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STATE OF ALASKA



POUCH V  
JUNEAU, ALASKA 99811  
(907) 465-3873

HOUSE LABOR AND COMMERCE COMMITTEE

March 2, 1984

FOR IMMEDIATE RELEASE

CONTACT: REP. JOHN COWDERY  
465-4905

HOUSE LABOR AND COMMERCE COMMITTEE AMENDMENT KEEPS  
SUSITNA EQUITY CLAUSE INTACT

JUNEAU - The House Labor and Commerce Committee on Friday approved House Bill 589, but added an amendment to the legislation which would ensure funding and construction of the Watana Dam phase of the Susitna Hydroelectric Project.

HB 589, authored by the Sheffield administration, proposed to repeal the so-called "susitna equity clause" as part of an attempt to finance four ailing hydroelectric projects under the direction of the Alaska Power Authority.

Rep. John Cowdery, R-Anchorage, chairman of the committee, said the amendment would delay repeal of the equity clause until construction of the Watana Dam is ensured with the establishment of a proposed major projects fund. "This is a message to the administration that Susitna supporters will not stand by idly while attempts are made to salvage the four dam pool" said Cowdery. The representative from south Anchorage noted "this is only the first step in the process of developing a comprehensive state-wide energy program. There is obviously a lot of negotiating to be done before the problems with hydropower in Alaska are resolved".

The Labor and Commerce Committee also approved a measure appropriating 35 million dollars to help stabilize power rates for the four dam pool. Both pieces of legislation now go to the Resources Committee where further work will be done on the states energy program and the proposed major projects fund.

MARCH 2, 1984

TO: JOHN  
FROM: KEN  
RE: HB 589

POINTS OF DEBATE FAVORING AMENDMENT TO HB 589

THE KEY WORD IN WENDTE'S OPPOSITION DEBATE WILL BE "IF".  
THERE ARE TOO MANY "IF'S" OR VARIABLES STILL TO BE  
RESOLVED BEFORE SUSITNA SUPPORTERS WILL ALLOW THE EQUITY  
CLAUSE TO BE REPEALED.

1. IF POWER SALES AGREEMENTS ARE SIGNED.
  
2. IF PETERSBURG DOES NOT SIGN THE AGREEMENT SOON, ALTERNATIVE POWER SALES CONTRACTS WILL HAVE TO BE DRAWN UP AND THERE IS NO ASSURANCE THE FOUR OTHER COMMUNITIES INVOLVED IN THE NEGOTIATIONS WILL AGREE TO THE NEW TERMS BECAUSE:
  - A. THE ENTRY RATE INTO THE INITIAL PROJECT FOR THE FOUR COMMUNITIES WILL BE HIGHER.
  
  - B. THE WHOLESALE POWER RATE MIGHT ALSO BE HIGHER BECAUSE OF LESS UTILIZATION AT LAKE TYEE.

3. IF THE LEGISLATURE APPROVES A MAJOR PROJECTS FUND WHICH PRIORITIZES WATANA CONSTRUCTION, IF THE LEGISLATURE APPROVES THE COMMITTEE SUBSTITUTE FOR HB 589, IF THE LEGISLATURE PASSES HB 684 APPROPRIATING FUNDS FOR RATE STABILIZATION, IF ALL THESE PIECES OF LEGISLATION ARE PACKAGED AND APPROVED IT WILL SOLIDIFY ALASKA'S COMMITMENT TO A COMPREHENSIVE STATEWIDE ENERGY PROGRAM.

4. IF THESE STEPS ARE TAKEN I WOULD PROJECT THE "BONDING APPEAL" FOR ALASKA'S HYDROELECTRIC PROJECTS WILL ESCALATE AND THERE WILL BE NO DEFAULT ON ANY OF THE SHORT DEBTS NOW FACING THE STATE.

AS CHAIRMAN, IT IS MY INTENTION TO PASS FROM THE LABOR AND COMMERCE COMMITTEE TO THE NEXT COMMITTEE OF REFERRAL, THE COMMITTEE SUBSTITUTE FOR HB 589 ALONG WITH HB 684 APPROVING A 35 MILLION DOLLAR APPROPRIATION FOR RATE STABILIZATION.

# STATE OF ALASKA



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## HOUSE LABOR AND COMMERCE COMMITTEE

March 2, 1984

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CONTACT: REP. JOHN COWDERY  
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HB 589: "An act relating to the Alaska Power Authority; and providing for an effective date."

My name is George Matz. I am Special Assistant to Commissioner Richard A. Lyon for the Department of Commerce and Economic Development. I am representing Commissioner Lyon who regrets that he is not able to attend this hearing because of previous commitments in Washington, D.C.

There are four points that I want to make in my testimony:

- o First, HB 589 is essential to the power sales agreements and the long-term financing of the "Four Dam Pool."
- o Second, the long-term financing of the "Four Dam Pool" is essential to the Energy Program for Alaska.
- o Third, the power sales agreements now being negotiated by the Alaska Power Authority (APA) should be financable.
- o Fourth, the Department of Commerce and Economic Development supports the terms and conditions of the power sales agreements being negotiated by the APA.

To elaborate on these points, the Energy Program for Alaska was conceived by the legislature in 1981 when it enacted Chapter 118, SLA 1981 (SB 25). After nearly three years of gestation, we are about to witness its birth as an operating power supply system. However, nearly \$200 million of interim financing must first be converted to long-term financing. How the financing occurs will determine the long-term health of the Energy Program for Alaska.

If revenue bonds are used for long-term financing, the Energy Program for Alaska will have overcome some prenatal illness and can look forward to a healthy life with ever more attractive power rates. Also, these initial projects can expect to be the parents of a family of power projects that serve the electrical needs of Alaska. Hopefully, with our improved diagnostic skills, we will prevent a recurrence of the problems previously experienced.

If long-term financing is based on additional State appropriations, the Energy Program for Alaska will draw nourishment from other State needs. Also, the program will not have demonstrated the ability to exist without 100% financial support from the State. This is not a good precedent for propagating additional power projects.

If the Energy Program for Alaska has neither revenue bond financing nor State appropriation, it will be stillborn. In financial terms that means the State would default on repayments of the interim financing.

As we approach the term of this gestation, we know that some assistance is needed to assure completion of long-term financing. Our bond counsel and underwriters warned us of some statutory problems that could impede the sale of revenue bonds. Also, the respective communities and utilities have stated that their participation is contingent on certain statutory changes.

As a result of this advice, the Governor has introduced HB 589 which includes the statutory changes required to meet the demands of both the bond buyer and the wholesale power buyer. The Administration considers each section of this bill to be essential.

The highlights of HB 589 are as follows:

1. Section 1 repeals the existing statutory requirement that industrial retail power rates can be no less than retail power rates to residential customers. This allows utilities to offer, if they wish, lower rates to large volume customers.
2. Section 1 and 2 allows the four projects that are part of the "Four Dam Pool" (Solomon Gulch, Swan Lake, Lake Tyee and Terror Lake) to be considered as one project. The significance of this is that the debt service portion of the wholesale power rate for each project will be unified rather than project-specific as currently required by the statutes. Project-specific allocation of debt service results in higher wholesale power rates for projects which are more costly and/or have unused capacity relative to other projects in the pool. However, new projects added to the Energy Program for Alaska will have project-specific rates.
3. Section 2 deletes the "Susitna clause" which otherwise would trigger substantial wholesale power rate increases for projects included in the Energy Program for Alaska. The possibility of this rate increase and the reduction that could occur in demand and revenues will have a decidedly negative effect on the ratings and interest rates of revenue bonds used for long-term financing of the "Four Dam Pool."
4. Section 2 includes a technical amendments which deletes "at the bus-bar" in order to remove ambiguity.
5. Section 3 protects the "Four Dam Pool" from the addition of new projects to the Energy Program for Alaska which could substantially increase their wholesale power rate.
6. Section 4 removes reference to the "Susitna clause" from definitions that apply to the Energy Program for Alaska.
7. Section 5, similar to Section 1, allows utilities to establish retail industrial rates that are less than residential rates.
8. Section 6 provides an immediate effective date.

HB 589 represents a tremendous amount of analysis and negotiating. All communities or utilities that are part of the "Four Dam Pool" have had extensive opportunity to partake in drafting the concept and the language of this bill. The Administration firmly believes that HB 589 represents the best resolution to a difficult problem and the best approach for leveraging further development of power projects in Alaska.

FEBRUARY 29, 1984

TO: JOHN

FROM: KEN

HB 589

HB 589 WOULD AMEND STATE STATUTES GOVERNING THE ALASKA POWER AUTHORITY. IT WOULD COMBINE FOUR HYDROELECTRIC PROJECTS, LAKE TYEE, SWAN LAKE, SOLOMON GULCH, AND TERROR LAKE, INTO ONE POWER PROJECT WHICH WOULD BE REFERED TO AS THE INITIAL PROJECT. THE LEGISLATION WOULD ALSO REPEAL THE HIGHLY CONTROVERSIAL "SUSITNA CLAUSE", A STATUTE APPROVED BY THE LEGISLATURE TO ASSURE THE CONSTRUCTION OF THE SUSITNA HYDROELECTRIC PROJECT.

WHILE I BELIEVE THIS BILL HAS CONSIDERABLE MERIT, I AM OPPOSED TO THE REPEAL OF THE SUSITNA CLAUSE WITHOUT SOME SUBSTITUTE ASSURANCE THAT THE WATANA PHASE OF SUSITNA WILL BE CONSTRUCTED. IT MY INTENTION, AS CHAIRMAN, TO TAKE TESTIMONY TODAY ON HB 589, AND, I WOULD ASK THE MEMBERS OF THIS COMMITTEE TO CONSIDER THAT TESTIMONY AND PERHAPS A COMMITTEE SUBSTITUTE.

LEGISLATIVE BRIEFING  
LABOR AND COMMERCE COMMITTEES  
ENERGY PROGRAM FOR ALASKA

The Energy Program for Alaska, adopted by the Legislature in 1981, provides for State construction, ownership, and operation of power generating projects throughout the State. Program objectives are achieved by providing financing through the Power Authority for the development of new power projects and the acquisition of existing projects. The Energy Program includes a check and balance system for project development and approval, through which a project's feasibility must be approved by the Legislature before expenditures for design and construction can begin. Following legislative approval and funding, the Power Authority designs and constructs the project, which is then owned by the State.

Under the Energy Program for Alaska, the Power Authority acquired the Solomon Gulch project, then being constructed by Copper Valley Electric Association. This project serves Valdez and Glennallen. The Swan Lake project, then being developed by Ketchikan Public Utilities, was also acquired under this program. In addition, the Power Authority assumed responsibility for developing and constructing the Tye Lake project for Wrangell and Petersburg, and the Terror Lake project near Kodiak.

These hydroelectric projects are known as the Four Project Pool, which has become the cornerstone of the Energy Program for Alaska. The Solomon Gulch project is in commercial operation; the Tye project will soon be providing test power to Wrangell and Petersburg; Swan Lake is providing test power to Ketchikan; and the Terror Lake project is about 95 percent complete with power projected to be on-line in September 1984. With the completion of these projects, the role of the Power Authority in power generation, transmission, and the wholesale marketing of electrical energy is significantly expanding.

When the Legislature began appropriating funds in 1979 for the construction of hydroelectric projects, it was intended that these projects were to be fully financed by the State. However, declining State revenues resulting from a drop in international oil prices has forced the abandonment, at least for the foreseeable future, of full State funding of these projects. Lower oil prices have also made the short term cost of hydropower from new projects less advantageous, when compared to the cost of diesel generated electricity, than it once was expected to be. Power Authority economic and financial analyses have necessarily assumed conservative long term oil price increases although experts consider the possibility of world oil supply interruptions could dramatically revise current Power Authority projections.

In the face of the financial reality of declining State revenue, the Legislature amended the Energy Program for Alaska with House Bill 9 (HB 9) in 1982. The original legislation had established a single wholesale power rate for all Power Authority projects in the State. HB 9 changed this by establishing a new rate setting mechanism based on pooling the debt service of the projects and providing that each project carry its own operation and maintenance costs.

To meet the requirements of HB 9 and the needs of consumers in the communities served by the Four Project Pool as equitably as possible, the Power Authority has

proposed new power sales agreements with those communities served by the Four Project Pool. These agreements are the result of several months of negotiation and extensive coordination between the Power Authority, the utilities to be served by the projects, financial institutions, the Governor's Office, and the legislative leadership. Under the agreements, initial consumer rates for the four hydroelectric projects are designed so as not to exceed the cost of diesel-generated power, and in the long-run, provide more favorable rates. They should provide significant benefits to the communities served by the projects as well as communities to be served by future projects that will be included in the program.

In order to implement the proposed power sales agreements, new legislation is necessary. These legislative changes are:

- Elimination of the energy fund requirement (commonly referred to as the Susitna Clause) to reduce the potential future risk to the Four Project Pool communities
- A limitation on the impact of new projects coming into the system on the debt requirement of the first four projects
- Authorization of the sale of power to industrial users at a separate rate
- Classification of the first four projects as one project in order to issue revenue bonds as a single system
- Approval and financing of a Rate Stabilization Fund (with a total State appropriation of approximately \$35 million) to off-set the difference between the costs of hydropower and diesel generated electricity during the early years of the projects.

Negotiations are still in progress with the Five communities involved in the Four Project Pool. The Power Authority plans to present its final offer to the Board of Directors for action on March 9, 1984. The communities have indicated that it will take thirty to forty-five days longer for them to ratify any agreement due to local ordinance requirements. Petersburg has indicated that they will conduct a local election on the matter on April 17, 1984.



ALASKA STATE LEGISLATURE  
HOUSE OF REPRESENTATIVES  
RESEARCH AGENCY

Pouch Y, State Capitol  
Juneau, Alaska 99811  
(907) 465-3991

March 10, 1983

MEMORANDUM

TO: Representative Jack McBride

FROM: Jack Kreinheder *JK*  
Research Staff

RE: History of Hydro Projects in Election District 1  
Research Request 83-54

You requested that we summarize the development of hydro projects in Election District 1, focusing on the Swan Lake, Lake Grace and Tye Lake sites. As you know, the Swan Lake and Tye Lake projects are under construction by the Alaska Power Authority, while Lake Grace was considered as an alternative to the Swan Lake site.

Existing Hydro Projects in Ketchikan and Petersburg

The City of Ketchikan's electric utility generates about 45 percent of its annual power production from three existing hydro facilities at Ketchikan, Beaver Falls, and Lake Silvis. The generation capacity of these hydro units is 4,200, 5,000, and 2,100 kilowatts, respectively. The first generating unit at the Ketchikan site was installed in 1938, with another unit added in 1957. The first Beaver Falls unit was installed in 1946, with two more generators added in 1954. The Lake Silvis plant was installed in 1968.

Ketchikan's remaining power demand is met by diesel generators with a total capacity of about 18,300 kilowatts. These diesel units will be retired except for standby generation purposes when the Swan Lake project is completed.

Petersburg generates about 50 percent of its current power requirements from the Crystal Lake hydro project. This project was originally developed in 1929, with a major expansion in 1955. The current generation capacity of the Crystal Lake plant is about 2,000 kilowatts.

The City of Wrangell presently generates all of its electricity from diesel plants.

Representative McBride  
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### Lake Grace

Lake Grace is located about 15 miles east of Swan Lake on the west side of Behm Canal. The proposed hydro plant at Lake Grace would have been substantially larger than Swan Lake in terms of power output and cost. The Lake Grace project would provide 25,000 kilowatts (KW) of capacity and 102 million kilowatt hours (KWH) of average annual energy, in comparison to 18,000 KW of capacity and 85.4 million KWH of energy for the Swan Lake project.

You expressed an interest in how the decision was made by Ketchikan to proceed with development of the Swan Lake hydro site, rather than the Lake Grace site. The principal basis for this decision was an appraisal report prepared by R.W. Beck and Associates in June 1977 for Ketchikan Public Utilities. This report evaluated the technical and economic feasibility and compared the cost of power for hydro developments at Swan Lake, Lake Grace, and Mahoney Lake, which is a smaller site.

The R.W. Beck report found that although hydro development was feasible at each of the three sites, Swan Lake was the most economic hydro alternative which would eliminate Ketchikan's reliance on diesel fuel. The average 10-year cost of power for the Swan Lake project was estimated at 6.7 cents per KWH, compared to 7.8 cents per KWH for the Lake Grace alternative. The Mahoney Lake alternative was competitive with Swan Lake with a power cost of 6.7 cents per KWH, but the Mahoney Lake site would not generate enough power to replace all of Ketchikan's diesel generation. A summary comparison of the three projects is included in Appendix A, taken from the R.W. Beck report.

You also indicated an interest in whether the U.S. Borax mineral development at Quartz Hill was considered in the evaluation of alternative hydro projects for Ketchikan. It appears that the power requirements of the Borax development were not given significant consideration, for at least two reasons. When the Borax molybdenum discovery was first announced in 1977, Borax planned to meet its power needs by constructing its own hydro project at Wilson Lake (this plan was later dropped because of strong local opposition, due in large part to the high sport fishing value of Wilson Lake). In addition, the City of Ketchikan was primarily concerned with meeting the power needs of its residents, not of mining or other industries outside of the city.

R.W. Beck recommended that Lake Grace and Mahoney Lake be reevaluated as additional hydroelectric developments when the power output from Swan Lake nears full utilization. Lake Grace is now within the Histy Fjords National Monument, which may make future development of this site more difficult. The Lake Grace area was withdrawn under federal land classification at one time as a power project site, but is unclear whether this withdrawal was superceded by the National Monument designation.

Swan Lake

The Alaska Power Authority prepared the following brief history of the Swan Lake project, which is expected to begin producing power by January or February of 1984.

The City of Ketchikan, having made the decision to discontinue its reliance on the use of diesel electric generation to meet rising energy demands, authorized the engineering firm of R.W. Beck in September of 1977 to investigate the feasibility of developing, as a major hydroelectric generating resource, the Swan Lake Project which is located approximately 22 miles northeast of Ketchikan near the northern end of Carroll Inlet in the central portion of Revillagigedo Island.

In June of 1978, R.W. Beck issued a feasibility report indicating that a hydroelectric project which would demonstrate a benefit/cost ratio of 1.25 could be constructed at Swan Lake at a total investment cost of \$80,924,000. Subsequently, the City of Ketchikan, Ketchikan Public Utilities (KPU) authorized R.W. Beck to proceed with preparation of final design of the project.

The 1980 legislature through joint resolution authorized the Alaska Power Authority to issue bonds up to the maximum amount of \$120,000,000 for financing the construction of the Swan Lake Project.

Construction was initiated by KPU in November of 1980. Funding for project design and initial construction was secured primarily through the proceeds or loans from the Power Authority's Power Project Revolving Loan Fund.

On May 28, 1981, the Power Authority loaned KPU \$35,000,000 for construction from funds which had been raised through the sale of General Obligation Bonds.

On May 21, 1982, the Power Authority and KPU executed an acquisition agreement under which, in return for providing funds to complete project construction, the Power Authority will receive title to the project and as operation of the project [begins] will provide sufficient power for the City of Ketchikan's needs via a Power Sales Agreement.

The total construction cost for the Swan Lake project is now estimated at \$93.5 million in nominal dollars. The target completion date is April 1984; however, the construction work is ahead of

Representative McBride  
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schedule and the project may be completed as early as January 1984. Swan Lake will have an installed generation capacity of 22.5 megawatts and an annual firm energy production of about 70 million KWH. The project is expected to have about 50 percent utilization in its first years of operation; that is, about 35 million KWH of the 70 million KWH available will be used by Ketchikan Public Utilities. The year in which the full capacity of Swan Lake will be consumed depends largely on the rate of increase in future power demand, which is uncertain. However, current Power Authority projections show the project being fully utilized in about 2002.

### Lake Tyee

I believe that you have seen a copy of my memo on the Tyee project to Representative Clocksin, dated February 11. Attached to that memo was a Tyee chronology prepared by the Power Authority which focused mainly on cost estimates. This chronology is also attached here as Appendix 2.

The Tyee project was originally proposed by the Thomas Bay Power Authority, a local Petersburg and Wrangell group. This group was first interested in the development of the Thomas Bay hydro site, but a reconnaissance study by the Corps of Engineers indicated that the smaller Tyee project was more feasible and cost-effective. Based on the Corps study, the Thomas Bay Power Authority dropped the Thomas Bay site in favor of the Tyee project. When the Alaska Power Authority became operational in 1978, an agreement was reached for the Authority to take over the development of the project and proceed with design and licensing work.

The Alaska Power Authority prepared the following brief history of the Tyee project.

On December 19, 1979, the Alaska Power Authority submitted an application to the Federal Energy Regulatory Commission (FERC) for the construction of the Tyee Hydroelectric Project in the vicinity of Wrangell and Petersburg, Alaska. Our engineers, R.W. Retherford Associates/International Engineering Company (IECO), estimated the cost of the project at that time at \$53,333,000, including an allowance for inflation at the rate of seven percent per year during the construction period. Procurement of long-lead-time turbines began in July 1981, in anticipation of a FERC license. FERC issued a license August 5, 1981, and the award of several additional procurement and one construction contract followed almost immediately thereafter.

Representative McBride  
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The power-on-line date is scheduled for January 1984. The current estimate of the total project cost is \$124 million. Available funds include \$82 million in State grants and \$50 million in interim financing.

The powerhouse is located in the Tongass National Forest, approximately 40 miles east-southeast of Wrangell, Alaska. The project is designed to develop the energy potential of Tye Lake--a natural lake at Elevation 1396--convert it to electricity, and transmit the energy to the communities of Wrangell and Petersburg for distribution.

Tye will have an initial generating capacity of 20 megawatts, expandable to 30 megawatts with the addition of a third generating unit. The project will be able to produce about 110 million KWH per year, of which about 34 million KW (31 percent) is expected by the Power Authority to be sold to Petersburg and Wrangell in the first year of operation. Based on the Power Authority's estimate of 2.5 percent annual increase in power demand, the power output from the Tye project will not be fully utilized until the year 2033.

I have also attached as Appendix C a memorandum by George Matz of the Office of Management and Budget which outlines the history of the Tye project from the perspective of studies and approvals.

If you have any questions or would like more specific information on any of these hydroelectric projects, please do not hesitate to contact me. Also, I plan to complete a response to your research request on Swan Lake power rates (#83-89) by March 25. This analysis will compare projected power rates for the Swan Lake project with current power generation costs in Ketchikan and discuss alternatives for reducing Swan Lake rates, if necessary.

ALTERNATIVE HYDRO PROJECTS  
SUMMARY OF CHARACTERISTICS

	<u>Swan Lake Project</u>	<u>Lake Grace Project</u>	<u>Mahoney Lake Project</u>
<u>BASIN HYDROLOGY</u>			
Drainage Area Above Dam, Sq. Mi. ....	36.5	29.2	2.05
Avg. Drainage Area Elevation .....	1,800	1,500	2,500
Avg. Annual Runoff at Dam Site, A.F. ...	335,000	279,000	33,500
Avg. Annual Runoff per Sq. Mi., cfsm ...	12.7	13.2	22.4
Max. Annual Runoff at Dam Site, A.F. ...	426,360	350,900	43,050
<u>PROJECT POWER DATA</u>			
Avg. Annual Energy Generated, GWh .....	88.0	105.2	49.7
Avg. Annual Energy at Load Center, GWh .	85.4	102.0	48.2
Annual Firm Energy Generated, GWh .....	68.0	93.3	29.5
Annual Firm Energy at Load Center, GWh .	66.0	90.5	28.6
Dependable Capacity at Load Center, kW .	18,000	25,000	9,000
<u>RESERVOIR</u>			
Normal Maximum Pool Elevation .....	330	500	1,956
Minimum Reservoir Elevation .....	269	458	1,776
Reservoir Area at Normal Maximum Pool ..	1,500	2,580	68
Active Storage Capacity, A.F. ....	86,000	150,600	7,150
<u>DAM</u>			
Type .....	Conc. Arch	Conc. Arch	None
Crest Elevation .....	344	509	-
Height Above Foundation, Feet .....	190	150	-

SPILLWAY

Length, Ft. ....  
Crest Elevation .....

Project      Project      Project  
SWAN LAKE      LAKE GRAY      MATHONEY LAKE

100      200      90  
330      500      1,956

POWER INTAKE .....

Single      Multi-      Lake Tap and  
Level on    Level on    Valve  
Dam      Abutment    Chamber

POWER CONDUIT

Tunnel:

Diameter, Ft. ....  
Length, Ft. ....  
Q Maximum, cfs ....  
V Maximum, fps .....

10      9  
2,250      3,400  
1,160      920  
14.8      14.5

-  
-  
-  
-

Penstock (Steel):

Diameter, Ft. ....  
Length, Ft. ....  
Q Maximum, cfs ....  
V Maximum, fps .....

9      6.5  
70      875  
1,160      920  
18.2      27.8

3  
6,200  
86  
12.2

POWERHOUSE

Turbines (Type) .....

Speed, rpm .....

Net Design Head, Ft. ....

Rated Capacity, Best Gate, kW Total ....

Discharge at Avg. Head, cfs .....

Avg. Tailwater Elevation .....

2-Vertical    2-Vertical    2-Impulse  
Shaft      Shaft  
Francis      Francis  
450      600      900  
291      429      1,709  
22,680      26,700      10,600  
1,014      855      78  
8      27      88

TABLE W-7  
(Cont. In next)

	<u>SWAN LAKE</u> Project	<u>Lake Grace</u> Project	<u>Mahoney Lake</u> Project
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TRANSMISSION LINE

Voltage, kV .....	115	115	34.5
Length, Mi. (for New Line) .....	25	40	4
Type .....	Wood-Pole	Wood-Pole	Wood-Pole

ACCESS ROADS

New Roads, Miles .....	1.0	3.6	7.0
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**ALASKA POWER AUTHORITY**

334 WEST 5th AVENUE - ANCHORAGE, ALASKA 99501

Phone: (907) 277-7641  
(907) 276-0001

February 9, 1983

Mr. Jack Kreinheder  
House Research Agency  
Pouch Y  
Juneau, Alaska 99811

Subject: Tye Hydroelectric Project-Summary of Estimated Total Costs

Dear Jack:

As per your request, following is a brief summary on the sequence of events on the Tye hydropower project primarily relating to cost. The summary of Board actions was extracted from our corporate minutes. Most of the actions taken by the Board were based on advice from myself and my staff.

On December 19, 1979, the Alaska Power Authority submitted a revised application to the Federal Energy Regulatory Commission (FERC) for the construction of the Tye Hydroelectric Project in the vicinity of Wrangell and Petersburg, Alaska. Our engineers, R.W. Retherford Associates/International Engineering Company (IECO) estimated the total cost of the project at that time at \$39,590,000 (1980\$'s). With an allowance for inflation and interest during construction the estimated total capital investment at that time came to \$53,333,000.

In September 1980, IECO submitted a revised cost estimate of \$50,976,000 (August 1980\$'s).

Early in 1981, the Power Authority retained EBASCO Services, Inc., to prepare an independent cost estimate. EBASCO subsequently estimated the total project cost at \$96,693,000 (May 1981\$'s). Escalated to the midpoint of construction, this would represent a completed cost of approximately \$110 million. After reviewing the EBASCO estimate, IECO conceded that its previous estimates were low and IECO raised its estimate to \$81,069,000 (June 1981\$'s). EBASCO refuted this revised estimate.

Procurement of long-lead-time turbines began in July 1981 in anticipation of a FERC license. The Board of Directors was realigned by Statute in the latter part of July 1981. The FERC issued a license on August 5, 1981 and the award of several additional procurement and one construction contract followed almost immediately thereafter.

IECO continued to make monthly reports on the status of the project, including estimated total project costs. It is important to note that by the end of March 1982, IECO had increased its project estimate to \$97,072,000,

including engineering costs prior to construction. In the March report the overhead transmission line was estimated to cost \$12,840,000 plus a \$6,000,000 contingency. Less than two months later, during the bid opening for that contract, IECO provided an engineer's estimate of \$23,280,897.00--an estimate that is 24 percent above any previous estimate, including contingency funds. The actual low bid was even higher at \$24,901,466.

Starting with the IECO estimate from the March 1982, report, adjusting for the actual low bid on the transmission line, and adding the estimated cost for a proposed separate substation construction contract, the estimated total project cost was increased by IECO to \$110,133,000 (May 1982). This did not include approximately \$5 million for owner provided insurance. During the months that followed, the total project cost has decreased and increased, slightly, as adjustments have been made for actual bids on relatively small procurement contracts..

In December 1982, and again in January 1983, senior staff of IECO and IECO's parent company, Morrison Knudson (M-K), met with representatives of the Power Authority to discuss construction management of the project, including total project costs. The latest information from IECO is that the total project cost will not exceed \$124,886,100. The Power Authority has asked the parent company, M-K, to completely review this estimate. A report from the M-K staff is anticipated the second week of March 1983.

A summary of Board actions, as extracted from our corporate minutes, is as follows:

October 4, 1978 Board receives report on Tye Project indicating that, according to the reconnaissance study by Robert W. Retherford Associates, (RWR) the Project looks favorable and that Thomas Bay Power Commission (TBPC) will soon enter into contract with RWR for Federal Energy Regulatory Commission (FERC) work and that TBPC may request the Alaska Power Authority to take over the project.

November 18, 1978 APA Board voted to make \$120,000 loan to TBPC for Tye FERC work and this would supplement the \$300,000 available from the Water Resources Revolving Loan Fund (WRRLF) in order to cover the \$475,000 contract with RWR.

June 21, 1979 Board makes a loan to TBPC of \$60,000 for Tye Project. TBPC and Representative E.J. Haugen request the APA take over Tye. The Board directed staff to bring information back at next Board meeting for Project take-over.

September 27, 1979 Tye Letter of Understanding with TBPC adopted by Board.

November 2, 1979 Board authorized Executive Director to submit FERC license application. Also passed "stop-the-clock" resolution needed for bonding.

February 7, 1980 Board agreed to extend contract for advanced Engineering

and Design to IECO for Tyee but it was later decided with legal council to seek competitive proposals.

April 18, 1980 Board selects IECO for the Engineering and Design from among three proposals.

October 23, 1980 Board informed that costs have increased from \$39,000,000 to \$51,000,000 and has IECO explain to Board.

April 20, 1981 Board selects consultant panel as required by FERC.

May 14, 1981 Board awards Bids for Turbines.

July 6, 1981 Board considered awarding contract for Steel Towers and Conductors but defers "notice to proceed" until after opening of major Civil Contract so that the Board could get a better fix on the true cost of the Project.

August 18, 1981 FERC license has been received. Bids for Civil construction were reviewed as were the economics of the Project based on new cost estimates. Notice-to-proceed was given on Towers and Conductors. The Board was informed that existing funds were insufficient and that interim financing would be necessary. Board deferred action until the next meeting.

September 10, 1981 Board awards Civil Works contract to Southeast Harrison Western (SEHW) after lengthy debate.

October 2, 1981 Board informed on legal actions against Tyee construction contracts. Need for interim financing was discussed and indicated a proposal would be presented to the Board in December, 1981. Risk Management's desire to use "Wrap-up Insurance" on Tyee Project was discussed and actions that would be taken to effectuate such a program.

December 15, 1981 A Finance Plan was presented to the Board. It was recommended that the Board appoint a subcommittee to review the feasibility of the Tyee Project based on present knowledge of the costs. Commissioners Ward and Mueller and Dr. Weeden were appointed to the subcommittee. The Board moved that final financing documents for financing be prepared. The economics of the Project was reviewed.

January 22, 1982 Senator Dankworth and Representative Haugen addressed the Board and recommended proceeding with interim financing. Board authorized securing of \$50,000,000 in interim financing. Board awarded a contract for Underwater Cables.

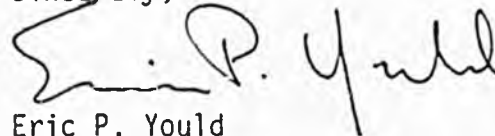
May 25, 1982 The Board awarded the Overhead Transmission Line contingent upon the Legislature not passing a piece of legislation that was being considered but that subsequently was not passed. Thus on June 3, 1982 the Executive Director informed the Board of his intent to issue the award for Transmission Tower construction.

February 9, 1983

October 22, 1982 The Board awarded contract for Transformers.

I trust this information is of assistance to you. If there is any further information you need, please call on me.

Sincerely,



Eric P. Yould  
Executive Director

CC:

C. Conway

Comm. D. Lyon

# MEMORANDUM

State of Alaska

TO Gordon Harrison  
Associate Director  
Office of Management and Budget FILE NO  
Division of Strategic Planning

DATE February 23, 1983

TELEPHONE NO 465-3573

FROM George Matz <sup>GSM</sup>  
Division of Strategic Planning  
Office of Management and Budget

SUBJECT Tyee Lake Project

There has been controversy recently regarding the Tyee Lake Project. The City of Petersburg has stated that the cost of power from the project is too expensive and they may not want to sign a power sales contract under the terms initially proposed by the Alaska Power Authority (APA). This situation has led to an examination of other questions including the projects economic feasibility and the process by which this is determined. The purpose of this memo is to provide an historical perspective on the question of economic feasibility. The information in this memo should supplement rather than duplicate information in a February 9, 1983 memo from Eric Yould to Jack Kreinheder and a February 11, 1983 memo from Jack Kreinheder to Representative Don Locksin.

The feasibility study for the Tyee Lake Project was completed for the APA in December of 1979. The statute at this time (AS 44.56.180) required the Office of the Governor to evaluate APA feasibility studies. Since the APA was in its infancy and the Tyee Lake Project was its first project to have completed a feasibility study, no formal review was undertaken.

In 1980, the Legislature passed an omnibus energy bill (Ch 83, SLA 1980) which amended requirements for APA reconnaissance and feasibility studies. This bill also requires the Division of Budget and Management (now Office of Management and Budget) to review these studies for statutory compliance and provide a recommendation to the Governor and the Legislature for feasibility studies. However, certain projects, including the Tyee Lake Project, had been previously approved by the Legislature and were exempted from review by the Division of Budget and Management. House Joint Resolution No. 62, which had been approved by the Legislature earlier in the 1980 session, stated that the general design of the Tyee Lake Project was approved and that the APA could incur \$70,000,000 in revenue bond indebtedness to finance the project.

In 1981, the Legislature once again made significant amendments to the APA statutes (Ch 118, SLA 1981). One of the more significant amendments established a Power Development Fund to be used primarily for financing construction of State owned power projects. Restrictions were placed on the use of this fund. One of these restrictions (AS 44.83.394) states that "the authority may not use money in the fund for a power project except in compliance with AS 44.83.177-44.83.187 and unless the authority determines that the project is economically feasible."

Ch 90, SLA 1981 (which was the appropriation bill which accompanied Ch 118, SLA 1981) made appropriations to begin construction on three power projects. These projects, and the amount of their respective appropriations are Tyee Lake Project - \$48,000,000, Swan Lake Project - \$53,000,000, and the Terror Lake Project \$81,500,000. Additional appropriations in the form of a loan, had previously been made to each of these projects. These loans were converted to grants by another bill Ch 91, SLA 1981.

Although each of these projects had completed feasibility studies and received legislative approval, AS 44.83.394 required a final review of the economic feasibility of each project before the APA could make expenditures from the Power Development Fund. The statutes are not specific as to how the economic feasibility should be determined. The APA assumed that the feasibility assessment should be treated as an updated supplement to previous feasibility studies rather than repeat the entire process.

Apparently, the APA's first attempt at complying with AS 44.83.394 was an August 13, 1981 memo from Robert Mohn, Director of Engineering to the Record (see Attachment A). The information in this memo was presented to the August 18, 1981 meeting of the APA Board of Directors to demonstrate that even with more recent and higher construction cost estimates, the Tyee Lake Project was economically feasible at the "most likely" load growth rates. Following this presentation, the Board was asked to approve the award of construction contracts which would obligate funds in the Power Development Fund. It should be noted that this was the first meeting of a newly appointed Board of Directors and not all of the Board members were familiar with statutory requirements for power projects.

Ron Lehr, a Board member and Director of Budget and Management at that time, questioned some of the points used in the presentation and requested backup information. This information was sent to Budget and Management where staff found the information inadequate to make a determination regarding the economic feasibility of the Tyee Lake Project. APA staff was informed of this and responded in a September 10, 1981 letter with copies of the calculations used for the August 13, 1981 memo.

Budget and Management staff reviewed these calculations, found some technical errors, and requested that corrections be made in the analysis. Apparently, the request led to a decision by the APA to provide a more complete and adequate explanation of the economic feasibility of the project. The product of this effort was a "Findings and Recommendations" report that was completed on December 2, 1981 and distributed to the Board at its December meeting. This report fully explained the assumptions that were being used and provided enough details to review the economic feasibility of the project.

Although a review by Budget and Management of the "Findings and Recommendations" report was not required by statute, a review was undertaken for the benefit of Ron Lehr who's interest was both as a Board member and State Budget Director. Ron Lehr distributed this review to the Board at its January, 1982 meeting.

The Budget and Management review (Attachment B) questioned several assumptions and calculations used in the "Findings and Recommendations" report. The conclusion of the review is that the Tyee Lake Project may not be economically feasible based on the "most likely" load forecast but should be economically feasible if the actual load should exceed the "most likely" load forecast. Some of the more significant points brought out in the review are given below.

- 1) If and When - The economic feasibility analysis of a power project, particularly projects having a long life such as hydro power, should not only determine "if" the project is feasible but "when" is the most economic time to begin construction. A timing exercise of this nature was not done for the Tyee Lake Project even though such an exercise is most applicable to projects which have initial overcapacity, such as the Tyee Lake Project.
- 2) Reserve Capacity - Neither this economic analysis or cost of power calculation considered the cost of reserve capacity.
- 3) Load Forecast - The base year for the load forecast was higher than actual data. Also, the load forecast assumed an increase in electric space heating even though fuel oil appears to be a less expensive alternative.
- 4) Alternative - A number of smaller and less remote hydro-electric alternatives were not given detailed consideration. U.S. Army Corps of Engineers data indicates that some of these projects could have lower power costs than the Tyee Lake Project. Also, since all of the projects were smaller, overcapacity would not be a significant problem.

The load forecast in the most significant and perhaps the most uncertain parameter which applies to the economic feasibility of the Tye Lake Project. Since the load forecasts were made a few years ago, we now have the benefit of hindsight to assess the accuracy of the first few years of the forecast. This information is presented below based on the "most likely" forecast for the "Findings and Recommendations" report and the "expected" forecast for the Feasibility Study. The Feasibility Study used 1978 as the last year of actual data. Neither of these forecasts, as presented, subtract out approximately 11,700 MWh of annual generation from an existing hydroelectric facility near Petersburg.

Energy Sales (MWh) for Wrangell and Petersburg

<u>Year</u>	<u>Actual</u>	<u>Findings and Recommendations Report</u>	<u>Feasibility Study</u>
1978	29,981	---	29,981
1979	29,087	---	31,445
1980	29,788	30,535	32,990
1981	29,222	31,726	35,275
1982	30,989	32,963	37,710

In summary, commitments to the Tye Lake Project have been slightly ahead of establishing a more rigorous process for assessing the economic feasibility of proposed APA projects. Specifically:

- 1) the feasibility study for the project was completed before an independent review process was firmly established by the Legislature;
- 2) the Legislature approved the project without benefit of an independent cost analysis as now required by statute; and
- 3) construction contracts had been awarded before the "Findings and Recommendations" report had been completed and before the provisions of AS 44.83.394 has been met.



STATE OF ALASKA  
OFFICE OF THE GOVERNOR  
JUNEAU

February 8 1984

The Honorable Jalmar Kerttula  
Alaska State Senate  
Pouch V  
Juneau, AK 99811.

Dear Senator Kerttula:

Under the authority of art. III, sec. 18, of the Alaska Constitution, I am transmitting a bill relating to the sale of power by the Alaska Power Authority. The bill amends portions of AS 44.83.398, which governs sale of power from projects in the energy program for Alaska. The amendments are necessary before power sales agreements can be signed and long-term financing can be put in place for the Lake Tye, Swan Lake, Solomon Gulch, and Terror Lake hydroelectric projects -- the "four dam pool."

A section-by-section analysis follows.

Sections 1 (by amending AS 44.83.398(a)) and 5 (by repealing AS 44.83.398(d)) of the bill eliminate restrictions on industrial power rates that may be charged by utilities purchasing power from projects in the energy program for Alaska. The statute currently prohibits utilities from charging a retail power rate to industrial consumers that is less than the rate charged to residential consumers. The change allows utilities to offer a lower rate to large-volume consumers, or consumers who currently use their own generation sources, which should reduce the overall rate to all consumers. The authority has discussed with the utilities the use of fixed-term supply contracts with industrial users with the length of the contract limited so that, when usage of power from the hydroelectric facilities approaches capacity, more power will be available to residential consumers and they will not end up subsidizing industrial power rates.

Section 1 also provides for the combination of the Lake Tyee, Swan Lake, Solomon Gulch, and Terror Lake hydroelectric projects into one power project for the purposes of the wholesale power rate calculation in AS 44.83.398-(b)(1). This power project is referred to as the "initial project."

Section 2 deletes the "Susitna clause" in AS 44.83.398-(b)(2). Repeal of this provision is desired by both the authority and the purchasing utilities because of the potential effect on rates. It is also viewed as crucial to the long-term financing of the initial project and future projects in the energy program for Alaska. The rating services are reluctant to give a favorable rating to revenue bonds issued with this provision in place because of the possibility that ratepayers' rates could increase substantially in 1991. The rates could be high enough to reduce demand and revenues, thus jeopardizing the ability of the utilities to meet their payment obligations under the power sales contracts.

Section 2 also describes the method for determining the amounts to be allocated to each hydroelectric facility in the initial project. Under this combined system the facilities share the debt service for the entire project and there is a single cents-per-kilowatt-hour rate for debt service applicable to all four hydroelectric facilities in the initial project. The rate for costs of operations, maintenance, equipment replacement, safety inspections, and investigations is determined separately for each facility. The result is a different wholesale rate for each facility in the initial project, but a sharing of debt service which substantially reduces the wholesale rate for projects such as Lake Tyee.

Section 3 adds a sentence to AS 44.83.398(e) to allow the power authority to contractually limit the amount of debt service payable by power purchasers as a consequence of the later addition of new projects to the energy program for Alaska.

Section 4 removes the reference to the "Susitna clause" from AS 44.83.398(g).

Section 6 provides for an immediate effective date.

Sincerely,

  
Bill Sheffield  
Governor

Alaska Power Authority  
Commissioner: D Lyon  
Executive Director: Lary Crawford

Board meeting, 22 February 1984

Power Sales agreements;

1. Copper Valley: close to an agreement. Jim Billingham, manager of utilities states that he shows some concern of confronting his public with a cost not seen before. Presently Glennallen diesel generation is .06 PKW and proposed APA power will be .07 PKW. This constitutes a 40% increase to some. Valdez is an emphatic NO! Average monthly consumption in Glennallen is 340 KWH and translates to \$90 per month, while Valdez is running an average monthly bill of 550 KWH or \$151. per month. A 40% increase can be devastating.
2. Wrangell: Matt Cole (position unknown) will be taking power sales agreement to city council Thursday night (Feb 23rd) for consideration. He says discussion (informal) with council members appears good and contract may be forthcoming.
3. Kodiak: David Neese, Mgr of Muni-power. Municipality has agreed to purchase power from APA. Two suggestions: possible loans to consumers and the establishment of an advisory board.
4. Ketchikan: Rick -?-- . mgr of utilities says it looks very good, contract in the making with questions as to wording of legal documents.
5. Petersburg: NO!

Management study (status report) presented by Roger McMannus of Mead consultants for FY 84, FY 85, FY 86.

Presently APA employes 69 persons

Executive Dept-----	4
Planning -----	9
Projects -----	18
Operations -----	7
Finance-Administration ---	31

*People* *People*

APA is asking for an immediate increase of 16, 17 more FY 85, and an additional 9 for FY 86 to total 111 persons.

1984 Susitna contingency fund: 3.18 Million dollars  
Drilling request (wantana dam) 1.9 million. if approved this will leave in the contingency fund 1.28 million.

Competitive bidding on Watana Dam drilling will be let 27 Feb 84 with awarding of contract sometime in mid April 84.

STATE OF ALASKA 1984 LEGISLATIVE SESSION  
FISCAL NOTE

Revision Date: \_\_\_\_\_

Page 1 of 2

REQUEST  
Bill/Resolution No.: HB 589  
Title: Relating to the Alaska Power Authority  
Sponsor: Governor  
Requestor: \_\_\_\_\_  
Date of Request: \_\_\_\_\_

FISCAL DETAIL  
Agency Affected: Commerce & Economic Development  
Program Category Affected: Development  
BRU, Program or Subprogram(s) Affected: Alaska Power Authority

EXPENDITURES/REVENUES: (Thousands of Dollars)

	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89
OPERATING						
100 PERSONAL SERVICES						
200 TRAVEL						
300 CONTRACTUAL						
400 SUPPLIES						
500 EQUIPMENT						
600 LAND & STRUCTURES						
700 GRANTS, CLAIMS						
800 MISCELLANEOUS						
TOTAL OPERATING	-0-	-0-	-0-	-0-	-0-	-0-
CAPITAL						
REVENUE						

FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER						
TOTAL						

POSITIONS:

FULL-TIME						
PART-TIME						
TEMPORARY						

SOURCE OF FUNDS TO OFFSET FISCAL IMPACT OF BILL:

ANALYSIS: Attach a separate page for analysis

Prepared By: George Matz Phone: 465-2079  
Division: Dept. of Commerce & Economic Development Date: 1/6/84  
Approved by Commissioner: Richard A. Lyon Date: 2/6/84  
Agency: Dept. of Commerce & Economic Development

Distribution (by Agency preparing fiscal note):

- Legislative Finance
- Legislative Sponsor
- Requestor
- Office of Management and Budget
- Impacted Agency(ies)

12/1/83

Analysis:

HB 589

Page 2 of 2

Repeal of the "Susitna Clause" will remove the obligation that the State must appropriate \$5 billion to the Power Development Fund by 1991 in order to prevent triggering of a requirement that there be a 10 percent rate of return on power project investments.

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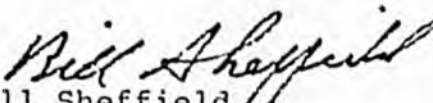
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