

LEG. FINANCE - BILLS 1979 - 1980 1017

SSHB 31 thru CSHB 32



# RECORDS CERTIFICATION



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James O. Smith  
Signature of Camera Operator

3/8/90  
Date

SENATE FINANCE COMMITTEE  
BILL CHECKLIST

- 1. Original Bill Document   ✓
- 2. History Cover Form   ✓
- 3. Printed Copies:
  - Original Bill   ✓
  - Committee Substitutes or  
Amendments   ✓
- 4. Committee Report Form   ✓
- 5. Fiscal Note:
  - In File   ✓ HB31
  - Requested            Date
- 6. Backup:
  - Handouts
  - Letter from Governor
  - Letter from Sponsor
  - Other

COMMITTEE REPORT  
SENATE

FURTHER: None

3/22/79

Date: April 9, 1979

Mr. President:

The Committee on FINANCE has had CS 2d SSHB 31  
creating the Delta Junction Bison Range Area

under consideration and (a majority of the committee) (the committee)  
reports it back with the following recommendations:

- do pass  do not pass
- do pass with attached amendments(s)
- replace with CS for \_\_\_\_\_  same title  
 new title
- and recommends \_\_\_\_\_
- AND attaches a "Letter of Intent"  New Fiscal Note
- reports it back <sup>in the bill</sup> without recommendation
- referred to the \_\_\_\_\_ Committee

MEMBERS SIGNING  
DO PASS

John Schmitt - No Pass  
William Locking DOP-155  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

MEMBERS HAVING  
OTHER RECOMMENDATIONS:

Holman - No Rec  
Bert Ray - No Rec  
 \_\_\_\_\_  
LaPointe - No Rec  
Lawrence H. Roe  
 \_\_\_\_\_

John Schmitt  
 CHAIRMAN

Original sponsor: Moss

Offered: 3/15/79  
Referred: Rules

1 IN THE HOUSE

BY THE RESOURCES COMMITTEE

2 CS FOR 2d SPONSOR SUBSTITUTE FOR HOUSE BILL NO. 31

3 IN THE LEGISLATURE OF THE STATE OF ALASKA

4 ELEVENTH LEGISLATURE - FIRST SESSION

5 A BILL

6 For an Act entitled: "An Act creating the Delta Junction Bison Range Area."

7 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

8 \* Section 1. It is the purpose of this Act to perpetuate free-ranging  
9 bison on the land described in this Act by management of the habitat to pro-  
10 vide an adequate winter range for the bison. It is also the purpose of this  
11 Act to alter seasonal movements of bison herds on the land in order to dimi-  
12 nish the damage caused by the herds to agriculturally developed land.

13 \* Sec. 2. AS 16.20 is amended by adding new sections to read:

14 ARTICLE 6. STATE RANGE AREAS.

15 Sec. 16.20.300. DELTA JUNCTION BISON RANGE. The following de-  
16 scribed areas excluding valid existing rights, are established as the  
17 Delta Junction Bison Range Area:

18 (1) Township 11 South, Range 12 East, Fairbanks Meridian

19 Section 28: S 1/2 SW 1/4, SW 1/4 SE 1/4 and that portion  
20 of the NW 1/4 SW 1/4 east of the west bank of Granite Creek  
21 excluding A.S.L.S. 78-93, Tract A, Unit 1

22 Sections 29, 32: those lands east of the west bank of  
23 Granite Creek

24 Section 33: all, excluding A.S.L.S. 78-93, Tract A, Unit  
25 1

26 Section 34: S 1/2 NW 1/4, excluding A.S.L.S. 78-93,  
27 Tract A, Unit 1, S 1/2

28 Section 35: S 1/2, S 1/2 NW 1/4, that portion of the NE  
29 1/4 lying south of the Alaska Highway excluding a corridor

1 extending 1320 feet from the center line of the highway

2 Section 36: that portion lying south of the Alaska  
3 Highway excluding a corridor extending 1320 feet from the center-  
4 line of the highway

5 (2) Township 12 South, Range 11 East, Fairbanks Meridian

6 Sections 13, 24-26, 35, 36: all

7 Sections 1, 11, 12, 14, 22, 23, 27, 34: those lands east  
8 of the west bank of Granite Creek

9 (3) Township 12 South, Range 12 East, Fairbanks Meridian

10 Sections 1-4, 7-25, 30, 36: all

11 Sections 5, 6: those lands east of the west bank of  
12 Granite Creek

13 (4) Township 12 South, Range 13 East, Fairbanks Meridian

14 Sections 5, 6, 9: that portion lying south of the Alaska  
15 Highway excluding a corridor extending 1320 feet from the center-  
16 line of the highway

17 Section 7: all

18 Section 8: all, excluding a corridor extending 1320 feet  
19 from the centerline of the Alaska Highway

20 Section 10: that portion of the SW 1/4 lying south of  
21 the Alaska Highway excluding a corridor extending 1320 feet from  
22 the centerline of the highway

23 Section 14: S 1/2 S 1/2 SW 1/4

24 Section 15: S 1/2, NW 1/4, excluding a corridor  
25 extending 1320 feet from the centerline of the Alaska Highway

26 Sections 16-22: all

27 Section 23: S 1/2, NW 1/4, S 1/2 NE 1/4, S 1/2 N 1/2 NE  
28 1/4

29 Section 24: SW 1/4, S 1/2 NW 1/4, excluding a corridor

1 extending 1320 feet from the centerline of the Alaska Highway, S  
2 1/2 S 1/2 SE 1/4

3 Sections 25-36: all

4 (5) Township 12 South, Range 14 East, Fairbanks Meridian

5 Sections 19, 28-30, 33-35: that portion lying south of  
6 the Alaska Highway excluding a corridor extending 1320 feet from  
7 the centerline of the highway

8 Sections 31, 32: all

9 (6) Township 13 South, Range 13 East, Fairbanks Meridian

10 Sections 1-5, 9-15, 23-25, 36: all

11 (7) Township 13 South, Range 14 East, Fairbanks Meridian

12 Section 1: that portion lying south of the Alaska High-  
13 way excluding a corridor extending 1320 feet from the centerline of  
14 the highway

15 Sections 2-36: all

16 (8) Township 13 South, Range 15 East, Fairbanks Meridian

17 Sections 5, 6, 8-10, 15: that portion lying south of the  
18 Alaska Highway excluding a corridor extending 1320 feet from the  
19 centerline of the highway

20 Sections 7, 16-20, 30: all

21 Sections 21, 22, 28, 29, 31, 32: that portion lying west  
22 of the east bank of the Little Gerstle River

23 (9) Township 14 South, Range 14 East, Fairbanks Meridian

24 Section 1: that portion lying west of the east bank of  
25 the Little Gerstle River

26 Sections 2-6: all

27 (10) Township 14 South, Range 13 East, Fairbanks Meridian

28 Section 1: all

29 (11) Township 14 South, Range 15 East, Fairbanks Meridian

1                   Section 6: that portion lying west of the east bank of  
2                   the Little Gerstle River

3                   Sec. 16.20.310. GAME MANAGEMENT PLAN. (a) The commissioner of  
4                   fish and game shall develop and may amend a game management plan for  
5                   bison in the area described in AS 16.20.300. After holding public  
6                   hearings in accordance with AS 44.62.310 and 44.62.312, the commissioner  
7                   shall implement the game management plan.

8                   (b) The game management plan shall include, but is not limited to,  
9                   (1) planting grains for bison and planting other wildlife  
10                  forage;

11                  (2) altering existing plant cover to create additional range  
12                  and year-round habitat for bison and other animal species in the area;

13                  (3) tilling to produce forage.

14                  (c) The commissioner of fish and game shall develop and amend the  
15                  game management plan to coordinate, as closely as possible, the game  
16                  management plan with the activities of the Agricultural Development  
17                  Authority, Department of Natural Resources, relating to the Big Delta  
18                  agricultural development project.

19                  Sec. 16.20.320. ACTIVITIES ON RANGE AREA. Nothing in AS 16.20.-  
20                  300 - 16.20.320 shall be construed as prohibiting activities on land  
21                  described in AS 16.20.300 which are otherwise permitted in accordance  
22                  with the laws and regulations of this state, including, but not limited  
23                  to, hunting, trapping, engaging in recreational activities and using the  
24                  land for access to adjacent areas.

A M E N D M E N T #2

Offered in the SENATE

By Sumner

TO: CS FOR 2d SSHB 31

Page 4, line 25, add the following new language:

\* Sec. 3. The provisions of secs. 1 and 2 of this Act terminate three years after the effective date of this Act unless the legislature provides otherwise by law, ~~within three years after the effective date of this Act.~~

HB 31  
HB 119

## DELTA BISON MANAGMENT

Annual costs at present: \$16,500  
Proposed brome planting: \$2,500,000 over next five years

### Background

About 20 buffalo were transplanted to central Alaska from Montana in the 1920s. Since then the herd has grown to an estimated 600-700 statewide, of which about 250 are in the Delta area.

Because the Delta herd often interferes with farmers in the area, the Department of Fish and Game in conjunction with the Governor's Office and Bob Palmer is proposing a five-year project to clear and plant 5,000 acres of brome grass. According to F & G biologists, brome grass is "candy" to a buffalo and should keep the animals from straying into farmers' fields, ruining crops and generally creating management problems.

The brome project is estimated to cost \$2.5 million over the next five years. The department currently is requesting about \$50,000 to clear and plant the first 100 acres. Each succeeding year the department plans to clear and plant an additional 500 acres, until the 5,000 acre total is planted.

Don McNight, game research chief for the game division, said the department cannot be 100 percent certain that the brome project will succeed or that the animals will not continue to cause the farmers problems. But McNight said the department does not have any other solutions. Fences won't work, and a mass transport is not considered feasible.

McNight said there also may be problems with the feds, who have indicated they do not want any buffalo in the national parks/monuments withdraw because the animals are not native to Alaska. Specifically, the feds have said they want the approximately 70-animal herd in the Wrangell-St. Elias proposed park moved out. If the feds elect to transport the animals to the Delta area, management problems and cost to the state would substantially increase, McNight said.

The department has considered destroying the Delta herd, but believes politically such a decision would be met with fierce opposition. People in the Delta area are very defensive of the bison.

Rep. Pappy Moss has introduced legislation to establish a 70,000 acre critical habitat area on state lands adjacent to, but away from, the existing and potential barley fields. He proposes the area as an alternative range where the bison would ruminant. Of the 70,000 acres, Fish and Game proposes to clear and plant 5,000. Moss also has introduced a bill to appropriate \$20,000 to Fish and Game to develop and implement a comprehensive management plan for the bison.

/jk

ANNUAL COSTS FOR BISON MANAGEMENT

Delta Biologist 2.5 months	Salary	\$ 4,430
	Benefits	<u>1,130</u>
		5,560
Assistance from Reg. III Biologists 1.5 months	Salary	4,090
	Benefits	<u>1,140</u>
		5,230
Temp. Fish and Game Technician 3 months	Salary	4,560
	Benefits	<u>450</u>
		5,010
	TOTAL	\$15,800
Vehicle mileage		200
Air charter		<u>500</u>
	TOTAL ANNUAL COSTS	\$16,500

CLEARING AND BROME PLANTING PROJECT (5,000 acres over 5 years)

Clearing land (100 acres)	\$36,480
Trail construction	4,560
Seeding and fertilization	<u>4,560</u>
	\$45,600

----figures from Don McNight, Dept. of Fish and Game

/jk

# THE DELTA LAND MANAGEMENT PLANNING STUDY

## PART VII: WILDLIFE

### CITIZEN COUNCIL OPINION

Several wildlife issues were discussed at the Citizen Council's February meetings. Regarding bison, most Citizen Council members wanted special areas set aside for bison habitat management, and a majority of these people agreed with proposals for three management areas: one south of the Alaska Highway and two along the Delta River. Citizen Council members thought these areas ought to be managed by the Department of Fish and Game, but wanted to hear specific plans.

A majority also approved proposals for habitat manipulation on three old burns: at Jarvis Creek, Ninetyeight Creek and Flat Creek. (Habitat manipulation is intervention in natural processes to favor a particular species. For instance, an old burn starting to grow back in black spruce might be re-burned to encourage new growth of willows, a preferred browse for moose.)

A majority of the Citizen Council also agreed that the Goodpaster Flats, Shaw Creek Flats, and the entire Macomb Plateau (not just the part that lies within the study area) should be managed for wildlife habitat.

### PLANNING TEAM RECOMMENDATIONS

**BISON.** The Delta bison herd is the largest and most viable in Alaska. It is felt that the herd should be maintained as wild and free-ranging, with its numbers being controlled by annual public hunting.

It is recommended that three bison habitat management areas--south of the Alaska Highway, gravel bars and lowlands of the Delta River north of Black Rapids, and the west side of the Delta near Rainbow Lake--be established. (See map.) The Division of Lands should classify these areas immediately to facilitate their management by the Department of Fish and Game.

One of the areas--grassy bars and adjacent lowlands on the west bank of the Delta River near Black Rapids--is on Fort Greely military lands. Essentially all bison calving occurs in this area, and it serves as summer habitat for most of the herd. Because it is so important, the Planning Team recommends that the State attempt to acquire the area. If this is not possible, the State should seek a cooperative management agreement with the military. To insure that this bison calving and summering grounds receives adequate protection, it is recommended that the state legislature designate it as critical habitat.

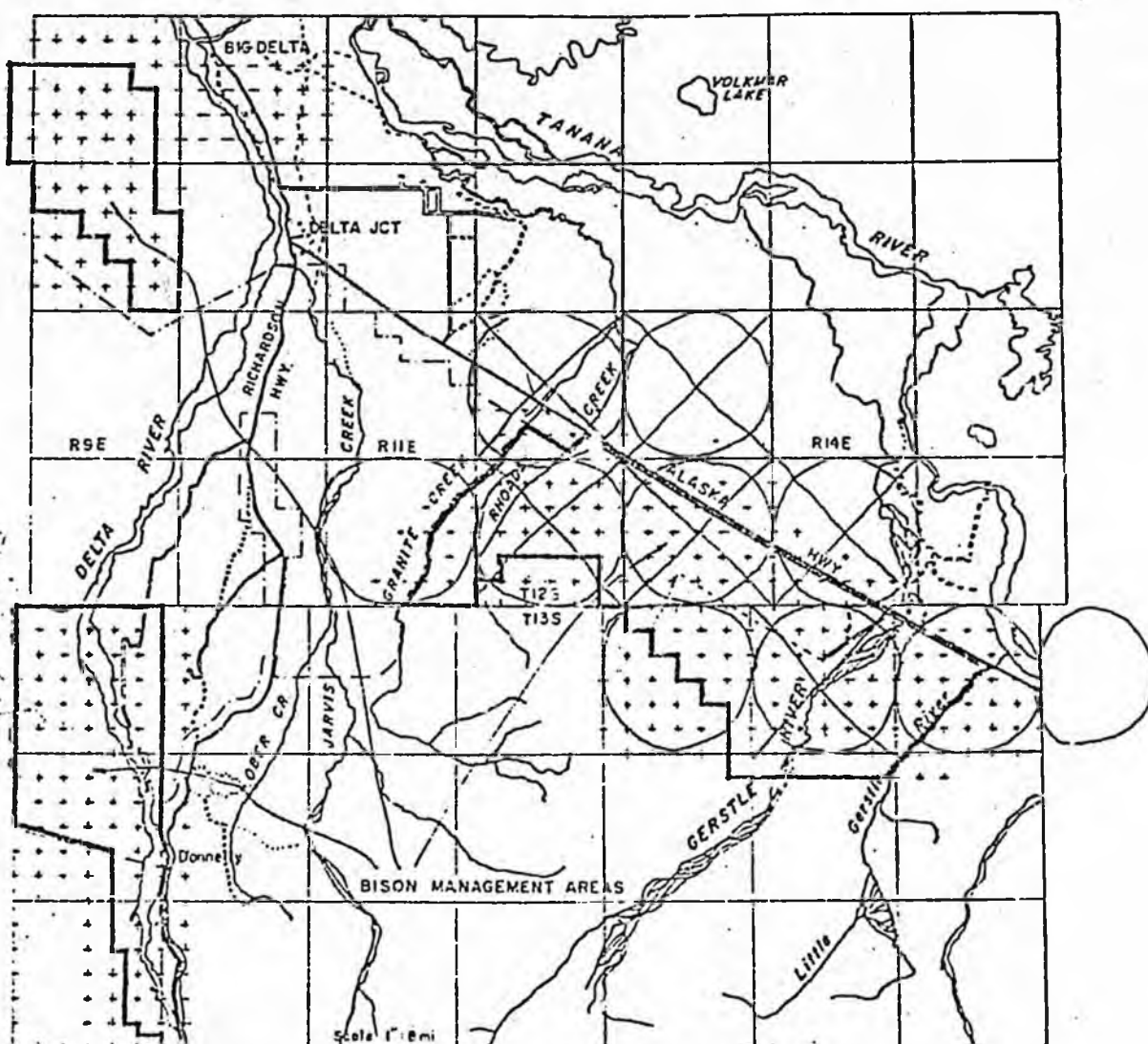
From early September through February, the bison herd is in or near the Clearwater farming district. To assure that the bison continue to have adequate winter range and in an attempt to keep the bison out of fields that have not yet been harvested, it is recommended that the legislature establish a wildlife management area on state lands south of the Alaska Highway to the foothills of the Granite Mountains, from Granite Creek on the west to the Little Gerstle River on the east. This area should be administered for the benefit of all its wildlife, not only bison, and with due consideration given to timber, recreation, and other resources found there. The Department of Fish and Game should develop a management plan for the area and present it to the public before any habitat manipulation is undertaken. (Tentative plans call for a total of 5,000 acres to be planted in grains for wildlife forage; in addition, each year some 2,000

## THE DELTA LAND MANAGEMENT PLANNING STUDY

to 5,000 acres--possibly up to 10,000--would be burned. However, the pace and scale of habitat manipulation depend to some extent on the pace and scale of agricultural development in the Clearwater farming area.) It is further recommended that the military be encouraged to return lands it has disturbed within this area to their original condition.

As an aid to habitat management, it is recommended that the existing soil survey along the Alaska Highway be extended south to the limit of the Class II and III soils.

In all three bison areas, hunting, fishing, and trapping should be allowed to continue, along with any other use that does not interfere with the maintenance of the habitat's productivity. Intensive development would not be consistent with the purposes for which these bison areas are recommended.



BURNS. (See maps.) It is recommended that the Jarvis Creek, Ninetyeight Creek, and Flat Creek burns be classified to protect wildlife habitat and to allow the Department of Fish and Game to undertake habitat manipulation. Hunting, fishing, and trapping would be compatible uses of these areas.

## THE DELTA BISON RANGE

2/1/52  
The Delta bison herd stands in the path of agricultural and economic development. A bison range in the Delta Junction area will eliminate many future conflicts, perpetuate free ranging bison, and secure the future of lands well suited for wildlife recreation.

The trend of economic development in the Delta area will significantly reduce bison range in the near future. Moose range and habitat for waterfowl and upland game bird hunting will also be reduced significantly. With the advent of a large increase in tilled land of private ownership or single purpose use, access for the purpose of hunting or recreation may be severely restricted or become too costly for the average Alaskan.

A bison range encompassing significant moose winter range as well as a valuable public hunting area for big game, waterfowl and upland game birds would minimize the impact of development in this area.

The proposed Delta Bison Range lies southeast of Delta Junction in relatively flat to rolling country in the shadow of the Alaska Range. The area encompasses 77,595 acres. The vegetation of the area is dominated by black spruce with white spruce along the drainages. Soil types in the lower elevations indicate the land is arable. The Department proposes to clear and develop 5,000 acres for bison range. This portion of the bison range will be tilled to produce forage for wintering bison. The remaining land not specifically tilled for bison winter forage will be periodically and systematically managed by altering the existing

plant cover to create additional bison range as well as winter range for moose and year around habitat for sharp-tailed grouse, ruffed grouse and furbearers. The lower Gerstle River and surrounding area appears to be suitable or easily developed as a calving ground and supplement to the presently used summer range.

The development of alternate calving and summer range would help insure the long term future of the Delta Bison herd. The high degree of dependence on the limited calving and summer range on federal lands used by the military and a similar dependence on the existing agricultural lands for winter range leaves the herd with a very tenuous future. The total area proposed for the Bison range also encloses some fine lakes and clear water grayling streams. Future development of the stocked lakes would be enhanced under the concept of a State wildlife range.





## Buffalo Legislation Proposed . . .

Continued from Page 1

inevitably occur, which the department has attempted to curb over the years with varying, but mostly minimal, degrees of success. They have endeavored to round-up and corral them on foot, on horseback, and even from helicopters, during critical growing and harvest seasons.

When the Delta herd increased to nearly 500 animals in the late 60s, conflicts proliferated and became proportionately more nettlesome for local growers and homeowners. That led to the first and only transplant to another habitat in Alaska, and about 30 bison were released on a wilderness site, at Farewell, about 100 miles south of McGrath. Other small groups have split away from the main herd and settled in the Healy Lake and Chitina River areas. The department estimates that there currently is a total of 600 to 800 bison in Alaska. One splinter herd slowly emigrated to a new range in the Copper River region a couple hundred miles southeast of Delta. It has also multiplied over the years, and at one time included a fabled albino buffalo which hunters stalked unsuccessfully for years. The white beast eventually disappeared, and its fate is unknown except, perhaps, to some unchronicled poacher.

One legislator asked Bob Hinman, deputy director of the division of game, whether it wouldn't be more practical to fence the Delta bison out of the grain fields, than to try to create an enormous new habitat for them. Aside from

the prohibitive cost of fencing miles of farmland, Hinman replied, no fence is bison-proof. Its vulnerability, he said, is largely measured by the strength of a given bison's motive to, well, bull its way through. And awed eyewitnesses in Delta tell of the cornered 2,000-pound beast which once cleared a seven-foot log fence from a standing position.

Despite an ingrained professional bias against managing exotic — that is, non-native — species, most Fish and Game Department biologists have developed a grudging affection for Alaska's remnant bison herds, and have managed them fairly well over the years in the face of imposing obstacles. They have enthusiastically endorsed Rep. Moss' proposal to develop a new habitat and management plan for the Delta herd.

If the legislature approves, they tentatively plan to clear 5000 acres of the proposed 70,000-acre critical habitat area of dense, mature stands of dense, mature stands of alder, black spruce, and willow, both by controlled burns and conventional land clearing techniques. That would set the stage for new growths of the grass, vetch, pea vine and other plants on which the bison thrive. They also plan to clear and plant trails of grain, marked at intervals with salt licks, leading away from the farmlands.

Rep. Moss has also observed that some family groups which migrate annually from their spring calving grounds to overwintering areas are beginning to follow a new migration route which closely tracks the route

of the trans-Alaska oil pipeline in the area where lush grasses and other edible lowbush have sprouted in the wake of construction. Fortunately, the new route meanders away from the farmlands, thrusting into the proposed new critical habitat area.

Deputy Director Hinman told the committee members he can't assure them that the experimental plan will be successful nor even guess what variations or innovations may develop the range manipulation effects proceeds along the lines proposed.

But he thinks it's worth a try. The alternative may be a dismal micro-version of the conservation tragedy which wiped out millions of the Delta bison's ancestors in the American plains 100 years ago.

### RUSSELL BLOOD

Marine Sgt. Russell Blood, son of Mr. and Mrs. Slim Blood of Mineral Creek Loop Road, Valdez, recently participated in exercise "Palm Tree 5-78" in the California desert.

He is assigned to the 2nd Battalion, 5th Marines, based at Camp Pendleton, Calif.

Conducted at Marine Corps Air/Ground Combat Training Center, Twentynine Palms, Calif., "Palm Tree 5-78" tested the capability of a battalion landing team to deploy by strategic airlift and to provide realistic live-fire training. The exercise stressed coordinated air and artillery fire support for infantry units.

A 1974 graduate of Valdez High School, Blood joined the Marine Corps in July 1974.

Subscribe

FISCAL NOTE

I. REQUEST

Bill/Resolution No. HB 31
Title An Act creating the Delta Junction critical habitat area
Requested by House Resources Date 2/14/79

II. FISCAL DETAIL

Agency Affected Department of Fish & Game
Program Category Affected Natural Resources
Budget Request Unit(s) Affected Game Division & Habitat Protection

EXPENDITURES (Thousands of Dollars)

Table with 7 columns (FY 79 to FY 84) and 7 rows (100 PERSONAL SERVICES to 700 GRANTS, CLAIMS, ETC). Total row shows -0- for all years.

FUNDING (Thousands of Dollars)

Table with 7 columns (FY 79 to FY 84) and 3 rows (GENERAL FUND, FEDERAL FUNDS, OTHER (Specify)). All values are -0-.

POSITIONS

Table with 7 columns (FY 79 to FY 84) and 3 rows (FULL TIME, PART TIME, TEMPORARY). All values are -0-.

III. ANALYSIS (See Fiscal Note Preparation Instructions, Section III)

Implementation of this legislation will cost an estimated 70.0 per year. These funds are included in the current operating budget, as the Department is involved in Bison management, and the funds which are part of HB 119. Therefore, the fiscal note on this piece of legislation is zero.

IV. DATE 2/15/79 PREPARED BY Russell H. Clark
AGENCY Department of Fish & Game
PHONE 465-4120
Original: Legislative Finance
cc: Budget and Management
Prime Sponsor (First Legislator Named)
Keith Specking, Office of the Governor
33-001 (Rev. 10/70)
File

Introduced: 2/2/79  
Referred: Resources

1 IN THE HOUSE

BY MOSS

2 SPONSOR SUBSTITUTE FOR HOUSE BILL NO. 31  
3 IN THE LEGISLATURE OF THE STATE OF ALASKA  
4 ELEVENTH LEGISLATURE - FIRST SESSION

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12 nish the damage caused by the herds to agriculturally developed land.

13 \* Sec. 2. AS 16.20 is amended by adding new sections to read:

14 ARTICLE C. STATE RANGE AREAS.

15 Sec. 16.20.300. DELTA JUNCTION BISON RANGE. The following de-  
16 scribed areas are established as the Delta Junction Bison Range Area:

17 (1) Township 11 South, Range 12 East, Fairbanks Meridian

18 Section 17: SW 1/4 those lands south of the Alaska  
19 Highway right-of-way

20 Section 18: S 1/2 those lands south of the Alaska High-  
21 way right-of-way

22 Section 19: NE 1/4, NW 1/4 those lands north of Fort  
23 Greely military withdrawal (P.L. 87-334), SE 1/4 those lands north  
24 of Fort Greely military withdrawal (P.L. 87-334)

25 Section 20: NE 1/4 those lands south of the Alaska  
26 Highway right-of-way, NW 1/4, SE 1/4, SW 1/4 those lands north of  
27 Fort Greely military withdrawal (P.L. 87-334)

28 Section 21: NW 1/4 those lands south of the Alaska  
29 Highway right-of-way, S 1/2 those lands south of the Alaska Highway

1 right-of-way

2 Section 22: SW 1/4 those lands south of the Alaska  
3 Highway right-of-way

4 Section 26: SE 1/4 those lands south of the Alaska  
5 Highway right-of-way, SW 1/4 those lands south of the Alaska High-  
6 way right-of-way

7 Section 27: NE 1/4 those lands south of the Alaska  
8 Highway right-of-way, NW 1/4 those lands south of the Alaska High-  
9 way right-of-way, S 1/2

10 Section 28: E 1/2, NW 1/4 those lands north of Fort  
11 Greely military withdrawal (P.L. 87-334), SW 1/4 those lands north  
12 of Fort Greely military withdrawal (P.L. 87-334)

13 Section 29: NE 1/4 those lands north of Fort Greely  
14 military withdrawal (P.L. 87-334), NW 1/4 those lands north of Fort  
15 Greely military withdrawal (P.L. 87-334), SE 1/4 those lands south  
16 of Fort Greely military withdrawal (P.L. 87-334)

17 Section 32: NE 1/4 those lands south of Fort Greely  
18 military withdrawal (P.L. 87-334), NW 1/4 those lands south of Fort  
19 Greely military withdrawal (P.L. 87-334), SE 1/4, SW 1/4 those  
20 lands east of Fort Greely military withdrawal (P.L. 87-334)

21 Sections 33, 34: All

22 Section 35: NE 1/4 those lands south of the Alaska  
23 Highway right-of-way, NW 1/4, S 1/2

24 Section 36: NW 1/4 those lands south of the Alaska  
25 Highway right-of-way, SE 1/4 those lands south of the Alaska High-  
26 way right-of-way, SW 1/4

27 (2) Township 11 South, Range 13 East, Fairbanks Meridian

28 Section 31: SW 1/4 those lands south of the Alaska  
29 Highway right-of-way

1 (3) Township 12 South, Range 11 East, Fairbanks Meridian  
2 Section 1: SE 1/4 those lands south of Fort Greely  
3 military withdrawal (P.L. 87-334)

4 Section 12: NE 1/4 those lands south of Fort Greely  
5 military withdrawal (P.L. 87-334), NW 1/4 those lands south of Fort  
6 Greely military withdrawal (P.L. 87-334), SE 1/4, SW 1/4 those  
7 lands south of Fort Greely military withdrawal (P.L. 87-334)

8 Section 13: All

9 Section 14: NE 1/4 those lands south of Fort Greely  
10 military withdrawal (P.L. 87-334), NW 1/4 those lands south of Fort  
11 Greely military withdrawal (P.L. 87-334), SE 1/4, SW 1/4 those  
12 lands south and east of the Fort Greely military withdrawal (P.L.  
13 87-334)

14 Section 23: E 1/2, NW 1/4 those lands east of the Fort  
15 Greely military withdrawal (P.L. 87-334), SW 1/4

16 Sections 24, 25, 26: All

17 Section 27: NE 1/4 those lands south and east of the  
18 Fort Greely military withdrawal (P.L. 87-334), SE 1/4 those lands  
19 south and east of the Fort Greely military withdrawal (P.L. 87-334)

20 Section 34: E 1/2, NW 1/4 those lands south and west of  
21 the Fort Greely military withdrawal (P.L. 87-334), SW 1/4 those  
22 lands south and west of the Fort Greely military withdrawal (P.L.  
23 87-334)

24 Sections 35, 36: All

25 (4) Township 12 South, Range 12 East, Fairbanks Meridian

26 Sections 1 - 4: All

27 Section 5: E 1/2, NW 1/4 those lands south of the  
28 Fort Greely military withdrawal (P.L. 87-334), SW 1/4

29 Section 6: NE 1/4 those lands south of the Fort Greely

1 military withdrawal (P.L. 87-334), SE 1/4, SW 1/4 those lands south  
2 of the Fort Greely militar, withdrawal (P.L. 87-334)

3 Sections 7 - 25: All

4 Section 30: All

5 (5) Township 12 South, Range 13 East, Fairbanks Meridian

6 Section 5: NW 1/4 those lands south of the Alaska Highway  
7 right-of-way, SE 1/4 those lands south of the Alaska Highway right-  
8 of-way, SW 1/4 those lands south of the Alaska Highway right-of-way

9 Section 6: NE 1/4 those lands south of the Alaska High-  
10 way right-of-way excluding lands within F025785, NW 1/4 those lands  
11 south of withdrawal F025785, S 1/2

12 Sections 7, 8: All

13 Section 9: NE 1/4 those lands south of the Alaska High-  
14 way excluding Mil. Pur. Wdl. (PLO 386), NW 1/4 those lands south of  
15 the Alaska Highway excluding Mil. Pur. Wdl. (PLO 386), SE 1/4 those  
16 lands south of the Alaska Highway right-of-way, SW 1/4

17 Section 10: SW 1/4 those lands south of the Alaska  
18 Highway right-of-way

19 Section 14: S 1/2, S 1/2, SW 1/4

20 Section 15: NW 1/4, S 1/2

21 Sections 16 - 22: All

22 Section 23: N 1/2, N 1/2 NE 1/4, NW 1/4, S 1/2

23 Section 24: S 1/2 NW 1/4, S 1/2 S 1/2 SE 1/4, SW 1/4

24 Sections 25, 26, 27: All

25 Section 28: N 1/2, SE 1/4 excluding those lands within  
26 Mil. Pur. Wdl. (PLO 910), SW 1/4 excluding those lands within Mil.  
27 Pur. Wdl. (PLO 910)

28 Sections 29, 30, 31: All

29 Section 32: NE 1/4 excluding those lands within Mil.

1 Pur. Wdl. (PLO 910), W 1/2, SE 1/4 excluding those lands within  
2 Mil. Pur. Wdl. (PLO 910)

3 Section 33: NE 1/4 excluding those lands within Mil.  
4 Pur. Wdl. (PLO 910), NW 1/4 excluding those lands within Mil. Pur.  
5 Wdl. (PLO 910)

6 Section 34: NE 1/4 excluding those lands within Mil.  
7 Pur. Wdl. (PLO 910), NW 1/4 excluding those lands within Mil. Pur.  
8 Wdl. (PLO 910), SE 1/4 excluding those lands within Mil. Pur. Wdl.  
9 (PLO 910)

10 Section 35: N 1/2, SE 1/4, SW 1/4 excluding those lands  
11 within Mil. Pur. Wdl. (PLO 910)

12 Section 36: All

13 (6) Township 12 South, Range 14 East, Fairbanks Meridian

14 Section 19: SE 1/4 those lands south of the Alaska  
15 Highway right-of-way, SW 1/4 those lands south of the Alaska High-  
16 way right-of-way

17 Section 28: SE 1/4 those lands south of the Alaska  
18 Highway right-of-way, SW 1/4 those lands south of the Alaska High-  
19 way right-of-way

20 Section 29: NE 1/4 those lands south of the Alaska  
21 Highway right-of-way, NW 1/4 those lands south of the Alaska High-  
22 way right-of-way, S 1/2

23 Sections 30 - 32: All

24 Section 33: NE 1/4 those lands south of the Alaska  
25 Highway right-of-way, W 1/2, SE 1/4

26 Section 34: NE 1/4 those lands south of the Alaska  
27 Highway right-of-way, NW 1/4 those lands south of the Alaska High-  
28 way right-of-way, SE 1/4 those lands south of the Alaska Highway  
29 right-of-way, SW 1/4

1                   Section 35: SW 1/4 those lands south of the Alaska  
2 Highway right-of-way

3                   (7) Township 13 South, Range 13 East, Fairbanks Meridian

4                   Section 1: NE 1/4 excluding those lands within Mil. Pur.  
5 Wdl. (PLO 910)

6                   Section 4: NW 1/4 excluding those lands within Mil. Pur.  
7 Wdl. (PLO 910), SW 1/4 excluding those lands within Mil. Pur. Wdl.  
8 (PLO 910)

9                   Section 5: N 1/2, SE 1/4 excluding those lands within  
10 Mil. Pur. Wdl. (PLO 910), SW 1/4

11                   (8) Township 13 South, Range 14 East, Fairbanks Meridian

12                   Section 1: NE 1/4 those lands south of the Alaska High-  
13 way right-of-way excluding existing right-of-way (44LD 513,  
14 F-013513) and ILMT 56933, NW 1/4, SE 1/4 excluding existing right-  
15 of-way (44LD513, F-013513), SW 1/4 excluding existing right-of-way  
16 (44LD513, F-013513)

17                   Section 2: N 1/2, SE 1/4 excluding existing right-of-way  
18 (44LD513, F-013513), SW 1/4

19                   Sections 3 - 5: All

20                   Section 6: NE 1/4, NW 1/4 excluding those lands within  
21 Mil. Pur. Wdl. (PLO 910), SE 1/4 excluding those lands within Mil.  
22 Pur. Wdl. (PLO 910), SW 1/4 excluding those lands within Mil. Pur.  
23 Wdl. (PLO 910)

24                   Section 8: NE 1/4 excluding those lands within Mil. Pur.  
25 Wdl. (PLO 910), NW 1/4 excluding those lands within Mil. Pur. Wdl.  
26 (PLO 910), SE 1/4 excluding those lands within Mil. Pur. Wdl. (PLO  
27 910)

28                   Section 9: N 1/2, SE 1/4 excluding those lands within  
29 Mil. Pur. Wdl. (PLO 910), SW 1/4 excluding those lands within Mil.

1 Pur. Wdl. (PLO 910)

2 Section 10: N 1/2, SE 1/4 excluding existing right-of-  
3 way (44LD513, F-013513) and right-of-way mat. site (F-025897 and  
4 exclusion USS 4218), SW 1/4 excluding existing right-of-way  
5 (44LD513, F-013513)

6 Section 11: NE 1/4 excluding existing right-of-way  
7 (44LD513, F-013513), NW 1/4 excluding existing right-of-way  
8 (44LD513, F-013513), S 1/2

9 Sections 12 - 14: All

10 Section 15: NE 1/4, NW 1/4 excluding existing right-of-  
11 way (44LD513, F-013513) and those lands within Mil. Pur. Wdl. (PLO  
12 910), SE 1/4 excluding those lands within Mil. Pur. Wdl. (PLO 910),  
13 SW 1/4 excluding those lands within Mil. Pur. Wdl. (PLO 910)

14 Section 21: NE 1/4 excluding those lands within Mil.  
15 Pur. Wdl. (PLO 910), SE 1/4 excluding those lands within Mil. Pur.  
16 Wdl. (PLO 910)

17 Section 22: E 1/2, NW 1/4 excluding those lands within  
18 Mil. Pur. Wdl. (PLO 910), SW 1/4

19 Sections 23 - 27: All

20 Section 28: E 1/2, NW 1/4 excluding those lands within  
21 Mil. Pur. Wdl. (PLO 910), SW 1/4 excluding those lands within Mil.  
22 Pur. Wdl. (PLO 910)

23 Section 31: SW 1/4 excluding those lands within Mil.  
24 Pur. Wdl. (PLO 910)

25 Section 32: SW 1/4 excluding those lands within Mil.  
26 Pur. Wdl. (PLO 910)

27 Section 33: NE 1/4, NW 1/4 excluding those lands within  
28 Mil. Pur. Wdl. (PLO 910), SE 1/4, SW 1/4 excluding those lands  
29 within Mil. Pur. Wdl. (PLO 910)

1                   Sections 34 - 36: All

2                   (9) Township 13 South, Range 15 East, Fairbanks Meridian

3                   Section 5: SW 1/4 those lands south of the Alaska High-  
4 way right-of-way excluding right-of-way Per. 22562

5                   Section 6: NE 1/4 those lands south of the Alaska High-  
6 way right-of-way, NW 1/4 those lands south of the Alaska Highway  
7 right-of-way excluding right-of-way F-013513 and ILMT 56933, SE 1/4  
8 those lands south of the Alaska Highway right-of-way excluding  
9 right-of-way 029736, SW 1/4 excluding right-of-way mat. site  
10 F-029735

11                   Section 7: NE 1/4 excluding right-of-way 029736, W 1/2,  
12 SE 1/4

13                   Section 8: NE 1/4 those lands south of the Alaska High-  
14 way right-of-way excluding right-of-way Per. 22562, NW 1/4 ex-  
15 cluding right-of-way Per. 22562, SE 1/4 excluding right-of-way Per.  
16 22562, SW 1/4

17                   Section 9: NW 1/4 those lands south of the Alaska High-  
18 way right-of-way, SE 1/4 those lands south of the Alaska Highway  
19 right-of-way, SW 1/4 those lands south of the Alaska Highway right-  
20 of-way

21                   Section 10: SW 1/4 those lands south of the Alaska  
22 Highway right-of-way

23                   Section 15: NE 1/4 those lands south of the Alaska  
24 Highway right-of-way, NW 1/4 those lands south of the Alaska High-  
25 way right-of-way, S 1/2

26                   Section 16: All

27                   Section 17: NE 1/4 excluding right-of-way Per. 22562, NW  
28 1/4 excluding right-of-way Per. 22562, SE 1/4, SW 1/4 excluding  
29 right-of-way Per. 22562

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Section 18: All

Section 19: NE 1/4 excluding right-of-way Per. 22562, W  
1/2, SE 1/4 excluding right-of-way Per. 22562

Section 20: E 1/2, NW 1/4 excluding right-of-way Per.  
22562, SW 1/4

Sections 21, 22: All

Section 29: E 1/2, NW 1/4 excluding right-of-way  
Per. 22562 and Res. U. Apl. 26697, SW 1/4

Section 30: NE 1/4 excluding right-of-way Per. 22562, W  
1/2, SE 1/4

Sections 31, 32: All

(10) Township 14 South, Range 14 East, Fairbanks Meridian

Sections 1 - 4: All

Section 5: E 1/2, NW 1/4 excluding those lands within  
Mil. Pur. Wdl. (PLO 910), SW 1/4 excluding those lands within Mil.  
Pur. Wdl. (PLO 910)

Sections 11 - 14: All.

Sec. 16.20.310. GAME MANAGEMENT PLAN. (a) The commissioner of  
fish and game shall develop and may amend a game management plan for  
bison in the area described in AS 16.20.300. After holding public  
hearings in accordance with AS 44.62.310 and 44.62.312, the commissioner  
shall implement the game management plan.

(b) The game management plan shall include, but is not limited to,

(1) planting grains for bison and planting other wildlife  
forage;

(2) altering existing plant cover to create additional range  
and year-round habitat for bison and other animal species in the area;

(3) tilling to produce forage.

(c) The commissioner of fish and game shall develop and amend the

1 game management plan to coordinate, as closely as possible, the game  
2 management plan with the activities of the Agricultural Development  
3 Authority, Department of Natural Resources, relating to the Big Delta  
4 agricultural development project.

5 Sec. 16.20.320. ACTIVITIES ON RANGE AREA. Nothing in AS 16.20.-  
6 300 - 16.20.320 shall be construed as prohibiting activities on land  
7 described in AS 16.20.300 which are otherwise permitted in accordance  
8 with the laws and regulations of this state, including, but not limited  
9 to, hunting, trapping, engaging in recreational activities and using the  
10 land for access to adjacent areas.

Introduced: 1/24/79  
Referred: Resources and  
Finance

1 IN THE HOUSE

BY MOSS

2 HOUSE BILL NO. 31

3 IN THE LEGISLATURE OF THE STATE OF ALASKA

4 ELEVENTH LEGISLATURE - FIRST SESSION

5 A BILL

6 For an Act entitled: "An Act creating the Delta Junction critical habitat  
7 area."

8 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

9 \* Section 1. It is the purpose of this Act to perpetuate free ranging  
10 bison on the land described in this Act by management of the habitat to pro-  
11 vide an adequate winter range for the bison. It is also the purpose of this  
12 Act to alter seasonal movements of bison herds on the land in order to  
13 diminish the damage caused by the herds to agriculturally developed land.

14 \* Sec. 2. AS 16.20.230 is amended by adding a new paragraph to read:

15 (12) Delta Junction:

16 (A) Township 11 South, Range 12 East, Fairbanks Meridian

17 Section 17: SW 1/4 those lands south of the Alaska  
18 Highway right-of-way

19 Section 18: S 1/2 those lands south of the Alaska  
20 Highway right-of-way

21 Section 19: NE 1/4, NW 1/4 those lands north of  
22 Fort Greely military withdrawal (P.L. 87-334), SE 1/4 those  
23 lands north of Fort Greely military withdrawal (P.L. 87-334)

24 Section 20: NE 1/4 those lands south of the Alaska  
25 Highway right-of-way, NW 1/4, SE 1/4, SW 1/4 those lands north  
26 of Fort Greely military withdrawal (P.L. 87-334)

27 Section 21: NW 1/4 those lands south of the Alaska  
28 Highway right-of-way, S 1/2 those lands south of the Alaska  
29 Highway right-of-way

1                   Section 22: SW 1/4 those lands south of the Alaska  
2 Highway right-of-way

3                   Section 26: SE 1/4 those lands south of the Alaska  
4 Highway right-of-way, SW 1/4 those lands south of the Alaska  
5 Highway right-of-way

6                   Section 27: NE 1/4 those lands south of the Alaska  
7 Highway right-of-way, NW 1/4 those lands south of the Alaska  
8 Highway right-of-way, S 1/2

9                   Section 28: E 1/2, NW 1/4 those lands north of Fort  
10 Greely military withdrawal (P.L. 87-334), SW 1/4 those lands  
11 north of Fort Greely military withdrawal (P.L. 87-334)

12                   Section 29: NE 1/4 those lands north of Fort Greely  
13 military withdrawal (P.L. 87-334), NW 1/4 those lands north of  
14 Fort Greely military withdrawal (P.L. 87-334), SE 1/4 those  
15 lands south of Fort Greely military withdrawal (P.L. 87-334)

16                   Section 32: NE 1/4 those lands south of Fort Greely  
17 military withdrawal (P.L. 87-334), NW 1/4 those lands south of  
18 Fort Greely military withdrawal (P.L. 87-334), SE 1/4, SW 1/4  
19 those lands east of Fort Greely military withdrawal (P.L.  
20 87-334)

21                   Sections 33, 34: All

22                   Section 35: NE 1/4 those lands south of the Alaska  
23 Highway right-of-way, NW 1/4, S 1/2

24                   Section 36: NW 1/4 those lands south of the Alaska  
25 Highway right-of-way, SE 1/4 those lands south of the Alaska  
26 Highway right-of-way, SW 1/4

27                   (B) Township 11 South, Range 13 East, Fairbanks Meridian

28                   Section 31: SW 1/4 those lands south of the Alaska  
29 Highway right-of-way

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(C) Township 12 South, Range 11 East, Fairbanks Meridian

Section 1: SE 1/4 those lands south of Fort Greely military withdrawal (P.L. 87-334)

Section 12: NE 1/4 those lands south of Fort Greely military withdrawal (P.L. 87-334), NW 1/4 those lands south of Fort Greely military withdrawal (P.L. 87-334), SE 1/4, SW 1/4 those lands south of Fort Greely military withdrawal (P.L. 87-334)

Section 13: All

Section 14: NE 1/4 those lands south of Fort Greely military withdrawal (P.L. 87-334), NW 1/4 those lands south of Fort Greely military withdrawal (P.L. 87-334), SE 1/4, SW 1/4 those lands south and east of the Fort Greely military withdrawal (P.L. 87-334)

Section 23: E 1/2, NW 1/4 those lands east of the Fort Greely military withdrawal (P.L. 87-334), SW 1/4

Sections 24, 25, 26: All

Section 27: NE 1/4 those lands south and east of the Fort Greely military withdrawal (P.L. 87-334), SE 1/4 those lands south and east of the Fort Greely military withdrawal (P.L. 87-334)

Section 34: E 1/2, NW 1/4 those lands south and west of the Fort Greely military withdrawal (P.L. 87-334), SW 1/4 those lands south and west of the Fort Greely military withdrawal (P.L. 87-334)

Sections 35, 36: All

(D) Township 12 South, Range 12 East, Fairbanks Meridian

Sections 1 - 4: All

Section 5: E 1/2, NW 1/4 those lands south of the

1 Fort Greely military withdrawal (P.L. 87-334), SW 1/4

2 Section 6: NE 1/4 those lands south of the Fort  
3 Greely military withdrawal (P.L. 87-334), SE 1/4, SW 1/4 those  
4 lands south of the Fort Greely military withdrawal (P.L.  
5 87-334)

6 Sections 7 - 25: All

7 Section 30: All

8 (E) Township 12 South, Range 13 East, Fairbanks Meridian

9 Section 5: NW 1/4 those lands south of the Alaska  
10 Highway right-of-way, SE 1/4 those lands south of the Alaska  
11 Highway right-of-way, SW 1/4 those lands south of the Alaska  
12 Highway right-of-way

13 Section 6: NE 1/4 those lands south of the Alaska  
14 Highway right-of-way excluding lands within FO25785, NW 1/4  
15 those lands south of withdrawal FO25785, S 1/2

16 Sections 7, 8: All

17 Section 9: NE 1/4 those lands south of the Alaska  
18 Highway excluding Mil. Pur. Wdl. (PLO 386), NW 1/4 those lands  
19 south of the Alaska Highway excluding Mil. Pur. Wdl.  
20 (PLO 386), SE 1/4 those lands south of the Alaska Highway  
21 right-of-way, SW 1/4

22 Section 10: SW 1/4 those lands south of the Alaska  
23 Highway right-of-way

24 Section 14: S 1/2, S 1/2, SW 1/4

25 Section 15: NW 1/4, S 1/2

26 Sections 16 - 22: All

27 Section 23: N 1/2, N 1/2 NE 1/4, NW 1/4, S 1/2

28 Section 24: S 1/2 NW 1/4, S 1/2 S 1/2 SE 1/4, SW

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Sections 25, 26, 27: All

Section 28: N 1/2, SE 1/4 excluding those lands within Mil. Pur. Wdl. (PLO 910), SW 1/4 excluding those lands within Mil. Pur. Wdl. (PLO 910)

Sections 29, 30, 31: All

Section 32: NE 1/4 excluding those lands within Mil. Pur. Wdl. (PLO 910), W 1/2, SE 1/4 excluding those lands within Mil. Pur. Wdl. (PLO 910)

Section 33: NE 1/4 excluding those lands within Mil. Pur. Wdl. (PLO 910), NW 1/4 excluding those lands within Mil. Pur. Wdl. (PLO 910)

Section 34: NE 1/4 excluding those lands within Mil. Pur. Wdl. (PLO 910), NW 1/4 excluding those lands within Mil. Pur. Wdl. (PLO 910), SE 1/4 excluding those lands within Mil. Pur. Wdl. (PLO 910)

Section 35: N 1/2, SE 1/4, SW 1/4 excluding those lands within Mil. Pur. Wdl. (PLC 910)

Section 36: All

(F) Township 12 South, Range 14 East, Fairbanks Meridian

Section 19: SE 1/4 those lands south of the Alaska Highway right-of-way, SW 1/4 those lands south of the Alaska Highway right-of-way

Section 28: SE 1/4 those lands south of the Alaska Highway right-of-way. SW 1/4 those lands south of the Alaska Highway right-of-way

Section 29: NE 1/4 those lands south of the Alaska Highway right-of-way, NW 1/4 those lands south of the Alaska Highway right-of-way, S 1/2

Sections 30 - 32: All

1                   Section 33: NE 1/4 those lands south of the Alaska  
2 Highway right-of-way, W 1/2, SE 1/4

3                   Section 34: NE 1/4 those lands south of the Alaska  
4 Highway right-of-way, NW 1/4 those lands south of the Alaska  
5 Highway right-of-way, SE 1/4 those lands south of the Alaska  
6 Highway right-of-way, SW 1/4

7                   Section 35: SW 1/4 those lands south of the Alaska  
8 Highway right-of-way

9                   (G) Township 13 South, Range 13 East, Fairbanks Meridian

10                  Section 1: NE 1/4 excluding those lands within Mil.  
11 Pur. Wdl. (PLO 910)

12                  Section 4: NW 1/4 excluding those lands within Mil.  
13 Pur. Wdl. (PLO 910), SW 1/4 excluding those lands within Mil.  
14 Pur. Wdl. (PLO 910)

15                  Section 5: N 1/2, SE 1/4 excluding those lands  
16 within Mil. Pur. Wdl. (PLO 910), SW 1/4

17                   (H) Township 13 South, Range 14 East, Fairbanks Meridian

18                  Section 1: NE 1/4 those lands south of the Alaska  
19 Highway right-of-way excluding existing right-of-way (44LD  
20 513, F-013513) and ILMT 56933, NW 1/4, SE 1/4 excluding  
21 existing right-of-way (44LD513, F-013513), SW 1/4 excluding  
22 existing right-of-way (44LD513, F-013513)

23                  Section 2: N 1/2, SE 1/4 excluding existing right-  
24 of-way (44LD513, F-013513), SW 1/4

25                  Sections 3 - 5: All

26                  Section 6: NE 1/4, NW 1/4 excluding those lands  
27 within Mil. Pur. Wdl. (PLO 910), SE 1/4 excluding those lands  
28 within Mil. Pur. Wdl. (PLO 910), SW 1/4 excluding those lands  
29 within Mil. Pur. Wdl. (PLO 910)

1                   Section 8: NE 1/4 excluding those lands within Mil.  
2 Pur. Wdl. (PLO 910), NW 1/4 excluding those lands within Mil.  
3 Pur. Wdl. (PLO 910), SE 1/4 excluding those lands within Mil.  
4 Pur. Wdl. (PLO 910)

5                   Section 9: N 1/2, SE 1/4 excluding those lands  
6 within Mil. Pur. Wdl. (PLO 910), SW 1/4 excluding those lands  
7 within Mil. Pur. Wdl. (PLO 910)

8                   Section 10: N 1/2, SE 1/4 excluding existing right-  
9 of-way (44LD513, F-013513) and right-of-way mat. site  
10 (F-025897 and exclusion USS 4218), SW 1/4 excluding existing  
11 right-of-way (44LD513, F-013513)

12                   Section 11: NE 1/4 excluding existing right-of-way  
13 (44LD513, F-013513), NW 1/4 excluding existing right-of-way  
14 (44LD513, F-013513), S 1/2

15                   Sections 12 - 14: All

16                   Section 15: NE 1/4, NW 1/4 excluding existing  
17 right-of-way (44LD513, F-013513) and those lands within Mil.  
18 Pur. Wdl. (PLO 910), SE 1/4 excluding those lands within Mil.  
19 Pur. Wdl. (PLO 910), SW 1/4 excluding those lands within Mil.  
20 Pur. Wdl. (PLO 910)

21                   Section 21: NE 1/4 excluding those lands within  
22 Mil. Pur. Wdl. (PLO 910), SE 1/4 excluding those lands within  
23 Mil. Pur. Wdl. (PLO 910)

24                   Section 22: E 1/2, NW 1/4 excluding those lands  
25 within Mi. Pur. Wdl. (PLO 910), SW 1/4

26                   Sections 23 - 27: All

27                   Section 28: E 1/2, NW 1/4 excluding those lands  
28 within Mil. Pur. Wdl. (PLO 910), SW 1/4 excluding those lands  
29 within Mil. Pur. Wdl. (PLO 910)

1                   Section 31: SW 1/4 excluding those lands within  
2 Mil. Pur. Wdl. (PLO 910)

3                   Section 32: SW 1/4 excluding those lands within  
4 Mil. Pur. Wdl. (PLO 910)

5                   Section 33: NE 1/4, NW 1/4 excluding those lands  
6 within Mil. Pur. Wdl. (PLO 910), SE 1/4, SW 1/4 excluding  
7 those lands within Mil. Pur. Wdl. (PLO 910)

8                   Sections 34 - 36: All

9                   (I) Township 13 South, Range 15 East, Fairbanks Meridian

10                   Section 5: SW 1/4 those lands south of the Alaska  
11 Highway right-of-way excluding right-of-way Per. 22562

12                   Section 6: NE 1/4 those lands south of the Alaska  
13 Highway right-of-way, NW 1/4 those lands south of the Alaska  
14 Highway right-of-way excluding right-of-way F-013513 and ILMT  
15 56933, SE 1/4 those lands south of the Alaska Highway right-  
16 of-way excluding right-of-way 029736, SW 1/4 excluding right-  
17 of-way mat. site F-029735

18                   Section 7: NE 1/4 excluding right-of-way 029736, W  
19 1/2, SE 1/4

20                   Section 8: NE 1/4 those lands south of the Alaska  
21 Highway right-of-way excluding right-of-way Per. 22562, NW 1/4  
22 excluding right-of-way Per. 22562, SE 1/4 excluding right-of-  
23 way Per. 22562, SW 1/4

24                   Section 9: NW 1/4 those lands south of the Alaska  
25 Highway right-of-way, SE 1/4 those lands south of the Alaska  
26 Highway right-of-way, SW 1/4 those lands south of the Alaska  
27 Highway right-of-way

28                   Section 10: SW 1/4 those lands south of the Alaska  
29 Highway right-of-way

1 Section 15: NE 1/4 those lands south of the Alaska  
2 Highway right-of-way, NW 1/4 those lands south of the Alaska  
3 Highway right-of-way, S 1/2

4 Section 16: All

5 Section 17: NE 1/4 excluding right-of-way Per.  
6 22562, NW 1/4 excluding right-of-way Per. 22562, SE 1/4, SW  
7 1/4 excluding right-of-way Per. 22562

8 Section 18: All

9 Section 19: NE 1/4 excluding right-of-way Per.  
10 22562, W 1/2, SE 1/4 excluding right-of-way Per. 22562

11 Section 20: E 1/2, NW 1/4 excluding right-of-way  
12 Per. 22562, SW 1/4

13 Sections 21, 22: All

14 Section 29: E 1/2, NW 1/4 excluding right-of-way  
15 Per. 22562 and Res. U. Apl. 26697, SW 1/4

16 Section 30: NE 1/4 excluding right-of-way Per.  
17 22562, W 1/2, SE 1/4

18 Sections 31, 32: All

19 (J) Township 14 South, Range 14 East, Fairbanks Meridian

20 Sections 1 - 4: All

21 Section 5: E 1/2, NW 1/4 excluding those lands  
22 within Mil. Pur. Wdl. (PLO 910), SW 1/4 excluding those lands  
23 within Mil. Pur. Wdl. (PLO 910)

24 Sections 11 - 14: All.

25 \* Sec. 3. AS 16.20 is amended by adding a new section to read:

26 Sec. 16.20.280. DELTA JUNCTION CRITICAL HABITAT AREA. (a) The  
27 commissioner of fish and game shall develop and may amend a habitat  
28 management plan for the area described in AS 16.20.230(12). After  
29 holding public hearings in accordance with AS 44.62.310 and 44.62.312,

1 the commissioner shall implement the habitat management plan.

2 (b) The habitat management plan may include, but is not limited  
3 to,

4 (1) planting grains for bison and planting other wildlife  
5 forage;

6 (2) altering existing plant cover to create additional range  
7 and year-round habitat for bison and other animal species in the area;

8 (3) tilling to produce forage.  
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# RECORDS CERTIFICATION



I, the undersigned, an employee of the State of Alaska, do hereby certify that the microfilm images on this microform are accurate reproductions of the original records of the State of Alaska as accumulated during the regular course of business, and that it is the established policy and practice of this State to microfilm its records and to dispose of the original records after microfilm reproductions have been made.

James O. Smith  
Signature of Camera Operator

3/8/90  
Date

SENATE FINANCE COMMITTEE  
BILL CHECKLIST

- 1. Committee Copy-Current Bill
- 2. History Cover Form
- 3. Printed Copies:
  - Original Bill
  - Committee Substitutes or Amendments
- 4. SFC Committee Report Form

- 5. Fiscal Information:
  - Note in File \_\_\_\_\_
  - Note Requested \_\_\_\_\_ Date \_\_\_\_\_
  - Other Financial Backup \_\_\_\_\_
  - (See Below) \_\_\_\_\_

- 6. Backup:
  - Handouts \_\_\_\_\_
  - Letter from Governor \_\_\_\_\_
  - Letter from Sponsor \_\_\_\_\_
  - Completed Committee Reports \_\_\_\_\_
  - Committee Resources
  - Other \_\_\_\_\_

3-30-79

There are project reports on the various sections of this bill in Milt Barker's office.

- per Jay Hogan -



Original sponsors: Gardiner and Freeman

Offered: 2/27/79  
Referred: Rules

Funding Information

General Fund	\$7,115,000
Other Funds	-0-
	<u>\$7,115,000</u>

1 IN THE HOUSE

BY THE FINANCE COMMITTEE

2 CS FOR HOUSE BILL NO. 32

3 IN THE LEGISLATURE OF THE STATE OF ALASKA

4 ELEVENTH LEGISLATURE - FIRST SESSION

5 A BILL

6 For an Act entitled: "An Act making special appropriations to the power  
7 project revolving fund of the Alaska Power Authority;  
8 and providing for an effective date."

9 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

10 \* Section 1. The sum of \$3,115,000 is appropriated from the general fund  
11 to the power project revolving fund of the Alaska Power Authority (AS 44.56.-  
12 170) for costs associated with the Swan Lake hydroelectric project.

13 \* Sec. 2. The sum of \$2,000,000 is appropriated from the general fund to  
14 the power project revolving fund of the Alaska Power Authority (AS 44.56.170)  
15 for costs associated with the Terror Lake hydroelectric project.

16 \* Sec. 3. The sum of \$2,000,000 is appropriated from the general fund to  
17 the power project revolving fund of the Alaska Power Authority (AS 44.56.170)  
18 for costs associated with the Tye Lake hydroelectric project.

19 \* Sec. 4. This Act takes effect immediately in accordance with AS 01.10.-  
20 070(c).

21  
22  
23  
24  
25  
26  
27  
28  
29

# ALASKA POWER AUTHORITY

333 WEST 4th AVENUE - SUITE 31 - ANCHORAGE, ALASKA 99501

Phone: (907) 277-7641  
(907) 276-2715

February 8, 1979

The Honorable Terry Gardiner  
Speaker of the House  
House of Representatives  
Alaska State Legislature  
Pouch V  
Juneau, Alaska 99811

Dear Representative Gardiner:

You have requested information on the need for interim funding of the proposed Swan Lake Hydropower Project. The Swan Lake Project proposed by the Ketchikan Public Utilities is at a critical stage of development. If the project is to be constructed on schedule to provide power in 1983, the design and preliminary engineering for the project must proceed during 1979-80 while the application for license to construct is processed by the Federal Energy Regulatory Commission. If funding is not available this year, the construction schedule and power-on-line date will slip one year. The cost to the consumers in the Ketchikan area will be increased investment in additional diesel combustion generation capacity and construction cost increases due to inflation which can be conservatively estimated at \$10 million.

HB 32 provides sufficient funds for the Swan Lake project to insure development on schedule and to provide lower cost energy in the Ketchikan area. HB 32 provides a loan instead of a grant, which demonstrates the intent of hydroelectric development to pay for itself. Based upon the feasibility studies completed to date, the Swan Lake Project appears to be the best long-range alternative for the provision of low cost energy to the Ketchikan community. There is a definite need for the financing as provided by HB 32 to keep the Swan Lake Project on schedule.

Sincerely,



Eric P. Yould  
Executive Director

# SWAN LAKE PROJECT

## DESIGN AND CONSTRUCTION SCHEDULE

APPRAISAL REPORT

EVALUATION REPORT

FERC LICENSE

U.S.F.S. ENVIRONMENTAL ANALYSIS

DESIGN AND CONTRACT DOCUMENTS

A FIELD INVESTIGATIONS

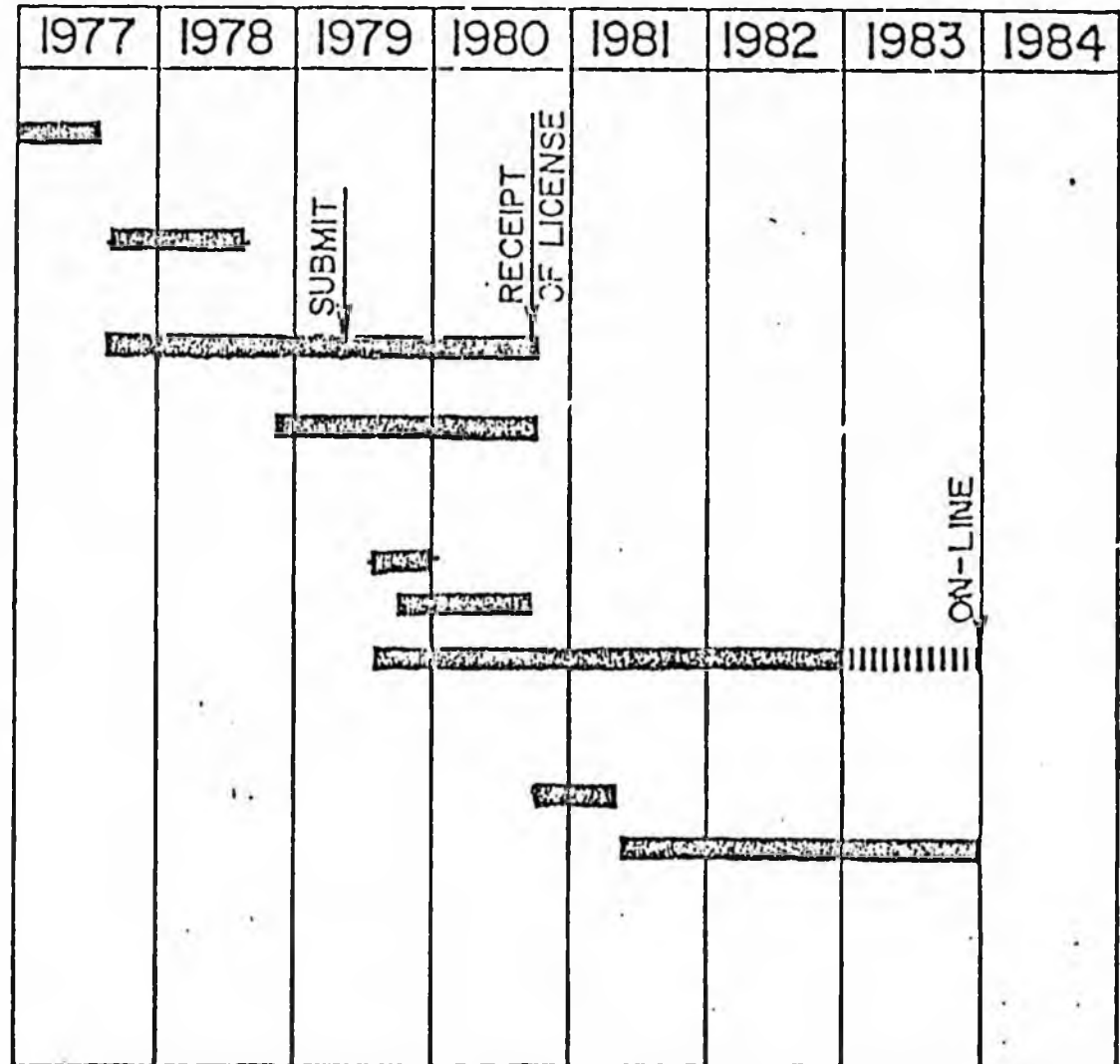
B ACCESS

C MAJOR PROJECT FEATURES

CONSTRUCTION

A ACCESS

B MAJOR PROJECT FEATURES





# KETCHIKAN PUBLIC UTILITIES

334 FRONT STREET

P. O. BOX 7070 KETCHIKAN, ALASKA 99901  
7300

TELEPHONE 907-225-3111

December 21, 1978

MUNICIPALLY OWNED  
ELECTRIC WATER PHONE

Representative Oral Freeman  
2743 3rd Avenue  
Ketchikan, Alaska 99901

Subject: Swan Lake Hydroelectric Project  
Appropriation for Fiscal Year 1980

Dear Oral,

In reply to your request for the appropriation needed for the 1980 fiscal year to continue with the Swan Lake Project, I submit the following information.

- |                |   |
|----------------|---|
| 1. \$750,000   | - Complete all permitting, licensing, surveying and field investigations for the Project.         |
| 2. \$1,450,000 | - Initiate final design of the Project facilities and prepare contract bid documents.             |
| 3. \$419,000   | - Supervisory control system for Swan Lake Project.   |
| 4. \$496,000   | - Supervisory control system for existing generating system (coordinating with Swan Lake system). |

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\$3,115,000	Total Appropriation Request
-------------	-----------------------------

The supervisory control requirements for the Swan Lake Project should be coordinated with those for the existing generating plants and a common system installed that would serve all KPU plants. Accordingly, the estimate for Swan Lake includes the supervisory requirements in this budget in order that an integrated system can be developed. Since the master control terminal for the overall system, which would be installed at the Bailey Plant would commonly serve the existing plants as well as the Swan Lake Plant, it would have to be installed before the system could be made functional for the existing plants.

It is recommended that the total integrated system be included in the 1980 FY budget to provide for the capital investment requirements of automation of the existing system now and for extension of the system to the Swan Lake Plant later. This will result in considerable cost

savings as compared with installing one system for the existing plants initially and adding another for Swan Lake later. Our estimates are based on prorating the cost of the master terminal between the existing system requirements and the Swan Lake requirements. If a complete system were installed initially for the existing plants, and the Swan Lake Project portion deferred, the entire hardware and installation costs of the master station for the Bailey Plant would be assigned to the automation of the existing plants, with only the cost of one remote terminal at Swan Lake being deferred.

Accordingly, it is recommended that the funding for all of the integrated supervisory system be budgeted for FY 1980 and all of the equipment be procured initially. This will allow the master terminal and the remote terminals at the existing plants to be installed and placed in operation initially, with the installation of the Swan Lake remote unit to be deferred. The Swan Lake remote unit should be procured with the rest of the equipment to insure compatibility.

Very truly yours,

Donald D. Bowey, Utilities Manager

By Robert E. Arnold  
Robert E. Arnold  
Utilities Engineer

cc: Terry Gardiner ✓  
Robert Ziegler



## KETCHIKAN PUBLIC UTILITIES

334 FRONT STREET

P. O. BOX 1019 KETCHIKAN, ALASKA 99901

TELEPHONE 907-225-3111

7300

November 28, 1978

MUNICIPALLY OWNED  
ELECTRIC WATER PHONE

Mr. Terry Gardiner  
State Representative  
P. O. Box 6092  
Ketchikan, Alaska 99901

Subject: Swan Lake Hydroelectric Project  
Ketchikan, Alaska

Dear Terry:

Enclosed for your information and review is a copy of the Swan Lake Hydroelectric Project, Evaluation Report prepared by R. W. Beck and Associates, Inc., engineering consultant for the City of Ketchikan dba Ketchikan Public Utilities. As you may know, the Swan Lake Project has had a long history of evaluation and preliminary engineering having been studied and recommended in 1951 by the Bureau of Reclamation, U. S. Department of the Interior and again reviewed in 1959 and 1962 by the Bureau of Reclamation as a viable hydroelectric project. However, the project was never followed through to completion due no doubt to the large initial capital investment required during a period when diesel generation (its alternative) was relatively inexpensive.

Today, in light of the dramatic (traumatic) increases in the cost of fuel oils, diesel generation is no longer a viable alternative. As the enclosed report concludes, the Swan Lake Hydroelectric Project has replaced diesel generation as the long term, least expensive means of adding additional electrical generation in spite of its large initial cost.

The State of Alaska in 1978 via the House of Representatives and the Senate recognized the inability of various Alaska electric Utilities to find funding of the magnitude required for hydroelectric projects.

In an effort to reduce the financial burden of the large initial capital investment required for viable hydroelectric projects, as well as to make possible a source of funding for such projects, the legislative bodies by an overwhelming majority funded the Alaska Power Authority (APA).

The APA was charged with the responsibility, "...to promote, develop, and advance the general prosperity and economic welfare of the people of Alaska by providing a means of constructing, acquiring, financing and operating power production facilities....". To date, a total of \$620,000 has been borrowed by the City of Ketchikan dba Ketchikan Public Utilities for the Swan Lake Project. Of this amount, \$200,000

has been loaned to the City under the auspices of the APA, and indications are good that another \$100,000 will be made available to us before the end of November 1978.

The citizens of the City of Ketchikan and the Gateway Borough through their elected Representatives have gone on record that it is their desire and hope that the Swan Lake Hydroelectric Project be constructed and in service by late 1983 if at all possible, and will be most appreciative of any efforts you may or can render on their behalf which will make the Swan Lake Project a reality.

The staff of Ketchikan Public Utilities would appreciate any comments and suggestions you may provide toward the furtherance of this project. In addition, we would be happy to secure for you any information or responses you may request.

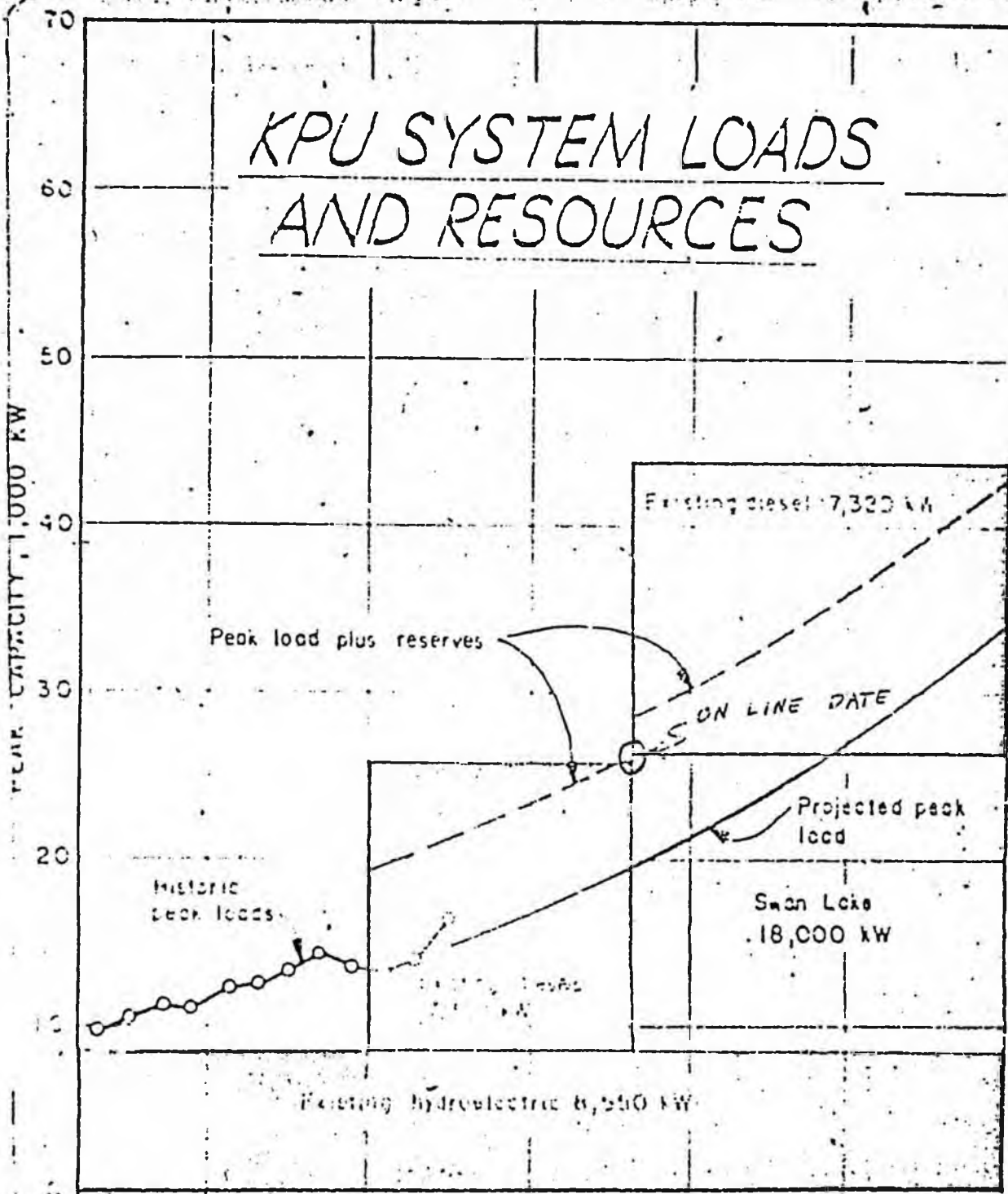
Very truly yours,

KETCHIKAN PUBLIC UTILITIES



Donald D. Bowey  
Utilities Manager

# KPU SYSTEM LOADS AND RESOURCES



62-65  
 66-68  
 69-71  
 72-74  
 75-77  
 78-80  
 81-83  
 84-85

PEAK LOADS  
 AT LOAD CENTER

## SWAN LAKE HYDROELECTRIC PROJECT

CHAIRMAN - AND MEMBERS OF THE COMMITTEE

MY NAME IS BOB ARNOLD AND I AM HERE TODAY REPRESENTING THE MANAGER OF KETCHIKAN PUBLIC UTILITIES TO TESTIFY FOR THE APPROPRIATION REQUEST YOU HAVE BEFORE YOU FOR THE SWAN LAKE PROJECT.

LET ME, FIRST OF ALL, ADDRESS THE ISSUE OF THE DIRECT APPROPRIATION FOR HYDROELECTRIC PROJECTS YOU GENTLEMEN HAVE MADE AND ARE MAKING POSSIBLE.

NUMBER ONE - THESE APPROPRIATIONS ARE FOR THE PURPOSE OF LOANS AND NOT GRANTS.

NUMBER TWO - THESE APPROPRIATIONS WILL ULTIMATELY BE RETURNED TO THE POWER PROJECT REVOLVING LOAN FUND FOR THE DEVELOPMENT.

NUMBER THREE - BECAUSE OF THIS REVOLVING LOAN FUND ASPECT, THESE APPROPRIATIONS CANNOT BE CONSTRUED AS BEING BENEFICIAL TO ONE LOCALITY WITHIN THE STATE ONLY.

SECOND, LET ME DIRECT YOUR ATTENTION TO THE FACT THAT ALASKA'S WATER RESOURCES - IF DEVELOPED - ARE ACTUALLY WORTH MORE THAN THAT OIL SITTING UP THERE IN PRUDHOE BAY. THIS IS EVIDENT IN THAT THE COST COMPARISON OF THESE HYDROELECTRIC PROJECTS MUST SHOW THAT IT IS LESS EXPENSIVE TO PRODUCE POWER FROM HYDROELECTRIC ENERGY THAN BY BURNING OIL.

WITH THIS FACT IN MIND, AND CONSIDERING THE DURATION OF THE BENEFITS - A HYDROELECTRIC FACILITY IS CONSIDERED TO BE A HUNDRED YEARS. THE QUESTION TO BE ANSWERED IS NOT; "CAN WE DELAY THIS YEARS' APPROPRIATION IN THE HOPE THAT IT WILL BE EASIER TO FUND NEXT YEAR?", BUT RATHER; "CAN WE AFFORD NOT TO PROCEED WITH THE DEVELOPMENT OF ALASKA'S WATER RESOURCES?".

THIS QUESTION BRINGS US TO THE ROOT OF THE MATTER AND IN PARTICULAR TO THE ROOT OF KETCHIKAN'S REQUEST FOR A DIRECT APPROPRIATION FOR THE SWAN LAKE HYDROELECTRIC PROJECT, FRANKLY SPEAKING, IF KETCHIKAN IS NOT SUCCESSFUL IN OBTAINING YOUR HELP AT THIS TIME FOR THE SWAN LAKE APPROPRIATION, IT WILL DIRECTLY IMPACT KETCHIKAN TO THE TUNE OF AN ADDITIONAL 10 - 13 MILLION DOLLARS IN CAPITAL OUTLAY ALONE PRIOR TO 1984.

THIS \$10 - \$13 MILLION CONSISTS OF:

\$6,000,000 TO \$7,000,000 IN ESCALATION OF CONSTRUCTION COSTS DUE TO INFLATION (7% TO 9%).

\$4,000,000 TO \$6,000,000 FOR ACQUISITION OF ADDITIONAL DIESEL GENERATION TO MEET THE LOAD.

TRANSLATED IN TERMS OF PROJECT FINANCING, IT MEANS WE WILL NEED TO ARRANGE PROJECT FINANCING FOR 91 TO 92 MILLION RATHER THAN 85 MILLION. ADDITIONALLY, REPAYMENT OF THAT FINANCING WILL NEED TO BE STRUCTURED TAKING INTO CONSIDERATION THE DEBT SERVICE FOR THE \$4 TO \$6 MILLION FOR THE ACQUISITION OF ADDITIONAL DIESEL GENERATION.

## SWAN LAKE HYDROELECTRIC PROJECT

CHAIRMAN - AND MEMBERS OF THE COMMITTEE

MY NAME IS TED FERRY, CHAIRMAN OF THE KETCHIKAN PUBLIC UTILITIES ADVISORY BOARD. WE ARE HERE TODAY TO TESTIFY ON BEHALF OF THE CITY OF KETCHIKAN AND THE KETCHIKAN GATEWAY BOROUGH FOR THE SWAN LAKE HYDROELECTRIC PROJECT.

I WOULD LIKE TO GIVE YOU A BRIEF HISTORY OF THE SWAN LAKE PROJECT TO DATE - AND THEN TURN OUR TESTIMONY OVER TO BOB ARNOLD REPRESENTING THE MANAGER OF KETCHIKAN PUBLIC UTILITIES.

THE SWAN LAKE HYDROELECTRIC PROJECT WAS FIRST RECOMMENDED FOR CONSTRUCTION TO THE U. S. CONGRESS BY THE BUREAU OF RECLAMATION IN 1951. FAILURE TO OBTAIN FUNDING AT THAT TIME LED TO A STATUS REPORT IN 1959 AND A RE-EVALUATION STUDY IN 1962. THE BENEFIT COST RATIO WAS FAVORABLE AND THE NEED FOR THE POWER WAS DEMONSTRATED.

NO FUNDING BECAME AVAILABLE FOR THE PROJECT AND KETCHIKAN REVERTED TO DEVELOPING A SMALL HYDROELECTRIC PROJECT AT LAKE SYLVIA. SUBSEQUENTLY, ALL ELECTRICAL DEMAND GROWTH HAS BEEN MET WITH THE INSTALLATION OF SEVERAL DIESEL GENERATORS.

STEADILY INCREASING DIESEL GENERATING COSTS FORCED KETCHIKAN TO AGAIN PURSUE THE DEVELOPMENT OF A LARGE SCALE HYDROELECTRIC PROJECT. THIS IT WAS THAT KETCHIKAN WORKED TOWARDS CREATION OF A STATE VEHICLE BY WHICH COMMUNITIES COULD SECURE LOW INTEREST LOANS FOR THE DEVELOPMENT OF HYDROELECTRIC PROJECTS.

THE "WATER RESOURCES REVOLVING LOAN FUND" WAS THE VEHICLE CREATED AND AT A LATER DATE; THE "ALASKA POWER AUTHORITY".

KETCHIKAN THEN PROCEEDED VIA R. W. BECK AND ASSOCIATES AND THE HELP MADE AVAILABLE BY YOU, THE LEGISLATURE, TOWARD THE DEVELOPMENT OF A LARGE-SCALE HYDROELECTRIC PROJECT. IN JUNE 1978, R. W. BECK AND ASSOCIATES PRESENTED THEIR APPRAISAL REPORT RECOMMENDING THAT THE CITY PROCEED WITH THE SWAN LAKE HYDROELECTRIC PROJECT.

YOU MAY ASK WHAT IS KETCHIKAN DOING TO DEMONSTRATE ITS "GOOD FAITH". FIRST, TO THE \$755,000 LOANED TO DATE BY THE STATE TO KETCHIKAN TOWARD THIS PROJECT; THE ~~CITY OF~~ KETCHIKAN CITY COUNCIL AUTHORIZED THE ADDITION OF AN AMOUNT NOT TO EXCEED \$300,000. OUT OF ITS POCKET. SECOND, BY THE VERY NATURE OF THE STATE'S PROVISION OF FUNDS -- A LOAN, KETCHIKAN AS THE DEBTOR ASSUMES THE RISK.

BEFORE DEFERRING TO MR. ARNOLD FOR THE BALANCE OF OUR TESTIMONY, I WOULD LIKE TO EMPHASIZE THAT IT IS THE TIME SCHEDULING THAT IS CRITICAL AND THEREFORE ASK THAT YOU NOT ALLOW THIS PROJECT TO BE DELAYED BY ANOTHER YEAR'S LOSS OF FUNDING. ~~CERTAINLY~~, KETCHIKAN ~~IS ASSUMING THE RISK THAT ADDITIONAL FINANCING CAN BE SECURED TO BRING THIS PROJECT ON LINE.~~ IS ASSUMING THE RISK THAT ADDITIONAL FINANCING CAN BE SECURED TO BRING THIS PROJECT ON LINE. CAN YOU, IN LIGHT OF THE IMPORTANCE TO ALASKA OF DEVELOPING AN ALTERNATIVE ENERGY SUPPLY - OTHER THAN OIL, NOT PROVIDE THE HELP NECESSARY TO DO THIS.

I APPRECIATE THE TIME TAKEN BY THE COMMITTEE, AND THE INTEREST SHOWN ON THIS MAJOR STATEWIDE<sup>-2-</sup> PROBLEM.

Respectfully  
Lee J. [Signature]



## CITY OF KETCHIKAN

334 FRONT STREET

P. O. BOX 7300

TELEPHONE 907 225-3111

February 23, 1979

Senator John Sackett, Chairman  
Senate Finance Committee  
State Capitol, Room 423  
Pouch V  
Juneau, Alaska 98111

Subject: Senate Finance Committee meeting of 2-19-79.  
Presentation by Ketchikan delegation,  
re: Swan Lake Hydroelectric Project

Dear Senator Sackett:

On behalf of our delegation I want to again thank you and the committee for your courtesy in permitting and listening to our presentation on the Swan Lake Project.

The committee at various times asked pertinent questions and requested specific data be presented to them. I believe that Eric Yould, Executive Director of the Alaska Power Authority, was to undertake the submission of certain data requested. Not being aware of what Eric Yould might offer, and being concerned in retrospect, I would like to clarify and make perfectly clear the following.

The \$3.115 million we are currently seeking is a loan, and a loan only, which will be repaid to the State of Alaska at an interest rate not to exceed five (5) percent.

When considering the actual construction costs of the Project amounting to \$80+ million, the committee should not construe such as a direct tap on State finances in any way whatsoever. We do not expect to see the construction costs as direct appropriations from the coffers of the State of Alaska.

If the contents of this letter are duplicated in Eric Yould's submission, I apologize. However, in consideration that the Senate Finance Committee is in the process of their deliberations, and that time could be of the essence, I did want to clarify the two (2) questions if clarification was needed.

Very truly yours,

Donald D. Bowey  
Utilities Manager

DDB:mm

# ALASKA POWER AUTHORITY

## EXECUTIVE SUMMARY

OF THE

TERROR LAKE HYDROELECTRIC PROJECT

DEFINITE PROJECT REPORT

and

LICENSE APPLICATION

This report summarizes key characteristics of the Terror Lake Hydroelectric Project for the purpose of satisfying requirements of Section 180 of A.S. 44.56. Data have been obtained from the Terror Lake Hydroelectric Project Definite Project Report and the Application for License for the Terror Lake Hydroelectric Project prepared by Robert W. Retherford Associates and International Engineering Company, Inc.

# ALASKA POWER AUTHORITY

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Description of the Project

Project Cost

Engineering Considerations

Need for the Project: Anticipated Power Requirements

Existing Near-Term Sources of Power

Alternatives Considered

Environmental Impact of the Chosen Alternative

Measures to Enhance the Environment or to Avoid or  
Mitigate Adverse Environmental Effects

Unavoidable Adverse Environmental Effects

Irreversible and Irretrievable Commitments of Resources

Conclusions

# ALASKA POWER AUTHORITY

## INTRODUCTION

The Terror Lake Hydroelectric Project was initially studied in 1966 by the Kodiak Electric Association, Inc. (KEA). The project never proceeded to construction primarily due to the small load requirements of KEA at that time and the stable low price of diesel fuel associated with existing generation capacity. Since that time, costs of fuel have dramatically increased and the energy demand for the KEA service area has increased 150%. In 1977 the KEA, Inc. applied for and received \$420,000 of funds from the Water Resources Revolving Loan Fund of the State of Alaska Department of Commerce and Economic Development for feasibility studies and preparation of a License Application for construction from the Federal Energy Regulatory Commission (FERC). KEA also received a \$100,000 loan from the Power Project Revolving Loan Fund of the Alaska Power Authority in late 1978 to complete the License Application. The License Application was submitted in January, 1979 to FERC, and the License approval process will last 12 to 18 months. The body of this report addresses design, economics, financing, and environmental impacts of construction of the Terror Lake Hydroelectric Project once a license is approved.

## ALASKA POWER AUTHORITY

The operation of construction equipment will result in the usual effects experienced at construction sites, such as exhaust and crank-case emissions from diesel and gasoline engines, noise and dust. The effects on air quality cannot be quantified. Noise will in general be more noticeable in this uninhabited area. The emissions and dust are controllable to acceptance standards, the former by mechanical means, the latter by wetting down with water. Clearing and earth moving operations associated with project facilities located in or near stream channels will also contribute sediment to surface waters resulting in temporary increases in turbidity. The construction of coffer dams at the Terror Lake dam site and the intake structure will increase turbidity in Terror Lake, which in turn will effect the Terror River for a short time. Also, surface water contamination could arise from accidental spills of fuels and lubricants.

### Irreversible and Irretrievable Commitments of Resources.

The project structures will comprise unavoidable changes to the landscape. The dams, penstock, powerhouse, switch yard, access roads and the transmission line are items which will be visible to any future visitor to the area. However, the project has been laid out, and all the structures will be designed so as to minimize the visual impact and disturbance of the landscape. Changes in the topography could be considered an irreversible and irretrievable commitment of land features and uses. Although visual and physical effects of the disturbance of natural ground conditions may persist for years, natural physical processes will tend to eventually reestablish equilibrium conditions.

Three waterfalls, two on Falls Creek and one on Shotgun Creek will be virtually eliminated because of the diversion of water from the upper reaches of the catchment basins. Significant flow over these falls will occur only during periods of extremely high flow approaching a probable maximum flood event. Terror Lake reservoir will inundate about 580 acres of land that is now wildlife habitat and Shotgun Creek dam about 50 acres. The transmission line will preempt the use of the land within its final right-of-way from certain other types of use such as the production of commercial timber.

The investment cost of the construction of the proposed project would be an irreversible and irretrievable commitment of economic resources. The total estimated capital investment for the project is \$81 million. Once investment is embodied in the project, it is essentially no longer available for other productive uses. There will, however, be a continuous return from the investment in the form of the benefits and revenues generated from power useage. Indirect effects of increased human intrusion into the Terror Lake area would be an irreversible impact on the existing recreational values. Development of the project may expand the present limited recreational use of the area. The availability of reliable electric power from the proposed project would assist in the development of the community now served by KEA, and would be an indirect inducement for expanded industrial, commercial, and recreational growth in Kodiak.

If constructed, it is highly unlikely that the project will ever be abandoned. However, if this happened, the amount of work to be done to

## ALASKA POWER AUTHORITY

by-products. The use of the hydroelectric plant will reduce or eliminate the accumulation of solid waste produced by the operation of the diesel electric plants in Kodiak, such as used lube oil.

### Unavoidable Adverse Environmental Effects.

The total land area required for the construction of the project will be 4130.4 acres, which includes all rights-of-way, reservoir areas, and locations of construction activity. The amount of land actually disturbed by project construction activities will be about 650 acres, although during the three year construction period, the total area will essentially be unavailable for other active uses.

The construction of the proposed dam at Terror Lake will raise the water surface about 133 feet. This will flood 580 acres of land now covered by low brush. Most of the inundation will occur along the Terror River upstream from the present inlet to Terror Lake. Terror Lake dam, about five miles of access road, and the Mount Glotoff Glacier diversion works will be located within the Kodiak National Wildlife Refuge. In addition, the Mount Glotoff Glacier diversion works will be located within the Mount Glotoff Resource Natural Area.

For the most part, disturbances associated with construction activities will have a limited short term adverse effect on the biota. These disturbances will result from increased human activity, the operation of heavy equipment, clearing, excavation, blasting and spoil disposal. Although the project could result in loss of individual animals primarily by displacement or loss of habitat, impact will be minimal to species and ecosystems. The area of greatest potential impact on wildlife habitat will be in the immediate vicinity of the Kizhuyak River where dens of the land otter and red fox may occur. Wildlife habitat will be lost on 580 acres of land that will be inundated by raising the elevation of Terror Lake. A portion of the predominantly alder-covered slopes will be lost as the wintering areas for mountain goats and as habitat of the bear and other residents of the drainage basin. Inundation of the Terror River valley above the present inlet to Terror Lake will result in the loss of beaver and tundra vole habitat. Species most sensitive to the presence of construction activities are the Kodiak bear and the mountain goat. In the region surrounding Terror Lake, blasting and construction activity could cause mountain goats that may inhabit the slopes above the reservoir to evacuate the project area temporarily. Increased human activity in the area during the construction period could also increase the frequency of confrontations between Kodiak bears and humans. Disturbance of visiting endangered Peregrine falcons and resident bald Eagles by construction activities could effect their reproductive success.

Activities related to construction of the 69 Kv transmission line and clearing of the right-of-way will probably increase sedimentation in nearby streams. This impact is expected to be minor and short term, however, it will have little impact on fishery resources in the streams, unless it occurs in the fall during salmon spawning. Construction of Terror Lake dam could temporarily alter the water quality of Terror River. If the stream receives large sediment loads during construction, salmon spawning areas at the mouth of the river could be adversely affected.

## ALASKA POWER AUTHORITY

approximately 50 feet wide. Inspection and maintenance of the transmission line will be mainly by helicopter, and the access track will not be maintained after the construction period. Conductors will be spaced about ten feet apart to prevent electrocution of birds that may perch on the poles. A helicopter will be used to transport men and equipment to the Mount Glotoff Glacier diversion works in order to avoid the need for an access road. The project access roads will be watered during dry periods in order to reduce the amount of dust generated by construction equipment. Mufflers will be installed on construction equipment to reduce the noise levels and the resulting impact to wildlife.

Disturbed ground surfaces will be graded, terraced if necessary, and reseeded. Felled trees will be trimmed of branches and logs stacked along the right-of-way. Branches and brush will be scattered in such a way to preclude their being washed into nearby streams. Underbrush will be left along the transmission line right-of-way for use as browse by deer and other wildlife that use the area as a wintering ground. Trees along the transmission line have a slow growth rate and will be trimmed back periodically as necessary.

The access road from the jetty to the powerhouse will be maintained to permit access for maintenance and inspection of the powerhouse and switch yard. The access road to Terror Lake and the other diversion works will be maintained to a lower standard. It will be used for vehicular access for inspection of all the project structures at least once a year during the summer months, and also for program maintenance work. Emergency access during the winter will be by helicopter, and the road will not be kept open after the first winter snows.

Waste material and excavation spoil will be produced at all project facility sites. Part of the spoil generated at the Terror Lake intake structure will be used in the construction of a coffer dam; all spoil at this site will be covered by the Terror Lake reservoir. Rock spoil generated by the excavation of the main power tunnel, as well as by the excavation of branch tunnels at the Falls Creek and Rolling Rock Creek diversion works, will be disposed of in the canyon of Rolling Rock Creek. As much as possible of the sand and gravel spoil at Falls Creek diversion works will be used for the construction and maintenance of the access road. The remainder will be disposed of in the area behind the Shotgun Creek diversion dam and will be inundated by the project waters. Much of the spoil in the vicinity of the powerhouse will be used to build up the switch yard elevation so that it will be above the elevation of the Kizhuyak River. All other waste materials will be disposed of by removal or burial in natural or excavated depressions not subject to erosion by stream flow and covered with two feet of earth material.

The 17.3 mile long transmission line route was selected to provide maximum protection from high winds and ice buildup, and also to reduce the impact on the landscape. No permanent access road will be constructed along the transmission line route, and clearing of vegetation along the route would be kept to a minimum. Cleared brush along the transmission line would be spread over the right-of-way in areas where it cannot be washed into streams by rainfall runoff.

The operation of the project will not produce solid waste or other

## ALASKA POWER AUTHORITY

total amount of sediment entering the Kizhuyak River will be reduced by the project since the flows in Shotgun Creek, Falls Creek, and Rolling Rock Creek will be greatly diminished because of the diversion schemes. Regulated flows in the Terror River will reduce flooding along the stream.

In order to prevent environmental pollution arising from construction activities, all applicable federal, state and local laws and regulations concerning environmental pollution control and abatement will be complied with. The effects of the controlled releases to maintain minimum stream flows on the Terror River will be monitored during the operation of the project by measurements of the increased fish population in the Lower Terror River. The intertidal zone near the mouth of Terror River will be monitored during the construction period for any increase in sediment deposition.

The land which would be flooded by the increased elevation of Terror Lake is covered by brush, but no large trees. The brush will be cleared before the reservoir is filled in order to reduce maintenance work at the intake and outlet structures.

It has been requested by the State Historic Preservation Officer, Alaska Department of Natural Resources, that a field reconaissance should be conducted in the project area prior to construction to determine if there are any historical or archeological resources which might be adversely affected by the project. Mitigation measures will depend on the type and location of any historical resources that may be discovered and the recommendations of the State Historic Preservation Officer. There are no sites listed in the National Register of Historic Places, and a preconstruction archeological survey of three potential areas will be undertaken.

Because the project is located in a highly seismic region, all project facilities will be designed to withstand horizontal and vertical ground acceleration values consistent with historic levels of shaking in the Kodiak Island region. Terror Lake dam, each of the diversion dams, and the powerhouse will be founded on competent bedrock to insure their integrity during a seismic event. However, the present remoteness of the project provides inherent protection to life and property in the event of a structural breach.

Erosion and siltation of streams will be minimized by limiting stream fording by construction equipment, by revegetating exposed areas, and by providing runoff diversion structures and sediment traps where necessary. Special precautions will be taken to insure that fuel, oil, and grease will not enter streams. Spoil disposal areas have been located in Terror Lake and the pondage formed by the Shotgun Creek diversion dam, where the material will be inundated on completion of the project. The tunnel spoil will be located in a gully on the lower part of Rolling Rock Creek, where it will not be visible except to observers immediately adjacent to it. Measures will be taken to control stream flow and runoff at this and any other spoil areas, to prevent erosion and contamination of water.

The cleared path of the 69 Kv transmission line right-of-way will be

# ALASKA POWER AUTHORITY

## ENVIRONMENTAL IMPACT OF THE CHOSEN ALTERNATIVE

This section of the summary is divided into three parts addressing the major questions associated with environmental impacts of the Terror Lake hydroelectric project. These areas of concern are (1) measures to enhance the environment or to avoid or mitigate adverse environmental effects, (2) unavoidable adverse environmental effects, and (3) irreversible and irretrievable commitments of resources. The Terror Lake project would have adverse environmental impact on terrestrial habitat and fisheries if the ecosystems were not considered within the design, construction and eventual operation of the project.

### Measures to Enhance the Environment or to Avoid or Mitigate Adverse Environmental Effects.

The Terror Lake reservoir will not be operated for flood control, irrigation, navigation, reclamation, recreation or water supply. Releases will be made through the outlet works at the Terror Lake dam in order to maintain specified minimum flows throughout the year at the mouth of the Terror River in efforts to improve the fish habitat in the lower reaches of the River. In addition, discharges from the powerhouse into the Kizhuyak River could be utilized to maintain a fish hatchery downstream of the powerhouse, and increase the fish population of that river also.

Long term impacts on species and ecosystems will be associated with increased visits caused by easier access to the area. The use of the access roads for vehicles can be restricted to KEA maintenance personnel. It is unlikely that any imbalances or major alterations to an ecosystem or the loss of an endangered species will result from the operation and maintenance of this project, because of the relatively small area of habitat disturbed and the stable population of the resident endangered species. Both the fishing industry and the wild life, particularly the bears, will benefit from the increased quantities of fish produced in the Terror River and the Kizhuyak River as a result of project implementation. Potential recreational uses of the project area will not impact a large population of brown bear or involve "substantial and sustained" human occupation. The transmission line will probably have negligible impact on the wildlife species because of the relatively small area involved. Clearing of vegetation along the right-of-way could benefit some species by permitting a regrowth of brush that would provide forage for browsers, such as deer and snowshoe hare.

Operation of the project will not add significantly to existing noise levels, nor will it diminish air quality except during the period of construction. Operation of the project will permit less extensive use of existing diesel generators in Kodiak, thereby causing an improvement in the air quality. The diesel units will still be used for peak generation and standby capacity.

The estimated sedimentation in the Terror Lake reservoir over a period of 50 years will amount to about 80 acre feet, a negligible amount compared to the combined live and dead storage of 94,000 acre feet. The

## ALASKA POWER AUTHORITY

The last alternative to the project would be "no-action". This would mean that power generation on Kodiak would continue to be based on diesel oil as the basic energy source. The cost of electric power there would continue to escalate, and its production would continue to cause air and noise pollution, and to use a non-renewable resource. The construction impacts associated with the proposed project would be avoided but the potential to establish improved fisheries in the Kizhuyak and Terror Rivers would be lost, and the economic benefits associated with the construction of the project would not be realized.

## ALASKA POWER AUTHORITY

extended about eleven miles southwest to the Bells Flat area. KEA owns and operates a generating station at the Village of Port Lions, however, this facility is not presently nor will it be in the foreseeable future connected by a transmission intertie to the City of Kodiak generation and transmission system. The existing capacity in the Kodiak generating station will firm the capacity to be installed in the proposed Terror Lake project and will provide emergency capacity in case of transmission line outage. The U. S. Coast Guard system presently has 5200 Kw of generating capacity and will add one 2500 Kw diesel combustion unit in 1980. Required reserve capacity throughout the expansion period of 1983 to 1997 will be provided by in-place diesel capacity prior to completion of the Terror Lake project.

### Alternatives Considered

Numerous energy alternatives were considered and found to not be viable alternatives to hydropower either because they were not economically feasible or because they are still at the research stage and are not yet technically feasible. Diesel, coal and natural gas for combustion turbines or steam-fired plants are not economic alternatives to the proposed Terror Lake project.

In earlier studies the entire Island was investigated for potential hydroelectric development sites. The main criteria used in locating potential sites were an adequate volume of water, a high head, and a location at a reasonable distance from Kodiak for the transmission line. Foremost attractive alternatives to the Terror Lake project were (1) Terror Lake-Terror River development, (2) Terror Lake-Uganik Lake development, (3) Hidden Basin River development, (4) Spiridon Lake development. The first three alternative hydroelectric developments were discussed in the section entitled "Engineering Considerations" where developments down different river valleys were considered and discounted due to the disadvantages of locating the powerhouse further away from the City of Kodiak than the proposed project, longer transmission lines and access roads, poor geological conditions along the power tunnel route, higher costs of construction for schemes that produce considerably less power, and environmental problems which are of a similar nature to the Terror Lake project. The Spiridon Lake development involves no work at Terror Lake. Spiridon Lake lies at elevation 440 on the peninsula between Uganik Bay on the east and Spiridon Bay on the west and is approximately 50 miles west of the City of Kodiak. Spiridon Lake shows the potential for a relatively low cost power development; however, it is too small to meet the immediate needs of the KEA, Incorporated. Spiridon Lake could be a future source of economic energy after the Terror Lake project has been developed to its ultimate potential. The energy production would be about 20% of that from the Terror Lake project. The Spiridon Lake project would probably result in lesser environmental impacts than the proposed project. However, it is doubtful if the reduced impacts would be proportional to the much smaller energy benefits of this scheme.

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## NEED FOR THE PROJECT

### Anticipated Power Requirements

Present and projected capacity and energy requirements for the Kodiak Electric Association were developed by the Rural Electrification Administrations (REA) in their report "Power Requirement Study, Alaska III, Kodiak, Kodiak Electric Association, Incorporated, Kodiak, Alaska", in May, 1977. The U.S. Coast Guard station to the southwest of Kodiak now generates its own electric power and has written letters stating its interest in buying power from KEA in the future when the Terror Lake project comes on line with sufficient power. When the Terror Lake hydroelectric project comes into service, it is intended to replace generation by the existing diesel engine powered generators with cheaper, cleaner hydroelectric power. The existing diesel capacity will be maintained for standby generating capacity.

Load growth in the Kodiak service area has been predicated primarily upon two future developments; growth in the fishing industry associated with the new 200 mile limit, and potential offshore oil development. Even without oil development the Kodiak service area will experience one of the most significant load growths over the next ten years of any utility in the State of Alaska. Energy consumption from 1968 to 1976 doubled from 25 Gwh to 50 Gwh and the present forecast is for an additional doubling of energy demand to 100 Gwh in 1984. The excess firm energy from the Terror Lake project in 1984 will only represent 25% of the Kodiak service areas energy demand. If excess power from the project is marketed to the U. S. Coast Guard station on Kodiak, then the entire firm energy of the project can be utilized from the power-on-line date. Without a power sales contract to the Coast Guard station the firm energy produced by the Terror Lake project will be totally utilized by KEA customers by 1989. The cost of energy from the project, whether excess energy is sold to the U. S. Coast Guard or not, will be no greater than the cost of energy produced by the diesel generation alternative in 1984.

Power requirements projections in the Definite Project Report and in the License Application reflect an 8.6% average annual growth rate in energy demand for the KEA service area through 1986, and a 3.5% average annual growth rate from 1986 to 1996. This forecast appears realistic based upon past trends and recent forecasts of population growth and commercial development for the Kodiak area as reflected in the OCS planning activities and reports prepared by the Kodiak Island Borough Planning Department.

### Existing and Near Term Sources of Power

The KEA owns and operates a diesel engine powered generating station located in the City of Kodiak that contains eleven units with a total capacity of 24,918 Kw (2 at 800 Kw, 2 at 484 Kw, 1 at 645 Kw, 3 at 2,000 Kw, 1 at 2,665 Kw, 1 at 2500 Kw and 2 at 5270 Kw). KEA will add to its Kodiak station another 7000 Kw diesel powered unit, which is scheduled to be on line in 1981. This will insure that sufficient firm power is available until the proposed Terror Lake project comes into production. The present distribution system in Kodiak now extends from the generating station about 4 miles north to Monashka Bay, and is being

# ALASKA POWER AUTHORITY

## ENGINEERING CONSIDERATIONS

Alternative developments to the proposed project were analyzed to establish the optimum project for development. They include alternative developments down different river valleys, alternative developments down the Kizhuyak Valley, and an underground versus a surface powerhouse. The proposed Terror Lake-Kizhuyak Valley scheme allows the high catchment basins of Shotgun Creek and Falls Creek, with a combined area of 6.4 square miles, to be included in the project for a relatively low capital cost. Most alternative schemes do not have this capability, nor do they pass close to other areas with comparable flow that could be diverted to the system. The recommended scheme has been laid out so that the tunnel is located entirely within a granitic formation, the best rock for tunneling in the area. Alternative schemes would have the power tunnel pass wholly or in part through varying amounts of weaker, foliated slates. The recommended project also has the powerhouse location closest to Kodiak, so that the transmission line is shorter than in other developments.

An underground powerhouse, penstock and tailrace tunnel would have to pass through poor quality rock which would require extensive deep drilling to determine feasibility. A surface penstock and powerhouse offers no unknown disadvantages in that the valley slopes are neither severe nor unstable, and there is no avalanche danger. Overburden is not deep, and suitable rock foundations for the penstock anchor blocks should be found at a reasonable depth. The powerhouse will be located on rock formed by cutting a bench into the hillside. Steel thickness in the penstock will not be excessive, and the cost per unit length will be less than that for a tunnel.

The 26,300 foot long power tunnel is the most costly construction element of the entire project. Extensive deep hole drilling to test the rock conditions along the power tunnel alignment have not been accomplished. This testing would of necessity have to be extensive and extremely expensive in order to determine the amount of tunnel support and lining that could be required. The potential of discovery of fractured rock along the power tunnel alignment is the greatest area for potential cost overruns. The power tunnel cost represents 42% of the cost of the total hydraulic production plant. The cost estimates for the total project contain a 25% contingency for underground work which may prove adequate for any problems that might develop for the power tunnel.

The U.S. Fish & Wildlife Service and State of Alaska Department of Fish & Game have recommended minimum flows for the mouth of the Terror River for maintenance of spawning beds. The natural river flows are generally less than the recommended minimums from December to April when most potential damage occurs, and exceed the minimum recommended values from May to November. Operation studies reflecting controlled flow releases at the Terror Lake Dam outlet works to supplement natural inflow below the dam have demonstrated that the recommended minimum flows at the mouth of the Terror River can always be met.

UNIT COST OF ENERGY FROM DIESEL

In 1984

	mills/kWh
Diesel Fuel and Lube Oil Cost <u>1/</u>	55.4
Operation and Maintenance Cost <u>2/</u>	6.6
Construction Debt Repayment <u>3/</u>	<u>3.9</u>
Unit Cost of Energy	65.9

In 2017

Diesel Fuel and Lube Oil Cost	516.6
Operation and Maintenance Cost	62.0
Construction Debt Repayment	<u>12.1</u>
Unit Cost of Energy	590.7

In 2018

Diesel Fuel and Lube Oil Cost	552.7
Operation and Maintenance Cost	66.3
Construction Debt Repayment	<u>12.1</u>
Unit Cost of Energy	631.1

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1 / Based on actual 1977 price of 41.2¢/gal. for diesel fuel plus 5% for lube oil, escalated at 11% to 1980 and at 7% thereafter. Average fuel rate: 14 kWh/gal.

2 / Estimated at 12% of total operating cost.

3 / Based on unit cost of 7,000 kw diesel generators at a 65% PUF in 1982, 1985, and 1993, and inflation rate of 7%, and an interest rate of 6.5%.

TERROR LAKE HYDROELECTRIC PROJECT  
UNIT COST ENERGY

Generation

Installed capacity	20.0 MW
Firm Capacity	15.0 MW
Annual firm generation	132 kWh x 10 <sup>6</sup>
Average annual secondary generation	<u>7 kWh x 10<sup>6</sup></u>
Average annual total generation	139 kWh x 10 <sup>6</sup>
Annual power sold <u>1/</u>	125 kWh x 10 <sup>6</sup>

Capital Cost

Total construction cost (Jan. 1979 prices)	\$64,400,000
Interest during construction (at 6.5% per year)	6,660,000
Allowance for inflation (at 7% per year)	<u>9,940,000</u>
Total capital investment (by Jan. 1983)	\$81,000,000
Capital Cost per installed kW	4,050

<u>Unit Cost of Energy from Hydro Power</u>	6.5% Loan for <u>35 Years</u>
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Debt repayment factor	0.0731
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In 1984

Annual debt repayment	\$5,922,000
Annual O&M costs <u>2/</u>	<u>321,000</u>
Total annual costs	\$6,243,000
Unit cost of energy	50 mills/kWh

In 2017

Annual debt repayment	\$5,922,000
Annual O&M costs <u>2/</u>	<u>2,993,000</u>
Total annual costs	\$8,915,000
Unit cost of energy	72 mills/kWh

In 2018

Annual debt repayment	---
Annual O&M costs	<u>\$3,203,000</u>
Total annual costs	\$3,203,000
Unit cost of energy	26 mills/kWh

1 / Assuming 10% losses in transmission, station service and non-revenue uses.

2 / Estimated at \$15/kWh, escalated at 7%/year

# ALASKA POWER AUTHORITY

## PROJECT COSTS

The estimated direct construction cost for the Terror Lake Project is \$64.4 million. The total capital investment including interest during construction at 6.5% and an allowance for inflation at 7% per year is \$81 million. The direct construction cost is for prices as of January, 1979. Construction could start in early 1980 and continue through the three year period 1980-1982 with power coming on-line in 1983.

The Kodiak Electric Association, Inc. has applied for a loan with the Rural Electrification Administration for funds to construct the Terror Lake Hydroelectric Project. Depending on the outcome of the loan application, the balance of the necessary funds may be obtained through a tax exempt revenue bond issue through the Alaska Power Authority with a guarantee by the National Rural Utilities Cooperative Finance Corporation. The State of Alaska would encumber no general obligation for the long term financing.

The following table illustrates the relative advantages for unit costs of energy of equivalent power sold for the Terror Lake hydroelectric project and equivalent diesel generation. The Table presents the annual costs/Kwh for the two developments, and accounts for inflation in diesel fuel and other operating costs. Capital financing costs are estimated at 6.5% for both alternatives based on a combination of 5% REA loans and revenue bond financing through the Alaska Power Authority utilizing federal guarantees and security arrangements provided by the Cooperative Finance Corporation. The cost of money for construction could ultimately be materially less than 6.5%.

The unit cost of energy from Terror Lake is considerably less than the cost of energy from alternative diesel generation in the first year of operation. The comparative advantage of Terror Lake energy increases with time with rising costs of diesel fuel and the constant debt service associated with the capital intensive hydroelectric development.

# ALASKA POWER AUTHORITY

## DESCRIPTION OF THE PROJECT

Terror Lake lies in a natural high-level basin in the mountains of Kodiak Island about 18 air line miles southwest from the City of Kodiak. The natural storage of the Lake will be increased by building a dam across the lake's natural outlet to the Terror River. A power tunnel will leave the lake from an intake structure on the eastern shore and carry water to an outlet portal on the slopes of the Kizhuyak Valley. A single penstock will extend from the tunnel outlet down the side of the Kizhuyak Valley to a surface powerhouse located on the valley floor. Discharge water from the turbines will flow into the Kizhuyak River. Electrical power will be carried to Kodiak on a 69 Kv transmission line.

The surface elevation of the Lake will be raised from 1,250 feet to 1,383 feet. Natural storage of Terror Lake will be increased by 78,000 acre feet. The natural catchment or run-off to Terror Lake is 15.1 square miles, and the catchment area will be supplemented by diversion of 8.6 square miles of the adjacent catchment areas of Shotgun Creek, Falls Creek, Rolling Rock Creek, and the Mount Glotoff Glacier. Provisions will also be made for future diversion of run-off in 4 square miles of the Hidden Basin Creek catchment area.

The dam will be a compacted rock-fill structure with a height of 156 feet with an upstream impervious face of asphaltic concrete. Crest elevation will be 1,391 feet. An ungated, unlined 600 foot long side channel spillway will have an inlet at elevation 1,383 feet. Controlled release of water down Terror River will be through a reinforced concrete outlet conduit through the base of the dam. The total volume of fill used in the dam will be 910,000 cubic yards, and the total crest length of the dam is 2100 feet.

The power tunnel will be horseshoe shaped, ten feet in diameter, and pass through granite for its entire five mile length. The penstock will be made of steel and surface run for 3,400 feet from the tunnel outlet to the power house. The thickness of the steel will vary from 3/8 to 3/4 inches and will have a yield stress of 50,000 psi. The diameter of the penstock will vary from 96 to 56 inches.

The powerhouse will be located three miles upstream from where the Kizhuyak River meets the ocean. It will contain two horizontal axis 13,000 HP, Pelton-type impulse turbines rated at 10 megawatts each. Elevation of the plant is 109.5 feet and will operate at an average head of 1,150 feet. Provisions will be made for the addition of a third turbine in the powerhouse. Normal operation of the powerhouse will be from a control center in Kodiak, but equipment will be provided for operation at the Terror Lake powerhouse.

## SECTION X

### ECONOMIC ANALYSIS

#### 1. GENERAL

Economic feasibility for a project is commonly expressed as a benefit-cost ratio; benefits being calculated as the cost of the most economic viable alternative available to a project and costs being those of the project under consideration.

For KPU the most economically viable alternative would be construction of a diesel-electric generating facility of similar capability located near the load center. The benefit of the hydroelectric project is then totaled as the cost of the diesel generating facility and the benefit-cost ratio is determined herein for the first year of Project operation. Other types of fossil fuel generating units are not considered to be viable for the magnitude of KPU's present system loads due to high operating and fuel transportation costs. Wind, solar and geothermal alternatives are not considered to be viable alternatives.

Another measure of the economic feasibility of a project is the dollar savings (or deficit) which will result from comparison of the cost of its operation, with the cost, or assigned benefit, of the most economic alternative. In this case the alternative is continued diesel generation including additional installations as needed to meet the future load. For a hydroelectric project this is commonly determined over a period of initial operation, possibly ten years, discounted on a present worth basis. For the Project, estimated savings were calculated assuming two slightly different premises. First, because all of the output may not be marketable at the commercial on-line date, a determination of dollar savings was made over the early years of Project opera-

tion with benefits assigned only for that portion of the output which is presently estimated to be useable to meet KPU's system loads. Secondly, as an overall indication of economic feasibility of the Project, a determination of dollar savings was made over the same period assigned as above and with credit taken assuming that all of the Project output was marketed. Thus the excess energy from the Project over and above the City's requirements was assumed to be sold at the cost of Project power based on total annual costs and output. The actual cost savings for the Project would fall between these two limits and would depend upon the marketability of that portion of the power output not needed to meet KPU's loads during the initial 6 years of operation. Thereafter it was estimated that all of the Project output would be used by the City.

## 2. PROJECT COSTS

### a. Capital Costs

As described in Section IX, estimates of construction costs were made on the basis of contract bids for the major items of work being received in January 1981 which corresponds to a commercial on-line date of November 1983. A cash flow for the construction phase was developed to permit determination of interest during construction. It was assumed that the Project will be financed by loans from the Alaska Water Resources Revolving Loan Fund or the State Power Authority Power Project Revolving Fund, with interest at 5%, a loan period of 50 years, and with loan repayment, principal and interest, beginning at the date of commercial operation. As shown in Table IX-1, the Total Investment Cost, including interest during construction, is \$80,924,000. The Total Capital Requirements (total amount of loan) include the Total Investment Cost plus a reserve fund equal to one year's debt service on the loan, and are \$85,690,000 (See Table X-1).

b. Annual Costs

Debt service was calculated based on a 47-year repayment period, which is the 50 year loan less the 3-year construction period. Interest on funds used through construction is accumulated and included in the total amount of the loan.

Annual costs for operation and maintenance, administrative and general, insurance and interim replacements were developed for the Project. These costs have been estimated assuming the plant will be remotely operated from Ketchikan and that full time operators will not be required at the plant. Operation and Maintenance costs were derived based on assumed manpower requirements, material and equipment costs and transportation costs and are generally based on figures developed by the Alaska Power Administration specifically for the Swan Lake Project based on experience on the Snettisham Project near Juneau. Details of this analysis are presented in a recent report published in February 1978<sup>(14)</sup>. It was assumed that a minimum of three maintenance personnel would be assigned to live at the site and they would be qualified to operate the plant in the event of an emergency. The costs were adjusted to a 1978 price level and then escalated at a uniform rate of 7% per year to arrive at an estimated operating cost at the on-line date. Administrative and General costs were included in Operation and Maintenance costs and Insurance and Interim Replacements have been assumed at 0.1% and 0.2% respectively of the Total Capital Requirements.

Table X-1 shows the estimated Total Annual Cost for the first year of operation will be \$5,401,000. Annual costs include the debt service of constant amount, plus all operating and maintenance costs escalated at 7% annually.

### 3. COSTS OF DIESEL ALTERNATIVE

#### a. General

For the economic analysis of the Project as discussed above, two alternative diesel installations were considered. Either alternative would supplement existing hydro and diesel generation at the time the Project enters into service.

The first, to determine the first year benefit-cost ratio, would involve construction of a new diesel installation, with the same capability as the Project, delivering 18,000 kW of dependable capacity and 85,400,000 kWh of average annual energy to the load center at the November 1983 on-line date.

The second alternative diesel installation, used to determine the estimated savings with Project operation in the early years, would involve adding generating capacity in approximately 6,450 kW increments to KPU's system to meet growing peak load and energy requirements. This incremental capacity installation is consistent with KPU's recent practice of purchasing new diesel capacity to meet load growth.

#### b. Capital Costs

Capital requirements for construction of new diesel installations in the range of sizes considered in this analysis are shown in Table X-2 which presents the costs on a dollar per kilowatt basis. Prices for equipment and other items were developed based on quotations from suppliers and from recent experience with similar installations. Costs were estimated based on a January 1978 bid price level and escalated as necessary assuming a 1-3/4 year construction period. Engineering and owner administration costs were included at 7% of direct construction costs plus contingencies. It is assumed that these investments would be financed

through sale of 25-year bonds at an interest rate of 7% and the bond issue would include a reserve fund equal to one year's debt service.

c. Annual Costs

Annual costs for the diesel alternative are shown on Table X-3 along with the criteria upon which they are based. Operating and maintenance costs are based on KPU's historical experience, which compares favorably to data from the FERC and other sources. Estimated diesel fuel costs have been derived using a base price of 41 cents per gallon in July 1977 which is representative of prices recently paid by KPU. Construction and operation costs have been assumed to escalate at 7% annually. To be conservative an overall 7% per year escalation rate has also been applied to future oil costs. However it is generally predicted that oil will escalate at a rate several percent higher than the general escalation amount. Hence for the Project economic feasibility determination, diesel variable annual costs have further been determined assuming that diesel fuel costs escalate at 10% annually from present levels, or 3% higher than other costs. The estimated unit costs are shown in Table X-3. Annual costs include the fixed costs of constant amount, plus all variable costs escalated annually.

Based on the cost data shown in Table X-3, the estimated Total Annual Cost to deliver the full Project output for the first year of operation of the diesel alternative would be \$5,906,000, assuming 7% diesel fuel price escalation. For a 10% fuel price escalation rate this figure would be \$6,760,000 (see Table X-4).

4. ECONOMIC FEASIBILITY DETERMINATION

a. First Year Benefit-Cost Ratio

As shown in Table X-4 the benefit-cost ratio for the Project for the first year of operation is 1.09 for 7% annual es-

calation of fuel oil costs. This ratio is based on a diesel alternative with an installed capacity equal to the dependable capacity and producing the average annual output of the Project, and thus assumes full utilization of the power from either source. A 10% escalation rate of fuel oil costs will result in a first year benefit-cost ratio of 1.25.

b. Ten Year Economic Analysis

Cumulative savings were calculated for the Project for the first ten years of operation (1983-1993) both without and with credit for sale of excess Project output in the early years. Fixed costs for existing KPU diesel and all costs of existing hydro facilities have not been included as they are assumed to be the same for both alternatives. Development of these analyses for the condition assuming no sale of excess energy is shown in Table X-5 for an assumed 7% annual escalation rate for cost of oil, and Table X-7 for 10% escalation. Tables X-6 and X-8 show the corresponding analyses for the assumption that the early year Project energy in excess of the City's requirements will be sold at the average cost of production and would result in a credit to the Project. These tables show the savings (or deficit) of the Project operation compared to continued diesel operation over the initial 10 year period. The total present worth savings over this period is then derived.

For the first ten years of Project operation and with no sale of excess energy the present worth values in 1983 dollars of cost savings are \$1,096,000 and \$15,492,000 for 7% and 10% fuel escalation, respectively. If the excess energy is sold as discussed above, the present worth values (1983 dollars) of cost savings are \$8,218,000 and \$22,611,000 for 7% and 10% fuel escalation respectively.

From the above analyses it can be seen that the Project is economically feasible whether or not output in excess of the City's needs during the early years of operation can be marketed. However, economic feasibility will improve significantly if diesel fuel prices escalate at rates higher than other costs, and if part or all of the excess power output during the early years of operation can be marketed.

## 5. FINANCIAL CONSIDERATIONS

While the Project is economically feasible it should be noted in Tables X-5 and X-6 that during the initial three to five years of the Project schedule the costs would be more for Project power than for the alternative of continuing with diesel generation, if no excess power can be marketed. Early year power costs for the Project can be diminished by marketing as much as possible of the excess power output. Preliminary discussions have been held with Louisiana Pacific-Ketchikan regarding purchase of some of the excess energy on a retractable sales basis to diminish its need to operate expensive oil fired generation facilities for electric energy while simultaneously reducing Ketchikan's power cost. Also, as discussed in Section VIII, the Alaska Department of Fish and Game desires to construct a fish hatchery at the Project and the Cape Fox Corporation anticipates development of recreational - industrial facilities on newly acquired land near the mouth of the White River. Both could well become KPU power customers.

In addition, it is an accepted practice in financial arrangements for hydroelectric projects to provide for deferred principal payments during the first several years of operation when full output of a project is not utilized. This provides for reasonable initial power costs from a project and slightly increased power costs in the future when the full output is being utilized and revenue producing potential is at the maximum. It is reason-

able to assume that such a financing approach could be applied to the Project to maintain Ketchikan's initial power costs within a reasonable range.

SWAN LAKE PROJECT  
PROJECT COSTS

CAPITAL COST

Total Investment Cost	\$80,924,000
Reserve Fund <sup>(1)</sup>	<u>4,766,000</u>
TOTAL CAPITAL REQUIREMENTS	\$85,690,000

ANNUAL COST<sup>(2)</sup>

Debt Service (47 years @ 5%) <sup>(3)</sup>	\$ 4,528,000
Operation and Maintenance <sup>(4)</sup>	615,000
Insurance	86,000
Interim Replacements	<u>172,000</u>
TOTAL ANNUAL COST	\$ 5,401,000

- (1) Reserve fund equal to one year of debt service.
- (2) Project annual cost based on first year of operation beginning November 1983.
- (3) Includes credit for interest earned on reserve funds @ 5%.
- (4) Operation and Maintenance costs include administrative and general cost items.

## SWAN LAKE PROJECT

CAPITAL COSTS OF ALTERNATIVE DIESEL INSTALLATION<sup>(1)</sup>

	<u>Cost per kW</u>
Land, Site Development and Building .....	\$ 35.50
Engine Generators .....	295.00
Electrical Equipment and Switchyard .....	50.00
Dock and Fuel Unloading Facilities .....	10.00
Fuel Storage Facilities .....	35.60
Initial Fuel Supply (2) .....	<u>35.86</u>
DIRECT CONSTRUCTION COST (3) .....	\$ 461.96
Contingencies (4) .....	<u>24.00</u>
Subtotal .....	\$ 485.06
Engineering and Owner Administration (5) .....	<u>33.95</u>
TOTAL CONSTRUCTION COST (6) .....	\$ 519.01
Interest During Construction (7) .....	<u>6.45</u>
TOTAL CAPITAL INVESTMENT (On-Line Nov. 1979)....	\$ 525.46
TOTAL CAPITAL INVESTMENT (On-Line Nov. 1983) ...	\$ 688.77
RESERVE FUND (8) .....	\$ 64.65
TOTAL CAPITAL REQUIREMENTS (on-line Nov. 1983)(9)	\$ 753.42

- (1) Costs based on dependable capacity delivered to the load center for a large capacity (equal in size to the Project alternative) diesel base load plant.
- (2) Sufficient fuel for two months operation at 60% plant factor based on July 1977 fuel cost of 41 cents per gallon.
- (3) January 1978 bid.
- (4) Contingencies at 5% of Direct Construction Cost.
- (5) 7% of Direct Construction Cost plus Contingencies
- (6) January 1978 bid, on-line 1-3/4 years later (11/79).
- (7) 1-3/4 year construction period; 7% interest rate.
- (8) Reserve fund equal to one year's debt service.
- (9) 7% escalation from 11/79 to 11/83.

## SWAN LAKE PROJECT

## ANNUAL COSTS OF ALTERNATIVE DIESEL INSTALLATION

Total Capital Requirements - \$/kW <sup>(1)</sup> .....	\$753.42
(on-line November 1983)	
<u>Fixed Annual Costs - \$/kW 1983-84</u>	
Debt Service (25 years @ 7%) <sup>(2)</sup> .....	\$ 60.10
Fixed O & M <sup>(3)</sup> .....	\$ <u>45.00</u>
TOTAL	\$105.10
<u>Variable Annual Costs - Mills/kWh 1983-84</u>	
Fuel Cost <sup>(4)</sup> .....	47.00
Fuel Cost <sup>(5)</sup> .....	57.00

- (1) See Table X-2 for determination of diesel capital costs.
- (2) Includes credit for interest on reserve fund @ 5%.
- (3) \$30 per kW in 1977 escalated to 1983 at 7%.
- (4) Based on 41 cents per gallon in 1977 escalated at 7% annually to 1983-84 period; heat content of diesel fuel 140,000 Btu/gal. and average heat rate of diesel unit 10,000 Btu/kWh over life of plant.
- (5) Based on 41 cents per gallon in 1977 escalated at 10% annually to the 1983-84 period.

## SWAN LAKE PROJECT

ECONOMIC ANALYSIS OF PROJECT  
COMPARED TO SAME SIZE DIESEL  
ALTERNATIVE<sup>(1)</sup>PROJECT ANNUAL COST

Debt Service .....	\$4,528,000
Operating Costs .....	<u>873,000</u>
TOTAL PROJECT ANNUAL COST	\$5,401,000

DIESEL ALTERNATIVE ANNUAL COSTDiesel Fuel Price  
Escalation Rate

	<u>7%</u>	<u>10%</u>
Fixed Costs <sup>(2)</sup> .....	\$1,892,000	\$1,892,000
Variable Costs (Fuel Costs) .....	\$4,014,000 <sup>(3)</sup>	\$4,868,000 <sup>(4)</sup>
TOTAL ANNUAL COST OF DIESEL ALTERNATIVE <sup>(5)</sup>	\$5,906,000	\$6,760,000

BENEFIT-COST RATIO

1.09                      1.25

- (1) Values shown are for the first year of operation, beginning in November 1983.
- (2) 18,000 kW x \$105.10 per kW.
- (3) 85,400,000 kWh x 47.0 Mills/kWh.
- (4) 85,400,000 kWh x 57.0 Mills/kWh.
- (5) Annual Project benefit.

TEN YEAR ECONOMIC ANALYSIS<sup>(1)</sup>  
 NO SALE OF PROJECT EXCESS POWER  
 7% DIESEL FUEL PRICE ESCALATION

(All Costs \$1000)

Period <sup>(4)</sup>	Diesel Alternative			Project	Savings or (Deficit) Amount	Present Worth of Savings or (Deficit) <sup>(5)</sup>
	Total New Capacity kW	Energy GWh	Annual Costs <sup>(2)</sup>	Annual Costs <sup>(3)</sup>		
1983-84	6,450	50.15	3,035	5,401	(2,366)	(2,366)
1984-85	6,450	55.79	3,504	5,462	(1,958)	(1,847)
1985-86	6,450	61.72	4,041	5,527	(1,486)	(1,323)
1986-87	6,450	67.94	4,655	5,597	( 942)	( 791)
1987-88	6,450	74.47	5,356	5,672	( 316)	( 250)
1988-89	12,900	81.33	7,107	5,752	1,355	1,013
1989-90	12,900	85.40	7,827	5,838	1,987	1,401
1990-91	12,900	85.40	8,309	5,930	2,379	1,582
1991-92	12,900	85.40	8,826	6,028	2,798	1,756
1992-93	12,900	85.40	9,378	6,133	3,245	<u>1,921</u>
Cumulative Present Worth Savings						1,096

- (1) Initial 10 years of operation
- (2) Assuming generation to meet projected load each year.
- (3) Operating costs escalated at 7% annually from on-line date.
- (4) November - October, typical.
- (5) November 1983 level, 6% discount rate.