1139

TABLE 2
NATIONAL HYDROPOWER STUDY
POTENTIAL HYDROPOWER SITES IDENTIFIED FOR DETAILED STUDY IN ALASKA (cont)

Map Index Number	Project Name	Site Ident Number	Name of Stream	Latitude	Longitude	Owner	Additional Capacity Potential (kW)	Additional Energy Potential (MWh)	Average Cost of Energy (mills/kWh)
48.	Anita	AK6NPA0414	Zimovia Straight	56 15.5	132 26.5	undeveloped	3,200	14,000	54.60
49.	Harding River	AK7NPA0301	Harding River	56 16.1	131 38.9	undeveloped	18,000	85,000	60.44
50.	Tyee Creek	AK7NPA0408	Tyee Creek	56 12.0	131 33.0	undeveloped	30,000	133,000	27.66
51.	Swan Lake	AK7NPA0132	Falls Creek	55 35.9	131 21.0	undeveloped	22,000	85,000	58.33
52.	Mahoney Lake	AK7NPA0123	Mahoney Lake	55 25.0	131 31.1	undeveloped	14,400	56,000	30.42
53.	Upper Silvis	AKDNPA0139	Beaver Falls	55 22.8	131 30.9	City of Ketchikan	2,000	49,100	21.71
54.	Lake Connell	AKDNPA0141	Ward Creek	55 26.0	131 40.2	City of Ketchikan	2,000	10,400	56.45
55.	Ketchikan	AKINPA0138	Ketchikan Creek	55 21.5	131 37.0	City of Ketchikan	2,000	15,000	31.10
56.	Chester Lake	AKPNPA0097	Nichols Off	55 7.1	131 31.6	City of Metlakatla	2,500	5,200	48.75
57.	Black Bear	AK7NPA0104	Black Bear	56 32.9	132 0.5	undeveloped	5,000	22,000	44.36
58.	Lake Mary	AK7NPA0395	Old Franks Creek	55 26.0	132 29.0	undeveloped	9,600	42,300	49.80
59.	Mellen Lake	AK7NPA0255	Reynolds Creek	55 12.0	132 36.0	undeveloped	8,000	30,000	41.68

TABLE 3

The following tables provide physical data and environmental and social impacts of the proposed projects. The environmental and social impact codes can be identified through the following matrixes:

Description Matrix for Potential Environmental Concerns Code

Environmental Concern / Column No.	State/Nat'l Parks & Wilderness area	Designated and Potential W&S R.	Resident Fish	Anadromous Fish	Wildlife Habitat	Endangered Species	Wetlands
Impact	1	2	3	4	5	6	7
Unknown	U	U	U	U	U	U	U
No	N	N	N	N	N	N	N
Yes	Y	Y	Y	Y	Y	Y	Y

Description Matrix for Potential Social Concerns Code

Social Concern / Column No	Cultural/Historical Resources	Community Relocation	Transportation Relocation	Farm Land	Local Comment	Environmental Group Comment	Other Group Comment	Utility Interest	State Comment
Impact	1	2	3	4	5	6	7	8	9
Unknown	U	U	U	U	U	U	U	U	U
No	N	N	N	N	N	N	N	N	N
Yes	Y	Y	Y	Y	Y	Y	Y	Y	Y

SURVEY SITES
TABLE 4

SITE ID / DEP ACTV CODE INV GEOG. AREA	PROJECT NAME / PRIMARY CO. -NAME OF STREAM / OWNER / MAP REFERENCE	LATITUDE LONGITUDE DR.AREA (D M.M) (D M.M) (SQ.MI)	PROJ.PURP. STATUS AVE. Q (CFS)	DAM HT F C STOR. PWR. HD. (FT) (AC FT) (FT)	EXIST.CAP. INC. CAP. TOT. CAP. (KW) (KW) (KW)	EXIST.ENRG INC.ENERGY TOT.ENERGY (MWH) (MWH) (MWH)	ANUL. COST ENERGY COST (1000 $) ($/MWH)	ENVIRONMENTAL IMPACT CODE / SOCIAL IMPACT CODE
AKJUPA0102	SNETTISHAM	58 5.9	H	10.0	97160	168500	1902.8	YNNNUNN
I 2	JUNEAU LUNG LAKE	133 48.0	OP	150000	23300	0	0	
SOUTHEAST	AK POWER ADMIN.	30	447.0	800.0	70460	84250		NNNNYNYYY
	TAKU RIVERA-6							
AK6NPA0042	SPEEL DIVISION	58 6.9	H	325.0	0	0	9032.7	NNUUUUU
I 2	JUNEAU SPEEL RIVER	133 42.9	IS	910000	63000	275000	32.846	
SOUTHEAST	UNDEVELOPED	194	-2314.5	272.7	63000	275000		UNNUUUUUU
	TAKU RIVERA-5.							
AK7NPA0083	SWEETHEARTFALLS	57 56.6	H	150.0	0	0	4850.2	NNUUUUU
I 2	JUNEAU SWEETHEARTCRE	133 38.1	IS	206000	29000	127000	38.199	
SOUTHEAST	UNDEVELOPED	35	328.0	611.5	29000	127000		UNNUYYYYY
	SUMDUM D-5							
AK7NPA0086	TEASE	58 5.9	H	80.0	0	0	2050.9	NNUUUUU
I 2	JUNEAU TEASE CREEK	133 40.2	IS	22000	16000	70000	29.428	
SOUTHEAST	UNDEVELOPED	11	152.0	1032.9	16000	70000		UNNUYYYYY
	TAKU RIVERA-5.							
AKMNPA0086	TREADWELL DITCH	58 15.5	H	5.0	0	0	297. 8	NNUUUUU
I 2	JUNEAU TREADWELL DIT	134 22.3	IS	400	2500	10000	25.700	
SOUTHEAST	AK ELEC LIGHT & POWER	15	75.0	517.4	2500	10000		UNNUUUUYU
	JUNEAU D-2,A-2							
AK7NPA0143	UPPER SWEETHEART	57 59.7	H	35.0	0	0	1316.7	NNUUUUU
I 2	JUNEAU SWEETHEARTCRE	133 30.6	IR	18000	7000	30660	42.945	
SOUTHEAST	UNDEVELOPED	5	45.0	1178.8	7000	30660		UNNUUUUUU
	SUMDUM D-5							
AK7NPA0103	BRADLEY LAKE	59 45.0	H	120.0	0	0	7587.5	NNYYYNY
I 2	KENAI-COOKIN BRADLEY CREEK	150 51.0	PA	363000	94000	410000	18.408	
SO CENTRAL	UNDEVELOPED	86	594.0	1053.9	94000	410000		NNNUYYYYY
	SELDUVIA D-3,C-3.							
AK7NPA0106	CHAKACHAMNA LAKE	61 13.0	H	5.0	0	0	1968A	YNUUUUU
I 2	KENAI-COOKIN CHAKACHAMNA R	152 22.0	IS	4015000	366000	1600000	12.305	
SO CENTRAL	UNDEVELOPED	1120	3646.0	792.2	366000	1600000		UNNUUUUUU
	TYONEK A-7.							
AK6NPA0108	COFFEE	61 12.0	H	120.9	0	0	8068.1	NNYYUUU
I 2	KENAI-COOKIN BELUGA RIVER	151 10.0	IS	0	37000	160000	50.413	
SO CENTRAL	UNDEVELOPED	840	2486.0	108.8	37000	160000		UNNUUUUUU
	TYONEK A-8.							

SURVEY SITES
TABLE 4

SITE ID DEP CODE ACTV INV GEOG. AREA	PROJECT NAME PRIMARY CO. -NAME OF STREAM OWNER MAP REFERENCE	LATITUDE (D M.M) LONGITUDE (D M.M) DR.AREA (SQ.MI)	PROJ.PURP. STATUS AVE. Q (CFS)	DAM HT (FT) F C STOR. (AC FT) PWR. HD. (FT)	EXIST.CAP. (KW) INC. CAP. (KW) TOT. CAP. (KW)	EXIST.ENRG (MWH) INC.ENERGY (MWH) TOT.ENERGY (MWH)	NUL. COST (1000 $) ENERGY COST ($/MWH)	ENVIRONMENTAL IMPACT CODE SOCIAL IMPACT CODE
AK6NPA0012	KISARALIK RIVER	60 26.4	H	315.0	0	0	7431.4	YYUUUUU
I 2	BETHEL KISARALIK RIV	160 5.5	ID	716000	30000	131000	56.728	
SOUTHWEST	UNDEVELOPED	544	800.0	264.7	30000	131000		UUNUUUUUU
	BETHEL B-3.							
AK7NPA0018	GRANT LAKE	59 45.9	H	56.0	0	0	1848.5	UNUUUUU
I 2	BRISTOL BAY WOOD RIVER	158 32.0	IS	52500	2700	12672	145.87	
SOUTHWEST	UNDEVELOPED	37	96.0	209.7	2700	12672		UNNUUUUUU
	DILLINGHAMD-7,D-8							
AK7NPA0155	LAKE ELVA	59 37.9		137.0	0	0	2324.6	UUNNNNU
I 2	BRISTOL BAY ELVA CREEK	159 0.0		29000	1000	8000	290.58	
SOUTHWEST	UNDEVELOPED	10	52.2	259.7	1000	8000		NUNUUUUYU
	GOODNEWS BAY C-1							
AK7NPA0032	TAZIMINA	59 58.0	H	45.0	0	0	4809.8	YNYYNNN
I 2	BRISTOL BAY TAZIMINA RIVE	154 33.0	IS	148000	18000	224000	17. 8	
SOUTHWEST	UNDEVELOPED	320	1440.0	190.0	18000	224000		UUNUUUUUU
	ILIAMNA D-5.							
AK5NPA0039	POWER CREEK 1	60 35.1	H	25.0	0	0	2687.0	UUYYNUN
D 2	CORDOVA-MCCA POWER CREEK	145 32.4	SP	0	5000	26000	103.34	
SO CENTRAL	UNDEVELOPED	21	251.0	359.6	5000	26000		UUNNYNUYY
	CORDOVA C-5.							
AK1NPA0094	ANNEX	58 19.5	H	25.0	3500	6000	171.52	UNUUUUU
I 2	JUNEAU ANNEX CREEK	134 7.6	OP	23400	1750	3000	57.176	
SOUTHEAST	ALASKA ELEC LGT AND PWR	6	-63.4	755.0	5250	9000		UUUUUUUUU
	JUNEAU B-1							
AK7NPA0356	CRATER LAKE	58 8.0	H	55.0	0	0	1977.4	UUNNNUY
D 2	JUNEAU CRATER CREEK	133 45.7	IS	118000	11872	41490	47.659	
SOUTHEAST	UNDEVELOPED	12	185.0	979.0	11872	41490		UUUUYUUYY
	TAKU A-6.							
AKMNPA0099	GOLD CREEKS	58 17.4	H	5.0	1600	6800	312.48	UNUUUUU
I 2	JUNEAU GOLD CREEK	134 23.9	OP	0	2000	9965	34.879	
SOUTHEAST	ALASKA ELECTRIC LIGHT & POWER	10	-57.7	225.0	3600	15765		UUUUUUUUU
	JUNEAU B-2							
AK5NPA0096	LAKE DOROTHY	58 14.0	H	5.0	0	0	2286.3	YUUUUUU
I 2	JUNEAU DOROTHY CREEK	134 3.0	IS	165000	30000	150000	15.242	
SOUTHEAST	UNDEVELOPED	11	112.0	2347.6	30000	150000		UUNUYYYYY
	TAKU RIVERA-6.							

SURVEY SITES
TABLE 4

SITE ID / PROJECT NAME / LATITUDE / PROJ.PURP. / DAM HT / EXIST.CAP. / EXIST.ENRG / ANUL. COST / ENVIRONMENTAL
PRIMARY CO. -NAME OF STREAM / LONGITUDE / STATUS / F C STOR. / INC. CAP. / INC.ENERGY / ENERGY COST / IMPACT CODE
DEP ACTV / OWNER / OR.AREA / AVE. Q / PWR. HD. / TOT. CAP. / TOT.ENERGY / /
CODE INV / MAP REFERENCE / (D M. / / (FT) / (KW) / (MWH) / (1000 $) /
GEOG. AREA / / (D M.M) / / (AC FT) / (KW) / (MWH) / (3/MWH) / SOCIAL
/ / (SQ.MI) / (CFS) / (FT) / (KW) / (MWH) / / IMPACT CODE
AKINPA0138 / KETCHIKAN LAKES / 55 21.5 / SM / 33.0 / 4200 / 14800 / 159.52 / NNUUUUU
I 2 / KETCHIKAN KETCHIKAN CRE / 131 37.0 / OP / 9200 / 1400 / 2140 / 74.545 /
SOUTHEAST / CITY OF KETCHIKAN / 11 / -146.1 / 265.0 / 5600 / 16940 / / UNNIIUUIUU
/ KETCHIKAN B-5 / / / / / / /
AKONPA0141 / LAKE CONNELL DAM / 55 26.0 / SO / 85.0 / 0 / 0 / 590.28 / NNUUUUU
I 2 / KETCHIKAN WARD CREEK / 131 40.2 / OP / 8300 / 2000 / 10456 / 56.450 /
SOUTHEAST / KETCHIKAN PULP COMPANY / 13 / 174.0 / 149.8 / 2000 / 10456 / / UNNUUUUUU
/ KETCHIAKANB-5,B-6 / / / / / / /
AK7NPA0123 / MAHONEY LAKE UPPER / 55 25.0 / M / 25.0 / 0 / 0 / 1691.8 / NNYNYNN
I 2 / KETCHIKAN MAHUNEY LAKE / 131 31.1 / IS / 10200 / 14800 / 55590 / 30.426 /
SOUTHEAST / UNDEVELOPED / 2 / 44.0 / 1825.1 / 14800 / 55590 / / YNNNYNIIYY
/ KETCHIKAN B-5 / / / / / / /
AK7NPA0132 / SWAN LAKE / 55 35.9 / M / 195.0 / 0 / 0 / 4958.7 / NNYYNIU
I 2 / KETCHIKAN FALLS CR HEVI / 131 21.0 / IS / 179000 / 22000 / 85000 / 54.334 /
SOUTHEAST / UNDEVELOPED / 36 / 464.0 / 274.7 / 22000 / 85000 / / YNNNYUIIYY
/ KETCHIKAN C-3. / / / / / / /
AKONPA0139 / UPPER SILVIS LAKE / 55 22.8 / M / 60.0 / 2100 / 5000 / 286.20 / NNUUUUU
D 2 / KETCHIKAN BEAVER FALLS / 131 30.9 / OP / 22000 / 2000 / 49111 / 5.9277 /
SOUTHEAST / CITY OF KETCHIKAN / 22 / -574.9 / 265.0 / 4100 / 58111 / / UNNUUUUUU
/ KETCHIKAN B-5 / / / / / / /
AK7NPA0146 / TERROR LAKE / 57 40.0 / M / 70.0 / 0 / 0 / 2772.1 / YNNYYNN
I 2 / KODIAK TERROR RIVER / 153 6.0 / IS / 0 / 20000 / 139000 / 19.943 /
SO CENTRAL / UNDEVELOPED / 17 / 99.0 / 1148.8 / 20000 / 139000 / / YYNYYNUYY
/ KODIAK C-4. / / / / / / /
AKONPA0175 / BELUGA UPPER / 61 15.9 / M / 180.0 / 0 / 0 / 11143 / NNUYUUU
D 2 / MATANUSKA-SU BELUGA RIVER / 151 15.0 / IS / 0 / 48000 / 210000 / 53. 66 /
SO CENTRAL / UNDEVELOPED / 880 / 2484.0 / 141.8 / 48000 / 210000 / / UNNIIIIJUIU
/ TYONEK B-6. / / / / / / /
AK6NPA0181 / CHULITNA HURRICANE / 63 4.9 / M / 230.0 / 0 / 0 / 7882.3 / NNUIIIUU
I 2 / MATANUSKA-SU CHULITNA RIVE / 149 45.0 / IS / 0 / 34000 / 166000 / 45. 74 /
SU CENTRAL / UNDEVELOPED / 795 / 2622.0 / 206.7 / 34000 / 166000 / / UNYIIJUIUU
/ HEALY A-6. / / / / / / /
AK6NPA0186 / DEVIL CANYON NPA PROPOSAL / 62 48.4 / HRC / 635.0 / 0 / 0 / 39328 / NYNNNIIN
D 2 / MATANUSKA-SU SUSITNA RIVER / 149 18.9 / FP / 1050000 / 776000 / 3810000 / 11.532 /
SO CENTRAL / UNDEVELOPED / 5810 / 9227.0 / 574.8 / 776000 / 3810000 / / UNNNYNUYY
/ TALKEETNA ATS D-5 D-6. / / / / / / /

SURVEY SITES
TABLE 4

SITE ID / PRIMARY CD. -NAME OF STREAM / OWNER / MAP REFERENCE	PROJECT NAME	LATITUDE / LONGITUDE / DR.AREA (D M,M) (D M,M) (SQ.MI)	PROJ.PURP. / STATUS / AVE. Q (CFS)	DAM HT / F C STOR. / PWR. HD. (FT) (AC FT) (FT)	EXIST.CAP. INC. CAP. TOT. CAP. (KW) (KW) (KW)	EXIST.ENRG ANNL. INC.ENERGY TOT.ENERGY (MWH) (MWH) (MWH)	COST / ENERGY COST (1000 $) ($/MWH)	ENVIRONMENTAL IMPACT CODE / SPCIAL IMPACT CODE
AK6NPA0197	KEETNA	62 26.5	H	360.0	0	0	9849.7	
I 2	MATANUSKA-SU TALKEETNA RIV	149 41.6	IS	910000	74000	324000	30.362	
SU CENTRAL	UNDEVELOPED	1250	2400.0	285.7	74000	324000		UNKNOWN
	TALKEETNA MTS H-6							
AK6NPA0211	SKWENTNA (HAYES)	61 51.9	H	360.0	0	0	14713	
I 2	MATANUSKA-SU SKWENTNA RIVE	152 7.0	IS	0	96000	490000	30. 27	
SU CENTRAL	UNDEVELOPED	950	2424.0	290.7	96000	490000		UNKNOWN
	TYONEK C-4.							
AK6NPA0216	TALKEETNA 2	62 28.0	H	575.0	0	0	9867.0	
I 2	MATANUSKA-SU TALKEETNA RIV	149 22.0	IS	0	90000	406445	23.341	
SU CENTRAL	UNDEVELOPED	850	1650.0	369.6	90000	406445		UNKNOWN
	TALKEETNA MTNS B-5.							
AK6NPA0222	MATANA NWAPROPOSAL	62 48.9	HRC	810.0	0	0	42568	
D 2	MATANUSKA-SU SUSITNA RIVER	148 30.9	FP	9624000	792000	3800000	17.979	
SU CENTRAL	UNDEVELOPED	5180	8137.0	659.3	792000	3800000		UNKNOWN
	TALKEETNA MTS U-4,3,2 C-2,1.							
AK6NPA0224	YENTNA	61 36.9	H	120.0	0	0	36940	
D 2	MATANUSKA-SU YENTNA RIVER	150 32.0	IS	0	219000	960000	38.474	
SU CENTRAL	UNDEVELOPED	6400	17611.0	81.4	219000	960000		UNKNOWN
	TYONEK C-2.							
AKPNPA0097	CHESTER LAKE	55 7.1	H	12.0	0	0	254.55	
I 2	OUTER KETCHI NICHOLS OFFST	131 51.6	OP	300	2500	5221	48.759	
SOUTHEAST	METLAKATLAPOWER & L IGHT	2	25.0	749.2	2500	5221		UNKNOWN
	KETCHIKAN A-5							
AK7NPA0106	BLACK BEARLAKE	56 32.9	H	28.0	0	0	976. 6	
I 2	PRINCE OF WA BLACK BEARCRE	132 0.5	IS	6900	5000	22000	44.367	
SOUTHEAST	UNDEVELOPED	1	13.5	1058.5	5000	22000		UNKNOWN
	CRAIG C-5							
AK7NPA0395	LAKE MARY	55 26.0	H	30.0	0	0	2104.9	
I 2	PRINCE OF WA OLD FRANKSCRE	132 29.0	IS	95000	9600	42300	49.808	
SOUTHEAST	UNDEVELOPED	27	240.0	244.7	9600	42300		UNKNOWN
	CRAIG B-2							
AK7NPA0255	HELLEN LAKE	55 12.0	H	35.0	0	0	1250.4	
I 2	PRINCE OF WA REYNOLDS CREE	132 36.0	IS	0	8000	30000	41.662	
SOUTHEAST	UNDEVELOPED	6	62.0	844.1	8000	30000		UNKNOWN
	SITKA D-3.							

SURVEY SITES
TABLE 4

SITE ID / DEP ACTV / CODE INV / GEOG. AREA	PROJECT NAME / PRIMARY CO. -NAME OF STREAM / OWNER / MAP REFERENCE	LATITUDE / LONGITUDE / DR.AREA (D M.M) (D M.M) (SQ.MI)	PROJ.PURP. / STATUS / AVE. Q (CFS)	DAM HT / F C STOR. / RAP. HO. (FT) (AC FT) (FT)	EXIST.CAP. / INC. CAP. / TOT. CAP. (KW) (KW) (KW)	EXIST.ENRG / INC.ENERGY / TOT.ENERGY (MWH) (MWH) (MWH)	ANUL. COST / ENERGY COST (1000 $) ($/MWH)	ENVIRONMENTAL IMPACT CODE / SOCIAL IMPACT CODE
AK7NPA0283	SNOW	60 17.9	H	310.0	0	0	8685.5	NNUUUUU
1 2	SEWARD SNOW RIVER	149 18.0	IS	0	63000	278000	51.242	
SO CENTRAL	UNDEVELOPED	85	710.0	652.3	63000	278000		UNNUUUUUU
	SEWARD A-7.							
AK7NPA0319	HONODINO LAKE	56 22.3	H	5.0	0	0	1041.7	NNUUUUU
1 2	SITKA BIG PORT WALT	134 42.9	IS	28000	5000	24300	44.516	
SOUTHEAST	UNDEVELOPED	3	66.0	479.5	5000	24300		UNNUUUUUU
	PORT ALEXANDER B-3.							
AK7NPA0321	CARBON LAKE	57 1.9	H	65.0	0	0	2849.8	NNUUUUU
1 2	SITKA UNNAMED	134 28.1	IS	56880	10000	49000	58.160	
SOUTHEAST	UNDEVELOPED	27	483.0	259.7	10000	49000		UNNUUUUUU
	SITKA A-3.							
AK7NPA0325	DIANA LAKE	56 53.0	H	5.0	0	0	1318.0	NNUUUUU
1 2	SITKA UNNAMED	135 3.0	IS	0	8000	35000	37.658	
SOUTHEAST	UNDEVELOPED	4	56.0	1473.5	8000	35000		UNNUUUUUU
	PORT ALEXANDER D-4.							
AK7NPA0332	GREEN LAKE	56 95.30	H	200.0	0	0	3101.9	NNNNNNN
1 2	SITKA VODOPAD RIVER	135 11.60	UC	132000	16400	64000	48.467	
SOUTHEAST	UNDEVELOPED	28	291.0	348.6	16400	64000		NNNUYYYYY
	PORT ALEXANDER D-4							
AK7NPA0335	KASNYKU LAKE	57 11.0	H	20.0	0	0	1248.8	NNUUUUU
1 2	SITKA KASNYKU FALLS	134 49.9	IS	0	7000	30000	41.626	
SOUTHEAST	UNDEVELOPED	5	70.0	650.3	7000	30000		UNNUUUUUU
	SITKA A-5.							
AK7NPA0291	MAKSOUTOF RIVER	56 30.0	H	80.0	0	0	2747.1	NNUUUUU
1 2	SITKA MAKSOUTOF RIV	134 57.9	IS	0	24000	117000	23.479	
SOUTHEAST	UNDEVELOPED	24	375.0	569.4	24000	117000		UNNUUUUUU
	PORT ALEXANDER C-3.							
AK7NPA0296	MILK LAKE	56 58.0	H	30.0	0	0	1290.3	NNUUUUU
1 2	SITKA MILK CREEK	134 47.0	IS	0	7000	33000	39.101	
SOUTHEAST	UNDEVELOPED	11	230.0	645.3	7000	33000		UNNUUUUUU
	PORT ALEXANDER B-3							
AKINPA0346	PELICAN CREEK	57 34.7	H	22.0	500	2000	128.56	NNUUUUU
1 2	SITKA PELICAN CREEK	136 7.8	OP	200	1000	1700	75.507	
SOUTHEAST	PELICAN UTIL. CO.	12	150.0	120.0	1500	3700		UNNUUUUUU
	SITKA D-7							

SURVEY SITES
TABLE 4

SITE ID / DEP CODE / ACTV INV / GEOG. AREA	PROJECT NAME / PRIMARY CO. -NAME OF STREAM / OWNER / MAP REFERENCE	LATITUDE / LONGITUDE / DR.AREA (D M.M) (D M.M) (SQ.MI)	PROJ.PURP. / STATUS / AVE. Q (CFS)	DAM HT / F C STOR. (AC FT) / PWR. HD. (FT)	EXIST.CAP. / INC. CAP. / TOT. CAP. (KW) (KW) (KW)	EXIST.ENRG / INC.ENERGY / TOT.ENERGY (MWH) (MWH) (MWH)	ANUL. COST / ENERGY COST (1000 $) ($/MWH)	ENVIRONMENTAL IMPACT CODE / SOCIAL IMPACT CODE
AK7NPA0311 I 2 SOUTHEAST	TAKATZ CREEK SITKA TAKATZ CREEK UNDEVELOPED SITKA 1-3.	57 6.9 134 51.0 10	H IS 180.0	205.0 145800 990.0	0 20000 20000	0 97000 97000	3344.6 34.480	YNNNNUU UNNUUUUUUU
AK6NPA0078 I 2 SOUTHEAST	DAYEBAS CREEK SKAGWAY-YAKU DAYEBAS CREEK UNDEVELOPED SKAGWAY B-1	59 17.2 135 2.0 11	H IS 85.5	15.0 0 344.6	0 5000 5000	0 18190 18190	1199.6 65.951	NNNNYUU UNNUUUUYU
AK1NPA0359 I 2 SOUTHEAST	DEWEY LAKES SKAGWAY-YAKU DEWEY CREEK SKAGWAY B-1	59 26.8 135 18.9 7	HS OP 30.0	20.0 410 400.0	375 1000 1375	1000 1300 2300	108.40 87.365	NNUUUUU UNUUUUUUU
AK7NPA0357 I 2 SOUTHEAST	GOAT LAKE SKAGWAY-YAKU PITCHFORK FAL UNDEVELOPED SKAGWAY C-1.	59 31.3 135 11.0 4	H IS 29.0	15.0 6000 1866.1	0 10000 10000	0 46000 46000	1555.2 33.408	NNUUUUU UNNUUUUUU
AK7NPA0041 I 2 SO CENTRAL	ALLISON CREEK VALDEZ-CHIT- ALLISON CREEK UNDEVELOPED VALDEZ A-7	61 7.1 146 10.2 5	H IS 40.0	1.0 19980 1148.9	0 8000 8000	0 18000 18000	837.10 46.505	NNUYNNN UNNNYYYYY
AK7NPA0386 I 2 SO CENTRAL	SOLOMON GULCH VALDEZ-CHIT- SOLOMON GULCH UNDEVELOPED VALDEZ A-7	61 30.9 146 15.9 18	H IS 138.0	10.0 0 607.3	0 12000 12000	0 65000 65000	1462.1 25.571	NNNNNUU UNNUYUUUYY
AK7NPA0310 I 2 SOUTHEAST	THOMAS BAY WRANGELL PET CASCADE CREEK UNDEVELOPED SUMDUM A-2A-3	57 3.3 132 45.2 18	H IS 226.0	3.0 97500 1443.5	0 50000 50000	0 217417 217417	4016.8 18.477	NNNNNNN UNNNYYYYY
AK6NPA0414 I 2 SOUTHEAST	ANITA WRANGELL-PET ZIMOVIA STRAI UNDEVELOPED PETERSBURGH-2.	56 15.5 132 26.5 2	H IS 27.0	68.0 15500 1005.0	0 3230 3230	0 14150 14150	772.60 54.607	NNUUUUU UNUUUUUUU
AK7NPA0301 I 2 SOUTHEAST	HARDING RIVER WRANGELL-PET HARDING RIVER UNDEVELOPED BRADFIELD CANAL A-5	56 16.1 131 38.9 61	H IS 725.0	190.0 200000 254.7	0 18000 18000	0 85000 85000	5137.6 60.447	NNUUUUU UNUUUUUUU

SURVEY SITES
TABLE 4

SITE ID DEP ACTV CODE INV GEOG. AREA	PROJECT NAME PRIMARY CO. -NAME OF STREAM OWNER MAP REFERENCE	LATITUDE LONGITUDE DR.AREA (D M.M) (D M.M) (SQ.MI)	PROJ.PURP. STATUS AVE. Q (CFS)	DAM HT F C STOR. PWR. HD. (FT) (AC FT) (FT)	EXIST.CAP. INC. CAP. TOT. CAP. (KW) (KW) (KW)	EXIST.ENRG INC.ENERGY TOT.ENERGY (MWH) (MWH) (MWH)	ANUL. COST ENERGY COST (1000 $) ($/MWH)	ENVIRONMENTAL IMPACT CODE SOCIAL IMPACT CODE
AK7UPA0400 I 2 SOUTHEAST	RUTH LAKE WRANGELL-PET DELT CREEK UNDEVELOPED PETERSBURG D-3.	56 59.0 132 45.0 8	H IS 61.0	210.0 0 1447.5	0 13000 13000	0 63000 63000	2873.6 45.613	NNUUUUU UNNUUUUUU
AK7UPA0401 I 2 SOUTHEAST	SCENERY CREEK WRANGELL-PET SCENERY CREEK UNDEVELOPED SUMDUM A-2,A-3.	57 4.9 132 41.9 21	H IS 202.8	10.0 60000 619.3	0 15000 15000	0 67000 67000	2280.7 34. 41	NNUUUUU UNNUUUUUU
AK7UPA0408 I 2 SOUTHEAST	TYEE CREEK WRANGELL-PET TYEE CREEK UNDEVELOPED BRADFIELD CANAL A-5.	56 12.0 131 33.0 14	H IS 163.0	100.0 105000 1356.6	0 30000 30000	0 132940 132940	3678.2 27.668	NNUUUUU UNNUUUUUU
AK6UPA [illegible]27 I 2 YUKON	HAWANE YUKON-KOYUKU NENANA RIVER UNDEVELOPED FAIRBANKS A-5.	64 11.0 149 15.0 2450	H IS 4692.0	230.0 0 206.7	0 200000 200000	0 566000 566000	27731 48.995	NNUUUUU UYYUNNNNN

TABLE 5

Regional Requirements versus Hydroelectric Potenti:

REGION	ESTIMATED REQUIREMENT		HYDROELECTRIC POTENTIAL		MARKETABLE HYDROELECTRIC POTENTIAL 1/	
	MW	GWh	MW	GWh	MW	GWh
Southcentral	2,541	10,560	2,728	12,004	2,587	11,184
Yukon	675	2,072	200	566	200	566
Southeast	349	1,131	549	2,486	152	668
Southwest	134	358	85	376	30	131
Remainder of State	301	879	0	0	0	0
	4,000	15,000	3,562	15,432	2,969	12,549

1/ Marketable Projects by Year 2000. Source: Alaska Power Administration

Susitna Power Now, Inc.
P.O. Box 7-4436 Fairbanks Alaska 99701 (907) 452-5272
P.O. Box 981 Anchorage Alaska 99510 (907) 276-7744

SUSITNA HYDROPOWER PROJECT

Pertinent Data

Location	Watana	Devil Canyon
	River Mile 165 (2 mi. upstream from DC pool head)	River Mile 134 (14.5 mi. from Gold Creek)
Type Construction	Earthfill	Concrete, thin-arch
Height, feet	810	635
Crest Length, feet	3,450	2,475
Design Earthquake Richter Scale	8.5	8.5
Water surface area (full pool) acres	43,000	7,550
Average annual estimated drawdown-feet	100	5
Reservoir Length (river miles inundated)	54+	28
Firm Annual Energy BkwHrs	3.1	3.0
Secondary Production for 2-dam system annually BkwHrs	0.44	0.36
Access Road, miles	37	27
Reservoir Storage Loss-Sedimentation, per 100 yrs.(comb.)	4.2 %	6.5 %

TRANSMISSION SYSTEM	to Anchorage	to Fairbanks
Two-single Circuit lines	136 miles 345 KV	198 miles 230 KV

COST

Total Project Costs January 1979 dollars	$2,590,000,000

Susitna Power Now, Inc. Newsletter

Volume 1, No. 1
April 1980

P. O. BOX 981, Anchorage, Alaska 99510 (907) 277-7644

SUSITNA BACKERS SPEAK OUT AT CHAMBER LUNCHEON

At a St. Patrick's Day luncheon of the Anchorage Chamber of Commerce backers of the Susitna Hydroelectric Project warned of massive cutbacks in the use of electricity and higher electrical rates by 1990 without development of the State's hydroelectric potential. In his remarks before the Chamber luncheon, John Spencer, Executive Manager of the Anchorage Municipal Utilities and Treasurer of SUSITNA POWER NOW, INC. urged that State funds be invested in the project. "It's not pleasant to have the lights go out... but if we don't do something that's what will happen", he said.

Eric Yould, Executive Director of the Alaska Power Authority told the luncheon audience that Alaska, with its precipitous terrain and large water run-off has "roughly one-half the un-tapped hydro power in the U.S.

Bob Penny, Co-Chairman of SUSITNA POWER NOW, INC. noted that eighty percent of the State's population would receive low-cost energy from the project. "I can think of no better way to spend the energy surplus than using it on this project", Penny said.

CHAMBER GIVES SUSITNA DAM OK

In a joint action the Anchorage and Fairbanks Chambers of Commerce have come out in support of the Susitna River Hydroelectric Project. The resolution notes that energy use will continue to rise as well as the price of natural gas and oil. The proposed hydroelectric power would help decrease dependence on those fuel sources. The businessmen came out in support of SB 294 and 295, providing for construction of the project by the A.P.A. and appropriating money for studies leading to application for a Federal license to construct the project.

SUSITNA POWER NOW, INC. OPENS ANCHORAGE OFFICE

At the Board of Directors meeting in Juneau, March 7, Co-Chairman Lee Wareham of Fairbanks announced the opening of the Anchorage office. Located at 2702 Denali the office is staffed by Ms. Eve Dischner. Office hours are from 9:00 to 5:00 and the telephone number is 276-7744.

MEMBERSHIP DRIVE

Ike Waldrop, Membership Chairman reported at the Board of Directors meeting in Juneau that the membership drive is just getting off the ground. LET'S ALL PITCH IN AND DO OUR SHARE - ENROLL YOUR FRIENDS AND NEIGHBORS AS MEMBERS. Requests for membership applications may be sent to the Anchorage office. Current membership stands at ~~300~~ 600+

SB 294 RECEIVES UNANIMOUS APPROVAL OF SENATE RESOURCES COMMITTEE

The Senate Resources Committee unanimously gave it's approval to SB 294 which directs the Alaska Power Authority to get the project moving. Bills which appropriate State money to that end are now in the Senate Finance Committee.

SUSITNA POWER NOW, INC. supported the measure with many witnesses as well as written testimony. Among those speaking in favor of the bill were former Governor Bill Egan. Egan, in his testimony said, "the time has come when we must do everything possible to turn public wealth from Prudhoe Bay oil production into an alternative source of power for use in Alaska."

The lone dissenting testimony provided the hearing's most lively moment. Joe Geldhof, a lobbyist for the Alaska Conservation Society and other environmental groups said his organization was not "flatly opposed" to the Susitna Project, but instead supported smaller hydroelectric dams. Senator Bettye Farenkamp (D-Fairbanks) reminded Mr. Geldhof of the testimony of the environmental groups at Ramparts hearings when they recommended Susitna as an alternative to the Ramparts Dam.

Of the Environmentalists testimony at the Ramparts hearings Senator Don Bennett (R-Fairbanks) said environmentalists had said the Ramparts Dam would flood the Yukon wetlands "and drown the ducks". "I didn't buy that", and continued saying that now the environmentalists say the Susitna Project might harm caribou migration. "It's a waste of my time", Bennett said of such testimony.

(Copies of SB 294, 295 and HB 739 & 570 as well as an abstract of the Senate Resources Committee Hearings (February 16 and March 7) are available from the Anchorage office os SUSITNA POWER NOW, INC.)

COMMENTS FROM OUR MEMBERS

"I feel it is a crime to use a non renewable resource to generate power when hydro-generation could be developed"..... Roger Connolly, Director of Training, Alaska Electrical Apprentice Training Trust.

"This project would give Alaska and Alaskans the energy needed now and for our future growth." ..... Bill Mike Baker, Fairbanks.

Readers and members comments and suggestions are solicited. Let us hear from you.

COMING NEXT MONTH

Future issues of this newsletter will feature a column giving the history of the Susitna Hydroelectric project dating back to the 1940's.

H E L P !

Senate Bill 385 appropriates 54 million dollars for a transmission line tie between South Central and Interior Alaska via the rail belt corridor from Willow to Healy. This line will accommodate economy energy transactions, pooling power generation reserves, and emergency power interchanges. If approved this session, the line could be completed by late 1983. This project warrants the highest priority for all Fairbanks-Anchorage residents.

YOU CAN HELP!

Immediately write your area legislators, the Governor and Lt. Governor urging support of SB 385.

GOVERNOR JAY S. HAMMOND
POUCH A
Juneau, Alaska 99811

LT. GOVERNOR TERRY MILLER
POUCH AA
Juneau, Alaska 99811

SEND CORRESPONDENCE TO: Alaska State Senate or Alaska State House, Pouch V
Juneau, Alaska 99811

From the desk of

UNITED STATES SENATOR MIKE GRAVEL

There is one aspect of the Susitna hydropower issue that I would like to address for your membership's information. As you know, I had authored and shepherded through the Senate Finance Committee a provision that would have allowed large hydroelectric projects to be financed by tax-exempt bonds. The Finance Committee passed the large hydro exemption on October 24, 1979. The full Senate passed it December 17, 1979.

This exemption had the potential of saving Railbelt electrical users literally hundreds of millions of dollars. It would have had an equal benefit on large hydro projects in other parts of the country.

Unfortunately, the House conferees from the Ways and Means Committee strongly oppose tax-exempt bonding of any kind, fearing that the bond purchasers derive an inappropriate tax free income from those bonds. Knowing that, I went to the conference committed to fight for the hydro exemption. Sadly, not one of the House conferees--including some whose districts would have benefited from the hydro exemption--supported the hydro exemption when I pushed it to a vote. It would appear that future efforts to procure the Hydro exemption will need more leverage and priority in the minds of the House members.

That should not be perceived as an insurmountable problem. It will be difficult, of course, as long as the House conferees insist that tax-exempt bonding which benefits large populations is somehow corrupt by virtue of the benefit that accrues to the bond purchaser.

Regardless, that is a fight I am committed to fighting when the time and opportunity arise in the future. For the time being I am confident that there will be any number of bills of substantial importance to the House's concerned Ways and Means members and that we will prevail in obtaining the desires exemption prior to 1983 when Susitna financing will be needed.

Correspondence may be addressed to Senator Gravel at:

UNITED STATES SENATOR MIKE GRAVEL
3121 Dirksen
Senate Office Building
Washington, D. C. 20510

JOIN SUSITNA POWER NOW!

Susitna Power Now was formed by a group of citizens for the sole purpose of creating a viable inflation-proof electrical energy future via construction of the Devil Canyon Upper Susitna Hydroelectric Project.

The Project will cost approximately 3 billion 1980 dollars and provide 6.1 billion kilowatt hours of firm electrical energy on an annual basis. This energy will benefit 80% of the State's population residing in Southcentral and Interior Alaska.

We need your help. Join NOW. Complete the membership application and mail to:

SUSITNA POWER NOW!, INC.
P. O. Box 981
Anchorage, Alaska 99510

MEMBERSHIP APPLICATION

NAME _____

TITLE _____

COMPANY _____

MAILING ADDRESS _____

_____

PHONE _____

SIGNATURE _____

DATE _____

Type of Membership:

General ___ $1.00 for three (3) years

Sustaining ___ $100.00 initiation
$10.00 month dues (payable semi-annually)

Institutional ___ $500.00 or more annually

REMARKS _____

_____

_____

_____

INTRODUCTION

In December 1979 the Economic Feasibility Study for a possible Anchorage - Fairbanks Transmission Intertie (Intertie Study) was completed by IECO-RWRA for the Alaska Power Authority. This Intertie Study reviewed alternative intertie designs that considered the railbelt requirements for generation with and without the Susitna hydroelectric project.

The study concluded that a feasible intertie was possible without the Susitna project as well as with it. The optimized designs for the alternatives studied were for the total line length (323 miles) and included the following voltage and conductor configurations:

Alternative Cases	Interconnection Description	Voltage kV-circ	Optimum ACSR kcmil-no.cond	Capability MW
W/o Susitna:				
I A & B	Anchorage - Ester	230 s/c	954 - 1/c	130
I C	Anchorage - Ester	345 s/c	795 - 2/c	380
I D	Anchorage - Ester	230 s/c	954 - 1/c	130
W/ Susitna:				
II A	Anchorage - D. Canyon	345 s/c x2	954 - 2/c	1200
	D. Canyon - Ester	230 s/c x2	1510 - 1/c	370

After study of the report it was suggested by the Anchorage Municipal Light and Power (AMLP) and the Golden Valley Electric Association (GVEA) that it would be useful to analyze an arrangement that would use existing lines (including a pending extension of a Matanuska Electric Association (MEA) line from Willow to Sunshine) with new line constructed for the remaining portion -- such new line to be built according to the design criteria of Susitna (see II A in the above Table).

The Alaska Power Authority (APA) authorized a brief supplementary study to determine the approximate transfer capabilities and construction costs of such an arrangement. The following pages report the results of this study.

Genesis of This Report

The Intertie Study concluded that a 230 kV single-circuit transmission line with a line loading capability of 130 MW is economically feasible in 1984. This line design is smaller in capacity than would be required if the Susitna Project were constructed. A line design compatible with the Susitna Project was not found feasible by 1984 although the larger capacity circuit is deemed technically preferable for the Anchorage - Fairbanks connection. Further studies were recommended toward finding a way to support this larger capacity circuit.

The suggestion of GVEA and AMLP to study an interim arrangement that would maximize the use of existing lines (resulting in the least amount of new construction) was supported by the APA as a potentially practical way to accomplish the intertie at an earlier date and provide that new construction would be compatible with the larger capacity circuits suitable for the Susitna Project.

The purpose of the following pages is to examine the technical character of such an arrangement with a view toward maximizing the power transfer capability at minimum initial construction cost.

Technical Scope of This Report

The depth of technical review of the interim arrangement described above will include only steady-state analysis of several line configurations with an assigned limit of approximately 30 degrees of power angle between the buses at Pt. MacKenzie and Gold Hill. The stability of these configurations is not analyzed. No serious stability problems are anticipated with the power angle limit as stated.

Future Stability Analysis

If it is determined that an interim system configuration as described herein be implemented, it is important to make a complete stability analysis that would consider the characteristics of such intertie, the connected rotating machinery (generators, motors) and the control characteristics (governors, voltage regulators, relaying and switching, etc.) Such a study would provide the guidelines for selection or modification of control equipment, if necessary, and establish guidelines for operating the interconnected system.

Line Configurations Studied

Five general line configurations were studied to provide information regarding line transfer capabilities and related construction costs:

I- Existing Lines to Willow and Healy
New 345 kV s/c line with 2-954 kcm, Willow to Susitna Jct. - 72 miles
New 230 kV s/c line with 1-1510 kcm, Susitna Jct. to Healy - 86.5 miles
Operate lines as follows:

Pt. Mack - Teeland	230 kV
Teeland - Willow	115 kV
Willow - Healy	230 kV (add 32 MVAR Shunt Reactor)
Healy - North Pole	138 kV (add 28 MVAR Shunt Reactor)

Use two winding transformers and no series compensation

II- Same as I above, except:
Use autotransformers and series compensation (20%, Willow to Healy)

II-1 Same as II above, except:
Existing lines to Sunshine and Healy
New 345 kV s/c line with 2-954 kcm, Sunshine to Susitna Jct.-43.5 miles
Operate lines as follows:

Pt. Mack - Teeland	230 kV
Teeland - Sunshine	115 kV
Sunshine - Healy	230 kV (add 32 MVAR Shunt Reactor)
Healy - North Pole	138 kV (add 28 MVAR Shunt Reactor)

III- Same as II-1 above, except:
Operate lines as follows:

Pt. Mack - Teeland	230 kV
Teeland - North Pole	138 kV (add no new Shunt Reactors)

Use autotransformer at Teeland and no series compensation

III-1 Same as III above, except:
Use series compensation (20%, Sunshine to Healy)

Summary and Conclusion

Load Flow studies of 13 Cases with the five configurations previously described were made using the General Electric Company "CIFLO$" program. The line and transformer data, and the worksheets for these cases are attached as Appendix-A.

The following Table-1, "Load Flow Summary Data" contains selected data from the load flow calculations and construction cost estimates for the various configurations. These estimates were developed from the cost data in the original Intertie Study. A sample calculation is shown in Appendix-B attached.

The load flow cases studied clearly show that an interim transmission intertie operated at 138 kV from an assumed supply point at Teeland substation to connect with the GVEA existing 138 kV system at Healy is a technically feasible connection capable of transferring up to 50-plus megawatts of power from Fairbanks to Anchorage and up to 35-plus megawatts from Anchorage to Fairbanks.

It is also shown that by constructing an additional 28.5 miles of new line to Willow an additional 5 megawatts could be transmitted. A more detailed review of the work sheets shows that the "weak" links of such an interim circuit arrangement are the existing 138 kV lines.

Such an interim arrangement is easily capable of transmitting at least 200,000,000 kWh of energy annually and providing reserve capacity as indicated. This could postpone other investments and provide an opportunity for exchange of the lowest cost energy alternatives available along the interconnected system.

If it is assumed that the energy exchanges possible are worth 3 cents per kWh (fuel cost differences now appearing in Anchorage and Fairbanks support this probability) a $6,000,000 per year minimum saving in fuel

cost is possible. The added value of reserve sharing would increase the annual savings attributable to this intertie. Depending on financing costs, it would appear that the $45,000,000 investment is attractive particularly when it is remembered that several million dollars of the cost is for future capacity related to the Susitna Project.

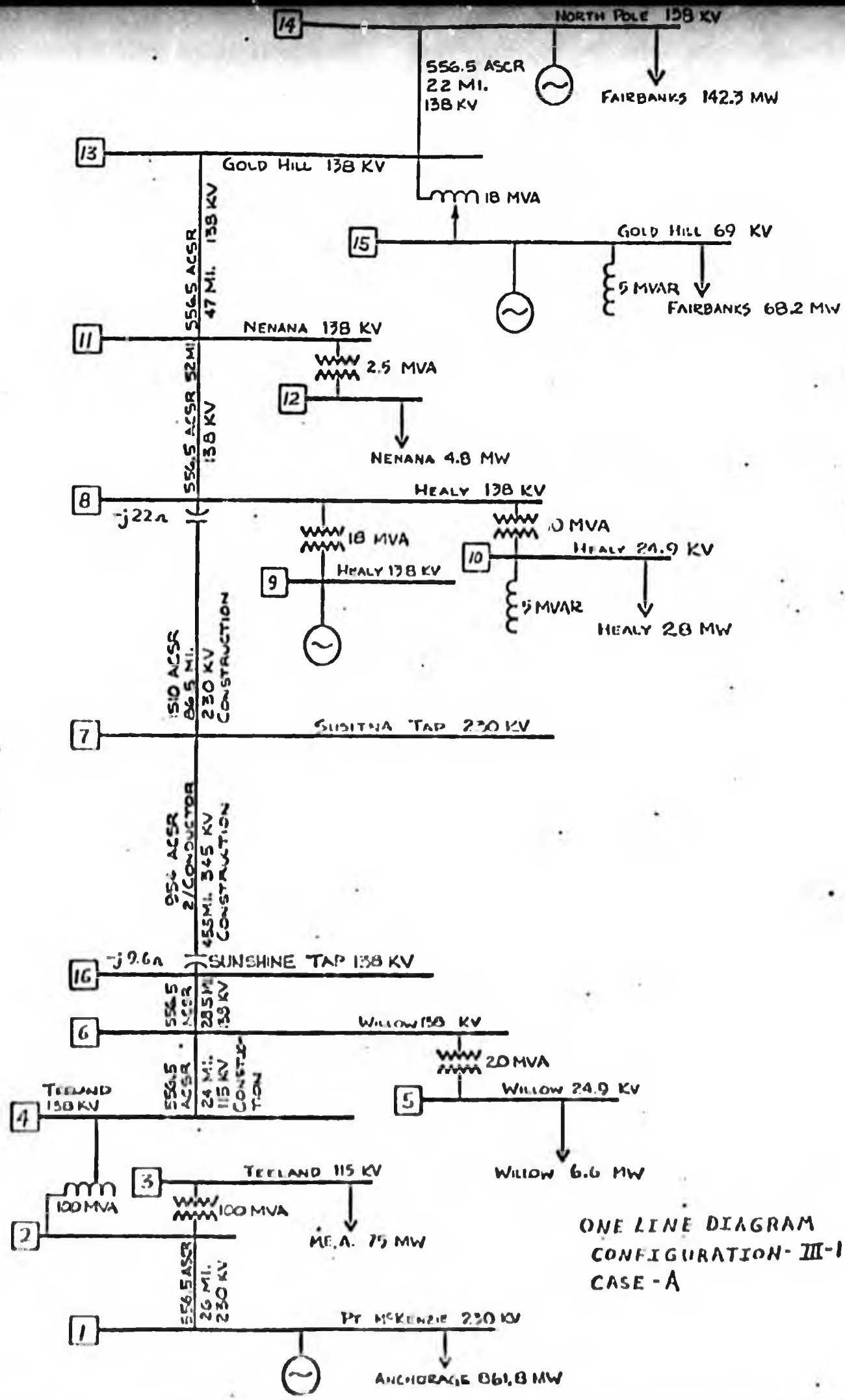
It is recommended that this interim arrangement is worth serious consideration particularly in view of the opportunity to accelerate the completion of an important segment of a renewable energy project. A decision to begin by mid-1980 would allow for construction to start in the winter of 1980-81 and for completion by mid 1983.

Additional specific studies to arrive at the basic details for design support and for negotiations of operating, wheeling and maintenance agreements should be implemented early in the course of action toward accomplishment of such a project.

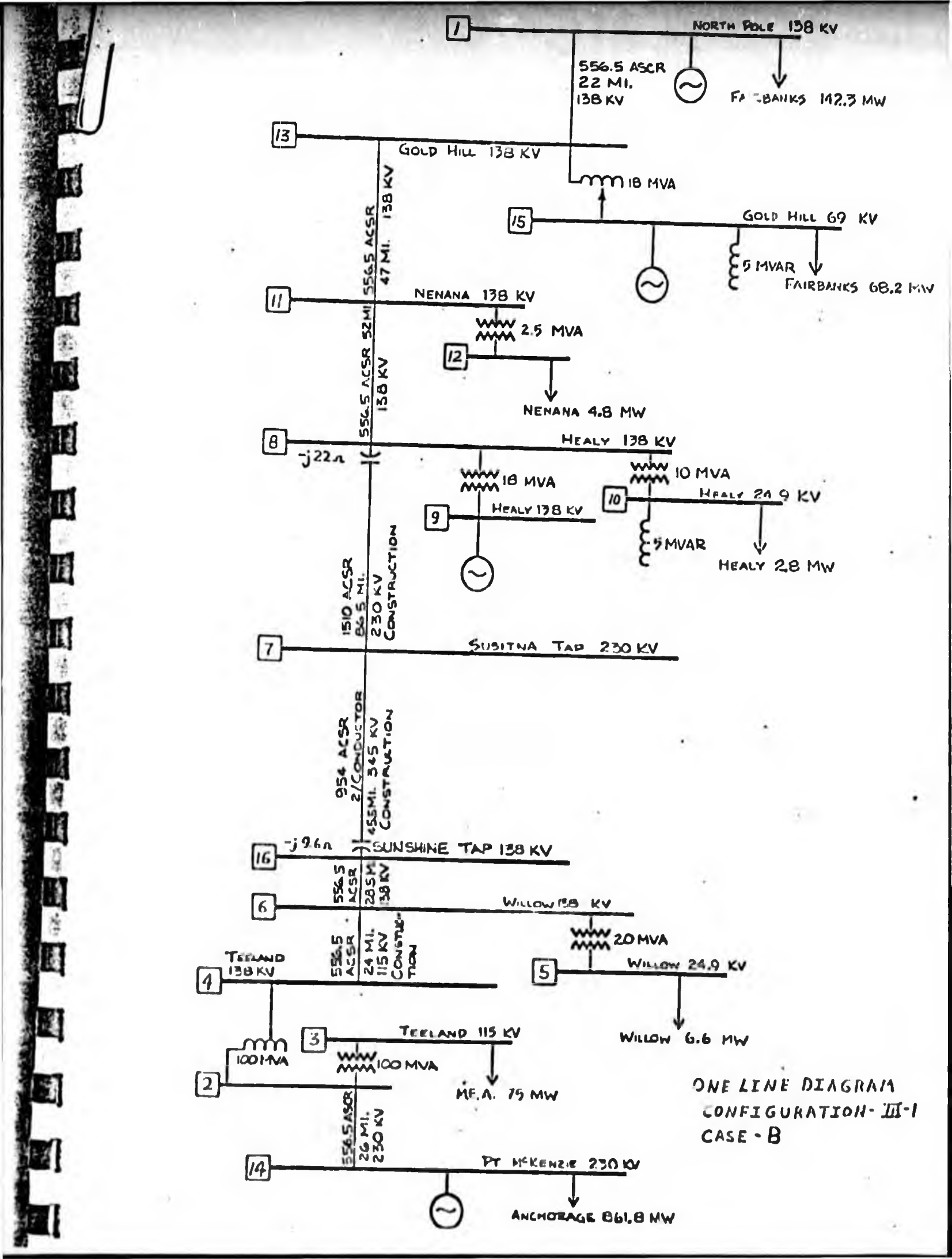
TABLE-1
LOAD FLOW SUMMARY DATA

	CASE	Load Flow Load Year	Line Section Power Transfer - MW	Line Voltage Range - %	Line Loss %/MW*	Power Angle - degrees Pt. Mac - N.Pole	Total Construction Cost**
I	CASE A	Anch-Fbks 1984 Loads	Willow to Healy 35	102 to 112	2.5 / 3.4	33°	$ 63,727,000
	CASE B	Fbks-Anch 1984 Loads	Healy to Willow 50	99 to 108	2.2 / 2.0	27°	$ 63,727,000
	CASE C	Fbks-Anch 1984 Loads	Healy to Willow 16	99 to 105	n.a.	9°	$ 63,727,000
II	CASE A	Anch-Fbks 1984 Loads	Willow to Healy 39	102 to 108	2.9	28°	$ 63,371,000
	CASE B	Anch-Fbks 1990 Loads	Willow to Healy 31	98 to 104	2.5 / 6.5	30°	$ 63,371,000
	CASE C	Fbks-Anch	Healy to Willow 51	97 to 104	1.6 / 3.5	23°	$ 63,371,000
II-1	CASE A	Anch-Fbks 1984 Loads	Sunshine to Healy 36	102 to 107	3.0 / 4.1	31°	$ 52,630,000
III	CASE A	Anch-Fbks 1984 Loads	Sunshine to Healy 34	103 to 106	2.8 / 3.8	30°	$ 44,587,000
	CASE B	Open circ.-Healy 1984 Loads	Sunshine to Healy 0	104 to 112	---	3°	$ 44,587,000
III-1	CASE A	Anch-Fbks 1984 Loads	Sunshine to Healy 35	103 to 106	2.9 / 3.9	28°	$ 45,032,000
	CASE B	Fbks-Anch 1984 Loads	Healy to Sunshine 54	102 to 105	4.5 / 4.2	31°	$ 45,032,000
	CASE C	Anch-Fbks 1990 Loads	Sunshine to Healy 27	100 to 105	3.0 / 7.5	31°	$ 45,032,000
	CASE D	Fbks-Anch 1990 Loads	Healy to Sunshine 53	97 to 104	2.7 / 5.9	30°	$ 45,032,000

* Line Loss is calculated as a % of the total Generation on line for each case. MW are also shown.
** Construction costs estimated using unit costs from Intertie Study (See Appendix B for sample).



ONE LINE DIAGRAM
CONFIGURATION - III-1
CASE - A



ONE LINE DIAGRAM
CONFIGURATION - III-1
CASE - B

Report of
Technical Advisory Committee
on
Economics of Anchorage - Fairbanks
Minimal Transmission Intertie

Anchorage Municipal Light & Power

Golden Valley Electric Association

Fairbanks Municipal Utilities System

January 1980

Robert W. Retherford Associates' Anchorage-Fairbanks transmission intertie supplementary study for maximizing use of existing lines with new lines at Susitna Design capacity, completed January 24, 1980, demonstrated the probable technical feasibility of transmitting economy energy from Anchorage to Fairbanks and reserve generating capacity from Fairbanks to Anchorage over a minimal transmission line. This report examines the economics of such interchanges for Configuration III - 1 Cases A and B of the RWRA study.

ECONOMY ENERGY

From data in the supplementary study it was estimated that annual losses in transmitting 200 million KWH at economy energy from Anchorage to Fairbanks would be about 4% or 8 million KWH. 200 million KWH generated by AMLP would replace 192 million KWH generated by GVEA with simple cycle and regenerative combustion turbines averaging 13,000 BTU per KWH.

AMLP's fuel consumption to generate the economy energy was determined by using the General Electric HPROD production costing program to model generator operation. HPROD was run for AMLP's system load plus economy energy and for AMLP system load alone. The difference between the two amounts of fuel was the fuel burned to generate the economy energy for GVEA. The following table shows the fuel saved.

FUEL CONSUMPTION, MILLIONS OF BTU

GENERATION BY

YEAR	GVEA	AMLP	FUEL SAVED
1984	2,500,000	2,200,000	300,000
1985	2,500,000	2,330,000	170,000
1986	2,500,000	2,560,000	-60,000

The 300,000 million BTU saved in 1984 is equivalent to about 52,000 barrels of fuel oil. The amount of fuel consumed by AMLP to generate economy energy increases each year; as AMLP system load grows, less efficient generating units must be operated to produce the economy fuel.

Monetary savings from economy energy, of course, depend on the relative costs of fuel in Anchorage and Fairbanks. To give an idea of the amounts of money involved without attemptiong to forecast fuel prices several years hence, fuel was priced at present values of $2.85 per million BTU for GVEA and $0.829 per million BTU for AMLP:

FUEL COSTS

GENERATION BY

YEAR	GVEA	AMLP	SAVING
1984	$7,125,000	$1,824,000	$5,301,000
1985	7,125,000	1,932,000	5,193,000
1986	7,125,000	2,122,000	5,003,000

The supplementary study showed that GVEA could provide 53 MW of reserve generating capacity to AMLP over the transmission line. Without this reserve capacity it would be necessary for AMLP to install a peaking combustion turbine to maintain firm generating capacity. Capital recovery costs of such a peaking turbine were estimated to be $847,000 annually at today's prices. The value of 53 MW of reserve capacity furnished by GVEA to AMLP over the transmission line would thus be $847,000 annually.

SUMMARY

Adding the value of economy energy to that of reserve generating capacity produced the following total value of the transmission line to AMLP and GVEA:

YEAR	ECONOMY ENERGY	RESERVE CAPACITY	TOTAL
1984	$5,301,000	$847,000	$6,148,000
1985	5,193,000	847,000	6,040,000
1986	5,003,000	847,000	5,850,000

COST ESTIMATE (1979 Dollars)

CONFIGURATION III-1

1.	New Transmission Lines		
1.1	Healy - Susitna Tap, 86.5 m. (sc, 230 kV, 1510 kcmil ACSR)	$176,693./mile	15,283,945
1.2	Susitna Tap - Willow 71.5m (sc, 345 kV, 2 x 954 kcmil ACSR)	$253,320./mile	18,112,380
		Transmission Total:	$33,396,325
2.	Substations		
2.1	Healy 138 kV Addition of Series Compensation	150,000	
2.2	Healy 138 kV Circuit breakers & property	243,000	
2.3	Willow 138 kV Addition of Series Compensation	150,000	
2.4	Willow 138 kV Circuit breakers and property 60 MVA Autotransformer 115/138 kV	1,243,000	
		Substations Total:	$ 1,786,000

CONFIGURATION III-1 (Cont.)

TOTAL COSTS (1979)

Transmission Lines	$ 33,396,325
Substations	1,786,000
Control and Communication	3,300,000
Engineering/Design	3,000,000
	$ 41,482,325

DISBURSEMENTS AND ESCALATION

		Escalated @ 8% p.a.
198? (7%)	2,903,760	3,387,000
198 (25%)	10,370,580	13,064,000
1983 (68%)	28,207,985	38,376,000
	41,482,325	54,827,000
		- 41,482,325
	Total Escalation	13,344,675

PROJECT COST SUMMARY

Project Costs	$41,482,325
Escalation	13,344,675
Total	$54,827,000

Susitna Power Now, Inc.
P.O. Box 7-4436 Fairbanks Alaska 99701 (907) 452-5272
P.O. Box 981 Anchorage Alaska 99510 (907) 276-7744

February 14, 1980

The Honorable Bill Sumner
Alaska State Senate
Pouch V
Juneau, Alaska 99811

Dear Senator Sumner:

Legislation providing for funding and construction of the proposed Anchorage/Fairbanks Transmission Line Intertie justifies a position of highest priority early this session. Support documentation is contained in appropriate pages taken from the Anchorage-Fairbanks Intertie Supplementary Study conducted by the International/R.W. Retherford Engineering firm and an economic study performed by Anchorage Municipal Light and Power personnel in cooperation with GVEA and the Fairbanks Municipal Utilities System, copies of which are enclosed.

The figures speak for themselves. However, in the event you are not into engineering studies, we will summarize the results for you.

The following plan is recommended:

1. Build approximately 158 miles of new transmission line and connect to existing facilities at Healy and Willow at an approximate 1983 dollar costs of $54,827 000.

2. The new section is to be built to specifications designed to ultimately transmit energy to both Interior and South Central Alaska supplied from the Upper Susitna Hydroelectric Project.

3. Once completed, the Intertie will be capable of providing for economy energy transactions, a pooling of reserve capacities, and emergency power support between the State's population centers. Further it will be used to supply energy for the Susitna Project once construction is underway.

4. The benefits are substantial. Following is a brief description of the several major ones:

A savings in direct fuel costs in excess of $5,000,000 annually.

A savings in capital investment for reserve generator units of $847,000 annually.

A savings thru displacement by electricity generated from high efficiency natural gas fired units rather than expensive oil fired generation of 425,180 barrels of fuel oil each year.

These are the major ones; there are many more.

5. Financing. We propose the State appropriate $54,827,000 from the general fund early this session and that said funds be administered by the Alaska Power Authority for the purpose of constructing the transmission line project in an expeditious manner. (SB No. 385 sufficiently addresses the funding issue.)

Further, that the utilities using said intertie be assessed appropriate wheeling and/or capacity charges sufficient to cover all operations and maintenance costs incurred by the APA following completion of the facility.

Principal and interest costs associated with the capital investment to be held in abeyance pending completion of the first phase of the Upper Susitna Hydro Project. At that time all capital costs for the line will be co-mingled with those of the prime project and amortized accordingly.

This project will benefit thousands of Alaskans and is therefore most worthy of your support.

Thank you and best wishes.

Lee Wareham, Co-chairman
Susitna Power Now

Bob Penney Co-chairman
Susitna Power Now

R. L. Hufman
Gen. Mgr.
GVEA

Tom Stahr
Gen. Mgr.
Anch. ML&P

Malcolm Cheek
Gen. Mgr.
MEA

Harold Gillam
Gen. Mgr.
Fbks MUS

Enclosures
1. Portions of Engineering Analysis
2. Economic Evaluation

Alaska State Legislature

Senate

Office of the Secretary

Official Business

Pouch V
State Capitol
Juneau, Alaska 99811

April 14, 1980

MEMORANDUM TO: Resources Committee

From: Secretary of the Senate

Subject: Alaska Power Authority Reconnaissance Study

The President referred a letter and report from Eric P. Yould, Executive Director of the Alaska Power Authority concerning a Reconnaissance study of Lake Elva and the Black Bear Lake Projects to your committee.

Encl: Letter w/report

Pen

ALASKA POWER AUTHORITY

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

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

April 3, 1980

The Honorable Clem Tillion
President of the Senate
Alaska State Legislature
Pouch V
Juneau, Alaska 99811

Dear Senator Tillion:

A.S. 44.56.180(b) requires the Power Authority upon completion of the reconnaissance study to submit to the Governor and the Legislature a statement of its recommendations for financing each new project. In addition, if the recommended financing for the project includes a guarantee of indebtedness or an appropriation from the general fund, the Legislature must first give its approval by joint resolution before the Authority may proceed with the engineering or design phase of the project. "Reconnaissance study" is defined in Section 230(7).

A problem exists in that Section 180 does not clearly establish the requirement for legislative approval in relation to the project development process. As defined in the statute, "reconnaissance study" incorporates the first two phases of the development process which are reconnaissance study (a regional assessment of alternative projects to identify one or more projects with the greatest potential for development) and feasibility assessment (an assessment of one or more projects for engineering, economic, and environmental feasibility.

The third stage in the process is detailed field explorations, general design, and preparation of the Federal Energy Regulatory Commission license application. Detailed design commences either upon submission of a license application or receipt of a FERC license to construct. The stage of development involving field studies, general design, and preparation of a FERC license application is not recognized within the statutory requirements. The recommendations of the Power Authority for financing each new project can only be preliminary before completion of a definite project report and a license application. Although it appears that a preliminary recommendation for financing certain projects should be submitted at this time, the recommendations may not be required until further field investigations and general design are completed. Consequently, we have attached statements for the Lake Elva and the Black Bear Lake Projects. Similar statements for Dayebas Creek, Grant Lake, Kisaralik River, Mennonite Creek and Larsen Bay are being prepared and will be submitted as soon as possible.

Sincerely,

Eric P. Yould

Eric P. Yould
Executive Director

Attachments:
as noted

ALASKA POWER AUTHORITY

LAKE ELVA HYDROELECTRIC PROJECT

The Lake Elva Hydroelectric Project near Dillingham will produce 1.5 MW's of power and 7.1 million KWh's of average annual energy. The cost of the Project is estimated to be $13 million in 1979 dollars. The Project includes a rockfill dam across the creek, founded on bedrock, at stream mile 1.5 with an uncontrolled spillway through a saddle approximately 1,000 feet north of the dam with the crest at elevation 350. A 4,100 ft. low pressure 4 ft. diameter pipeline would connect to a 3,200 ft. power penstock to convey the water to the surface powerhouse at elevation 50. The Project would also include 9 miles of surface and 20 miles of submarine transmission line at 25 KV and the upgrade to 25 KV of the existing 22 mile long 7.2 KV line from Dillingham to Aleknagik. The Project appears feasible as a result of a feasibility assessment from the economic, social, engineering and environmental perspectives. Construction could begin on the Project as early as April of 1981.

The Project is eligible to be financed by a combination of state loans, loans from the Rural Electrification Administration, and revenue bonds issued by the Power Authority and guaranteed by the National Rural Electric Utilities Cooperative Finance Corporation. Current high interest rates in the municipal revenue bond market and the present financial condition of the Nushagak Electric Association make revenue bond financing extremely expensive for the utility and ultimately its customers. Nushagak Electric has received 2% loans from the REA in the past, however, the most optimistic estimate of REA financing considered to be available for this Project is 50% financing at 5% interest over 35 years.

The utility has expressed the desire to have the Power Authority design, acquire, and construct the Project. If this takes place REA loan funds may still be available to supplement state loans or revenue bonds issued to finance Project construction. The Project should be financed with REA loan funds to the maximum extent possible, with state loans and revenue bonds issued by the Power Authority and guaranteed by the National Rural Electric Cooperative Finance Corporation (CFC). It would be desirable to achieve 1/3 participation from each financing source for the Project. The Power Authority would work with REA and the Cooperative Finance Corporation to seek participation in funding the Project to the maximum extent possible. Due to present turmoil and high interest rates in the municipal markets, a 1/3 participation of the State in financing the Project appears to be necessary at this time.

Authorization is requested to proceed with the detailed engineering, design and preparation of a Federal Energy Regulatory Commission license application. Authorization to finance the Project will be required before construction can commence in accordance with A.S. 44.56.180. It is anticipated that up to $15 million in revenue bond authorization will be required for the Project to cover construction costs, interest during construction, inflation, and funding of a reserve if up to $5 million in REA or state loan funds are available to assist in the Project financing. This recommendation or statement for financing is preliminary at this time.

ALASKA POWER AUTHORITY

BLACK BEAR HYDROELECTRIC PROJECT

A Reconnaissance Study of the Black Bear Lake Project was funded by the Alaska Power Authority and completed by Harza Engineering Company in October of 1979. The project was determined to be economically feasible to meet the needs of Klawock, Craig and Hydaburg. Klawock is served by the Tlingit and Haida Regional Electric Authority (THREA), a rural electric utility with offices in Juneau. Craig and Hydaburg are served by the Alaska Power and Telephone Company (APT), an investor owned utility company with offices in Port Townsend, Washington. The Power Authority desires to proceed with design and preparation of a Federal Energy Regulatory Commission license application. Construction financing is anticipated to be accomplished by a combination of REA 5% loans, Power Authority revenue bonds secured by power sales contracts and possibly guaranteed by the Cooperative Finance Corporation, and state assistance in the form of subordinate loans.

PROJECT DESCRIPTION

The Black Bear Lake Project is located on the lake of the same name about 8 miles east of Klawock. The Project would have an installed capacity of 5000 kW and at full production level would produce about 22,000 MWh in an average year. Black Bear Lake could be constructed and in operation by 1985. The Project would consist of a dam, spillway, intake, penstock power-station and transmission line. A 20-foot high rock fill dam would be built across Black Bear Creek at the outlet of Black Bear Lake. An uncontrolled spillway with a discharge capacity of 1200 cfs would be built on the left abutment. Water would pass through a 26" steel penstock to a powerstation located near the base of a falls just downstream of the lake outlet. The powerhouse would be a pre-fabricated metal building containing four single-jet Pelton turbines. Each turbine would be directly coupled to a generator rated at 1250 kW. Power from the Project would be transmitted to Klawock over a 14-mile long, 23-kV transmission line. From Klawock power will be transmitted over 23-kV lines, 6 miles long, to Craig and 32 miles to Hydaburg.

EXISTING CAPABILITIES AND PROJECTED DEMAND

All existing generation capacity in the three communities is diesel fueled. The forecast loads for the interconnected system exclusive of the needs of the Alaska Timber Corporation are:

Year	Peak Demand, kW	Energy Generation, MWh/yr
1978 Actual	1810	6,590
1983	2210	8,060
1988	2480	10,150
1993	2830	11,650

ALTERNATIVES CONSIDERED

The most feasible alternative considered is the Alaska Timber Corporation proposal for a conventional wood waste steam generation system. This system could be constructed in a timely manner at a relatively low cost of $2.6 million to produce the short term needs of the Corporation and the communities of Klawock and Craig. The major difficulty with the system is the unreliable long term source of wood waste sufficient to meet community needs. After existing stockpiles are depleted, the wood waste produced by ATC operations will only be sufficient to power ATC operations. The wood generation system should be developed as soon as possible to produce electric power until the Black Bear Lake Project is operational.

Other alternatives for electric power generation were investigated and determined to be too expensive, inappropriate, or not available for use in the area.

ENVIRONMENTAL IMPACTS

The damming of Black Bear Creek at the outlet of Black Bear Lake would not affect the passage of anadromous fish since the falls serve as a natural barrier. The construction and operation of the Project, unless carefully controlled, could cause some disruption to downstream migratory and resident salmonid populations. Discharge rates and water temperature are the most critical parameters and these will have to be studied in depth during feasibility studies.

At the present level of study there do not appear to be any adverse environmental impacts of a magnitude which would prohibit construction of the Project or greatly restrict its operation.

ENGINEERING CONSIDERATIONS

The project is planned to provide sufficient storage to regulate the discharge from the Black Bear Lake and provide practically the entire Craig - Klawock - Hydaburg system capacity and energy requirements over the first 30 years of project life. The power plant and generator/turbine sizes and arrangement are appropriate for the project. Rock composition at the damsite and on valley sides is adequate for proper design of a project to withstand severe shaking from earthquakes that could occur in this high seismic activity area. The very steep slope on which the penstock would be constructed presents difficult construction problems. The selected alignment would eliminate the possibility of damage from snow and debris avalanches. Turbine and generators are appropriately sized for the system.

ALASKA POWER AUTHORITY

PROJECT FINANCING

Black Bear Lake should be developed as a capital project of the State since it is a regional project. The Rural Electric Administration may still participate in construction financing to the extent that the REA utility benefits from the Project. The supplemental financing should be provided by Power Authority revenue bonds either guaranteed by the National Rural Electric Utilities Cooperative Finance Corporation or by power sales contracts with the local utilities. State assistance in the form of subordinate loans may become necessary if present high interest costs for tax exempt revenue bonds persist. Authorization is requested to proceed with the detailed study and preparation of a Federal Energy Regulatory Commission license application for the Black Bear project. Authorization to finance the project will be required before construction can commence in accordance with A.S.44.56.180. It is anticipated that $30 million in revenue bond authorization will be required for the project to cover construction costs with inflation, interest during construction, and funding of a reserve if up to $5 million of REA loan funds are available to assist in the project financing. This recommendation or statement for financing is preliminary at this time due to the considerable amount of work on the project which remains to be accomplished.

Introduced: 1/19/79
Referred: Resources and Finance

IN THE SENATE

BY THE RULES COMMITTEE BY REQUEST OF THE GOVERNOR

SENATE JOINT RESOLUTION NO. 6

IN THE LEGISLATURE OF THE STATE OF ALASKA

ELEVENTH LEGISLATURE - FIRST SESSION

Relating to the Alaska Power Authority, the Phase I environmental, economic, social and engineering studies of the Susitna Hydroelectric Project, and the incurring of indebtedness for Phase I.

BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF ALASKA:

WHEREAS the Alaska Power Authority under AS 44.56.180 has submitted to the legislature and to the commissioner of commerce and economic development a statement outlining the status of the Susitna Hydroelectric Project and the Plan of Study outlining the necessary feasibility studies of the project which is planned to be designed, and may be acquired or constructed, by the United States under an agreement providing for ownership of the project by the authority; and

WHEREAS the Congress of the United States, on October 22, 1976, enacted P.L. 94-587, the Alaska Hydroelectric Power Development Act, which Act authorized the Secretary of the Army and the U.S. Army Corps of Engineers to participate in the Susitna Hydroelectric Project; and

WHEREAS the Phase I activities outlined delineate the environmental, economic, social, and engineering studies requisite to informed decision-making; and

WHEREAS the cost to be incurred during Phase I is now estimated to be $25,000,000, but may exceed that amount; and

WHEREAS it is considered to be in the best interests of the State of Alaska to proceed with Phase I of the project through the use of Alaska Power Authority sponsored financing; and

Biggie

WHEREAS legislative approval of project construction is required if project feasibility and desirability result from the study process conducted under Phase I activities;

BE IT RESOLVED that, based on the plan outlined in the statement of the Alaska Power Authority to the legislature and to the commissioner of commerce and economic development, the legislature agrees to the incurring of indebtedness by the Alaska Power Authority in an amount necessary to finance the cost of the Phase I feasibility studies of the Susitna Hydroelectric Project, including interest; and be it

FURTHER RESOLVED that Phase I studies must provide for substantive public involvement throughout the study process; and be it

FURTHER RESOLVED that the Legislative Affairs Agency shall conduct or contract for an independent review, in consultation with the Alaska Power Authority, based on existing data, of the economic, financial, biological and geophysical implications of the proposed Susitna Hydroelectric Project, and shall report to the legislature by January 15, 1980.

Susitna Power Now, Inc.
P.O. Box 7-4436 Fairbanks Alaska 99701 (907) 452-5272
P.O. Box 981 Anchorage Alaska 99510 (907) 276-7744

February 27, 1980

The Honorable Bill Sumner
Pouch V
Juneau, Alaska 99801

Dear Senator Sumner:

On Friday, March 7th at 1:30 p.m. the Senate Resources Committee will hold a hearing or Senate Bill 294. The hearing will be in the Butrovitch Room on the 2nd Floor of the Capitol Building.

Anyone wishing to sign up in advance to testify may do so by contacting Senator Bill Sumner's office at 465-3791.

We would like to have several hundred individuals represented through oral or written testimony. If you can't attend in person please indicate your support by either sending a public opinion telegram to Senator Sumner (at a cost of 95¢) or contacting your local Legislative Affairs Office who will take written testimony of up to 50 words for transmittal to Juneau.

At 10:00 a.m. on the morning of the hearing we will have our March Executive Board Meeting in Room 121 of the Capitol Building (right across the hall from Senator Kerttula's office).

Meeting Agenda:

1. Call to order
2. Financial and operational status report
3. Membership Committee status report
4. Legislative update by Senator Kerttula on status of SB294, SB295 and SB 385.
5. Discussion and preparation for Senate Resources Committee Hearing
6. Reassessment of near term goals
7. General discussion
8. Setting time and place for next meeting
9. Adjournment

This is a big one. It's very important to the success of the Susitna Project we demonstrate solid, broad based support.

Sincerely,

Lee Wareham
Co-Chairman

ALASKA POWER AUTHORITY

333 WEST4th · SUITE 31 · ANCHORAGE ALASKA 99501

March 17, 1978

The Honorable Jay S. Hammond
Governor
State of Alaska
Pouch A
Juneau, Alaska 9981!

Dear Governor Hammond:

This annual report on the operations of the Alaska Power Authority is submitted in accordance with requirements of Alaska Statute 44.56.200.

The previous twelve month activities of the Power Authority have centered on creating an organization of sufficient quality and expertise to carry out the objective of providing for lower cost ener for Alaskan communities. Concurrently, we have been coordinating the State's efforts on evaluating the potential of developing the Susitna Hydroelectric project. While this latter effort has necessarily occupied much of our time, our recent staffing has allowed us to become cognizant of and responsive to the energy needs of the smaller communities as well. The posture of the Power Authority is moving toward that of an organization with the ability to evaluate the engineering, economic, and financial feasibility of developing our hydroelectric and fossil-fuel fired generation resources, and, if desirable, to ultimately bring them to inception.

The Power Authority retained the services of Peat, Marwick and Mitchell to conduct a search for an Executive Director. This effort culminated with the January 17, 1978 appointment of Mr. Eric Yould, a five year state resident, who was previously with the Corps of Engineers as their project manager for the Susitna project. Mr. Yould holds a Bachelor of Science degree in Civil Engineering, and a Masters degree in Water Resources Engineering, both from the University of Kansas. In addition to his efforts on Susitna, he became quite well acquainted with the engineering and economic merit of the smaller hydropower projects throughout the state. To complement Mr. Yould, the Power Authority has hired the First Southwest Company as its Financial Advisor, and Wohlforth and Flint for its Bond Counsel. With this nucleus, the Power Authority should become quite capable of exercising the policies of the Board of Directors.

During the previous twelve month period, the Susitna project has received much of our attention. While Susitna has been studied for a number of years, there have been insufficient monetary expenditures to precisely determine the economic merit of the project or its environmental impact. Consequently, Congress has conditionally authorized Susitna for what is known as Phase I Advanced Engineering and

Design. Authorization to proceed with Phase I studies is contingent upon a twelve month, $3.0 million seismic analysis and foundation exploration program presently being conducted by the Corps of Engineers. Contained in the same bill that provides for the Phase I studies is a proviso sponsored by Senator Mike Gravel that allows for a federal/state cooperative development of the Susitna project. Under this concept, the federal government would design and construct the project using State funds, and the State would own and operate the project. The salient feature of this Act, commonly known as Section 203 of the 1976 Water Resources Development Act, is the protection afforded the State should it decide to participate. In essence, the federal government would absorb any costs incurred during the Phase I studies if the project proved unfeasible. Since the Phase I studies are estimated to cost in excess of $25.0 million, this guarantee is a tremendous safeguard. Participation under Section 203 does not commit the State to proceed to construction with the federal government. At the conclusion of the four year Phase I studies, the State could choose to proceed with its own efforts for developing Susitna. On the other hand, if the State does decide to construct under Section 203, safeguards from cost overruns could be realized. Obviously the monetary advantage afforded by these safeguards would have to be weighed against a possible loss of revenue which may result from encumbrances in dealing with the federal bureaucracy. The Power Authority plans to participate under Section 203 for the Phase I studies. Financing for the studies would come from the sale of revenue bonds; thus, the State would not be subjected to debt encumbrance. Should the Phase I studies indicate that the project is not feasible, the federal government would repay the cost and interest of the bonds. In order to streamline the Susitna project, Senator Gravel has entered new legislation to Congress that will give direct authorization of Susitna and will clear up some of the procedures of Section 203. Should this bill pass, it is anticipated that the Authority could proceed with the Phase I studies during the latter part of the upcoming summer. There is a possibility that Susitna could become ensnarled under the D-2 land classification as a Wild and Scenic River or that it should at least be studied for such a classification. Either classification could preclude ongoing study or construction efforts. To date, the Power Authority has made $100,000 available to the Corps of Engineers for the development of a Plan of Study for the accomplishment of the Phase I studies. This document is in the process of being finalized. Should the Authority not proceed with the Federal government, the Plan of Study could be utilized by private industry for the Advanced Engineering and Design studies.

Other business of the Power Authority entails the financing of two power studies, and the decision to loan $500,000 to Alaska Electric Light and Power from the Power Project Revolving Loan Fund. One study entailed a reconnaissance grade report on the hydroelectric potential in the Tlingit-Haida communities by Robert W. Retherford Associates, Engineers. The other study was co-funded by the Division of Energy and Power Development. This report entailed a review of the Railbelt area energy alternatives through the year 2000. The report concluded that based on existing cost data, the Susitna project is the most feasible energy option. The loan to AEL&P would be used for the automation of the existing hydropower project on Annex Creek.

During the previous twelve month period, the Power Authority received no project revenue and incurred the following expenses:

Expenditures
3/1/77 - 2/28/78

	3/1/77 6/30/77	7/1/77 2/28/78	Total 3/1/77 - 3/1/78
Personal Services	-0-	5,002	5,002
Travel	5,283	6,122	11,405
Contractual (1 & 2)	193,333	60,137	253,470
Commodities	1,673	15	1,688
Equipment	7,242	870	8,112
TOTAL	207,531	72,146	279,677

Footnote 1 & 2:

(1) Professional Service Contracts:		
Corps of Eng.	100,000	
Peat, Marwick & Mitchell	13,000	
R.W. Retherford	40,000	
Battelle N.W.	35,000	
Wohlforth & Flint		30,000
(2) Rent paid through 6/30/78		27,600

A Look Ahead: In that this is the first full year of the Authority, and consequently, the views and policies of the Authority are not widely known, a summation of what the Authority hopes to accomplish is appropriate. During the upcoming year, the Power Authority will become more and more involved in formulating plans for solving some of the State's energy problems which loom ahead. Although we are presently reviewing power projects on a community basis, we believe that it is imperative that long range regional plans be developed which will address the regional energy needs and the availability of energy alternatives to meet those needs. Much regional information has already been amassed by the Division of Energy and Power Development, and funding for such efforts should continue.

The present practice of electrical energy development within the state has centered around decentralization in which each community is attempting to bring to inception contiguous energy resources. However, the size of the available resources are not always commensurate with the size of the community needs. Furthermore, the small community load demands preclude the opportunity to benefit from "economy of scale". Other communities have virtually no energy options available outside of the traditional diesel fuel generation.

For these reasons it could be desirable to shift the thinking toward transmission interconnection instead of contiguous resources development. Three such regions which could possibly benefit from such an interconnection are Southeast Alaska, the Anchorage/Fairbanks railbelt area, and the AVEC communities. The per capita cost of interconnection, at least in Southeast and in the AVEC region, has historically proven to be quite expensive using conventional means. However there are some unconventional and innovative schemes which are emerging that might provide the beginnings of an effective transmission interconnection. Deserving of analysis for potential use as transmission lines are electrical systems using the earth as one leg of an electrical circuit. There are new ideas being used in submarine cable applications and renewed interest in the potential feasibility of small scale direct current converters. Studies of route locations, engineering assessment of technical problems, survey of cable manufacturers, and preliminary analysis of power requirements for these regions would be beneficial. Studies of this magnitude would cost approximately $500,000. If interconnection could be achieved, a new perspective in power planning could be realized. Communities that have energy alternatives available, perhaps excessive to their needs or ability to develop, could provide to communities that presently rely on expensive imported thermal generation.

It is also suggested that the technical and financial expertise of the Power Authority be utilized in management of the funds which may be available through the permanent fund for power development. The Authority could either act as a technical advisor to the Trustees of the Permanent Fund, or it could assist in managing the funds. The latter method could perhaps best be accomplished through the restructuring of the Power Project Revolving Loan Fund presently administered by the Power Authority. The fund could be expanded to provide for loans to municipalities for the purposes of feasibility studies and

construction financing of approved power projects ultimately to be financed on a long term basis by the Power Authority. It could also be used to provide a reserve fund to secure payment of outstanding long term Authority debt; and finally, it could be used to provide a loan fund to purchase junior lien revenue bonds of municipalities when the Authority can issue only a portion of the debt necessary for permanent financing.

Outside of the permanent fund, it would be desirable that the Power Project Revolving Loan Fund be appropriated an amount sufficient to allow it to operate as envisioned when the Power Authority was established. An assessment of the small community immediate needs reveals that roughly $3,000,000 should be appropriated for hydroelectric planning alone. To this, perhaps another $2,000,000 should be added to provide for the communities which have not made their power needs known. This loan program should be administered on an application and need basis with amounts and terms of financing prescribed by the Board of Directors of the Power Authority rather than by the present practice of having the legislature determining which communities are to receive loans and under what conditions. This latter practice is inefficient and untimely. In short, with its engineering, planning and financial expertise, the Power Authority should be granted the responsibility to administer its loan program as it was originally intended in the Authority's enacting legislation.

The task of providing reasonable cost power to our Alaskan communities is not an easy one. It can only be accomplished by sound planning and shrewd investment practices. Given the necessary resources and responsibility, the Power Authority can help all of Alaska provide for its energy needs.

Robert W. Ward

Robert W. Ward, Chairman
Board of Directors
Alaska Power Authority

SENATE RESOURCES COMMITTEE

TO: SENATOR SUMNER--CHAIRMAN DATE: FEBRUARY 8, 1979

FROM: JERROLD WATTS - STAFF RESEARCHER

Re: Senate Bill #63 and SJR6

SB#63 "An Act making special appropriation to the Alaska Power Authority for the Susitna Hydrolectric Project and proving for an effective date."

Requested is $8,178,000 for the purpose of a gurantee-the sale of the necessary bonds to finance the first year of the Phase I Studies of the Sustina Project.

The appropriation will be on condition, in that;
1. The full amount repaid to the State of Alaska,once the appropriation is no longer needed as a result of other funding sources.

2. Any money earned on the $8,178,000--will be paid to the state.

On June 30,1977- $100,000 from Personnel Services to Contractual Services within the Alaska Power Authority's FY'77 appropriations, was appropriated to fund a Plan of Study to be done by the U.S. CORPS of Engineers.

1978- The Legislature passed HCS for SJR 50 am House, authorizing the Alaska Power Authority to sell bonds to finance the completion of Phase I Studies for the Susitna Project.

Also included in the resolution, a provision which made the sale contingent upon the passage of P.L. 94-587(amended), which would gurantee the bonds and reimburse the state if the project was determined unfeasible.

The 1978 Congress failed to pass the legislation. There are plan to resubmit the propsal this year to Congress.

The project has been estimated to have a final cost of $24.1 million for the Phase I Studies. It is possible the State of Alaska will have to provide complete financing if the Congress fails to pass the P.L. 94-587 amendment.

Additional Requirements To Meet The Phase I Study Time Frame;

1. The corps of Engineers must recieve approval by the Federal Office of management and Budget to enter into an agreement by which the State finances its activities in regard to the project

2. Approval must also be recieved from village corporations which have lands adjacent to the project sites.

3. The internal Revenue Service must sanction the complex financing arrangement which the Alaska Power Authority has proposed.

The project is said to be economical feasible, environmentally acceptable and is desired by the majority of the people that the project will effect, and others.

rec'd 1/22/79 file

George L. Beneseh
Attorney at Law

Telephone 907/274-4726

213 West Sixth Avenue, Suite 1
Anchorage, Alaska 99501

January 17, 1979

The Honorable Jay Hammond
Governor, State of Alaska
Pouch "A"
Juneau, Alaska 99811

Dear Governor Hammond:

For your ready reference I have attached to this letter a copy of my letter of February 23, 1977 suggesting that the State itself "fund and construct" the Devil Canyon hydroelectric project. I proposed that the State use the permanent fund for this purpose rather than revenue bonds for the reasons stated in the letter, among others.

My proposal would have the State rather than the Corps of Engineers perform all of the investigations and design of the project as well as construction.

Although the plan was apparently rejected, I believe current circumstances warrant giving it serious review.

It is appalling to me that the State now finds itself in a position of having to fund the Corps of Engineers field work and studies because of the vindictiveness of Congressman Sieberling and/or other congressional HR-39 proponents. It seems to me that we greatly compromise ourselves and our situation in Congress if we appropriate $8.2 millin for use by the Corps, under the assumption that a benevolent Congress will authorize a total of $25 million for the future and/or reimburse us for the $8.2 million.

I seriously question the wisdom of giving Congressman Sieberling, Udahll, et al this additional leverage in the d-2 issues. It appears to me that we are in the process of making the investigations of the Devil Canyon project a pawn in the d-2 legislative process.

Furthermore, I question the impartiality of the Corps of Engineers to make any studies ostensibly for the State. The Corps is an integral part of a current federal administration that has thoroughly and ruthlessly demonstrated a decided anti-Alaskan and anti-development policy toward Alaska. Yet we seem to find ourselves

bent on a course that entrusts to this agency of the Federal Policy the feasibility analyses of a development-oriented project utilizing a river that the federal administration and wilderness oriented congressmen admittedly want to lock up in a wilderness withdrawal.

It is a fact of feasibility evaluation that the same basic data can yield totally differing results depending upon the results the evaluator wants to reach. Surely Alaska's interests are not properly served or represented by turning over this most important function of project development to the federal government.

Even if it is assumed that the Corps will act impartially and in the best interests of the State it will be a federal development on federal terms. Once the State is financially committed to any significant degree I feel we will have little control over what is done and how it is done.

It seems to me that we are already subject to excessive federal control without going out of our way to provide new avenues of federal control of our economy.

I also highly question the wisdom of using the Corps of Engineers for feasibility studies of the Susitna development for a more technical reason. The original Devil Canyon dam found feasible and proposed for construction by the Department of Interior's Bureau of Reclamation in 1960 was a thin arch dam. I may be wrong but it is my belief that the Corps of Engineers has never before proposed, designed or constructed a significant thin arch dam. I doubt that in the final analysis they will build one at Devil Canyon. A gravity dam at Devil Canyon would greatly increase the cost of the project.

It may be that information and data developed in the area since 1960 will pose additional considerations about constructing thin arch structures on the Susitna River. But I question whether the Corps is the appropriate party for making an unbiased, impartial assessment and evaluation of the feasibility of using thin arch structures. I believe the State should engage the services and expertise of a consulting firm which has broad experience in hydroelectric project planning, investigation, design and construction, and determine for itself the design of the project.

The State has an appropriate agency, the Alaska Power Authority, to plan and oversee the feasibility investigations, and ultimate development of the Devil Canyon Project. Surely it can be structured and appropriately funded to do the job in the best interests of Alaska. In my opinion, the State would get a better product, sooner, and at considerably less total cost. If we are going to appropriate $8 million for Devil Canyon studies this year, let's use it to firmly establish

and get in operation our own state agency and our own state investigations. If we do so we will save considerable time, expense, and federal interference in the long run.

I fail to see why we are using a federal agency as our planner, designer, and builder instead of the private sector, -- particularly under the current state of affairs between Alaska and the Federal Administration and Congress.

Sincerely yours,

George L. Benesch

cc: All Legislators
Alaska Power Authority
Commissioner Robert Ward

Telephone 907/274-4726

George L. Benesch
Attorney at Law

213 West Sixth Avenue, Suite 1
Anchorage, Alaska 99501

February 23, 1977

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The Honorable Jay Hammond
Governor of Alaska
Juneau, Alaska 99801

Subject: Use of the permanent fund for renewable resource development

Dear Governor Jay:

Now that the idea of a permanent fund is an accomplished fact and the fund will soon be receiving substantial deposits, it essentially becomes a matter of prudent investment. As I understand it the idea of the permanent fund is to preserve for future generations some of the benefits of current development of non-renewable resources; and as a hedge against the time when such non-renewable resources are depleted. It seems to me that one excellent way of accomplishing these objectives would be to invest part of that money in the development of renewable resources such as construction of hydroelectric projects.

A case in point would be the construction of the Devil Canyon Project on the Susitna River. Assuming that it is still an economically viable project, I would suggest that the State fund and construct the entire project using the permanent fund as a source of revenue rather than funding the project with issuance of revenue bonds. This type of funding would provide the State immediate and direct and flexible control over the debt service and the repayment period.

I also believe that serious thought should be given to the State itself controlling and contracting for all project design and construction rather than leave these extremely important functions to the Corps of Engineers or some other federal agency. To begin with I think that significant cost savings could be effected. I believe that you will find that federally constructed projects like this generally cost significantly more than comparable projects constructed by private companies or local governments. Furthermore, I suspect we might find that with state funding of federal design and construction, we may be reimbursing the federal government for grossly excessive overhead and administrative costs which neither

the federal administration nor the Congress would be inclined to reduce.

I also believe that there would still be a need for a very substantial participation and review by the State of all phases of design and construction which would duplicate much of the same functions performed by the Corps.

Thirdly, if the State itself gets into the hydroelectric development effort, funded by the permanent fund, it can plan and schedule its own developmental programs rather than be subservient to the development programs proposed by the federal government to fit its convenience. For example, it may be possible to program such construction to boost the economy of the State in periods of economic slump.

As you are well aware, the cost and availability of electric power is very often a major consideration to industrial development. As a corollary, there is a tremendous lobby effort in Congress by other states seeking to attract industry by means of federal development of low cost energy resources. If Alaska is dependent upon federal hydroelectric developmental programs, even though funded by the State, we are nevertheless competing with other states for resource development by the Corps. We may very well find that the Corps development programs and efforts do not necessarily reflect the best interest of Alaska.

I believe that Alaska hire programs would also be significantly affected. If projects such as Devil Canyon are constructed by the federal government, Alaska may have little to say about employment preferences and hiring practices which meet federal requirements and priorities but not necessarily those of the State.

Lastly, I believe this project development could be accomplished much sooner, if desired, if the State designs and constructs the Devil Canyon Project. This could be a very important factor in the ultimate cost of power. I am certain we can expect all costs of design, construction, etc. to continue to increase annually. The Devil Canyon Project, for example, could probably have been built when first recommended to Congress in 1961 for less than half the current construction cost. This would be an additional advantage to using the permanent fund revenue for project development.

With proper maintenance and replacements of equipment as needed, hydroelectric projects such as Devil Canyon have a useful life well beyond 100 years. However, if the State goes to the bond market for construction funds, it may be necessary to gear the repayment period of the project to the term of the bonds; and of course, the cost of power is inversely related to the payout period -- the shorter the period, the higher the unit cost of power until such time as the project is fully paid for.

In my February 7 letter to you concerning the Alaska Power Authority, I indicated that I was forwarding under separate cover, a number of documents relating primarily to the Devil Canyon and Snettisham hydroelectric projects.

Since they are the only copies I have and would be impossible for me to replace, I must confess that I have not mailed them. I had thought I would be going to Juneau this month on other matters and would carry them with me. However, it now appears that I will not be taking the trip. Therefore, if practical, I would like to deliver the documents to your Anchorage office either for review there or to be hand carried to Juneau by someone from your office on their next trip to Juneau.

Sincerely yours,

George L. Benesch

George L. Benesch