877-992-7322

Juneau office

302C Assembly
Building
211 Fourth Street
Juneau, Alaska 99801
907-463-3636

alaskapower.org

STATE CAPITOL
PO Box 110001
Juneau, Alaska 99811-0001
907-465-3500
fax: 907-465-3532



550 West 7th Avenue #1700
Anchorage, Alaska 99501
907-269-7450
fax: 907-269-7463
www.gov.alaska.gov
Governor@alaska.gov

Governor Sean Parnell
STATE OF ALASKA

January 14, 2011

The Honorable Gary Stevens
President of the Senate
Alaska State Legislature
State Capitol, Room 111
Juneau, AK 99801-1182

Dear President Stevens,

Under the authority of Article III, Section 18, of the Alaska Constitution, I am transmitting a bill that would authorize the Alaska Energy Authority (AEA) to move forward on pursuing a large hydroelectric project to supply much needed energy to Interior and Southcentral Alaska. The bill would authorize AEA to acquire, construct, own, and operate new power projects; create a new Alaska Railbelt energy fund as a fund of AEA; repeal the existing Railbelt energy fund (AS 37.05.520) after the balance of the existing fund is appropriated and transferred into the new fund or appropriated and expended for other purposes; address quorum requirements of the AEA board; and allow for the adoption of regulations to govern the procurement of supplies, services, professional services, and construction.

Alaska's State Energy Policy target is to reach 50 percent of its electricity generation through renewable energy by 2025. To achieve this goal, we must move aggressively and invest now to develop capacity for a major hydroelectric project on the Susitna River. This legislation allows AEA to continue with environmental and feasibility studies positioning the State to seek preliminary approval from the Federal Energy Regulatory Commission for a project that will provide half of Southcentral's electricity demand.

Alaska must invest now to create new opportunities for economic development and jobs for Alaskans. A Susitna Dam hydroelectric project will provide an important and much needed supply of renewable energy for Alaskan homes and businesses while creating jobs for Alaskans. A sectional analysis is provided with this packet.

I urge your prompt and favorable action on this important measure.

Sincerely,

A handwritten signature in black ink that reads "Sean Parnell".

Sean Parnell
Governor

Enclosure

Fiscal Note Numbers:
 Support for Fiscal Note Computations (Thousands of Dollars).
 Prepared by Alaska Energy Authority
 Updated January 25, 2011

| Component: Component Number: | AIDEA | AIDEA Facilities | AIDEA RDU | FN 1 of 2 | | FN 2 of 2 | | AEA Rural Energy | AEA PCE | AEA Owned | AEA RDU |
|-------------------------------------|------------------|------------------|------------------|--|--|------------------|----------------|----------------------|---------|-----------|----------------|
| | (1234) | (2361) | Total | AEA Statewide Project Devel., AEE (2888) | AEA Statewide Project Devel., AEE (2888) | Ops (2600) | (2602) | Facilities (2599) | Total | | |
| Operating Expenditures: | | | | | | | | | | | |
| 71000 Personal Services | (5,578.7) | | (5,578.7) | 5,638.7 | 1,125.0 | | | | | | 6,763.7 |
| 72000 Travel | | | 0.0 | | | | | | | | 0.0 |
| 73000 Contractual | 341.6 | | 341.6 | (2,311.1) | 238.0 | (2,329.3) | (160.0) | (25.0) | | | (4,587.4) |
| 74000 Supplies | | | 0.0 | | | | | | | | 0.0 |
| 75000 Land & Structures/Equipment | | | 0.0 | | 413.0 | | | | | | 413.0 |
| 77000 Grants & Claims | | | 0.0 | | | | | | | | 0.0 |
| 78000 Miscellaneous | | | 0.0 | | | | | | | | 0.0 |
| Total Operating | (5,237.1) | 0.0 | (5,237.1) | 3,327.6 | 1,776.0 | (2,329.3) | (160.0) | (25.0) | | | 2,589.3 |
| Funding Source | | | | | | | | | | | |
| 1002 Federal Receipts | | | 0.0 | | | | | | | | 0.0 |
| 1004 General Fund | | | 0.0 | 1,388.4 | | (816.7) | (160.0) | | | | 411.7 |
| 1007 IA Receipts | (5,379.9) | 142.8 | (5,237.1) | 341.6 | | | | | | | 341.6 |
| 1061 CIP Receipts | | | 0.0 | 1,512.6 | 1,776.0 | (1,512.6) | | | | | 1,776.0 |
| 1062 Power Project Fund | | | 0.0 | | | | | | | | 0.0 |
| 1074 Bulk Fuel Revolving Loan Fun | | | 0.0 | 60.0 | | | | | | | 60.0 |
| 1102 AIDEA Receipts | 142.8 | (142.8) | 0.0 | | | | | | | | 0.0 |
| 1107 AEA Corporate Receipts | | | 0.0 | 25.0 | | | | (25.0) | | | 0.0 |
| 1108 Statutory Desig. Program Rcpts | | | 0.0 | | | | | | | | 0.0 |
| 1173 Miscellaneous Earnings | | | 0.0 | | | | | | | | 0.0 |
| 1210 Renewable Energy Fund | | | 0.0 | | | | | | | | 0.0 |
| Total | (5,237.1) | 0.0 | (5,237.1) | 3,327.6 | 1,776.0 | (2,329.3) | (160.0) | (25.0) | | | 2,589.3 |
| Positions | | | | | | | | | | | |
| Transfer | (42.0) | | (42.0) | 42.0 | | | | | | | 42.0 |
| New positions | 1.0 | | 1.0 | 1.0 | 8.0 | | | | | | 9.0 |
| Net position change | (41.0) | | (41.0) | 43.0 | 8.0 | | | | | | 51.0 |
| Total positions | | | 35.0 | | | | | | | | 51.0 |

Analysis:

ALASKA INDUSTRIAL DEVELOPMENT & EXPORT AUTHORITY - AIDEA

Personal Services: TOTAL \$(5,578.7)

- \$ (5,578.7) Decrease in personal services costs with transfer of 42 employees to Alaska Energy Authority.
- \$ - Request one new position for AIDEA - Accountant IV, Range 20, to accommodate anticipated increased work load. Estimated cost is \$110.0
 No net increase in AIDEA Receipts requested - Cost offset by receipts from AEA for facilities costs. See net change in receipts for AIDEA Facilities Component.
 Net reduction in position count to AIDEA is 41.

Contractual Services: TOTAL \$341.6

- \$ 341.6 Contractual cost of AEA Employees providing shared services (Operations Department) to AIDEA.
- \$ (5,237.1) Net Change to Expenditures

ALASKA INDUSTRIAL DEVELOPMENT & EXPORT AUTHORITY - Facilities Maintenance

Currently AIDEA absorbs the building operating costs. This fiscal note estimates the impact to AEA and AIDEA if AEA reimbursed AIDEA for their pro rata share.

Facility Operating Cost = \$3.4 per PCN per year x 42 employees = \$142.8

Contractual Services: No net impact to expenditure line. Reimbursement of actual costs impacts only the revenue source.

Impact to Fund Source: Reduces AIDEA receipts and increases I/A receipts. Transfer AIDEA receipt authority to operations component

ALASKA ENERGY AUTHORITY - Statewide Project Development, Alternative Energy and Efficiency
FN 1 of 2

Personal Services: TOTAL \$ 5,638.7

Increase in personal services costs with transfer of approximately 42 employee from AIDEA. All employee costs will be accounted for in one component - Statewide Project Development, AEE. This transfer reduces contractual services in several AEA components and increases personal services in this component.

| | | |
|----|----------------|---|
| \$ | 160.0 | Approximately 2 FTE's providing support to the AEA PCE Component - GF funds. |
| \$ | 2,207.5 | Approximately 16 FTE's providing support to the AEA Rural Energy Operations Component - GF and CIP receipts. |
| \$ | 2,320.0 | Approximately 17 FTE's providing support to the AEA Statewide Project Development & AEE Component - GF and CIP receipts. |
| \$ | 891.2 | Approximately 7 FTE's who are defined as shared service. This includes 6 positions that report to the Deputy Director of Operations and one engineer that works on both AIDEA and AEA projects. |
| \$ | <u>5,578.7</u> | |
| \$ | 60.0 | Request one new position for AEA - Loan Officer R20. Request additional BF receipts of \$60.0 with remaining funds through current funding levels. |
| \$ | <u>5,638.7</u> | |

Contractual Services: TOTAL \$ (2,311.1)

| | | |
|----|------------------|---|
| \$ | (2,320.0) | Decrease Contractual Services and transfer cost to Personal Services. Approximately 17 FTE's. |
| \$ | (285.1) | Operations - Shared Services. Decrease Contractual Services and transfer cost to Personal Services. |
| \$ | 142.8 | Facility Operating Cost = \$3.4 per PCN per year x 42 employees = \$142.8 |
| \$ | 151.2 | G&A Cost Currently paid by AIDEA = \$3.6 per PCN per year x 42 employees = \$151.2 |
| \$ | <u>(2,311.1)</u> | |

\$ 3,327.6 Net change to expenditures

ALASKA ENERGY AUTHORITY - Statewide Project Development, Alternative Energy and Efficiency
FN 2 of 2

Personal Services: TOTAL \$ 1,125.0

Increased to include 8 staff for the first year as follows:

| | | |
|----|----------------|---|
| \$ | 210.0 | Project Manager Rg 27 |
| \$ | 175.0 | Environmental Manager Rg 26 |
| \$ | 70.0 | Administrative Assistant Rg 12 |
| \$ | 100.0 | Project Accountant Rg 18 |
| \$ | 155.0 | Financial/Budget Analyst Rg 24 |
| \$ | 140.0 | Public Outreach/Legislative Liaison Rg 23 |
| \$ | 155.0 | Procurement Manager Rg 24 |
| \$ | 120.0 | Data Systems Specialist Rg 20 |
| \$ | <u>1,125.0</u> | |

Contractual Services: TOTAL \$ 238.0

| | | |
|----|--------------|--|
| \$ | 189.0 | Annual Lease - 4,500 sq. ft. x \$3.50 per sq. ft./mo. X 12 mo.'s |
| \$ | 13.0 | Utilities - \$1.3 per person x 10 (8 staff + 2 contractors) |
| \$ | 36.0 | G&A Expense: \$3.6 per person - \$3.6 x 10 (8 staff + 2 contractors) |
| \$ | <u>238.0</u> | |

Equipment/Furniture: TOTAL \$ 413.0

| | | |
|----|---------------|---|
| \$ | 28.00 | IT Equipment \$2.0 per person per year x 14 (8 staff + 6 contractors). Assumes all equipment purchases in 1st yr for project office (including contract labor needs). |
| \$ | 385.00 | Tenant Improvement \$315.0 (\$70 x 4,500 sq ft); Moving Expenses \$21.0 and Furniture 49.0 |
| \$ | <u>413.00</u> | |

ALASKA ENERGY AUTHORITY - Rural Energy Operations

Personal Services: No Impact.

Contractual Services: TOTAL \$ (2,329.3)

\$ (2,207.5) Reduce cost contractual costs of employee services and transfer out to Statewide component. Approximately 16 FTE's.
\$ (121.8) Reduce contractual costs of Operations employees who provide shared services. Transfer cost to Statewide component personal services.
\$ (2,329.3)

ALASKA ENERGY AUTHORITY - Power Cost Equalization

Personal Services: No Impact.

Contractual Services: TOTAL \$ (160.0)

\$ (160.0) Reduce cost contractual costs of employee services and transfer out to Statewide component. Approximately 2 FTE's.
\$ (160.0)

ALASKA ENERGY AUTHORITY - Owned Facilities

Personal Services: No Impact.

Contractual Services: TOTAL \$ (25.0)

\$ (25.0) Reduce cost contractual costs of employee services and transfer out to Statewide component. Approximately 15% of 1 FTE.
\$ (25.0)

Summary of Net Increase in GF Request for AEA:

\$ 76.9 Shared Services - IT Support not previously paid for by AEA
\$ 40.8 Shared Services -HR Support not previously paid for by AEA
\$ 294.0 O/H Facility Operating Cost/G&A not previously paid for by AEA
\$ 411.7

CSSB 42(RES)
Sectional Analysis

Section 1: Would expressly authorize the legislature to appropriate amounts in the Railbelt energy fund to capitalize the new Railbelt energy fund, called the Alaska Railbelt energy fund, created by Section 3 of the bill. This would allow amounts to be appropriated and transferred from the existing Railbelt Energy fund into the new fund.

Section 2: Would place in the exempt service the executive director and other staff of AEA.

Section 3: Would establish the new Railbelt energy fund, called the Alaska Railbelt energy fund of AEA. The legislature may appropriate money from the fund for feasibility studies, license, permit, acquire or construct, or to make grants for power projects and electric transmission lines and interties that serve the Railbelt region.

Section 4: Would increase from 3 to 4 the quorum requirement for meetings of the AEA board of directors in reaction to statutory amendments made in 2010. Those amendments increased the size of the AIDEA board from 5 to 7. The AIDEA board serves as the board of AEA. The proposed amendment would correct the quorum for meetings of AEA's board of directors.

Section 5: Would empower AEA to hire employees and advisors in the exempt service. This power to hire employees would be equivalent to powers the Alaska Industrial Development and Export Authority (AIDEA) currently possesses.

Section 6: Would expand AEA's powers to allow AEA to acquire, construct, and conduct feasibility studies, engineering and design of new power projects.

Sections 7: Would empower AEA, if approved by law, to establish subsidiary corporations to support the acquisition, construction, ownership, and operation of power projects, and thereby potentially limit potential liability of AEA or strengthen the financial viability of a project.

Section 8: Would enable an AEA subsidiary to exercise powers currently granted to AEA under AS 44.83.090. For example, an AEA subsidiary would be exempt from regulation by the Regulatory Commission of Alaska (RCA) to the same extent as AEA is exempt (but utilities contracting with the AEA subsidiary would not be exempted, and RCA would still need to approve power sales agreements between the AEA subsidiary and the Railbelt utilities).

Section 9: Would provide that AEA must exercise for new power projects, existing statutory authority managing power projects. This obligation is currently limited to power projects from the pre-1993, "former energy program for Alaska."

Section 10: Would make AS 44.83.396 apply to AEA subsidiaries that own power projects . AS 44.83.393 addresses how AEA administers the power project and contracts for operators, and includes provisions providing for AEA to contract with qualified utilities for the operation of the project. The amendment in Section 10 will impose these same duties on a subsidiary of AEA formed for a power project.

Section 11: Would amend the definition of "feasibility study" under AS 44.83.990(3) so that the term is not limited to only pre-1993 power projects.

Section 12: Would repeal the existing Railbelt energy fund, AS 37.05.520. This repeal would become effective under Sections 16 and 17 when the balance of the fund is appropriated to AEA for deposit into the new Alaska Railbelt energy fund (created by Section 3), or appropriated for other authorized purposes.

Section 13 would provide "approval by law" for AEA to form a subsidiary corporation for the Watana Hydroelectric Power Project, as required by AS 44.83.085, to be enacted by Section 7 of the bill.

Section 14: Would provide transitional provisions to address the status of existing employees who perform AEA functions with the Alaska Industrial Development Export Authority. AEA has not possessed the statutory authority to hire its own staff since the reorganization of AEA affected by 1993 legislation (ch. 18, SLA 1993). Since the 1993 legislation, AEA programs have been implemented by AIDEA employees. AEA's executive director, for example, is an employee of AIDEA, but is independent from the executive director of AIDEA. Sections 2 and 5 would authorize AEA to hire its own employees, and thereby assume greater control over the implementation of AEA programs. Section 13 provides for the transition of these employees from AIDEA to AEA.

Section 15: Would instruct the revisor of statutes to amend the statutory heading of AS 44.83.040 to reflect that the section would also address AEA employees.

Section 16: Would make the repeal of the existing Railbelt energy fund, AS 37.05.520, contingently effective when an appropriation that becomes law appropriates the unexpended and unobligated balance of the fund to AEA for deposit into the new Alaska Railbelt energy fund (created by Section 3), or for other authorized purposes. The section also requires the Commissioner or the Department of Administration to notify the lieutenant governor and revisor of statutes when the conditions are met.

Section 17 would make the repeal effective on the date after the date the appropriation referenced in Section 16 becomes effective.

Section 18: Would provide for an immediate effective date, excepting the contingent effective date for repeal of the existing Railbelt energy fund.

Prepared by Department of Law
March 22, 2011

CSSB 42(RES)
Sectional Analysis

Sections 1, 3, 12, 16 and 17: Collectively, creates a new Railbelt energy fund called the Alaska Railbelt Energy Fund, as a fund of AEA and repeals the existing Railbelt energy fund. **Section 1** would expressly authorize the legislature to appropriate amounts in the Railbelt energy fund to capitalize the new Railbelt energy fund, called the Alaska Railbelt energy fund. This would allow amounts to be appropriated and transferred from the existing Railbelt Energy fund into the new fund. **Section 3** would establish the new Railbelt energy fund, called the Alaska Railbelt energy fund of AEA. The legislature may appropriate money from the fund for feasibility studies, license, permit, acquire or construct, or to make grants for power projects and electric transmission lines and interties that serve the Railbelt region.

Section 12: Would repeal the existing Railbelt energy fund. **Section 16** Would make the repeal of the existing Railbelt energy fund, AS 37.05.520, contingently effective when an appropriation that becomes law appropriates the unexpended and unobligated balance of the fund to AEA for deposit into the new Alaska Railbelt energy fund (created by Section 3), or for other authorized purposes., and requires the Commissioner or the Department of Administration to notify the lieutenant governor and revisor of statutes when the conditions are met. **Section 17** would make the repeal effective on the date after the date the appropriation referenced in Section 16 becomes effective.

Sections 2 and 5: Would empower AEA to hire employees and advisors in the exempt service. This power to hire employees would be equivalent to powers the Alaska Industrial Development and Export Authority (AIDEA) currently possesses.

Sections 14 and 15: Are transitional sections related to AEA hiring employees. **Section 14:** would address the status of existing employees who perform AEA functions with the Alaska Industrial Development Export Authority. AEA has not possessed the statutory authority to hire its own staff since the reorganization of AEA affected by 1993 legislation (ch. 18, SLA 1993). Since the 1993 legislation, AEA programs have been implemented by AIDEA employees. AEA's executive director, for example, is an employee of AIDEA, but is independent from the executive director of AIDEA. The bill would authorize AEA to hire its own employees, and thereby assume greater control over the implementation of AEA programs. **Section 15:** would instruct the revisor of statutes to amend the statutory heading of AS 44.83.040 to reflect that the section would also address employees.

Section 4: Would increase from 3 to 4 the quorum requirement for meetings of the AEA board of directors in reaction to statutory amendments made in 2010. Those amendments increased the size of the AIDEA board from 5 to 7. The AIDEA board serves as the board of

AEA. The proposed amendment would correct the quorum for meetings of AEA's board of directors.

Sections 6, 9, and 11: Would expand AEA's powers to allow AEA to acquire, construct, and conduct feasibility studies, engineering and design of new power projects. **Section 6** would amend the powers of AEA to add provisions related to new power projects. **Sections 9 and 11** would empower AEA to exercise for new power projects, existing statutory authority managing power projects which are currently limited to power projects from the pre-1993, "former energy program for Alaska." AS 44.83.396 (amended by **Section 9** of the bill) addresses how AEA administers the power project and contracts for operators. AS 44.83.990(3) (amended by **Section 11**) would define "feasibility study" so that it is not limited to only pre-1993 power projects.

Sections 7, 8, 10, and 13: Would empower AEA, if approved by law, to establish subsidiary corporations to support the acquisition, construction, ownership, and operation of power projects. **Section 7** would empower AEA to create subsidiary corporations for new power projects, and thereby potentially limit potential liability of AEA or strengthen the financial viability of a project. **Sections 8 and 10** of the bill would enable an AEA subsidiary to exercise powers currently granted to AEA. **Section 8** would amend AS 44.83.090 to exempt an AEA subsidiary from regulation by the Regulatory Commission of Alaska to the same extent as AEA is exempt (but would not exempt utilities contracting with the AEA subsidiary). **Section 10** would make AS 44.83.396 apply to AEA subsidiaries that own power projects . AS 44.83.393 addresses how AEA administers the power project and contracts for operators, and includes provisions providing for AEA to contract with qualified utilities for the operation of the project. The amendment in Section 10 will impose these same duties on a subsidiary of AEA formed for a power project. **Section 13** would provide "approval by law" for AEA to form a subsidiary corporation for the Watana Hydroelectric Power Project, as required by AS 44.83.085, to be enacted by Section 7 of the bill.

Section 18: Would provide for an immediate effective date, excepting the contingent effective date for repeal of the existing Railbelt energy fund.

Prepared by Department of Law
March 22, 2011

CSSB 42(RES)
COMPARISON: RCA REGULATION/AEA MANAGEMENT

Prepared by Department of Law
March 22, 2011

Statutory Bases For AEA Management:

1. AS 44.83.090(b) – AEA is not subject to jurisdiction by RCA, but that does not diminish RCA jurisdiction over utilities that purchase power from AEA projects. Absent another exemption, RCA must approve a power sales agreement before a utility could purchase from an AEA power project. AS 42.05.431(b).

- a. AEA exemption from RCA jurisdiction is similar to treatment given other political subdivisions.

AS 42.05.711(b) – a public utility owned by and operated by a political subdivision is not subject to RCA regulation under AS 42.05 (with limited exceptions) unless: (a) the governing body elects to be subject to AS 42.05, or (b) the political subdivision would directly compete with another utility.

2. AS 44.83.090(a) – mandates provisions that must be included in AEA power sales agreements. The contract must provide for payment of operating and maintenance costs, interest and amortization of bond debt, AEA monitoring of project, full disclosure of all cost factors so rates will be determined on basis of true cost data; periodic revision of rates based upon accurate cost data; security and default provisions. Here, AEA does not make a “profit” under power sales agreements.

AS 44.83.396(e) – mandates that AEA when it contracts for operation of a power project, review and approve annual budgets for operation and maintenance, and assure that the project is being operated efficiently and in a manner consistent with national standards for industry and agreements with bondholders.

Statutory Bases For RCA Regulation/Exemption

1. The statutory mandates on AEA under AS 44.83.090(a) and AS 44.83.396(e) largely duplicate what RCA could do under economic regulation.
 - a. AS 42.05.381 & AS 42.05.431(a) require rates be just and reasonable, and not discriminatory. Rates are based upon costs.

- b. AS 42.05.291 & AS 42.05.511 provide authority for RCA to investigate management, services and facilities for efficiency, safety, etc.
 - c. The statutory mandates on AEA alleviate the need for what would include duplicative RCA regulation, plus the legislature may provide oversight over AEA.
2. AS 42.05.431(b) – A wholesale power agreement between public utilities is subject to prior approval by RCA. This provision applies to utilities purchasing from AEA, absent another exemption.
- a. An example of exemption - AS 42.05.431(c) – provides that wholesale power and related agreements arising out of certain, specifically described projects which AEA owns or originally owned, are not subject to RCA review or approval until all long-term debt for the project is paid off.
 - b. The exemption eliminated time necessary for RCA review and approval, and potential litigation.
 - c. The exemption applies only to Bradley Lake Hydroelectric Project, and the original Four Dam Pool Hydroelectric Project (currently Lake Tyee and Swan Lake owned by the SEAPA joint action agency).
3. AS 42.05.431(b) – After RCA approves a wholesale power agreement and the agreement is in effect, RCA may not invalidate a sale under that contract. If sales under the contract make rates unjust or unreasonable, RCA can order parties to the agreement to negotiate or exercise dispute resolution mechanisms in the contract.
- a. Valid, approved power sales agreements will almost certainly be necessary to support financing a project.
4. AS 42.05.431(a) – includes provisions that municipal and cooperative utilities may include rate covenants in bond and debt instruments, and RCA may not reject a rate necessary to satisfy debt covenants relating to rates.
- a. This provision reduce scope of economic regulation and thereby offers assurances to creditors that the utility's debt will be repaid.
 - b. Application of this or similar provisions will likely be necessary for AEA financing of large projects.

CSSB 42(RES) – FERC Oversight
(Prepared by the Alaska Department of Law)

| FERC Oversight in Licensing Procedures | RCA Oversight |
|--|--|
| <ol style="list-style-type: none"> 1. The FERC process evaluates the broad public interest. <ol style="list-style-type: none"> a. Environmental issues, including fish, wildlife & botanical resources, and water use and quality. b. Socio-economic and cultural impacts. c. Recreational resources. d. Project description and operating details. e. Economic and cost of power. | <ol style="list-style-type: none"> 1. RCA approves power sales agreements. <ol style="list-style-type: none"> a. Rate under contract must be “just and reasonable.” b. Decision based on cost of power & reliability factors similar to those FERC uses in licensing. c. After a power sales agreement is approved <ol style="list-style-type: none"> i. RCA may not invalidate power sales under an approved contract, and ii. RCA does not economically regulate operations under the contract, but may order renegotiation or dispute resolution. |
| <ol style="list-style-type: none"> 2. The cost of power factors FERC evaluates in determining whether to grant a license include: <ol style="list-style-type: none"> a. Construction and operational plans. b. Whether the project can be operated efficiently. c. The local need for power. d. The projected cost of power. e. Comparison of the lowest cost, reasonable <u>alternative source of power.</u> | |
| <ol style="list-style-type: none"> 3. License conditions FERC imposes will impact the cost of power: <ol style="list-style-type: none"> a. FERC will impose license conditions (e.g., environmental conditions) which usually increase the cost of power. b. License conditions are mandatory. c. RCA economic regulation would not eliminate license conditions, regardless of impact on power rates. | |
| <ol style="list-style-type: none"> 4. Post licensing activities. <ol style="list-style-type: none"> a. FERC will review and enforce compliance with license conditions, including dam safety. b. FERC reviews and approves license amendments, e.g. to improve efficiency of project. c. FERC oversight might impact efficiency and costs, but is not focused upon economic regulation. | <ol style="list-style-type: none"> 2. RCA Statutory Regulation. <ol style="list-style-type: none"> a. Non-economic regulation includes potential investigation of services and facilities of public utility that are unreasonable, unsafe, inadequate, insufficient, or unreasonably discriminatory. b. Economic regulation includes: <ol style="list-style-type: none"> i. Approval of rates if “just and reasonable,” and “non-discriminatory.” ii. Potential investigation of utility management for inefficient or unreasonable practices. |

CSSB 42(RES) – FERC Oversight
(Prepared by the Alaska Department of Law)

Impact of Imposing Rate Regulation on Ability to Obtain Financing.

1. Financing a project at reasonable, economic rates requires minimizing risk of non-payment of the debt.
2. If “rate regulation” is imposed to eliminate the obligation of ratepayers to pay certain expenses (e.g., for cost overruns), another person or entity must pay.
 - a. Placing payment risk on lenders or bond holders will likely either (i) preclude financing, or (ii) increase the cost of financing (increased costs which would pass through to ratepayers).
 - b. Placing payment risk on utilities would generally redirect the obligation to the same persons - - from ratepayers to members for cooperatives, and from ratepayers to tax-payers for municipal utilities.
 - c. Future legislatures could choose to appropriate more funds to the project to cover cost overruns, and protect ratepayers.
3. RCA statutes protect lenders and bond holders of municipal and cooperative utilities, assuring that rates RCA approves will cover debt payments.