Alaska Energy Authority
Copper Valley Intertie
Insulator Assembly Material - TEAL Conductor

	PED	8/18/93		REV		1/6/94		
		Average Span	1125	ft				
	Loading Zone 2	Zone Length	60.87	mi				
		Total Structures	286					
90%	Tangent I String	Qty/Str	2					$191.74
239								
	Anchor Shackle	25k	AND	AS-25	1	478	$3.45	$3.45
	Insulator	12.5k RTL, YC-B	OB	511007-1201	1	478	$89.00	$89.00
	Suspension Clamp	30k	AND	HAS-182-S	1	478	$13.35	$13.35
	Armor Rod	Teal	PRE	AR 0137	1	478	$59.94	$59.94
	Vibration Damper	Teal/AR	FARGO	60710-12	1	478	$26.00	$26.00
	Tangent V-String	Qty/Str	1					$377.08
	Extension Link	12",25k	AND	HOO 30L	2	478	$21.20	$42.40
	Anchor Shackle	25k	AND	AS-25	2	478	$3.45	$6.90
	Insulator	12.5k RTL, YC-B	OB	511007-1201	2	478	$89.00	$178.00
	Socket Y Clevis	30k	AND	SYC 30	2	478	$8.28	$16.56
	Yoke Plate	30k	AND	YPD-30-15238-2	1	239	$26.57	$26.57
	Y Clevis	30k	AND	YCS-16-90	1	239	$7.36	$7.36
	Suspension Clamp	30k	AND	HAS-182-S	1	239	$13.35	$13.35
	Armor Rod	Teal	PRE	AR 0137	1	239	$59.94	$59.94
	Vibration Damper	Teal/AR	FARGO	60710-12	1	239	$26.00	$26.00
5%	Light Angle Structure	Qty/Str	3					$382.74
13								
	Swinging Bracket	Heavy, 3ft	HB	2848-F	1	40	$134.00	$134.00
	Anchor Shackle	30k	AND	AS-25	1	40	$3.45	$3.45
	Insulator	15k RTL, YC-B	OB	512007-1201	1	40	$146.00	$146.00
	Suspension Clamp	30k	AND	HAS-182-S	1	40	$13.35	$13.35
	Armor Rod	Teal	PRE	AR 0137	1	40	$59.94	$59.94
	Vibration Damper	Teal/AR	FARGO	60710-12	1	40	$26.00	$26.00
5%	Medium Angle Structure	Qty/Str	3					$680.76
13								
	Swinging Bracket	Heavy, 2ft	HB	2848-A	1	40	$102.00	$102.00
	Anchor Shackle	50k	AND	AS-50	1	40	$5.40	$5.40
	Insulator	25k RTL, YC-B	OB	513007-1201	1	40	$168.00	$168.00
	Double AGS	40k	PRE	AGS-5826	1	40	$167.08	$167.08
	Yoke Plate	40k	PRE	YP 5909	1	40	$165.03	$165.03
	Socket Clevis	50k	PRE	SC-5329	1	40	$47.25	$47.25
	Vibration Damper		FARGO	60710-12	1	40	$26.00	$26.00
	Deadend	Qty/Str	6			$538.70		$282.70
20								
	Anchor Shackle	50k	AND	AS-50	1	120	$5.40	$5.40
	Insulator	25k RTL,YC-B	OB	513008-1201	1	120	$182.00	$182.00
	HL Socket -YClevis	50k	AND	HSYC-50	1	120	$21.88	$21.88
	Comp DE w Term	Teal	FARGO	A 0312-29	1	120	$45.00	$45.00
	Jumper Post		OB	522008-1102	0.0	0	$256.00	$0.00
	Suspension Clamp	Teal	AND	TSC-106	1	60	$4.83	$2.42
286	Vibration Damper		FARGO	60710-12	1	120	$26.00	$26.00

Alaska Energy Authority
Copper Valley Intertie
Insulator Assembly Material - TEAL Conductor
PED 8/18/93 REV 1/6/94

		Estimating Data						
		Average Span	1000	ft				
	Loading Zone 3	Zone Length	37.94	mi				
		Total Structures	200					
80%	Tangent I String	Qty/Str	2					$200.74
145								
	Anchor Shackle	25k	AND	AS-25	1	290	$3.45	$3.45
	Insulator	12.5k RTL, YC-B	OB	511008-1201	1	290	$98.00	$98.00
	Suspension Clamp	30k	AND	HAS-182-S	1	290	$13.35	$13.35
	Armor Rod	Teal	PRE	AR 0137	1	290	$59.94	$59.94
	Vibration Damper	Teal/AR	FARGO	60710-12	1	290	$26.00	$26.00
	Tangent V-String	Qty/Str	1					$395.08
	Extension Link	12",25k	AND	HOO 30L	2	290	$21.20	$42.40
	Anchor Shackle	30k	AND	AS-25	2	290	$3.45	$6.90
	Insulator	12.5k RTL, YC-B	OB	511008-1201	2	290	$98.00	$196.00
	Socket Y Clevis	30k	AND	SYC 30	2	290	$8.28	$16.56
	Yoke Plate	30k	AND	YPD-30-15238-2	1	145	$26.57	$26.57
	Y Clevis	30k	AND	YCS-16-90	1	145	$7.36	$7.36
	Suspension Clamp	30k	AND	HAS-182-S	1	145	$13.35	$13.35
	Armor Rod	Teal	PRE	AR 0137	1	145	$59.94	$59.94
	Vibration Damper	Teal/AR	FARGO	60710-12	1	145	$26.00	$26.00
								$0.00
10%	Light Angle Structure	Qty/Str	3					$334.74
18								
	Swinging Bracket	Heavy, 3ft	HB	2848-F	1	54	$134.00	$134.00
	Anchor Shackle	30k	AND	AS-25	1	54	$3.45	$3.45
	Insulator	12.5k RTL, YC-B	OB	511008-1201	1	54	$98.00	$98.00
	Suspension Clamp	30k	AND	HAS-182-S	1	54	$13.35	$13.35
	Armor Rod	Teal	PRE	AR 0137	1	54	$59.94	$59.94
	Vibration Damper	Teal/AR	FARGO	60710-12	1	54	$26.00	$26.00
10%	Medium Angle Structure	Qty/Str	3					$675.76
18								
	Swinging Bracket	Heavy, 2ft	HB	2848-A	1	54	$102.00	$102.00
	Anchor Shackle	50k	AND	AS-50	1	54	$5.40	$5.40
	Insulator	15k RTL, YC-B	OB	512008-1201	1	54	$163.00	$163.00
	Double Armor Grip Suspen	40k	PRE	AGS-5826	1	54	$167.08	$167.08
	Yoke Plate	40k	PRE	YP 5909	1	54	$165.03	$165.03
	Socket Clevis	50k	PRE	SC-5329	1	54	$47.25	$47.25
	Vibration Damper		FARGO	60710-12	1	54	$26.00	$26.00
	Deadend	Qty/Str	6			$585.70		$298.70
19								
	Anchor Shackle	50k	AND	AS-50	1	114	$5.40	$5.40
	Insulator	25k RTL,YC-B	OB	513009-1201	1	114	$198.00	$198.00
	Hot Line Socket -YClevis	50k	AND	HSYC-50	1	114	$21.88	$21.88
	Comp DE w Term	Teal	FARGO	A 0312-29	1	114	$45.00	$45.00
	Jumper Post		OB	522009-1102	0.0	0	$287.00	$0.00
	Suspension Clamp	Teal	AND	TSC-106	1	57	$4.83	$2.42
	Vibration Damper		FARGO	60710-12	1	114	$26.00	$26.00

Alaska Energy Authority
Copper Valley Intertie
Insulator Assembly Material - TEAL Conductor
PED 8/18/93 REV 1/6/94

		Estimating Data						
		Average Span	900	ft				
	Loading Zone 4	Zone Length	9.27	mi				
		Total Structures	54					
70%	Tangent I String	Qty/Str	2					$200.74
35								
	Anchor Shackle	25k	AND	AS-25	1	290	$3.45	$3.45
	Insulator	12.5k RTL, YC-B	OB	511008-1201	1	290	$98.00	$98.00
	Suspension Clamp	30k	AND	HAS-182-S	1	290	$13.35	$13.35
	Armor Rod	Teal	PRE	AR 0137	1	290	$59.94	$59.94
	Vibration Damper	Teal/AR	FARGO	60710-12	1	290	$26.00	$26.00
	Tangent V-String	Qty/Str	1					$395.08
	Extension Link	12",25k	AND	HOO 30L	2	290	$21.20	$42.40
	Anchor Shackle	25k	AND	AS-25	2	290	$3.45	$6.90
	Insulator	12.5k RTL, YC-B	OB	511008-1201	2	290	$98.00	$196.00
	Socket Y Clevis	30k	AND	SYC 30	2	290	$8.28	$16.56
	Yoke Plate	30k	AND	YPD-30-15238-2	1	145	$26.57	$26.57
	Y Clevis	30k	AND	YCS-16-90	1	145	$7.36	$7.36
	Suspension Clamp	30k	AND	HAS-182-S	1	145	$13.35	$13.35
	Armor Rod	Teal	PRE	AR 0137	1	145	$59.94	$59.94
	Vibration Damper	Teal/AR	FARGO	60710-12	1	145	$26.00	$26.00
								$0.00
15%	Light Angle Structure	Qty/Str	3					$399.74
7								
	Swinging Bracket	Heavy, 3ft	HB	2848-F	1	54	$134.00	$134.00
	Anchor Shackle	30k	AND	AS-25	1	54	$3.45	$3.45
	Insulator	15k RTL, YC-B	OB	512008-1201	1	54	$163.00	$163.00
	Suspension Clamp	30k	AND	HAS-182-S	1	54	$13.35	$13.35
	Armor Rod	Teal	PRE	AR 0137	1	54	$59.94	$59.94
	Vibration Damper	Teal/AR	FARGO	60710-12	1	54	$26.00	$26.00
15%	Medium Angle Structure	Qty/Str	3					$694.76
7								
	Swinging Bracket	Heavy, 2ft	HB	2848-A	1	54	$102.00	$102.00
	Anchor Shackle	50k	AND	AS-50	1	54	$5.40	$5.40
	Insulator	25k RTL, YC-B	OB	513008-1201	1	54	$182.00	$182.00
	Double Armor Grip Suspen	40k	PRE	AGS-5826	1	54	$167.08	$167.08
	Yoke Plate	40k	PRE	YP 5909	1	54	$165.03	$165.03
	Socket Clevis	50k	PRE	SC-5329	1	54	$47.25	$47.25
	Vibration Damper		FARGO	60710-12	1	54	$26.00	$26.00
	Deadend	Qty/Str	6			$585.70		$298.70
5								
	Anchor Shackle	50k	AND	AS-50	1	114	$5.40	$5.40
	Insulator	25k RTL,YC-B	OB	513009-1201	1	114	$198.00	$198.00
	Hot Line Socket -YClevis	50k	AND	HSYC-50	1	114	$21.88	$21.88
	Comp DE w Term	Teal	FARGO	A 0312-29	1	114	$45.00	$45.00
	Jumper Post		OB	522009-1102	0.0	0	$287.00	$0.00
	Suspension Clamp	Teal	AND	TSC-106	1	57	$4.83	$2.42
	Vibration Damper		FARGO	60710-12	1	114	$26.00	$26.00

	A	B	C	D	E	F	G	H	I	J	K	L	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																								
2		Alaska Energy Authority																						
3		Copper Valley Intertie Feasibility Study																						
4		Crew and Equipment Rates																						
5		PED	Rates below include fund expenses and payroll taxes/insurance.																					
6			These are total burdened labor rates.																					
7																								
8																								
9		Crew Designation > > >								M1	M2	E1	FP2	FDE1	FDE2	ANC1	ANC2	FR1	STR1	STR2	STR3	CON1	CON2	CON3
10				Base $/hr	Base $/hr	Base $/hr	Base																	
11		Personnel		40 hr wk	6-9 hr	6-10 hr	Rate/hr	Source (1)																
12		General Laborer	App 70	$33.91	$36.88	$40.38	$27.79	A1201																
13		Timber Faller/ Clearing Laborer	App 70	$33.91	$36.88	$40.38	$28.54	A1202																
14		Groundperson	App 80	$37.65	$41.05	$45.00	$25.01	A0705						4	4					4	4	4	2	2
15		Journeyman Linemen	JL	$45.13	$49.38	$54.23	$36.48	A0704					1	1	1	1	1	1		2	2	5	2	4
16		Mechanic	JL	$45.13	$49.38	$54.23	$31.82	A1604				2												
17		Operator - Trucks up to 12 axles	JL	$45.13	$49.38	$54.23	$25.72	A2106																
18		Operator - Forklift/Crane	JL	$45.13	$49.38	$54.23	$33.12	A1601		1	2								1					
19		Operator - Pile Driving/Drilling	JL	$45.13	$49.38	$54.23	$36.48	A0704					1	1	1	1	1	1						
20		Operator - Stringing Eqt	JL	$45.13	$49.38	$54.23	$36.48	A0704														2	1	
21		Carpenter	JL	$45.13	$49.39	$54.23	$32.10	S0301																
22		Cement Mason/Framing	JL	$45.13	$49.38	$54.23	$30.50	N0401																
23		Lubeperson	JL	$45.13	$49.38	$54.23	$31.82	A1604				1												
24		Maintenance Person	App 90	$41.39	$45.21	$49.61	$28.54	A1202																
25		Support Person	App 80	$37.65	$41.05	$45.00	$27.79	A1201			1													
26		Welder	JL	$45.13	$49.38	$54.23	$34.20	A1101					1											
27		Rigger/Framer	JL	$45.13	$49.38	$54.23	$27.79	A1201		2	3								3					
28		Materialsperson	JL	$45.13	$49.38	$54.23	$24.40	A0706		2	1								1					
29		Line Foreman	LF	$48.13	$52.71	$57.92	$40.00	ped est		1			1	1	1		1	1	1	1	1	1	1	
30		Chain Person/Rod Person	App 80	$37.65	$41.05	$45.00	$25.39	A2006																
31		Surveyor, Instrument Person	JL	$45.13	$49.38	$54.23	$28.97	A2004																
32		Surveillance	App 90	$41.39	$45.21	$49.61	$27.79	A1201			1													
33		*Total Crew Burdened Expense 6-9's*					9	hour-day		$2,696	$3,443	####	$1,808	$2,841	$2,841	$889	$1,363	$1,363	$2,696	$2,841	$2,841	$5,063	$2,547	$2,517
34		*Subsistence/Travel Allowance*				at	$75	day-pers		$450	$600	$225	$300	$525	$525	$150	$225	$225	$450	$525	$525	$900	$450	$450
35		*Overhead*					at	40%		$1,079	$1,377	$533	$723	$1,136	$1,136	$356	$545	$545	$1,079	$1,136	$1,136	$2,025	$1,019	$1,007
36		*Profit*					at	15%		$404	$516	$200	$271	$426	$426	$133	$204	$204	$404	$426	$426	$759	$382	$377
37		*Total Labor Crew Cost 6-9's per hour*					9	per hour	cost	$514	$660	$255	$345	$548	$548	$170	$260	$260	$514	$548	$548	$972	$489	$483
38		*Total Crew Burdened Expense 6-10's*					10	hour-day		$3,291	$4,200	####	$2,206	$3,464	$3,464	$1,085	$1,664	$1,664	$3,291	$3,464	$3,464	$6,175	$3,106	$3,069
39		*Subsistence/Travel Allowance*				at	$75	day-pers		$450	$600	$225	$300	$525	$525	$150	$225	$225	$450	$525	$525	$900	$450	$450
40		*Overhead*					at	25%		$823	$1,050	$407	$552	$866	$866	$271	$416	$416	$823	$866	$866	$1,544	$777	$767
41		*Profit*					at	15%		$494	$630	$244	$331	$520	$520	$163	$250	$250	$494	$520	$520	$926	$466	$460
42		*Total Labor Crew Cost 6-10's per hour*					10	per hour	cost	$506	$648	$250	$339	$537	$537	$167	$255	$255	$506	$537	$537	$955	$480	$475
43																								
44						ALASKA ADDER> >		1.3																
45			Monthly	Daily	Assumed	Operating	Hourly	Total	Source(2)															
46		Equipment	Rental	(20 days)	Oper %	Cost/hr	Cost	Cost/hr																
47		Helicopter - Personnel, Bell 206L, 1100lb		$1,300	0.50	$316	$479	$239	ERA (3)													0		
48		Helicopter - AS Super Puma332L, 7000 lb		$10,500	1.00	$1,750	$3,063	$3,063	ERA (3)															
49		Helicopter - VERTOL 107-2, 10000 lb		$0	1.00	$3,000	$3,000	$3,000	Columbia											0	0	0		
50		Helicopter - CHINOOK 234, 26000 lb		$0	1.00	$7,500	$7,500	$7,500	Columbia															
51		Helicopter - Skycrane, 25000 lb		$0	1.00	$7,500	$7,500	$7,500	Erickson															
52	15000	Vibratory Hammer, LB Foster FNV-1800	$7,590	$380	0.50	$15	$81	$41	Dataquest						1			1						
53	15000	Power Pack		incl	0.50			$0	Dataquest						1									
54		Hydraulic Impact Brkr Stanley MB1500	$2,055	$103	0.50	$2	$19	$10	Dataquest				1											
55		Track Auger Watson 1500C	$13,055	$653	0.50	$31	$146	$73	Dataquest					1	1									
56		Hydraulic Track Drill IR LME500C	$10,655	$533	0.50	$27	$122	$61	Dataquest								1	1						
57		Crawler Hydraulic Excav CAT 213 LC	$5,185	$259	0.50	$12	$58	$29	Dataquest							1	1							
58		Light Duty Truck	$500	$25	0.75	$5	$11	$8	Dataquest	3	3	2												
59		Flatbed, 20k, Diesel	$965	$48	0.75	$6	$16	$12	Dataquest	2	1													
60		Tractor/Trailer	$3,750	$188	0.75	$16	$51	$38	Dataquest	2														
61		Yard Crane GROVE 1012, 60'X17.5T	$4,835	$242	0.75	$15	$59	$44	Dataquest	1	1								1					
62		Rough Terrain Crane GROVE RT58B	$5,445	$272	0.50	$16	$65	$33	Dataquest				1	1	1					1				
63		Tensioner/reel stands (PED EST)	$3,000	$150	0.75	$10	$37	$28	PED													1		
64		Puller	$4,000	$200	0.75	$15	$52	$39	PED													1		
65		Sagging Cat	$6,000	$300	0.50	$15	$68	$34	PED														1	
66		ATV/Snow	$400	$20	0.50	$4	$8	$4	PED		5													
67		SnoCat	$1,000	$50	0.50	$10	$21	$11	PED				1	1	1	1	1	1						
68		Forklift 11K	$2,240	$112	0.50	$8	$26	$13	Dataquest	2	1								1					
69		Compressor Diesel, 600cfm	$2,190	$110	0.50	$12	$33	$17	Dataquest	1	1								1				1	1
70		Welder/Genset (PED EST)	$600	$30	0.50	$4	$10	$5	PED	1		1	1						1					
71		Tamper, Gasoline 17" plate, 4hp	$140	$7	0.25	$1	$2	$0	Dataquest							2	1			2				
72		Miscellaneous	$500	$25	1.00	$5	$11	$11	Dataquest	3	2	2	1	1	1	0.5	0.5	0.5	2	1	1	2	3	3
73																								
74		*Net Equipment Costs/Standard Day*						hour		$248	$152	$42	$68	$127	$167	$46	$106	$117	$100	$44	$11	$88	$83	$48
75		*Special Mobilization Allowance*						ls																
76		*Overhead (Included In Daily)*					at	0%		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
77		*Profit*					at	15%		$37	$23	$6	$10	$19	$25	$7	$16	$18	$15	$7	$2	$13	$12	$7
78		*Total Equipment Costs per hour*								$285	$174	$48	$79	$146	$193	$52	$122	$135	$115	$51	$12	$101	$95	$56
79										M1	M2	E1	FP2	FDE1	FDE2	ANC1	ANC2	FR1	STR1	STR2	STR3	CON1	CON2	CON3
80		TOTAL CREW COST 6-9's per hour								$799	$834	$303	$423	$693	$740	$222	$382	$395	$629	$598	$560	$1,073	$583	$539
81		TOTAL CREW COST 6-10's								$790	$822	$299	$417	$683	$730	$219	$377	$390	$621	$589	$550	$1,056	$575	$530
82		Crew personnel								6	8	3	4	7	7	2	3	3	6	7	7	12	6	6
83																								

EXHIBIT C-5

	A	B	C	D	E	F	G	H	I	J	K	L	O	P	Q	R	S	T	U	V	W	X	Y	Z
84		The table below is an array whose crew houly rates are linked to estimating sheets.																						
85			6-9's	6-10's	personnel																			
86	1	ANC1	$222	$219	2		Anchor crew, log or plate, excavation																	
87	2	ANC2	$382	$377	3		Anchor crew, rock type																	
88	3	CON1	$1,073	$1,056	12		Stringing crew,fly in pilot line,pull in wire,splice																	
89	4	CON2	$583	$575	6		Stringing crew, sag, clip and install dampers																	
90	5	CON3	$539	$530	6		Stringing crew, make up deadends and jumpers																	
91	6	E1	$303	$299	3		Equipment maintenance, lubrication																	
92	7	FDE1	$693	$683	7		Foundation crew, direct embedment, auger then shell																	
93	8	FDE2	$740	$219	7		Foundation crew, direct embedment,drive caisson,auger to depth, vibratory hammer																	
94	9	FP1	$459	$453	4		Foundation crew, pile driving/vibratory hammer																	
95	10	FP2	$423	$417	4		Foundation crew, pile driving hydraulic ram																	
96	11	FR1	$395	$390	3		Foundation crew, rock, Hpile on rock anchors/grouted																	
97	12	HEL1	$581	$574	0		Small Helicopter Support, Local Mobilization																	
98	13	HEL2	$3,341	$3,335	0		Heavy Lift Helicopter Support, Local Mobilization, 10k																	
99	14	HEL3	$7,947	$7,939	0		Extra Heavy Lift Helicopter Support, Remote Mobilization, 20-25k																	
100	15	INSP1	$1,107	$1,093	10		Inspection, Clean Up																	
101	16	M1	$799	$790	6		Materials, Main Yard and Delivery to marshall yards																	
102	17	M2	$834	$822	6		Material handling, framing, packaging at marshall yards																	
103	18	STR1	$629	$621	6		Structure framing at marshall yards																	
104	19	STR2	$596	$588	7		Install self-supporting H-frames																	
105	20	STR3	$560	$550	7		Install guyed X-frames, structures on piles																	
106	21	SU1	$179	$176	2		Site layout, survey foundations, guys, structure staking																	
107			winter	summer																				
108																								
109																								
110																								
111		Notes																						
112		(1) Rates from Title 36 Public Contracts																						

	B	C	D	E	F	G	H	AA	AB	AC	AD
1											
2	Alaska Energy Authority										
3	Copper Valley Intertie Feasibility Study										
4	Crew and Equipment Rates										
5	PED	Rates below include fund expenses and payroll taxes/insurance.									
6		These are total burdened labor rates.									
7											
8											
9	Crew Designation > > >							INSP1	HEL1	HEL2	HEL3
10			Base $/hr	Base $/hr	Base $/hr	Base					
11	Personnel		40 hr wk	6-9 hr	6-10 hr	Rate/hr	Source (1)				
12	General Laborer	App 70	$33.91	$36.88	$40.38	$27.79	A1201				
13	Timber Faller/ Clearing Laborer	App 70	$33.91	$36.88	$40.38	$28.54	A1202				
14	Groundperson	App 80	$37.65	$41.05	$45.00	$25.01	A0705	4			
15	Journeyman Lineman	JL	$45.13	$49.38	$54.23	$36.48	A0704	2			
16	Mechanic	JL	$45.13	$49.38	$54.23	$31.82	A1604		1	1	1
17	Operator - Trucks up to 12 axles	JL	$45.13	$49.38	$54.23	$25.72	A2106				
18	Operator - Forklift/Crane	JL	$45.13	$49.38	$54.23	$33.12	A1601	1			
19	Operator - Pile Driving/Drilling	JL	$45.13	$49.38	$54.23	$36.48	A0704		1.25	1.25	2.5
20	Operator - Stringing Eqt	JL	$45.13	$49.38	$54.23	$36.48	A0704				
21	Carpenter	JL	$45.13	$49.38	$54.23	$32.10	80301				
22	Cement Mason/Framing	JL	$45.13	$49.38	$54.23	$30.50	N0401				
23	Lubeperson	JL	$45.13	$49.38	$54.23	$31.82	A1604				
24	Maintenance Person	App 90	$41.39	$45.21	$49.61	$28.54	A1202				
25	Support Person	App 80	$37.65	$41.05	$45.00	$27.79	A1201	1	1	1	1
26	Welder	JL	$45.13	$49.38	$54.23	$34.20	A1101				
27	Rigger/Framer	JL	$45.13	$49.38	$54.23	$27.79	A1201				
28	Materialsperson	JL	$45.13	$49.38	$54.23	$24.40	A0706	1			
29	Line Foreman	LF	$48.13	$52.71	$57.92	$40.00	ped est	1			
30	Chain Person/Rod Person	App 80	$37.65	$41.05	$45.00	$25.39	A2006				
31	Surveyor, Instrument Person	JL	$45.13	$49.38	$54.23	$28.97	A2004				
32	Surveillance	App 90	$41.39	$45.21	$49.61	$27.79	A1201		1	1	1
33	***Total Crew Burdened Expense 6-9's***					9	hour-day	$4,099	$1,776	$1,776	$2,332
34	***Subsistence/Travel Allowance***				at	$75	day-pers	$750	$319	$319	$413
35	***Overhead***					at	40%	$1,640	$711	$711	$933
36	***Profit***					at	15%	$615	$266	$266	$350
37	***Total Labor Crew Cost 6-9's per hour***					9	per hour	$789	$341	$341	$447
38	***Total Crew Burdened Expense 6-10's***					10	hour-day	$4,998	$2,166	$2,166	$2,844
39	***Subsistence/Travel Allowance***				at	$75	day-pers	$750	$319	$319	$413
40	***Overhead***					at	25%	$1,250	$542	$542	$711
41	***Profit***					at	15%	$750	$325	$325	$427
42	***Total Labor Crew Cost 6-10's per hour***					10	per hour	$775	$335	$335	$439
43											
44					ALASKA ADDER> >		1.3				
45		Monthly	Daily	Assumed	Operating	Hourly	Total				
46	Equipment	Rental	(20 days)	Oper %	Cost/hr	Cost	Cost/hr				
47	Helicopter - Personnel, Bell 206L, 1100lb		$1,300	0.50	$316	$479	$239	1	1		
48	Helicopter - AS Super Puma332L, 7000 lb		$10,500	1.00	$1,750	$3,063	$3,063				
49	Helicopter - VERTOL 107-2, 10000 lb		$0	1.00	$3,000	$3,000	$3,000			1	
50	Helicopter - CHINOOK 234, 26000 lb		$0	1.00	$7,500	$7,500	$7,500				
51	Helicopter - Skycrane, 25000 lb		$0	1.00	$7,500	$7,500	$7,500				1
52	Vibratory Hammer, LB Foster FNV-1800	$7,590	$380	0.50	$15	$81	$41				
53	Power Pack		incl	0.50			$0				
54	Hydraulic Impact Brkr Stanley MB1500	$2,055	$103	0.50	$2	$19	$10				
55	Track Auger Watson 1600C	$13,055	$653	0.50	$31	$146	$73				
56	Hydraulic Track Drill IR LME500C	$10,655	$533	0.50	$27	$122	$61				
57	Crawler Hydraulic Excav CAT 213 LC	$5,185	$259	0.50	$12	$58	$29	1			
58	Light Duty Truck	$500	$25	0.75	$5	$11	$8				
59	Flatbed, 20k, Diesel	$965	$48	0.75	$6	$16	$12				
60	Tractor/Trailer	$3,750	$188	0.75	$16	$51	$38				
61	Yard Crane GROVE 1012, 60'X17.5T	$4,835	$242	0.75	$15	$59	$44				
62	Rough Terrain Crane GROVE RT58B	$5,445	$272	0.50	$16	$65	$33				
63	Tensioner/reel stands (PED EST)	$3,000	$150	0.75	$10	$37	$28				
64	Puller	$4,000	$200	0.75	$15	$52	$39				
65	Sagging Cat	$6,000	$300	0.50	$15	$68	$34				
66	ATV/Snow	$400	$20	0.50	$4	$8	$4	2			
67	SnoCat	$1,000	$50	0.50	$10	$21	$11				
68	Forklift 11K	$2,240	$112	0.50	$6	$26	$13				
69	Compressor Diesel, 600cfm	$2,190	$110	0.50	$12	$33	$17				
70	Welder/Genset (PED EST)	$600	$30	0.50	$4	$10	$5				
71	Tamper, Gasoline 17" plate, 4hp	$140	$7	0.25	$1	$2	$0				
72	Miscellaneous	$500	$25	1.00	$5	$11	$11				
73											
74	***Net Equipment Costs/Standard Day***						hour	$277	$239	$3,000	$7,500
75	***Special Mobilization Allowance***						ls				
76	***Overhead (Included in Daily)***					at	0%	$0	NA	NA	NA
77	***Profit***					at	15%	$41	NA	NA	NA
78	***Total Equipment Costs per hour***							$318	$239	$3,000	$7,500
79								INSP1	HEL1	HEL2	HEL3
80	TOTAL CREW COST 6-9's per hour							$1,107	$581	$3,341	$7,947
81	TOTAL CREW COST 6-10's							$1,093	$574	$3,335	$7,939
82	Crew personnel							10	4.25	4.25	6.5
83											

	B	C	D	E	F	G	H	AA	AB	AC	AD
84	The table below is an array whose crew houly rates are linked to estimating sheets.										
85		6-9's	6-10's	personnel							
86	ANC1	$222	$219	2		Anchor crew, log or plate,					
87	ANC2	$382	$377	3		Anchor crew, rock type					
88	CON1	$1,073	$1,056	12		Stringing crew,fly in pilot l					
89	CON2	$583	$576	6		Stringing crew, sag, clip a					
90	CON3	$539	$530	6		Stringing crew, make up d					
91	E1	$303	$299	3		Equipment maintenance, h					
92	FDE1	$693	$683	7		Foundation crew, direct e					
93	FDE2	$740	$219	7		Foundation crew, direct e					
94	FP1	$459	$453	4		Foundation crew, pile drivi					
95	FP2	$423	$417	4		Foundation crew, pile drivi					
96	FR1	$395	$390	3		Foundation crew, rock, Hp					
97	HEL1	$581	$574	0		Small Helicopter Support,					
98	HEL2	$3,341	$3,335	0		Heavy Lift Helicopter Supp					
99	HEL3	$7,947	$7,939	0		Extra Heavy Lift Helicopte					
100	INSP1	$1,107	$1,093	10		Inspection, Clean Up					
101	M1	$799	$790	6		Materials, Main Yard and					
102	M2	$834	$822	8		Material handling, framing,					
103	STR1	$629	$621	6		Structure framing at mars					
104	STR2	$598	$588	7		Install self-supporting H-fr					
105	STR3	$560	$550	7		Install guyed X-frames, etc					
106	SU1	$179	$176	2		Site layout, survey founda					
107		winter	summer								
108											
109											
110											
111	Notes										
112	(1) Rates from Title 36 Public Contracts										

EXHIBIT C-6

[COSTTEMP.XLW]SUMMARY.XLS

EXHIBIT C-6
INTERTIE COST ESTIMATE SUMMARY
ROUTE ALTERNATIVE
A

A.	**Transmission Line Construction**					
						cost/mile
	A.1	Structures			$7,888,292	$58,855
	A.2	Foundations			$7,750,416	$57,826
	A.3	Guys and Anchors			$1,360,786	$10,153
	A.4	Framing			$2,667,789	$19,904
	A.5	Conductor			$6,657,034	$49,668
	A.6	Right-of-Way Clearing			$2,689,268	$20,065
	A.7	Mobilization			$1,316,216	$9,820
	A.8	Contingencies on Transmission Construction			$4,459,198	$33,270
	Subtotal Transmission Line Construction			*$34,788,999*		
	Labor	*138964* hours	Total Per Mile Cost	*$259,561*		
B.	**Substations**					
	B.1	New Sutton Substation			$1,824,316	
	B.2	Pump Station No. 11 Sub			$1,793,903	
C.	**Engineering Services**					
	C.1	Surveying	10000 per mile		$1,340,300	
	C.2	Geotechnical Investigation			$700,000	
	C.3	Meteorological Study			$35,000	
	C.4	Transmission Line			$912,500	
	C.5	Substation			$350,500	
D.	**Environmental Services, Right-of-Way Acquisition and Permitting**					
	D.1	Cultural Resource Survey	Included in D.3		$0	
	D.2	Raptor Survey	Included in D.3		$0	
	D.3	NEPA Process/EIS			$1,300,000	
	D.4	Visual Modeling Study			$40,000	
	D.5	Permits				

	D.5.a	ADNR/ASDOT-PF				$20,000
	D.5.b	ADF&G				$10,000
	D.5.c	BLM				$5,000
	D.5.d	Mat-Su Conditonal Use Permits				$10,000
	D.5.e	Corps Section 404 Permit/ADEC				$20,000
D.6	Right-of-Way Acquisition		miles	acres	cost/ac	
	D.6.a	Private Lands	0.0	0	1000	$0
	D.6.b	Native Lands	16.3	246	1000	$246,000
	D.6.c	State Lands	88.2	1330	0	$0
	D.6.d	Federal Lands	13.4	202	0	$0
	D.6.e	State/MH Lands	12.1	182	1000	$182,000
	D.6.f	Mat-Su Borough	1.0	15	1000	$15,000
	D.6.g	Native-Selected lands	3.0	45	1000	$45,000
	D.6.h	Mining Claims	125	na	1000	$125,000
	D.6.I	ROW Agent				$100,000

SUBTOTAL >>			$43,863,518
E.	**Construction Management**	5%	$2,193,176
F.	**Owner Costs** (Applied to items A-E)	3%	$1,381,701
G.	**Contingency on Non-Construction Costs** (items C,D,E, and F)	10%	$903,118
H.	**Total Project Development Cost Estimate**		$48,341,512

EXHIBIT C-6
INTERTIE COST ESTIMATE SUMMARY
ROUTE ALTERNATIVE
B

A.	**Transmission Line Construction**						cost/mile
	A.1	Structures				$7,750,189	$57,928
	A.2	Foundations				$7,826,801	$58,501
	A.3	Guys and Anchors				$1,588,920	$11,876
	A.4	Framing				$2,728,397	$20,393
	A.5	Conductor				$6,465,407	$48,325
	A.6	Right-of-Way Clearing				$3,438,704	$25,702
	A.7	Mobilization				$1,317,986	$9,851
	A.8	Contingencies on Transmission Construction				$4,458,805	$33,327
	Subtotal Transmission Line Construction				*$35,575,209*		
	Labor	*138604* hours	Total Per Mile Cost		*$265,903*		
B.	**Substations**						
	B.1	New Sutton Substation				$1,824,316	
	B.2	Pump Station No. 11 Sub				$1,793,903	
C.	**Engineering Services**						
	C.1	Surveying			10000 per mile	$1,337,900	
	C.2	Geotechnical Investigation				$700,000	
	C.3	Meteorological Study				$35,000	
	C.4	Transmission Line				$912,500	
	C.5	Substation				$350,500	
D.	**Environmental Services, Right-of-Way Acquisition and Permitting**						
	D.1	Cultural Resource Survey	Included in D.3			$0	
	D.2	Raptor Survey	Included in D.3			$0	
	D.3	NEPA Process/EIS				$1,300,000	
	D.4	Visual Modeling Study				$40,000	
	D.5	Permits					
		D.5.a ADNR/ASDOT-PF				$20,000	
		D.5.b ADF&G				$10,000	
		D.5.c BLM				$5,000	
		D.5.d Mat-Su Conditonal Use Permits				$10,000	
		D.5.e Corps Section 404 Permit/ADEC				$20,000	
	D.6	Right-of-Way Acquisition	miles	acres	cost/ac		
		D.6.a Private Lands	0.3	4	1000	$4,000	
		D.6.b Native Lands	21.3	320	1000	$320,000	
		D.6.c State Lands	88.7	1337	0	$0	
		D.6.d Federal Lands	7.3	110	0	$0	
		D.6.e State/MH Lands	13.1	198	1000	$198,000	
		D.6.f Mat-Su Borough	2.0	30	1000	$30,000	
		D.6.g Native-Selected lands	0.0	0	1000	$0	
		D.6.h Mining Claims	20	na	1000	$20,000	
		D.6.I ROW Agent				$100,000	
SUBTOTAL	>>					$44,606,328	
E.	**Construction Management**		5%			$2,230,316	
F.	**Owner Costs** (Applied to items A-E)		3%			$1,405,099	
G.	**Contingency on Non-Construction Costs** (items C,D,E, and F)		10%			$904,832	
H.	**Total Project Development Cost Estimate**					$49,146,576	

EXHIBIT C-6
INTERTIE COST ESTIMATE SUMMARY
ROUTE ALTERNATIVE
C

A.	**Transmission Line Construction**						cost/mile
	A.1	Structures				$7,883,419	$57,792
	A.2	Foundations				$7,965,529	$58,394
	A.3	Guys and Anchors				$1,630,091	$11,950
	A.4	Framing				$2,779,884	$20,379
	A.5	Conductor				$6,605,605	$48,425
	A.6	Right-of-Way Clearing				$3,258,734	$23,889
	A.7	Mobilization				$1,343,226	$9,847
	A.8	Contingencies on Transmission Construction				$4,545,885	$33,325
	Subtotal Transmission Line Construction				*$36,012,373*		
	Labor	*141416* hours	Total Per Mile Cost		*$264,001*		
B.	**Substations**						
	B.1	New Sutton Substation				$1,824,316	
	B.2	Pump Station No. 11 Sub				$1,793,903	
C.	**Engineering Services**						
	C.1	Surveying		10000 per mile		$1,364,100	
	C.2	Geotechnical Investigation				$700,000	
	C.3	Meteorological Study				$35,000	
	C.4	Transmission Line				$912,500	
	C.5	Substation				$350,500	

D. Environmental Services, Right-of-Way Acquisition and Permitting

D.1	Cultural Resource Survey	Included in D.3				$0
D.2	Raptor Survey	Included in D.3				$0
D.3	NEPA Process/EIS					$1,300,000
D.4	Visual Modeling Study					$40,000
D.5	Permits					
D.5.a	ADNR/ASDOT-PF					$20,000
D.5.b	ADF&G					$10,000
D.5.c	BLM					$5,000
D.5.d	Mat-Su Conditonal Use Permits					$10,000
D.5.e	Corps Section 404 Permit/ADEC					$20,000
D.6	Right-of-Way Acquisition	miles	acres	cost/ac		
D.6.a	Private Lands	0.3	4	1000		$4,000
D.6.b	Native Lands	16.6	250	1000		$250,000
D.6.c	State Lands	95.6	1442	0		$0
D.6.d	Federal Lands	7.6	115	0		$0
D.6.e	State/MH Lands	13.1	198	1000		$198,000
D.6.f	Mat-Su Borough	2.0	30	1000		$30,000
D.6.g	Native-Selected lands	0.0	0	1000		$0
D.6.h	Mining Claims	50	na	1000		$50,000
D.6.I	ROW Agent					$100,000

SUBTOTAL >>>			$45,029,693
E.	**Construction Management**	5%	$2,251,485
F.	**Owner Costs** (Applied to items A-E)	3%	$1,418,435
G.	**Contingency on Non-Construction Costs** (items C,D,E, and F)	10%	$906,902
H.	**Total Project Development Cost Estimate**		$49,606,515

EXHIBIT C-6
INTERTIE COST ESTIMATE SUMMARY
APPARENT PREFERRED ROUTE ALTERNATIVE
D

A.	**Transmission Line Construction**					cost/mile
	A.1	Structures			$7,717,699	$57,599
	A.2	Foundations			$7,598,190	$56,707
	A.3	Guys and Anchors			$1,226,521	$9,154
	A.4	Framing			$2,642,195	$19,719
	A.5	Conductor			$6,503,487	$48,537
	A.6	Right-of-Way Clearing			$2,792,960	$20,845
	A.7	Mobilization			$1,284,405	$9,586
	A.8	Contingencies on Transmission Construction			$4,347,472	$32,446
	Subtotal Transmission Line Construction			*$34,112,928*		
	Labor	*135787* hours	Total Per Mile Cost	*$254,593*		
B.	**Substations**					
	B.1	New Sutton Substation			$1,824,316	
	B.2	Pump Station No. 11 Sub			$1,793,903	
C.	**Engineering Services**					
	C.1	Surveying	10000 per mile		$1,339,900	
	C.2	Geotechnical Investigation			$700,000	
	C.3	Meteorological Study			$35,000	
	C.4	Transmission Line			$912,500	
	C.5	Substation			$350,500	

D. Environmental Services, Right-of-Way Acquisition and Permitting

D.1	Cultural Resource Survey	Included in D.3				$0
D.2	Raptor Survey	Included in D.3				$0
D.3	NEPA Process/EIS					$1,300,000
D.4	Visual Modeling Study					$40,000
D.5	Permits					
D.5.a	ADNR/ASDOT-PF					$20,000
D.5.b	ADF&G					$10,000
D.5.c	BLM					$5,000
D.5.d	Mat-Su Conditonal Use Permits					$10,000
D.5.e	Corps Section 404 Permit/ADEC					$20,000
D.6	Right-of-Way Acquisition		miles	acres	cost/ac	
D.6.a	Private Lands		0.0	0	1000	$0
D.6.b	Native Lands		16.3	246	1000	$246,000
D.6.c	State Lands		98.0	1477	0	$0
D.6.d	Federal Lands		8.3	125	0	$0
D.6.e	State/MH Lands		12.1	182	1000	$182,000
D.6.f	Mat-Su Borough		1.0	15	1000	$15,000
D.6.g	Native-Selected lands		3.0	45	1000	$45,000
D.6.h	Mining Claims		125	na	1000	$125,000
D.6.I	ROW Agent					$100,000

SUBTOTAL	>>		$43,187,048
E.	**Construction Management**	5%	$2,159,352
F.	**Owner Costs** (Applied to items A-E)	3%	$1,360,392
G.	**Contingency on Non-Construction Costs** (items C,D,E, and F)	10%	$897,564
H.	**Total Project Development Cost Estimate**		$47,604,356

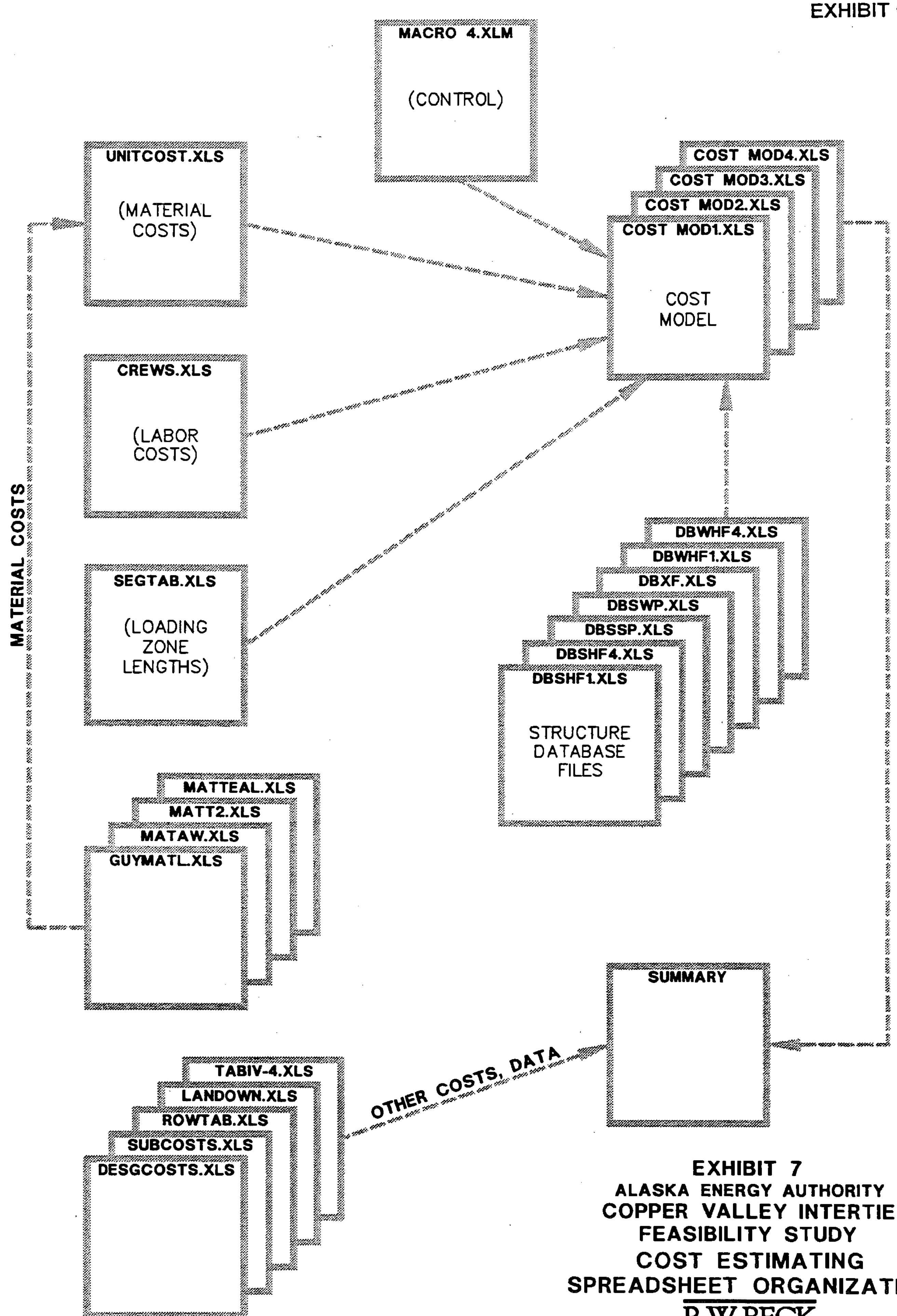


EXHIBIT 7
ALASKA ENERGY AUTHORITY
COPPER VALLEY INTERTIE FEASIBILITY STUDY
COST ESTIMATING SPREADSHEET ORGANIZATION

R.W. BECK AND ASSOCIATES

0135 D:\AEA\COST_EST 10-27-93 ● 11:21

TYPE ESTM: Feasibility
FILE: subcosts. xls
ESTM: JAB JAB
PROJ: SUTTON - GLENNALLEN 138 kV TRANSMISSION LINE
CHECKED: SKK
INTERTIE FEASIBILITY STUDY
APPROVED: WCK
ALL DOLLARS AS OF: eptember, 1993

Cost per manhour, Incl. O&P : $60.00

Line No.	Description	Qty	Unit	Unit Cost Material	Manhours or Labor Cost	Extended Material	Extended Labor	Subtotal
	NEW SUBSTATION NEAR O'NEILL SUBSTATION							
1	Power Xfmr, 12/16/ 20 MVA	1	ea	$345,000	260	$345,000	$15,600	$360,600
2	Circuit Breaker,115 kV	1	ea	$90,000	250	$90,000	$15,000	$105,000
3	Circuit Switcher, 138 kV	1	ea	$36,000	200	$36,000	$12,000	$48,000
4	Disconnect Switch,138 kV	2	ea	$13,000	109	$26,000	$13,080	$39,080
5	Disconn.Sw.w.gnd.sw.,138 kV	1	ea	$16,000	169	$16,000	$10,140	$26,140
6	Disconnect Switch, 115 kV	4	ea	$12,500	109	$50,000	$26,160	$76,160
7	Disconn.Sw.w.gnd.sw., 115 kV	1	ea	$15,500	169	$15,500	$10,140	$25,640
8	Voltage Xfmr, 138 kV	3	ea	$7,000	25	$21,000	$4,500	$25,500
9	Voltage Xfmr, 115 kV	3	ea	$6,000	25	$18,000	$4,500	$22,500
10	Surge Arrester,138 kV	3	ea	$3,500	10	$10,500	$1,800	$12,300
11	Surge Arrester, 115 kV	3	ea	$3,200	10	$9,600	$1,800	$11,400
12	Conductor, Clamps, Supp., etc.	1	ls	$10,000	150	$10,000	$9,000	$19,000
13	Control & Relay Panels	2	ea	$35,000	100	$70,000	$12,000	$82,000
14	RTU & Communication	1	ls	$50,000	200	$50,000	$12,000	$62,000
15	AC & DC Stn Service&Lighting	1	ls	$45,000	200	$45,000	$12,000	$57,000
16	Cables, Control & Protection	1	ls	$20,000	200	$20,000	$12,000	$32,000
17	Cable Trench	70	lf	$85	0.70	$5,950	$2,940	$8,890
18	Grounding System	1400	lf	$7	0.14	$9,800	$11,760	$21,560
19	Substation Testing	1	ls		$40,000		$40,000	$40,000
20	CIVIL WORKS							
21	Heavy Clearing and Grubbing	0.30	ac		$10,000		$3,000	$3,000
22	Stripping and Grading	0.25	ac		$20,000		$5,000	$5,000
23	Access ways	1	ls	$5,000	$30,000	$5,000	$30,000	$35,000
24	Structures, Tubular Steel							
25	138-kV Deadend	1	ea	$24,000	$8,000	$24,000	$8,000	$32,000
26	115-kV Deadend	1	ea	$20,000	$7,000	$20,000	$7,000	$27,000
27	Circuit Switcher Support	1	ea	$6,000	$3,000	$6,000	$3,000	$9,000
28	3 Phase Equipm't	2	ea	$4,000	$2,000	$8,000	$4,000	$12,000
29	Foundations							
30	138-kV Deadend	1	ea	$8,700	$17,400	$8,700	$17,400	$26,100
31	115-kV Deadend	1	ea	$8,100	$16,200	$8,100	$16,200	$24,300
32	Circuit Switcher Support	1	ea	$1,800	$3,600	$1,800	$3,600	$5,400
33	3 Phase Equipm't	1	ea	$1,000	$2,000	$1,000	$2,000	$3,000
34	Circuit Breaker, Switcher	2	ea	$2,600	$5,200	$5,200	$10,400	$15,600
35	Power Transformer	1	ea	$7,200	$14,000	$7,200	$14,000	$21,200
36	Control Building	1	ea	$3,300	$6,600	$3,300	$6,600	$9,900
37	Prefabricated Control Building	1	ea	$6,000	$7,000	$6,000	$7,000	$13,000
38	Oil Containment	1	ls	$14,000	$20,000	$14,000	$20,000	$34,000
39	Fence, 8' high chain link	320	lf	$20	$15	$6,400	$4,800	$11,200
40	Gates, 8' high x 20' wide	2	ea	$1,500	$1,500	$3,000	$3,000	$6,000
41	Final grading	1.50	ac		$10,000		$15,000	$15,000
42	Crush rock surfacing, 6"	130	cy	$30	$20	$3,900	$2,600	$6,500
43	Mobilization (Civil Works)	10	%			$13,160	$18,260	$31,420
44	Line Tap	1	ls	$75,000	$75,000	$75,000	$75,000	$150,000
45	Transport To Site	5	%			$42,418		$42,418
46	**Subtotal**					$1,110,528	$502,280	$1,612,808
47	**Contingencies**							
48	Material	10	%			$111,053		$111,053
49	Labor	20	%				$100,456	$100,456
50	TOTAL					$1,221,580	$602,736	$1,824,316

TYPE ESTM: Feasibility
FILE: subcosts. xls ESTM: JAB
PROJ: SUTTON - GLENNALLEN 138 kV TRANSMISSION LINE CHECKED:
INTERTIE FEASIBILITY STUDY APPROVED:
ALL DOLLARS AS OF: eptember, 1993

Cost per manhour, Incl. O&P : $60.00

Line No.	Description	Qty	Unit	Unit Cost Material	Manhours or Labor Cost	Extended Material	Extended Labor	Subtotal
	EXTENSION TO PUMP STATION NO. 11 SUBSTATION							
1	Shunt Reactor 138 kV 10 MVA	1	ea	$210,000	130	$210,000	$7,800	$217,800
2	Circuit Breaker,138 kV	1	ea	$95,000	250	$95,000	$15,000	$110,000
3	Circuit Switcher, 138 kV	1	ea	$36,000	200	$36,000	$12,000	$48,000
4	Disconnect Switch,138 kV	7	ea	$13,000	109	$91,000	$45,780	$136,780
5	Fuse w. support, 138 kV	1	ea	$15,000	169	$15,000	$10,140	$25,140
6	Voltage Xfmr, 138 kV	3	ea	$7,000	25	$21,000	$4,500	$25,500
7	Surge Arrester,138 kV	6	ea	$3,500	10	$21,000	$3,600	$24,600
8	Busbars, Clamps, Supp., etc.	1	ls	$20,000	220	$20,000	$13,200	$33,200
9	Control & Relay Panels	2	ea	$35,000	100	$70,000	$12,000	$82,000
10	RTU & Communication	1	ls	$50,000	250	$50,000	$15,000	$65,000
11	AC & DC Stn Service&Lighting	1	ls	$20,000	100	$20,000	$6,000	$26,000
12	Cables, Control & Protection	1	ls	$25,000	250	$25,000	$15,000	$40,000
13	Grounding System	2500	lf	$7	0.14	$17,500	$21,000	$38,500
14	Cable Trench	200	lf	$85	0.70	$17,000	$8,400	$25,400
15	Substation Testing	1	ls		$50,000		$50,000	$50,000
16	CIVIL WORKS							
17	Light Clearing and Grubbing	0.50	ac		$8,000		$4,000	$4,000
18	Stripping and Grading	0.50	ac		$10,000		$5,000	$5,000
19	Structures, Tubular Steel							
20	138-kV Deadend	3	ea	$24,000	$8,000	$72,000	$24,000	$96,000
21	Switch Support	3	ea	$6,000	$3,000	$18,000	$9,000	$27,000
22	3 Phase Equipm't	4	ea	$4,000	$2,000	$16,000	$8,000	$24,000
23	1 Phase Equipm't	10	ea	$700	$400	$7,000	$4,000	$11,000
24	Foundations							
25	138-kV Deadend - D/C	3	ea	$8,700	$17,400	$26,100	$52,200	$78,300
26	Switch Support	3	ea	$4,000	$5,500	$12,000	$16,500	$28,500
27	3 Phase Equipm't	2	ea	$2,100	$2,900	$4,200	$5,800	$10,000
28	1 Phase Equipm't	10	ea	$1,100	$1,400	$11,000	$14,000	$25,000
29	Circuit Breaker	2	ea	$3,150	$5,200	$6,300	$10,400	$16,700
30	Reactor	2	ea	$4,500	$7,800	$9,000	$15,600	$24,600
31	Oil Containment	1	ls	$12,000	$17,000	$12,000	$17,000	$29,000
32	Remove fence	450	lf		$5		$2,250	$2,250
33	Fence, 8' high chain link	625	lf	$20	$15	$12,500	$9,375	$21,875
34	Final grading	0.50	ac		$10,000		$5,000	$5,000
35	Crush rock surfacing, 6"	300	cy	$30	$20	$9,000	$6,000	$15,000
36	Demolition/Relocation	1	ls		$75,000		$75,000	$75,000
37	Mobilization (Civil Works)	15	%			$32,265	$31,219	$63,484
38	Transport To Site	10	%			$70,850		$70,850
39	**Subtotal**					$1,026,715	$553,764	$1,580,479
40	**Contingencies**							
41	Material	10	%			$102,672		$102,672
42	Labor	20	%				$110,753	$110,753
43	TOTAL					$1,129,387	$664,517	$1,793,903

Alaska Energy Authority
Copper Valley Intertie Feasibility Study
Right-of-Way Tabulation and Clearing Costs
PED

Segment	From	To	L	Percent Forest Cover Dense	Percent Forest Cover Medium	Percent Forest Cover Sparse	Percent Forest Cover Open	Assumed Tree Height	Average ROW Width	Subtotal ROW Acres	Average Clearcut Width	Subtotal Acres Cleared	Type Clearing 1-5	Basic Clearing Cost	Adjusted Clearing Cost	$1,600 per mile Traverse Open Ground	Estimated Clearcut Cost	Assumed Danger Trees	Subtotal Danger Trees	$75 Estimated Danger Tree Cost	Route Alternatives A	B	C	D	E-4 Subtotal Length Cleared	E-4 Subtotal Length Cleared	Segment
				100%	60%	30%	0%	ft	ft	acre	ft	acre	See Below	$/ac	$/ac	$	$	ea/uncl ac	ea	$75/tree					mi	1000'	
1-2	1	2	5.56	60%	30%	5%	5%	70	125	84	75	61	1	6000	4770	834	241936	50	1685	126364	368299	368299	368299	368299	4.42	23.34	1-2
2-3	2	3	11.38	50%	10%	33%	7%	50	100	138	75	103	1	6000	3954	6816	415156	30	1033	77455	492611			492611	7.49	39.53	2-3
2-31	2	31	6.58	80%	10%	5%	5%	70	125	100	75	60	1	6000	5250	987	316032	50	1994	149545		464578	464578		5.76	30.40	2-31
3-4	3	4	6.68	55%	40%	0%	5%	60	125	101	75	61	1	6000	4740	501	288348	60	2024	151818	440166	440166	440166	440166	5.28	27.86	3-4
4-5	4	5	7.22	15%	55%	5%	25%	70	100	88	75	66	1	6000	2970	3249	198189	10	219	16409		214598	214598		3.57	18.87	4-5
4-7	4	7	13.53	30%	10%	25%	35%	40	100	164	60	82	2	5000	2175	12177	190627	0	0	0	190627			190627	5.89	31.08	4-7
5-6	5	6	9.27	0%	10%	55%	35%	60	100	112	75	84	1	6000	1350	12615	126283	10	281	21068		147351	147351		2.09	11.01	5-6
6-8	6	8	8.73	0%	0%	10%	90%	50	100	108	75	79	2	5000	150	13095	25000	0	0	0			25000		0.26	1.38	6-8
6-9	6	9	4.71	35%	10%	40%	15%	70	100	57	60	29	1	6000	3180	3886	94660	30	866	64227		168888			2.50	13.18	6-9
7-8	7	8	12.52	0%	0%	10%	90%	30	100	152	60	76	5	4000	120	18780	27885	0	0	0	27885			27886	0.38	1.98	7-8
8-10	8	10	1.44	0%	0%	10%	90%	30	100	17	60	9	5	4000	120	2160	3207	0	0	0	3207		3207	3207	0.04	0.23	8-10
9-11	9	11	7.37	5%	25%	20%	50%	30	100	89	60	45	5	4000	1040	7739	64192	0	0	0		64192			1.92	10.12	9-11
10-11	10	11	4.25	0%	0%	10%	90%	30	100	52	60	26	5	4000	120	6376	9466	0	0	0			9466	9466	0.13	0.67	10-11
10-15	10	15	12.61	0%	5%	0%	95%	30	100	163	60	76	5	4000	120	17969	27140	0	0	0	27140				0.38	2.00	10-15
11-12	11	12	4.74	10%	10%	60%	20%	40	100	57	60	29	2	5000	1700	6688	64524	10	287	21645		76070	76070	76070	1.61	8.51	11-12
12-13	12	13	3.14	0%	70%	30%	0%	30	100	38	60	19	4	3500	1786	1413	35382	0	0	0		35382	35382	35382	1.60	8.46	12-13
13-14	13	14	3.3	0%	0%	10%	90%	30	100	40	60	20	4	3500	105	4950	7050	0	0	0		7050	7050	7050	0.10	0.52	13-14
14-15	14	15	1.91	0%	0%	0%	100%	30	100	23	60	12	4	3500	0	2865	2865	0	0	0			2865	2866	0.00	0.00	14-15
14-16	14	16	6.2	0%	0%	20%	80%	30	100	76	60	38	4	3500	210	9300	17191	0	0	0		17191			0.37	1.96	14-16
15-16	15	16	4.57	0%	0%	10%	90%	30	100	56	60	28	4	3500	105	6856	9763	0	0	0			9763		0.14	0.72	15-16
15-17	15	17	6.26	0%	0%	0%	100%	30	100	76	60	38	4	3500	0	9390	9390	0	0	0	9390			9390	0.00	0.00	15-17
16-18	16	18	5.89	0%	0%	20%	80%	30	100	71	60	36	4	3500	210	8835	16331	0	0	0		16331	16331		0.35	1.87	16-18
17-19	17	19	9.06	0%	30%	30%	40%	30	100	110	60	55	4	3500	945	9513	61402	0	0	0	61402			61402	2.46	12.92	17-19
18-21	18	21	13.75	20%	20%	60%	0%	30	100	167	60	83	4	3500	1750	12376	158208	0	0	0		158208	158208		6.88	36.30	18-21
19-20	19	20	12.13	20%	20%	60%	0%	30	100	147	60	74	4	3500	1750	10917	139569	0	0	0	139569			139569	6.07	32.02	19-20
20-22	20	22	4.99	20%	60%	10%	10%	30	100	60	60	30	4	3500	2066	1497	63948	0	0	0	63948			63948	2.94	16.54	20-22
21-23	21	23	5.19	60%	0%	20%	20%	30	100	63	60	31	2	5000	3300	3114	106914	0	0	0		106914	106914		3.43	18.09	21-23
22-26	22	26	13.56	70%	30%	0%	0%	30	100	164	60	82	2	5000	4400	0	361600	0	0	0	361600			361600	11.93	63.01	22-26
23-24	23	24	6.02	90%	0%	0%	10%	30	100	73	60	36	2	5000	4500	903	165085	0	0	0		165086	165086		5.42	28.61	23-24
24-25	24	25	4.88	0%	50%	25%	25%	30	100	59	60	30	2	5000	1875	3660	59115	0	0	0		59116	59116		1.83	9.66	24-25
25-26	25	26	2.27	50%	50%	0%	0%	30	100	28	60	14	4	3500	2800	0	38521	0	0	0		38621	38621		1.82	9.59	25-26
26-27	26	27	7.97	50%	50%	0%	0%	30	100	97	60	48	4	3500	2800	0	135248	0	0	0	135248	135248	135248	135248	6.38	33.67	26-27
27-28	27	28	6.44	50%	50%	0%	0%	30	100	78	60	39	2	5000	4000	0	166121	0	0	0	166121			166121	5.15	27.20	27-28
27-29	27	29	9.05	50%	50%	0%	0%	40	100	110	60	55	2	5000	4000	0	219394	0	0	0		219394	219394		7.24	38.23	27-29
28-29	28	29	2.6	85%	10%	0%	5%	30	100	32	60	16	2	5000	4550	195	71892	0	0	0	71892			71892	2.37	12.49	28-29
29-30	29	30	7.32	45%	20%	15%	20%	40	100	89	60	44	2	5000	3075	3843	140261	0	0	0	140261	140261	140261	140261	4.60	23.77	29-30
31-3	31	3	5.89	80%	10%	5%	5%	70	125	89	75	64	1	6000	5250	884	281997	50	1785	133864		415861	415861		5.16	27.21	31-3
																					2689268	3438704	3268734	2792960			

Do Not Move Data Below

$/ac	Type
6000	1 = hand, machine clearing high cost of slash and timber treatment
5000	2 = hand, machine clearing minimal slash and timber treatment
7000	3 = hand,machine clearing, minimal slash and timber treatment, raked road.
3500	4 = Roller crusher, timber crushed and left.
4000	5 = Power line contractor manual spot clearing, backcountry

EXHIBIT C-9

[COSTTEMP.XLW]DESGCOST.XLS

Alaska Energy Authority
Copper Valley Intertie
Engineering Cost Estimates

Transmission Line	Rate	$80	hr		
		Hours	Labor	Expenses	
System Studies		200	16000	5000	
Permitting Support		200	16000	2000	
Route Selection		100	8000	5000	
Value Engineering		200	16000	4000	
Preliminary Design		1000	80000	10000	
Surveyor Subcontract		200	16000	500	
Geotech Subcontract		100	8000	500	
Meteorology Subcontract		75	6000	500	
Visual Impact Study Subcontract		75	6000	500	
Final Design Drawings	160	6400	512000	100000	
REA Design Manual		150	12000	500	
Clearing Contracts		200	16000	3000	
Procurement Contract		150	12000	5000	
Construction Contract		300	24000	3000	
Bidding Assistance		300	24000	1000	
		9650	772000	140500	912500
11 months		877			
120 mh/month		7			
Substations					
Grading/Civil Works/Survey		200	16000	30000	
Foundations/Geotech		200	16000	35000	
Structures		200	16000	2000	
Construction Plan PS 11		100	8000	500	
Control Buildings		150	12000	2000	
Cable Schedule/Wiring		200	16000	2000	
Equipment Selection/Sizing		100	8000	3000	
Major Eqt Procurement		300	24000	3000	
Protective Relaying		150	12000	1000	
Drawings	50	2000	160000	30000	
Construction Contract		150	12000	2000	
Bidding Assistance		200	16000	1000	
		3950	272000	78500	350500
6 months		658		total	1263000
120 mh/month		5			

				Land Ownership All Segments							Route A Land Ownership							Route B - Land Ownership						
Segment	From	To	L	Private	Native	State	BLM	State/MH	Borough	Nat Sel	Private	Native	State	BLM	State/MH	Borough	Nat Sel	Private	Native	State	BLM	State/MH	Borough	Nat Sel
1-2	1	2	5.56	0	1.4	2.7	0	0.5	1	0	0	1.4	2.7	0	0.5	1	0	0	1.4	2.7	0	0.5	1	0
2-3	2	3	11.36	0	0	3.4	0	4.9	0	3	0	0	3.4	0	4.9	0	3							
2-31	2	31	6.58	0	0	6.58	0	0	0	0								0	0	6.58	0	0	0	0
3-4	3	4	6.68	0	0	0	0	6.7	0	0	0	0	0	0	6.7	0	0	0	0	0	0	6.7	0	0
4-5	4	5	7.22	0	0	4.6	0	1.6	1	0								0	0	4.6	0	1.6	1	0
4-7	4	7	13.53	0	0	13.53	0	0	0	0	0	0	13.53	0	0	0	0							
5-6	5	6	9.27	0	1.7	7.6	0	0	0	0								0	1.7	7.6	0	0	0	0
6-8	6	8	8.73	0	0.7	8	0	0	0	0														
6-9	6	9	4.71	0	4.7	0	0	0	0	0								0	4.7	0	0	0	0	0
7-8	7	8	12.52	0	0	12.5	0	0	0	0	0	0	12.5	0	0	0	0							
8-10	8	10	1.44	0	0	1.4	0	0	0	0	0	0	1.4	0	0	0	0							
9-11	9	11	7.37	0	0.7	6.7	0	0	0	0								0	0.7	6.7	0	0	0	0
10-11	10	11	4.25	0	0	4.25	0	0	0	0														
10-15	10	15	12.61	0	0	4.8	7.8	0	0	0	0	0	4.8	7.8	0	0	0							
11-12	11	12	4.74	0	0	4.7	0	0	0	0								0	0	4.7	0	0	0	0
12-13	12	13	3.14	0	0	3.1	0	0	0	0								0	0	3.1	0	0	0	0
13-14	13	14	3.3	0	0	2.5	0.8	0	0	0								0	0	2.5	0.8	0	0	0
14-15	14	15	1.91	0	0	0	1.9	0	0	0														
14-16	14	16	6.2	0	0	0	6.2	0	0	0								0	0	0	6.2	0	0	0
15-16	15	16	4.57	0	0	0	4.6	0	0	0														
15-17	15	17	6.26	0	0	0.7	5.6	0	0	0	0	0	0.7	5.6	0	0	0							
16-18	16	18	5.89	0	0	5.6	0.3	0	0	0								0	0	5.6	0.3	0	0	0
17-19	17	19	9.08	0	0	9.1	0	0	0	0	0	0	9.1	0	0	0	0							
18-21	18	21	13.75	0	0	13.8	0	0	0	0								0	0	13.8	0	0	0	0
19-20	19	20	12.13	0	0	12.1	0	0	0	0	0	0	12.1	0	0	0	0							
20-22	20	22	4.99	0	0	5	0	0	0	0	0	0	5	0	0	0	0							
21-23	21	23	5.19	0	0	5.2	0	0	0	0								0	0	5.2	0	0	0	0
22-26	22	26	13.56	0	0	13.6	0	0	0	0	0	0	13.6	0	0	0	0							
23-24	23	24	6.02	0	0	6	0	0	0	0								0	0	6	0	0	0	0
24-25	24	25	4.89	0	0	4.9	0	0	0	0								0	0	4.9	0	0	0	0
25-26	25	26	2.27	0	0	2.3	0	0	0	0								0	0	2.3	0	0	0	0
26-27	26	27	7.97	0	0	7.97	0	0	0	0	0	0	7.97	0	0	0	0	0	0	7.97	0	0	0	0
27-28	27	28	6.44	0	5	1.4	0	0	0	0	0	5	1.4	0	0	0	0							
27-29	27	29	9.06	0	4.7	4.4	0	0	0	0								0	4.7	4.4	0	0	0	0
28-29	28	29	2.6	0	2.6	0	0	0	0	0	0	2.6	0	0	0	0	0							
29-30	29	30	7.32	0	7.3	0	0	0	0	0	0	7.3	0	0	0	0	0	0	7.3	0	0	0	0	0
31-3	31	3	5.09	0.25	0.75	0	0	4.3	0	0								0.25	0.75	0	0	4.3	0	0
											0	16.3	88.2	13.4	12.1	1	3	0.25	21.25	88.65	7.3	13.1	2	0
			258.96									Total Segment Miles				134.00		Total Segment Miles				132.55		

EXHIBIT C-11

				Land Ownership All Segments							Route C - Land Ownership							Route D - Land Ownership						
Segment	From	To	L	Private	Native	State	BLM	State/MH	Borough	Nat Sel	Private	Native	State	BLM	State/MH	Borough	Nat Sel	Private	Native	State	BLM	State/MH	Borough	Nat Sel
1-2	1	2	5.58	0	1.4	2.7	0	0.5	1	0	0	1.4	2.7	0	0.5	1	0	0	1.4	2.7	0	0.5	1	0
2-3	2	3	11.36	0	0	3.4	0	4.9	0	3								0	0	3.4	0	4.9	0	3
2-31	2	31	6.58	0	0	6.58	0	0	0	0	0	0	6.58	0	0	0	0							
3-4	3	4	6.68	0	0	0	0	6.7	0	0	0	0	0	0	6.7	0	0	0	0	0	0	6.7	0	0
4-5	4	5	7.22	0	0	4.6	0	1.6	1	0	0	0	4.6	0	1.6	1	0							
4-7	4	7	13.53	0	0	13.53	0	0	0	0								0	0	13.53	0	0	0	0
5-6	5	6	9.27	0	1.7	7.6	0	0	0	0	0	1.7	7.6	0	0	0	0							
6-8	6	8	8.73	0	0.7	8	0	0	0	0	0	0.7	8	0	0	0	0							
6-9	6	9	4.71	0	4.7	0	0	0	0	0														
7-8	7	8	12.52	0	0	12.5	0	0	0	0								0	0	12.5	0	0	0	0
8-10	8	10	1.44	0	0	1.4	0	0	0	0	0	0	1.4	0	0	0	0	0	0	1.4	0	0	0	0
9-11	9	11	7.37	0	0.7	6.7	0	0	0	0														
10-11	10	11	4.25	0	0	4.25	0	0	0	0	0	0	4.25	0	0	0	0	0	0	4.25	0	0	0	0
10-15	10	15	12.61	0	0	4.8	7.8	0	0	0														
11-12	11	12	4.74	0	0	4.7	0	0	0	0	0	0	4.7	0	0	0	0	0	0	4.7	0	0	0	0
12-13	12	13	3.14	0	0	3.1	0	0	0	0	0	0	3.1	0	0	0	0	0	0	3.1	0	0	0	0
13-14	13	14	3.3	0	0	2.5	0.8	0	0	0	0	0	2.5	0.8	0	0	0	0	0	2.5	0.8	0	0	0
14-15	14	15	1.91	0	0	0	1.9	0	0	0	0	0	0	1.9	0	0	0	0	0	0	1.9	0	0	0
14-16	14	16	6.2	0	0	0	6.2	0	0	0														
15-16	15	16	4.57	0	0	0	4.6	0	0	0	0	0	0	4.6	0	0	0							
15-17	15	17	6.26	0	0	0.7	5.6	0	0	0								0	0	0.7	5.6	0	0	0
16-18	16	18	5.89	0	0	5.6	0.3	0	0	0	0	0	5.6	0.3	0	0	0							
17-19	17	19	9.06	0	0	9.1	0	0	0	0								0	0	9.1	0	0	0	0
18-21	18	21	13.75	0	0	13.8	0	0	0	0	0	0	13.8	0	0	0	0							
19-20	19	20	12.13	0	0	12.1	0	0	0	0								0	0	12.1	0	0	0	0
20-22	20	22	4.99	0	0	5	0	0	0	0								0	0	5	0	0	0	0
21-23	21	23	5.19	0	0	5.2	0	0	0	0	0	0	5.2	0	0	0	0							
22-26	22	26	13.56	0	0	13.6	0	0	0	0								0	0	13.6	0	0	0	0
23-24	23	24	6.02	0	0	6	0	0	0	0	0	0	6	0	0	0	0							
24-25	24	25	4.89	0	0	4.9	0	0	0	0	0	0	4.9	0	0	0	0							
25-26	25	26	2.27	0	0	2.3	0	0	0	0	0	0	2.3	0	0	0	0							
26-27	26	27	7.97	0	0	7.97	0	0	0	0	0	0	7.97	0	0	0	0	0	0	7.97	0	0	0	0
27-28	27	28	6.44	0	5	1.4	0	0	0	0								0	5	1.4	0	0	0	0
27-29	27	29	9.05	0	4.7	4.4	0	0	0	0	0	4.7	4.4	0	0	0	0							
28-29	28	29	2.6	0	2.6	0	0	0	0	0								0	2.6	0	0	0	0	0
29-30	29	30	7.32	0	7.3	0	0	0	0	0	0	7.3	0	0	0	0	0	0	7.3	0	0	0	0	0
31-3	31	3	6.89	0.25	0.75	0	0	4.3	0	0	0.25	0.75	0	0	4.3	0	0							
											0.25	16.55	95.6	7.6	13.1	2	0	0	16.3	97.95	8.3	12.1	1	3
			258.98								Total Segment Miles				135.1			Total Segment Miles				138.65		

COPPER VALLEY INTERTIE FEASIBILITY STUDY

SEGMENT SUMMARY

Segment		All	Length	Minimum	Maximum	Loading	Route Alt A						Route Alt B					
start	end	Segments	miles	Elevation	Elevation	Zone	Segment	miles	LZ1	LZ2	LZ3	LZ4	Segment	miles	LZ1	LZ2	LZ3	LZ4
1	2	1-2	5.56	655	1100	1	1-2	5.56	5.56	0.00	0.00	0.00	1-2	5.56	5.56	0.00	0.00	0.00
2	3	2-3	11.36	1100	1900	1	2-3	11.36	11.36	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
2	31	2-31	6.58	800	1125	1		0.00	0.00	0.00	0.00	0.00	2-31	6.58	6.58	0.00	0.00	0.00
3	4	3-4	6.68	1100	2200	1	3-4	6.68	6.68	0.00	0.00	0.00	3-4	6.68	6.68	0.00	0.00	0.00
4	4A	4-4A	2.92	2200	2800	1	4-4A	2.92	2.92	0.00	0.00	0.00	4-4A	2.92	2.92	0.00	0.00	0.00
4A	5	4A-5	5.24	2200	3000	1		0.00	0.00	0.00	0.00	0.00	4A-5	5.24	5.24	0.00	0.00	0.00
5	5A	5-5A	2.69	2900	3100	1		0.00	0.00	0.00	0.00	0.00	5-5A	2.69	2.69	0.00	0.00	0.00
5A	5B	5A-5B	2.01	3100	4800	4		0.00	0.00	0.00	0.00	0.00	5A-5B	2.01	0.00	0.00	0.00	2.01
5B	5C	5B-5C	2.28	2500	4800	4		0.00	0.00	0.00	0.00	0.00	5B-5C	2.28	0.00	0.00	0.00	2.28
4A	7	4A-7	10.61	2200	3400	3	4A-7	10.61	0.00	0.00	10.61	0.00		0.00	0.00	0.00	0.00	0.00
7	7A	7-7A	9.27	3400	4900	4	7-7A	9.27	0.00	0.00	0.00	9.27		0.00	0.00	0.00	0.00	0.00
5C	6	5C-6	2.34	2900	3000	1		0.00	0.00	0.00	0.00	0.00	5C-6	2.34	2.34	0.00	0.00	0.00
6	8	6-8	6.73	2830	3500	3		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
6	9	6-9	4.71	2200	3400	1		0.00	0.00	0.00	0.00	0.00	6-9	4.71	4.71	0.00	0.00	0.00
7A	8	7A-8	3.25	3200	4900	3	7A-8	3.25	0.00	0.00	3.25	0.00		0.00	0.00	0.00	0.00	0.00
8	10	8-10	1.44	2600	2800	3	8-10	1.44	0.00	0.00	1.44	0.00		0.00	0.00	0.00	0.00	0.00
9	11	9-11	7.37	2200	3000	3		0.00	0.00	0.00	0.00	0.00	9-11	7.37	0.00	0.00	7.37	0.00
10	11	10-11	4.25	2500	2600	3		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
10	15	10-15	12.61	2600	4300	3	10-15	12.61	0.00	0.00	12.61	0.00		0.00	0.00	0.00	0.00	0.00
11	12	11-12	4.74	2500	2900	3		0.00	0.00	0.00	0.00	0.00	11-12	4.74	0.00	0.00	4.74	0.00
12	13	12-13	3.14	2700	3000	2		0.00	0.00	0.00	0.00	0.00	12-13	3.14	0.00	3.14	0.00	0.00
13	14	13-14	3.3	3200	4000	3		0.00	0.00	0.00	0.00	0.00	13-14	3.30	0.00	0.00	3.30	0.00
14	15	14-15	1.91	3400	3700	3		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
14	16	14-16	6.2	3200	3500	3		0.00	0.00	0.00	0.00	0.00	14-16	6.20	0.00	0.00	6.20	0.00
15	16	15-16	4.57	3200	4400	3		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
15	17	15-17	6.26	3500	3800	3	15-17	6.26	0.00	0.00	6.26	0.00		0.00	0.00	0.00	0.00	0.00
17	17A	17-17A	3.2	3300	3900	3	17-17A	3.20	0.00	0.00	3.20	0.00		0.00	0.00	0.00	0.00	0.00
16	18	16-18	5.69	2950	3200	2		0.00	0.00	0.00	0.00	0.00	16-18	5.69	0.00	5.69	0.00	0.00
17A	19	17A-19	5.86	2600	3900	2	17A-19	5.86	0.00	5.86	0.00	0.00		0.00	0.00	0.00	0.00	0.00
18	18A	18-18A	3	2600	3300	2		0.00	0.00	0.00	0.00	0.00	18-18A	3.00	0.00	3.00	0.00	0.00
18A	18B	18A-18B	4.45	3300	3850	3		0.00	0.00	0.00	0.00	0.00	18A-18B	4.45	0.00	0.00	4.45	0.00
18B	21	18B-21	6.3	2350	3800	2		0.00	0.00	0.00	0.00	0.00	18B-21	6.30	0.00	6.30	0.00	0.00
19	20	19-20	12.13	2300	3365	2	19-20	12.13	0.00	12.13	0.00	0.00		0.00	0.00	0.00	0.00	0.00
20	22	20-22	4.99	2250	2725	2	20-22	4.99	0.00	4.99	0.00	0.00		0.00	0.00	0.00	0.00	0.00
21	23	21-23	5.19	2200	2317	2		0.00	0.00	0.00	0.00	0.00	21-23	5.19	0.00	5.19	0.00	0.00
22	26	22-26	13.56	2400	3107	2	22-26	13.56	0.00	13.56	0.00	0.00		0.00	0.00	0.00	0.00	0.00
23	24	23-24	6.02	2317	2660	2		0.00	0.00	0.00	0.00	0.00	23-24	6.02	0.00	6.02	0.00	0.00
24	25	24-25	4.88	2660	3000	2		0.00	0.00	0.00	0.00	0.00	24-25	4.88	0.00	4.88	0.00	0.00
25	26	25-26	2.27	2400	2850	2		0.00	0.00	0.00	0.00	0.00	25-26	2.27	0.00	2.27	0.00	0.00
26	27	26-27	7.97	2000	2200	2	26-27	7.97	0.00	7.97	0.00	0.00	26-27	7.97	0.00	7.97	0.00	0.00
27	28	27-28	6.44	1720	2100	2	27-28	6.44	0.00	6.44	0.00	0.00		0.00	0.00	0.00	0.00	0.00
27	29	27-29	9.05	1682	2172	2		0.00	0.00	0.00	0.00	0.00	27-29	9.05	0.00	9.05	0.00	0.00
28	29	28-29	2.6	1682	1720	2	28-29	2.60	0.00	2.60	0.00	0.00		0.00	0.00	0.00	0.00	0.00
29	30	29-30	7.7	1400	1682	2	29-30	7.70	0.00	7.70	0.00	0.00	29-30	7.70	0.00	7.70	0.00	0.00
31	3	31-3	5.89	1100	1900	1		0.00	0.00	0.00	0.00	0.00	31-3	5.89	5.89	0.00	0.00	0.00
								134.41 Total	26.52 OK	61.25	37.37	9.27		134.37 Total	42.61 OK	61.41	26.06	4.29

EXHIBIT C-12

COPPER VALLEY INTERTIE FEASIBILITY STUDY

SEGMENT SUMMARY

Segment		All	Length	Minimum	Maximum	Loading	Route Alt C						Route Alt D - Apparent Preferred					
start	end	Segments	miles	Elevation	Elevation	Zone	Segment	miles	LZ1	LZ2	LZ3	LZ4	Segment	miles	LZ1	LZ2	LZ3	LZ4
1	2	1-2	5.56	655	1100	1	1-2	5.56	5.56	0.00	0.00	0.00	1-2	5.56	5.56	0.00	0.00	0.00
2	3	2-3	11.36	1100	1900	1		0.00	0.00	0.00	0.00	0.00	2-3	11.36	11.36	0.00	0.00	0.00
2	31	2-31	6.58	800	1125	1	2-31	6.58	6.58	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
3	4	3-4	6.68	1100	2200	1	3-4	6.68	6.68	0.00	0.00	0.00	3-4	6.68	6.68	0.00	0.00	0.00
4	4A	4-4A	2.92	2200	2800	1	4-4A	2.92	2.92	0.00	0.00	0.00	4-4A	2.92	2.92	0.00	0.00	0.00
4A	5	4A-5	5.24	2200	3000	1	4A-5	5.24	5.24	0.00	0.00	0.00	4A-5	5.24	5.24	0.00	0.00	0.00
5	5A	5-5A	2.69	2900	3100	1	5-5A	2.69	2.69	0.00	0.00	0.00	5-5A	2.69	2.69	0.00	0.00	0.00
5A	5B	5A-5B	2.01	3100	4800	4	5A-5B	2.01	0.00	0.00	0.00	2.01	5A-5B	2.01	0.00	0.00	0.00	2.01
5B	5C	5B-5C	2.28	2500	4800	4	5B-5C	2.28	0.00	0.00	0.00	2.28	5B-5C	2.28	0.00	0.00	0.00	2.28
4A	7	4A-7	10.61	2200	3400	3		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
7	7A	7-7A	9.27	3400	4900	4		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
5C	6	5C-6	2.34	2900	3000	1	5C-6	2.34	2.34	0.00	0.00	0.00	5C-6	2.34	2.34	0.00	0.00	0.00
6	8	6-8	8.73	2630	3500	3	6-8	8.73	0.00	0.00	8.73	0.00	6-8	8.73	0.00	0.00	8.73	0.00
6	9	6-9	4.71	2200	3400	1		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
7A	8	7A-8	3.25	3200	4900	3		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
8	10	8-10	1.44	2600	2800	3	8-10	1.44	0.00	0.00	1.44	0.00	8-10	1.44	0.00	0.00	1.44	0.00
9	11	9-11	7.37	2200	3000	3		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
10	11	10-11	4.25	2500	2600	3	10-11	4.25	0.00	0.00	4.25	0.00		0.00	0.00	0.00	0.00	0.00
10	15	10-15	12.61	2600	4300	3		0.00	0.00	0.00	0.00	0.00	10-15	12.61	0.00	0.00	12.61	0.00
11	12	11-12	4.74	2500	2900	3	11-12	4.74	0.00	0.00	4.74	0.00		0.00	0.00	0.00	0.00	0.00
12	13	12-13	3.14	2700	3000	2	12-13	3.14	0.00	3.14	0.00	0.00		0.00	0.00	0.00	0.00	0.00
13	14	13-14	3.3	3200	4000	3	13-14	3.30	0.00	0.00	3.30	0.00		0.00	0.00	0.00	0.00	0.00
14	15	14-15	1.91	3400	3700	3	14-15	1.91	0.00	0.00	1.91	0.00		0.00	0.00	0.00	0.00	0.00
14	16	14-16	6.2	3200	3500	3		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
15	16	15-16	4.57	3200	4400	3	15-16	4.57	0.00	0.00	4.57	0.00		0.00	0.00	0.00	0.00	0.00
15	17	15-17	6.26	3500	3800	3		0.00	0.00	0.00	0.00	0.00	15-17	6.26	0.00	0.00	6.26	0.00
17	17A	17-17A	3.2	3300	3900	3		0.00	0.00	0.00	0.00	0.00	17-17A	3.20	0.00	0.00	3.20	0.00
16	18	16-18	5.89	2950	3200	2	16-18	5.89	0.00	5.89	0.00	0.00		0.00	0.00	0.00	0.00	0.00
17A	19	17A-19	5.86	2600	3900	2		0.00	0.00	0.00	0.00	0.00	17A-19	5.86	0.00	5.86	0.00	0.00
18	18A	18-18A	3	2600	3300	2	18-18A	3.00	0.00	3.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
18A	18B	18A-18B	4.45	3300	3850	3	18A-18B	4.45	0.00	0.00	4.45	0.00		0.00	0.00	0.00	0.00	0.00
18B	21	18B-21	6.3	2350	3800	2	18B-21	6.30	0.00	6.30	0.00	0.00		0.00	0.00	0.00	0.00	0.00
19	20	19-20	12.13	2300	3365	2		0.00	0.00	0.00	0.00	0.00	19-20	12.13	0.00	12.13	0.00	0.00
20	22	20-22	4.99	2250	2725	2		0.00	0.00	0.00	0.00	0.00	20-22	4.99	0.00	4.99	0.00	0.00
21	23	21-23	5.19	2200	2317	2	21-23	5.19	0.00	5.19	0.00	0.00		0.00	0.00	0.00	0.00	0.00
22	26	22-26	13.56	2400	3107	2		0.00	0.00	0.00	0.00	0.00	22-26	13.56	0.00	13.56	0.00	0.00
23	24	23-24	6.02	2317	2660	2	23-24	6.02	0.00	6.02	0.00	0.00		0.00	0.00	0.00	0.00	0.00
24	25	24-25	4.88	2660	3000	2	24-25	4.88	0.00	4.88	0.00	0.00		0.00	0.00	0.00	0.00	0.00
25	26	25-26	2.27	2400	2850	2	25-26	2.27	0.00	2.27	0.00	0.00		0.00	0.00	0.00	0.00	0.00
26	27	26-27	7.97	2000	2200	2	26-27	7.97	0.00	7.97	0.00	0.00	26-27	7.97	0.00	7.97	0.00	0.00
27	28	27-28	6.44	1720	2100	2		0.00	0.00	0.00	0.00	0.00	27-28	6.44	0.00	6.44	0.00	0.00
27	29	27-29	9.05	1682	2172	2	27-29	9.05	0.00	9.05	0.00	0.00		0.00	0.00	0.00	0.00	0.00
28	29	28-29	2.6	1682	1720	2		0.00	0.00	0.00	0.00	0.00	28-29	2.60	0.00	2.60	0.00	0.00
29	30	29-30	7.7	1400	1682	2	29-30	7.70	0.00	7.70	0.00	0.00	29-30	7.70	0.00	7.70	0.00	0.00
31	3	31-3	5.89	1100	1900	1	31-3	5.89	5.89	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
								136.99	37.90	61.41	33.39	4.29		134.57	36.79	61.25	32.24	4.29
								Total	OK					Total	OK			

Appendix D

SELECTED MATERIAL COST QUOTES

AW-1539-+H1-AC
3169.2

H-FRAME CONSTRUCTION

EXHIBIT D-1

ESTIMATING PRICING ONLY

McFarland Cascade™
Timber Conserving by Wood Preserving

L.D. McFarland Company

RECEIVED
SEP 10 1993
R.W. BECK & ASSOC
SEATTLE WA

Post Office Box 1496, 1640 E. Marc
Tacoma, Washington 98401
Tacoma: (206) 572-3033
Toll Free: (800) 847-1666

Quotation

FAX: 206-627-4188

TO R.W. BECK & ASSOCIATES, INC.
2101 FOURTH AVENUE
SEATTLE, WA 98121-2375

ATTN: PAUL DORVEL
206/441-7500
206/441-4962 FAX

DATE OF QUOTATION SEPTEMBER 9, 1993

OUR QUOTE NO.:

YOUR INQUIRY NO. ALASKA ENERGY AUTHORITY

WE ARE PLEASED TO QUOTE ON THE FOLLOWING ITEMS AT LISTED PRICES WITH FULL FREIGHT ALLOWED TO DESTINATION SHOWN BELOW:

WESTERN CEDAR POLES, FULL LENGTH THERMAL PENTA TREATED TO A FINAL NET RETENTION OF 1.0# PER CUBIC FOOT, 3' INCISING, FRAMED, PLANT INSPECTION AND CONFORMING TO ANSI/AWPA SPECIFICATIONS.

COASTAL DOUGLAS FIR POLES, FULL LENGTH PRESSURE PENTA TREATED TO A FINAL NET RETENTION OF .60# PER CUBIC FOOT, FRAMED, PLANT INSPECTION, AND CONFORMING TO ANSI/AWPA SPECIFICATIONS.

QUANTITY	CLASS & LENGTH		WESTERN CEDAR PRICE EACH	COASTAL DOUGLAS FIR PRICE EACH
28	1	50	$ 869	$ 806
197	1	55	1,006	932
28	1	60	1,149	1,076
42	1	65	1,294	1,251
222	1	70	1,457	1,440
188	1	75	1,596	1,620
54	1	80	1,950	1,829
40	1	85	2,072	2,057
4	H2	45	1,025	941
27	H2	50	1,182	1,083
4	H2	55	1,384	1,251
8	H2	60	1,561	1,481
46	H2	65	1,746	1,661
39	H2	70	1,999	1,850
11	H2	75	2,207	2,071
8	H2	80	2,435	2,281
5	H2	85	2,659	2,501

POLES SUPPLIED WILL EQUAL OR EXCEED SPECIFICATION QUOTED. REQUIRED CLASSES OR LARGER WILL BE PROVIDED AT NO ADDITIONAL COST.

DESTINATION ANCHORAGE, ALASKA
FOB: ALASKA HYDRO-TRAIN

SHIPMENT

POLES SUBJECT TO PRIOR SALE
TERMS: NET 30 DAYS FROM SHIPMENT UPON CREDIT APPROVAL

By: R.D. H[illegible] Jr.
ROBERT D. HAMMOND JR., AREA SALES MANAGER

cc: Salesman

THIS QUOTATION IS BASED ON CURRENT FREIGHT RATES.
RATE CHANGES PRIOR TO SHIPMENT WILL BE CHARGED TO CUSTOMER ACCOUNT.

McFarland Cascade™
Timber Conserving by Wood Preserving

L.D. McFarland Company

TEAL CONDUCTOR OPTION

ESTIMATING PRICING ONLY

Post Office Box 1496, 1640 E. Marc
Tacoma, Washington 98401
Tacoma: (206) 572-3033
Toll Free: (800) 847-1666

Quotation

FAX: 206-627-4188

TO R.W. BECK & ASSOCIATES, INC.
2101 FOURTH AVENUE
SEATTLE, WA 98121-2375

ATTN: PAUL DORVEL
206/441-7500
206/441-4962 FAX

DATE OF QUOTATION SEPTEMBER 9, 1993

OUR QUOTE NO.:

YOUR INQUIRY NO. ALASKA ENERGY AUTHORITY

WE ARE PLEASED TO QUOTE ON THE FOLLOWING ITEMS AT LISTED PRICES WITH FULL FREIGHT ALLOWED TO DESTINATION SHOWN BELOW:

ESTERN CEDAR POLES, FULL LENGTH THERMAL PENTA TREATED TO A FINAL NET RETENTION OF 1.0# PER UBIC FOOT, 3' INCISING, FRAMED, PLANT INSPECTION AND CONFORMING TO ANSI/AWPA SPECIFICATIONS.

OASTAL DOUGLAS FIR POLES, FULL LENGTH PRESSURE PENTA TREATED TO A FINAL NET RETENTION OF .60# ER CUBIC FOOT, FRAMED, PLANT INSPECTION, AND CONFORMING TO ANSI/AWPA SPECIFICATIONS.

QUANTITY	CLASS & LENGTH		WESTERN CEDAR PRICE EACH	COASTAL DOUGLAS FIR PRICE EACH
26	H1	60	$1,418	$1,316
182	H1	65	1,591	1,478
41	H1	70	1,833	1,649
27	H1	75	2,028	1,831
2	H1	80	2,163	2,021
2	H2	65	1,746	1,661
10	H2	70	1,999	1,850
1	H2	75	2,207	2,071
1	H2	80	2,435	2,281

'OLES SUPPLIED WILL EQUAL OR EXCEED SPECIFICATION QUOTED. REQUIRED CLASSES OR LARGER 'ILL BE PROVIDED AT NO ADDITIONAL COST.

DESTINATION ANCHORAGE, ALASKA
FOB: ALASKA HYDRO-TRAIN

SHIPMENT

POLES SUBJECT TO PRIOR SALE
TERMS: NET 30 DAYS FROM SHIPMENT UPON CREDIT APPROVAL By: R.D. H[illegible]
cc: Salesman

ROBERT D. HAMMOND JR., AREA SALES MANAGER

THIS QUOTATION IS BASED ON CURRENT FREIGHT RATES.
RATE CHANGES PRIOR TO SHIPMENT WILL BE CHARGED TO CUSTOMER ACCOUNT.

DOVE CONDUCTOR OPTION

ESTIMATING PRICING ONLY

McFarland Cascade™

Timber Conserving by Wood Preserving

L.D. McFarland Company

Post Office Box 1496, 1640 E. Marc
Tacoma, Washington 98401
Tacoma: (206) 572-3033
Toll Free: (800) 847-1666

Quotation

FAX: 206-627-4188

TO R.W. BECK & ASSOCIATES, INC.
2101 FOURTH AVENUE
SEATTLE, WA 98121-2375

ATTN: PAUL DORVEL
206/441-7500
206/441-4962 FAX

DATE OF QUOTATION SEPTEMBER 9, 1993

OUR QUOTE NO.:

YOUR INQUIRY NO. ALASKA ENERGY AUTHORITY

WE ARE PLEASED TO QUOTE ON THE FOLLOWING ITEMS AT LISTED PRICES WITH FULL FREIGHT ALLOWED TO DESTINATION SHOWN BELOW:

WESTERN CEDAR POLES, FULL LENGTH THERMAL PENTA TREATED TO A FINAL NET RETENTION OF 1.0# PER CUBIC FOOT, 3' INCISING, FRAMED, PLANT INSPECTION AND CONFORMING TO ANSI/AWPA SPECIFICATIONS.

COASTAL DOUGLAS FIR POLES, FULL LENGTH PRESSURE PENTA TREATED TO A FINAL NET RETENTION OF .60# PER CUBIC FOOT, FRAMED, PLANT INSPECTION, AND CONFORMING TO ANSI/AWPA SPECIFICATIONS.

QUANTITY	CLASS & LENGTH		WESTERN CEDAR PRICE EACH	COASTAL DOUGLAS FIR PRICE EACH
30	1	60	$1,149	$1,076
206	1	65	1,294	1,251
30	1	70	1,457	1,440
4	H1	65	1,591	1,478
25	H1	70	1,833	1,649
32	H1	75	2,028	1,831
3	H1	80	2,163	2,021

POLES SUPPLIED WILL EQUAL OR EXCEED SPECIFICATION QUOTED. REQUIRED CLASSES OR LARGER WILL BE PROVIDED AT NO ADDITIONAL COST.

DESTINATION ANCHORAGE, ALASKA
FOB: ALASKA HYDRO-TRAIN

SHIPMENT

POLES SUBJECT TO PRIOR SALE
TERMS: NET 30 DAYS FROM SHIPMENT UPON CREDIT APPROVAL By: R.D. H[illegible]

ROBERT D. HAMMOND JR., AREA SALES MANAGER

cc: Salesman

THIS QUOTATION IS BASED ON CURRENT FREIGHT RATES.
RATE CHANGES PRIOR TO SHIPMENT WILL BE CHARGED TO CUSTOMER ACCOUNT.

5

LINNETT CONDUCTOR OPTION

ESTIMATING PRICING ONLY

McFarland Cascade™

Timber Conserving by Wood Preserving

L.D. McFarland Company

Post Office Box 1496, 1640 E. Marc
Tacoma, Washington 98401
Tacoma: (206) 572-3033
Toll Free: (800) 847-1666

Quotation

FAX: 206-627-4188

TO R.W. BECK & ASSOCIATES, INC.
2101 FOURTH AVENUE
SEATTLE, WA 98121-2375

ATTN: PAUL DORVEL
206/441-7500
206/441-4962 FAX

DATE OF QUOTATION SEPTEMBER 9, 1993

OUR QUOTE NO.:

YOUR INQUIRY NO. ALASKA ENERGY AUTHORITY

WE ARE PLEASED TO QUOTE ON THE FOLLOWING ITEMS AT LISTED PRICES WITH FULL FREIGHT ALLOWED TO DESTINATION SHOWN BELOW:

WESTERN CEDAR POLES, FULL LENGTH THERMAL PENTA TREATED TO A FINAL NET RETENTION OF 1.0# PER CUBIC FOOT, 3' INCISING, FRAMED, PLANT INSPECTION AND CONFORMING TO ANSI/AWPA SPECIFICATIONS.

COASTAL DOUGLAS FIR POLES, FULL LENGTH PRESSURE PENTA TREATED TO A FINAL NET RETENTION OF .60# PER CUBIC FOOT, FRAMED, PLANT INSPECTION, AND CONFORMING TO ANSI/AWPA SPECIFICATIONS.

QUANTITY	CLASS & LENGTH		WESTERN CEDAR PRICE EACH	COASTAL DOUGLAS FIR PRICE EACH
32	H1	55	$1,263	$1,083
227	H1	60	1,418	1,316
57	H1	65	1,591	1,478
34	H1	70	1,833	1,649
3	H1	75	2,028	1,831

POLES SUPPLIED WILL EQUAL OR EXCEED SPECIFICATION QUOTED. REQUIRED CLASSES OR LARGER WILL BE PROVIDED AT NO ADDITIONAL COST.

DESTINATION ANCHORAGE, ALASKA
FOB: ALASKA HYDRO-TRAIN

SHIPMENT

POLES SUBJECT TO PRIOR SALE
TERMS: NET 30 DAYS FROM SHIPMENT UPON CREDIT APPROVAL By: R.D. H[signature]

cc: Salesman

ROBERT D. HAMMOND JR., AREA SALES MANAGER

THIS QUOTATION IS BASED ON CURRENT FREIGHT RATES.
RATE CHANGES PRIOR TO SHIPMENT WILL BE CHARGED TO CUSTOMER ACCOUNT.

EXHIBIT D-2

CABLEC
UTILITY CABLE COMPANY
Leadership Through Cable Technology

12842 Valley View, Suite 204
Garden Grove, CA 92645
(714) 895-8662 Fax: (714) 897-9952

RECEIVED
AUG 13 1993
R.W. BECK & ASSOC
SEATTLE WA

ACTION COPY
File WW1539 HM RC
Code 3/092

August 9, 1993

R.W. Beck & Associates
2101 Fourth Avenue, Suite 600
Seattle, WA 98121-2375

ATTENTION: Paul Dorvel
Principal Engineer

REFERENCE: Copper Valley Feasibility Study
Cablec Quote MM3-482

Dear Paul,

We are pleased to submit the attached proposal for

1,720,000	LBS	DOVE
2,110,000	LBS	TEAL
2,080,000	LBS	LINNET

If you have any questions regarding the attached proposal please don't hesitate to contact me.

Very truly yours,

Doug Feller / Frederica Payne

Doug Feller
Regional Manager

Attachments

DF/fp

CABLEC
UTILITY CABLE COMPANY
Leadership Through Cable Technology

PROPOSAL

FOR ESTIMATING PURPOSES ONLY

CUSTOMER: R.W. BECK & ASSOCIATES DATE: 08/09/93

INQ.#/JOB NAME: COPPER VALLEY FEASIBILITY STUDY REFERENCE #: MM3-482

ITEM	QUANTITY	UNIT	DESCRIPTION	PRICE	UNIT
1	1,720,000	LBS	DOVE ACSR	$1,039.00	MLBS
			DOVE ACSR NON-SPECULAR	$1,077.00	MLBS
			DOVE ACSR/EHS	$1,081.00	MLBS
			DOVE ACSR/EHS NON-SPECULAR	$1,119.00	MLBS
				$1,787,080	TOTAL VALUE

LENGTH/MFT:	3,795#	CU LBS/MFT:	0.00
REEL SIZE:	60x28	AL LBS/MFT:	524.00
REEL TYPE:	NR WOOD	LD LBS/MFT:	0.00
TOLERANCE:	+/-10%	NET WT/MFT:	766.00
DELIVERY:	6 - 8	WEEKS AFTER RECEIPT OF ORDER	

ITEM	QUANTITY	UNIT	DESCRIPTION	PRICE	PER UNIT
2	2,110,000	LBS	TEAL ACSR	$1,152.00	MLBS
			TEAL ACSR NON-SPECULAR	$1,184.00	MLBS
			TEAL ACSR/EHS	$1,194.00	MLBS
			TEAL ACSR/EHS NON-SPECULAR	$1,226.00	MLBS
			TEAL SSAC	$1,325.00	MLBS
				$2,430,720	TOTAL VALUE

LENGTH/MFT:	4,390#	CU LBS/MFT:	0.00
REEL SIZE:	68x38	AL LBS/MFT:	571.00
REEL TYPE:	NR WOOD	LD LBS/MFT:	0.00
TOLERANCE:	+/-10%	NET WT/MFT:	940.00
DELIVERY:	6 - 8	WEEKS AFTER RECEIPT OF ORDER	

ITEM	QUANTITY	UNIT	DESCRIPTION	PRICE	PER UNIT
3	2,080,000	LBS	LINNET /T-2	$1,166.00	MLBS
				$2,425,280	TOTAL VALUE

LENGTH/MFT:	4,240#	CU LBS/MFT:	0.00
REEL SIZE:	68x38	AL LBS/MFT:	634.00
REEL TYPE:	NR WOOD	LD LBS/MFT:	0.00
TOLERANCE:	+/-10%	NET WT/MFT:	926.00
DELIVERY:	6 - 8	WEEKS AFTER RECEIPT OF ORDER	

PRICES ARE:	ADJUSTABLE	COPPER =	$0.00000 PD FULL PLATE CATHODE
		ALUM =	$0.54000 MW US TRANS PRICE
		LEAD =	$0.00000 AMM US PRODUCER

PRICES ARE SUBJECT TO ADJUSTMENT BASED UPON FLUCTUATIONS IN THE PRICE OF RAW MATERIAL AND WILL BE INVOICED ACCORDINGLY UNLESS OTHERWISE SPECIFIED IN THE FORMAL BID. THE

BICCGroup
NORTH AMERICA

CABLEC
UTILITY CABLE COMPANY
Leadership Through Cable Technology

PROPOSAL

FOR ESTIMATING PURPOSES ONLY

CUSTOMER: R.W. BECK & ASSOCIATES DATE: 08/09/93

INVOICED PRICE WILL BE ADJUSTED TO REFLECT OUR METALS BASE ON DATE OF SHIPMENT.

DELIVERY IS APPROXIMATE AND DEPENDENT UPON BOTH THE AVAILABILITY OF RAW MATERIAL AND FLUCTUATIONS IN CURRENT MANUFACTURING LEADTIMES AS SPECIFIED ON FORMAL QUOTATION.

ACCEPTANCE PERIOD: 15 DAYS AFTER THE DATE OF BID OPENING.

FOB: FACTORY – FREIGHT ALLOWED TO SEATTLE, WA

TERMS OF PAYMENT: ON APPROVED CREDIT, NET CASH 30 DAYS FROM DATE OF SHIPMENT. ALL INVOICES ARE PAYABLE TO CABLEC IN U.S. FUNDS.

THE PROPOSED MATERIAL WILL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS WITH CLARIFICATIONS (IF APPLICABLE) AS NOTED:

AEIC:	N/A	CUST. SPEC:	N/A	DATED:
ICEA:	N/A	OTHER:	ASTM	

SEE CABLEC'S STANDARD TERMS AND CONDITIONS AS SHOWN ON THE REVERSE OF THE COVER SHEET.

EXHIBIT D-3

TRANSMITTAL SHEET

PAGE 1 OF 9 DATE 9-10-93

SEND TO:

COMPANY: R.W. Beck

ATTN.: Paul Dor[illegible]

LOCATION:

FACSIMILE NUMBER: 44[illegible]-4962

FROM:

NAME OF SENDER: Pete D'Ewart

FACSIMILE NUMBER: (206) 486-[illegible]42
D'EWART REPRESENTATIVES
P.O. BOX 866
BOTHELL, WA 98041
(206) 485-6545

REFERENCE: AK / COPPER VALLEY INTERTIE / PREFORMED LINE PROD

WORK ORDER

FILE CODE

ENCLOSURE FILED IN (S)

PREFORMED LINE PRODUCTS
QUOTATION

REP: DEWART REPRESENTATIVES
UTILITY: ALASKAN ENERGY AUTHORITY
DISTRIBUTOR: R. W. BECK, CONSULTING ENGR.
TYPE: DAILY QUOTE

DATE: 09/10/1993

NEW QUOTE NO: 08-W2348

ITEM NO	USAGE	CATALOG NUMBER	DESCRIPTION	BID PRICE	TOTAL NET SALES
1	22	AGSMS2354 DOUBLE 37#9		182.440 ✓	4,014
2	126	AGSMS2351 SINGLE 37#9		11.100	1,399
3	126	ARMS2345 37#9 ALTERNATE		20.880 ✓	2,631
4	22	SC-5329		47.250 ✓	1,040
5	22	YP-5909	YOKE PLATE, per PLP Dwg 100-387	165.030 ✓	3,631
6	191	AGS-5826 Tool DOUBLE	AGS ASSEMBLY	167.080 ✓	31,912
7	2,122	AR-0137	ARMOR RODS	59.940 ✓	127,193
8	2,122	AGS-5125 Tool ALTERNATE Tool	AGS ASSEMBLY	81.090 ✓	172,073
9	574	SC-5329		47.250 ✓	27,122
10	234	YP-5909	YOKE PLATE, per PLP Dwg 100-387	165.030 ✓	38,617
11	5,700	AWDE-4122	GUY-GRIP D.E.	7.280 ✓	41,496
12	5,700	BG-4223 ALTERNATE	BIG-GRIP DEAD-END	6.710	38,247
13	4,800	BG-4170	BIG-GRIP DEAD-END	15.160	72,768
14	400	BG-4169	BIG-GRIP DEAD-END	12.440	4,976
15	5,600	BG-4173	BIG-GRIP DEAD-END	26.080	146,048
16	0	BG-4183 USE BGMS8364 *		108.130	0
17	22	ARMS2350 37#9 DOUBLE ALTERNATE ITEM 1		25.180 ✓	554
18	126	AGSMS1395 ALTERNATE FOR SINGLE T2 CONDUCTOR	AGS ASSEMBLY	107.780	13,580
			TOTALS		~~[illegible]~~

Price Quotations are valid for 30 days from the date of the quotation.
Prices are net.
Preformed Line Products standard Terms and Conditions apply.

* USE BGMS8364 as a substitute for BG-4183 because we cannot provide BG-4183 due to no raw material. Substitute fits same size and is mfgd from different raw material size.

ALTERNATES LISTED FOR AGS AND AR FOR DIFFERENT CONDUCTORS

THIS IS AN ENGINEERING ESTIMATE QUOTE ONLY.
MARILYN A. SCHUSTER

CC: FEH

FACSIMILE TRANSMISSION

PREFORMED LINE PRODUCTS

General Offices:

660 Beta Drive
Cleveland, Ohio 44143
Tel. (216) 461-5200

FAX (216) 442-8816

Mailing Address:

P.O. Box 91129
Cleveland, Ohio 44101

To: D'Ewart	From: Marilyn
Attn.: DJ	Date: 9-10-93
Ref.:	Total Pages: 8
Fax No.:	Cost Center No.

Here is our estimating quote with lots of alternates for Alaska.

Marilyn

EXHIBIT D-4

HUGHES BROTHERS

P.O. BOX 159 • 210 NORTH 13TH STREET • SEWARD, NEBRASKA 68434 • PHONE 402/643-2991 • FAX 402/643-2149

RECEIVED
AUG 16 1993
R.W. BECK & ASSOC
SEATTLE, WA

August 12, 1993

R.W. Beck and Assoc.
2101 Fourth Avenue, Suite 600
Seattle, WA 98121-2375

ACTION COPY
File WW 1557 HAI HC
Code 3800.3, 3109.2

Att: Paul Dorvel

Dear Paul:

Enclosed are transverse span tables and drawings for your Alaska Energy Authority feasibility study of the Copper Valley Intertie.

I have analyzed a very basic and typical 138 kV H-frame using the conditions you outlined. To make the analysis less cumbersome, I determined the controlling loading cases and zones, then concentrated on optimizing the structure for those cases.

I determined that the worst case transverse loading occurred for the T2 Linnet, under Load Case 2, extreme wind. The worst case vertical loading occurred also for the T2 Linnet, but Load Case 3, extreme combined wind and snow.

I first checked the vertical span capacity of the TH-10 structure. Without any outside braces the structure is capable of 598 foot spans, based on the strength of the laminated arms. By adding outside vee braces, the spans can be stretched to 1100 feet, and the laminated arm size can be reduced to 3-1/8 x 9, which actually saves about $100.00 per structure due to the much lower arm price.

The transverse loads were checked assuming that the pole top assembly was braced. The span tables show the results for western red cedar and douglas fir poles, with our 1042 and 2094 X-braces. In order to force a plane of contraflexure into the poles, two braces are required for Class 2 and under poles. Four braces are required for Class 1 and higher poles due to their higher stiffness.

Prices estimates for the structures are:

TH-10X $1075.00
w/ 1042 X-brace, no braces, 3-5/8 x 9-1/2 arms
TH-10VOX $975.00
w/ 1042 X-brace, two outside braces, 3-1/8 x 9 arms
TH-10V4X $1055.00
w/ 1042 X-brace, four braces, 3-1/8 x 9 arms
TH-10VOX $1035.00
w/ 2094 X-brace, two outside braces, 3-1/8 x 9 arms
TH-10V4X $1120.00
w/ 2094 X-brace, four braces, 3-1/8 x 9 arms

These estimates include freight but do not include poles or any shield wire support.

I have also investigated the possibility of a single pole structure. The enclosed drawing shows the use of laminated wood poles with steel davits. Our laminated wood poles are manufactured by Bohemia in Eugene, Oregon. This structure can span around 300 feet with class 1 douglas fir laminated poles with T2 Linnet conductor. The davits work equally well with round wood poles, with comparable spans.

The estimated cost of a single pole structure with davits is:

Laminated pole, three davits $2950.00
class 1, 80 foot pole

Three davits for round wood pole $450.00
pole not included

These estimates include freight. I hope this information will help you in your feasibility study.

Regards,

HUGHES BROTHERS, INC.

Larry Vandergriend, P.E.
Senior Project Engineer

Maximum Theoretical Spans

With 1042 X-brace

X-Brace = 1042

Fiber Stress = 5400 (Western Red Cedar)

Arm Height = 7.75
Y = 6.5
Pole Spacing = 16
X-Brace on Pole = 15
X = 36.25

X-Brace Height = 3.375 in
X-Brace Width = 5.375 in

X-Brace Strength = 20,000

Wind Load = 26 lbs
Ice Loading (radial) = 0 in
Safety Factor = 1.3
# of Conductors = 3 T2 Linnet
# of Shield Wires = 0

Conductor Diameter = 1.108 in
Shield Wire Diameter = 0 in

Pole Class

1083	H2	H1	1	2	3
50	1403	1414	1425	1436	1448
55	1305	1318	1331	1344	1358
60	1223	1239	1254	1269	1285
65	1154	1172	1189	1206	1214
70	1095	1113	1132	1152	1061
75	1041	1061	1083	1105	945
80	993	1015	1038	1062	829
85	948	972	998	961	757
90	907	932	960	887	676
95	864	892	920	797	***
100	821	853	884	741	***
105	790	822	855	677	***
110	752	787	822	615	***
115	714	751	754	559	***
120	679	718	692	507	***

Maximum Theoretical Spans

With 2094 X-brace

X-Brace = 2094

Fiber Stress = 5400 (Western Red Cedar)

Arm Height = 7.75
Y = 6.5
Pole Spacing = 16
X-Brace on Pole = 15
X = 36.25

X-Brace Height = 3.75 in
X-Brace Width = 5.75 in

X-Brace Strength = 25,000

Wind Load = 26 lbs
Ice Loading (radial) = 0 in
Safety Factor = 1.3
# of Conductors = 3 T2 Linnet
# of Shield Wires = 0

Conductor Diameter = 1.108 in
Shield Wire Diameter = 0 in

Pole Class

1483	H2	H1	1	2	3
50	2141	2153	2164	2104	1651
55	2008	2021	2036	2050	1598
60	1899	1916	1933	1812	1429
65	1809	1829	1847	1537	1214
70	1733	1753	1666	1342	1061
75	1665	1688	1483	1195	945
80	1608	1630	1341	1081	829
85	1554	1497	1227	961	757
90	1505	1382	1132	887	676
95	1456	1281	1022	797	***
100	1407	1195	952	741	***
105	1361	1102	875	677	***
110	1283	1038	822	615	***
115	1187	957	754	559	***
120	1128	907	692	507	***

Maximum Theoretical Spans

8-11-1993

1042 X-brace

X-Brace = 1042

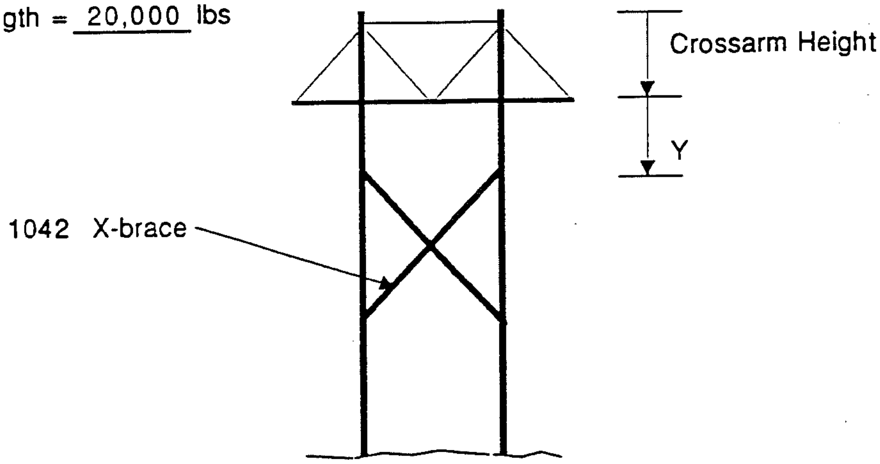
Fiber Stress = 8000 psi (Douglas Fir)

CrossArm Height = 7.75 ft
Y = 6.5 ft
Pole Spacing = 16 ft

X-Brace Height = 3.375 in
X-Brace Width = 5.375 in
X-Brace Strength = 20,000 lbs

Wind Load = 26 lbs
Ice Loading (radial) = 0 in
Safety Factor = 1.3
# of Conductors = 3
# of Shield Wires = 0

Conductor Diameter = 1.108 in
Shield Wire Diameter = 0 in
Transverse Wire Tension = 0 lbs



Pole Class

Pole Height	H3	H2	H1	1	2	3
55	1290*	1302*	1315*	1327*	1340*	1353*
60	1202*	1217*	1231*	1246*	1261*	1276*
65	1127*	1143*	1160*	1176*	1194*	1211*
70	1063*	1080*	1098*	1117*	1137*	1157*
75	1004*	1025*	1044*	1065*	1085*	1107*
80	952*	972*	995*	1018*	1040*	991
85	903*	926*	951*	974*	998*	893
90	859*	883*	908*	934*	962*	811
95	810*	839*	866*	892*	923*	-
100	767*	796*	825*	856*	887*	-
105	734*	764*	793*	825*	841	-
110	692*	725*	758*	790*	779	-
115	652*	686*	722*	757*	724	-
120	615*	650*	688*	724*	673	-

* DENOTES X-BRACE CONTROLLING

Maximum Theoretical Spans

8-11-1993

2094 X-brace

X-Brace = 2094

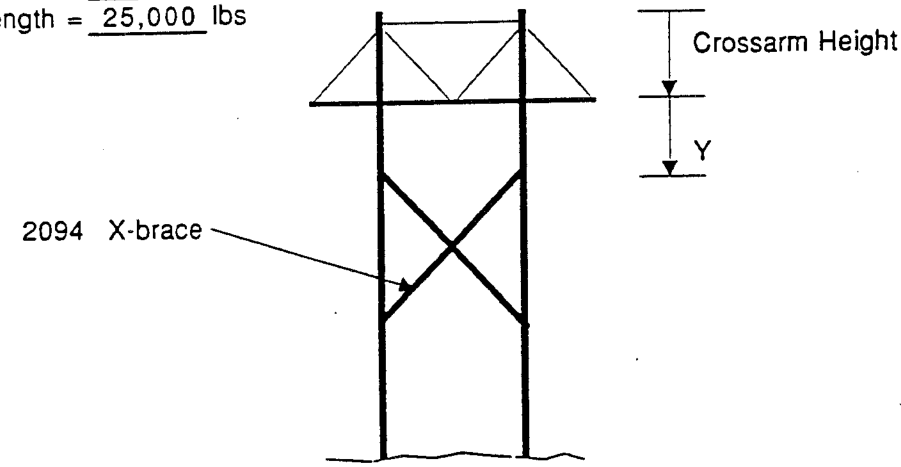
Fiber Stress = 8000 psi (Douglas Fir)

CrossArm Height = 7.75 ft
Y = 6.5 ft
Pole Spacing = 16 ft

X-Brace Height = 3.75 in
X-Brace Width = 5.75 in
X-Brace Strength = 25,000 lbs

Wind Load = 26 lbs
Ice Loading (radial) = 0 in
Safety Factor = 1.3
# of Conductors = 3
# of Shield Wires = 0

Conductor Diameter = 1.108 in
Shield Wire Diameter = 0 in
Transverse Wire Tension = 0 lbs



Pole Class

Pole Height	H3	H2	H1	1	2	3
55	1985*	1998*	2012*	2025*	2039*	1984
60	1868*	1883*	1899*	1914*	1930*	1649
65	1769*	1786*	1804*	1822*	1781	1426
70	1685*	1703*	1723*	1744*	1579	1267
75	1611*	1633*	1653*	1677*	1386	1112
80	1545*	1567*	1592*	1601	1273	991
85	1486*	1510*	1538*	1446	1149	893
90	1432*	1459*	1486*	1318	1077	811
95	1375*	1407*	1437*	1205	983	-
100	1325*	1356*	1389*	1140	903	-
105	1287*	1321*	1319	1064	841	-
110	1240*	1276*	1260	989	779	-
115	1194*	1233*	1178	922	724	-
120	1155*	1192*	1105	862	673	-

* DENOTES X-BRACE CONTROLLING

EXHIBIT D-5

RECEIVED

OCT 18 1993

R W BECK & ASSOC
SEATTLE, WA

HEES

HEES ENTERPRISES, INC.
POST OFFICE BOX 1110
ASTORIA, OREGON 97103
TELEPHONE: (503) 325-8778
FACSIMILE: (503) 325-2467

October 14, 1993

Mr. Paul Dorvel
R.W. BECK & ASSOCIATES
2101 4th Ave. Ste. 600
Seattle, WA 98121

SUBJECT: COPPER VALLEY INTERTIE

Dear Paul:

This is in reply to your request for estimating costs for various conductor accessory materials as you are evaluating comparative conductor systems.

I've enclosed a copy of our line card for your information and use.

In the table on Page 2, I've listed the appropriate full tension Uni-Grip splices and Dead End assemblies as manufactured by Fargo for the conductors being considered.

Also indicated are vibration dampers manufactured by both Fargo and Dulmison, Inc.

In considering conductor accessories for "T2 Linnet," you have an option in using separate fittings or a single tube design for both splices and dead ends.

Single tube designs are very quantity sensitive in pricing as each project is designed and manufactured and therefore it is not possible to provide single tube costs until we know the precise quantity required.

Experience to date indicates that the overwhelming majority of utilities installing T2 conductors are using separate fittings for each subconductor. The splices are staggered and a yoke plate accommodates the two dead end fittings for attachment to insulator strings.

In most cases, this allows the use of 60 ton presses to be used, compared to 100 ton presses required for the single tube designs. Also, by using separate fittings, the dead ends each have their own jumper for a consistent current path.

Mr. Paul Dorvel
R.W. BECK & ASSOCIATES
October 14, 1993
Page 2

For these reasons, we recommend that individual component fittings be used for T2 conductor as it will provide the most cost effective installation.

Fargo has never supplied a full tension splice or dead end for 37-#9 Alumoweld at this typically is a configuration used for tower grips, and for which tower guy dead end fittings are available.

At this point, we are unable to provide full tension splices or conventional dead end bodies for this conductor.

CONDUCTOR DESCRIP-TION	FULL TENSION SPLICE	DEAD END ASSEMBLY VERT EYE 15° JUMPER TERMINAL	VIBRATION DAMPER	
	FARGO CAT. NO.	FARGO CAT. NO.	FARGO CAT. NO.	DULMISON CAT. NO.
556.5 KCM "DOVE"	#A1510-25 EST PRICE $24.15	#A0110-25 EST PRICE $45.10	#60710-12 EST PRICE $25.60	DB221 EST PRICE $26.00
605 KCM 30/19 ACSR "TEAL"	#A1512-29 EST PRICE $30.40	#A0112-29 EST PRICE $47.20	#60710-12 EST PRICE $25.50	DB224 EST PRICE $26.00
336.4 KCM 26/7 "T-2-LINNET"	#A1508-13 EST PRICE $19.75	#A0108-13 EST PRICE $43.05	NOT APPLIC.	NOT APPLIC.

Sincerely,

HEES ENTERPRISES, INC.

Herbert N. Steinmeyer
President

HNS:emr

Enclosure

Appendix E

TECHNICAL REVIEW MEETING SUMMARY

ALASKA ENERGY AUTHORITY
COPPER VALLEY INTERTIE FEASIBILITY STUDY
TECHNICAL REVIEW MEETING JULY 6,1993

DRAFT SUMMARY OF PROCEEDINGS

General

The majority of the meeting was devoted to discussion of (1) loading zones, (2) design loading criteria, (3) structure type alternatives, (4) construction methods, and (5) contingencies. A Basis of Design document prepared by R.W. Beck was distributed to participants prior to the meeting and formed the basis for the discussion.

CVEA expressed concern that the feasibility study was not heading in the direction of a least cost alternative and emphasized that the success or failure of the project hinged on defining the most economical construction type and good project management. AEA offered that there is a basic difference in perspective on how to proceed with the study: rather than start with the feasible cost answer required and work toward the design, the study was formulated to cost estimate a line with reliability comparable to other lines in Alaska and then determine feasibility by comparing with other power supply options. AEA further clarified that the goal was a least cost line with reliability consistent with other lines in the area. R.W. Beck commented that to seek a least cost option requires a much more intense optimized, iterative effort than the scope of work allowed. CVEA implied that they would consider unreasonable any design selections which are a matter of philosophical differences and which cost more but buy nothing, e.g. longevity, lower maintenance costs, reliability.

Loading Zones

The loading zones proposed by R.W. Beck were presented to the group. CVEA and Power Engineers ("PEI") expressed concern that the length of the severe Loading Zone 3 (approximately 30 miles) would unnecessarily burden the cost of the project and recommended that the severe loading zone be confined to the approximately 8 miles over Chitna Pass in route segment S7-8. Chugach commented that after all is said and done just two loading zones might suffice; one being a severe zone for passage through remote and high country. R.W. Beck defended the use of three zones, citing the distinctly different loading regimes east and west of Tahneta Pass. AEA suggested that a fourth loading zone seemed appropriate. Consensus was reached to use four loading zones, with a new Loading Zone 4 carved out of present Loading Zone 3. MEA and CVEA proposed an elevation cutoff for determining Loading Zone 3 and 4 extents. The elevation of Eureka at El 3300 approximately was cited as a logical cutoff because there is distribution line experience to that point. Revised Loading Zones are shown in the attached base maps.

Design Loading Criteria

R.W. Beck stated that the extreme combined ice/snow and wind condition controls tensions and design. The loading criteria for each of three loading zones proposed by R.W. Beck were presented in Table 4-4 of the Basis of Design. The discussion focused on the extreme combined loading condition for the different zones.

Chugach wondered why the NESC Heavy loading, discussed at length during the first technical review meeting in 1992, was not used. R.W. Beck cited the back country routes at significantly higher elevations as one reason for more extreme loading.

MEA reiterated that in 15 years of experience they have observed little if any radial ice accumulation but have observed significant radial snow accumulation on lines in the Matanuska River Valley and other lines in their service territory. They stated that this snow is typically dislodged under wind. There is no information on snow density or windspeed. All MEA lines have been designed to NESC Heavy requirements and have experienced no failures due to extreme loading conditions. MEA indicated implied that the vast majority of failures was due to trees falling into the line. MEA objected to the use of an extreme combined wind and ice/snow condition in the Matanuska Valley, arguing that this would drive the cost of structures up. MEA further questioned why the intertie should be designed to a higher reliability standard than the lines which would feed it.

CVEA commented that the R.W. Beck proposed loadings were not surprising considering what they've experienced in the Pump Station No. 12 and Thompson Pass areas. They supported the approach to determine loadings on a segment/site-specific basis. CVEA commented that sometimes a wet snowfall in the fall will stick on lines until spring; MEA agreed this could occur sometimes. R.W. Beck noted that snow on Canadian lines had been observed to stick under 75 mph winds. CVEA expressed concern that the most extreme loading zone criteria was driving the selection of structure type and cost for all the loading zones and the line as a whole. CVEA commented that they have observed radial ice and snow accumulations of 2-3 inches on their lines but that the snow is dislodged under wind. CVEA also expressed a desire that the line in Loading Zone 4 be designed for severe loading because of its remoteness, high elevations and uncertainty about loading in the area. CVEA commented that the 1982 MRI loadings for the Copper Valley Basin portion of their route should be applicable to the current intertie routing in the basin.

PEI and others commented that without hard meteorological data, the entire exercise of selecting extreme combined loads is largely guesswork. PEI suggested that selection of an extreme loading criterion should be coupled with reliability criteria. PEI cited a line in Canada that had been designed for very severe ice loading many years ago, but that it had never experienced more than 0.5 inches radial ice. PEI discussed their philosophy on ice and wind loading. Based on CVEA's observation of 5 inches of rime ice, PEI considered it prudent to assume some extreme ice but coupled with the fact that CVEA lines are designed to NESC Heavy and have not failed, settled on the 1-inch radial ice loading as a reasonable compromise. Vertical loading does not greatly affect structure cost and they selected 1-inch radial ice or 1-inch radial ice plus 40 mph wind just to investigate what this would do to the line and its cost.

PEI also commented that access and ease of maintenance is a factor in deciding whether to accept lower loading criteria and reliability. AEA offered that high back country routes would likely be inaccessible for long periods under conditions of severe loading. CVEA questioned the assumption of extended periods of bad weather in the back country.

After much discussion, it was agreed to adopt the extreme design loadings shown in the revised Table 4-4 attached. This involved assigning old Loading Zone 3 loadings to new Loading Zone 4; reducing the new Loading Zone 3 loadings to 1.5 inches radial ice and 40 mph wind; adopting 2.5 inches of radial 30 pcf snow with a 20 mph wind for Loading Zone 1; and adopting 2.5 inches of radial 20 pcf snow over 1 inch radial ice no wind, and 1 inch radial ice with 40 mph wind for Loading Zone 2.

Structure Types

Chugach questioned why wood pole structures are not evidently being considered. MEA shared this question and further asked why no single pole construction, similar to the connecting O'Neill Tap Line. R.W. Beck stated its preference for steel based on perceptions of problematic price and availability of wood poles in the quantity and sizes needed, the longer life of steel compared to wood viewed against the increasing importance of the line to CVEA, and advantages in the strength to weight ratio. CVEA took the position that wood single pole and H-frame alternatives, as well as others perhaps, should be discussed in the study report. They suggested that a wood versus steel report done for Bradley could be updated.

Chugach, MEA and CVEA indicated they had no problems with wood pole supply but it was admitted that the classes and lengths they use may be different from intertie requirements. MEA further observed that wood poles typically last quite long in the relatively dry, cool Alaska climate in the Southcentral region. MEA opined that construction and O&M costs of the steel pole line would go up because of increased costs to climb a structure, i.e. using ladders. It was suggested to use permanent step bolts from the structure top to 15-20 feet from ground then removable ladders for the remainder. This met with general approval.

PEI indicated they had recently experienced price increases for wood poles on the order of 40% as well as supply problems in the Northwest. This pointed to a direction of supply problems and price increases in the future. While recognizing the long life of wood poles in Alaska, PEI stated that an argument could be made for steel having a longer life. PEI further noted that their operating objective in their screening study was to keep the cost of labor down since it is the major total cost component.

R.W. Beck said that when span is not a constraint, a single pole line with average spans of 350-400 feet will not compete cost-wise with an H-frame or X-frame line with spans of 800-1200 feet, that cost is driven up with the number of sites a foundation crew must work. PEI stated that they looked at several structure types including single pole and H-frame. PEI said they had run TLCADDtm with the choice of single pole structures or a family of H-frame structures and the program chose H-frames as the least costly. They did their screening cost study based on steel H-frame structures largely because they felt it to be on the high end of cost options and they reckoned that other options could eventually be shown to be less expensive.

R.W. Beck cited what they believed to be the advantages of the X-frame structure, namely inherent longitudinal capacity, flexibility, good performance in permafrost situations where frost jacking could occur, ease of readjustment after jacking, and its relatively light weight; the downsides include having to install two leg piles and two anchors at each site. Chugach confirmed that structure legs do jack and that the X-frame performs well and reliably in those situations. MEA agreed. CVEA said that on Glennallen to Valdez X-frames it's the anchor piles, not leg piles which have jacked. PEI stated that a lot depends on structure-foundation attachments. MEA noted that an H-frame connection would typically be a fixed, moment connection while the X-frame is a pinned, hinged connection.

Since it appeared no consensus was forming on a single structure type for the whole line or all the criteria, AEA proposed as sufficient for the feasibility study looking at two structure/conductor/foundation alternatives for each line segment and developing per mile costs for comparison.

PEI cited contractor estimating costs of $7500 to install the foundations and anchors for an X-frame structure versus $5600 (or $5800 ?) for a direct embedded H-frame. R.W. Beck mentioned that the estimates were done without the benefit of the contractor seeing the route or without knowledge of the geotechnical conditions. R.W. Beck related that some benefit could accrue by pile-driving crew acting as a discovery unit at a site. R.W. Beck offered that installation advantages of the X-frame could outweigh the increased foundation cost and that the contractor prepared his estimates without detailed consideration of scheduling and efficiency factors.

PEI suggested an X-frame structure might have to be flown in and assembled in sections and might require a large helicopter from the continental US to lift it in place. They offered that an H-frame would be easily assembled with local helicopters by flying in two poles, one with the crossarm. R.W. Beck believes that the weight of X-frame structures would allow them to be flown in fully assembled. PEI recalled that a lower-48 large helicopter would cost on the order of $500,000 to mobilize to Alaska. Chugach and others stated that Vertol helicopters were locally available. AEA questioned the cost of mobilization.

Clearances and Structure Height

PEI questioned R.W. Beck's assumption of 5 feet snow cover in Loading Zone 3 and the use of a margin of 5 feet to account for structure/insulator deflection under unbalanced ice loading. R.W. Beck cited the record snowfall in Eureka of 120 inches and the fact that the back country area could be expected to be colder with accumulated snow staying around longer. AEA supported the selection of 5 feet of snow based on experience. PEI suggested that the deflection margin might be more narrowly applied to route segments which are more likely to experience unbalanced loading, e.g. "varied terrain", around Chitna Pass and that 5 or so feet of average structure height could be saved; R.W. Beck had stated that average structure heights were 75-80 feet based on ruling span sags, aesthetic concerns, and possible high-time labor rates. MEA cited that their worst conductor sags due to unbalanced snow loads occur in level terrain. R.W. Beck stressed concern for public safety in the areas of significant snowmobiling. CVEA said that they wouldn't want to violate any good, reasonable safety standards.

Line Routing and Right-of-Way

CVEA noted that few, if any avalanche sites have been observed along the corridor, with the possible exception of Boulder Creek, and suggested that the line be considered avalanche free. They also noted that the intertie corridor has nowhere near the avalanche signs and problems of the Glennallen-Valdez line. It was generally agreed that enough latitude exists in route location that final structure spotting could avoid or adequately deal with any avalanche sites.

MEA noted that dealings with the Cook Inlet Region Corporation were business-like and should present no problems. CVEA indicated the Ahtnas appeared very cooperative. This would not likely be the case with Chickaloon land.

R.W. Beck explained that ROW widths were calculated based on blow-out criteria, but that this could be too conservative given the low likelihood of structures being built along the ROW edge. R.W. Beck suggested that a 125 ft ROW width, with 50 ft clearcut on centerline and danger trees felled would be more appropriate than the original 150 ft clearcut proposed. CVEA agreed with this approach.

MEA questioned whether anyone had talked to agencies about access down the ROW. CVEA said BLM would have no objections to a power line and know of no archaeological sites along the route. MEA said no EIS would be required; both BLM and ADNR are fairly satisfied with the EA process. PEI suggested that careful thought needs to be given to adding ROW width at about $1 million per 25-ft width. R.W. Beck suggested that it would very useful to arrange a flight of the routes with a local clearing contractor. PEI suggested looking at reduced phase spacing, with a T2 conductor, to limit ROW width; better to spend extra money on conductor to save clearing costs.

Cost Estimate and Contingency

CVEA objected to the planning for helicopter erection just to meet the needs of a contractor but at increased cost. AEA clarified that on the contrary, a contractor would likely select helicopter-assisted installation as a cost-savings measure. The general consensus was to leave this decision to the contractor, subject to specific right-of-way stipulations by ROW owners and third parties.

AEA stated that a contractor had flat out said he would transport all material by helicopter to the right-of-way and structure sites. CVEA and PEI agreed that this was their thinking too. CVEA also said they were counting on transport of personnel to remote locations by helicopter. AEA suggested that a contractor would want to drive equipment in to the right-of-way wherever possible to cut costs. AEA suggested that ground access along the right-of-way would probably be key to economic feasibility for the line; CVEA agreed.

CVEA stated it would be imprudent to adopt designs or issue contracts that would lead the project into a sole-source situation.

CVEA questioned the value of a $400,000 study that could not do work in enough detail to adopt a 10% contingency, especially considering the high clearing cost margin included earlier. CVEA expressed concern over the possibility of a 25-30% contingency. R.W. Beck clarified that we were proposing a minimum 20% contingency. AEA could not recall any feasibility study that used a 10% contingency. AEA supported the use of 20% contingency, given the uncertainties over right-of-way and environmental constraints. AEA also suggested that two levels of contingency could be used for comparison. R.W. Beck explained that they wouldn't use less than 10% even on a completely designed project out for bid. R.W. Beck explained its proposal to use 10% contingency on materials and 20% on installation. PEI indicated they felt the contingency should not be higher than 20 % and recalled that AEA commonly uses 15%. AEA recalled having seen 15% overall and 10% commonly on materials. PEI agreed with the approach to use separate contingencies on labor and material.

Appendix F

MISCELLANEOUS DOCUMENTS

EXHIBIT F-1

DAMES & MOORE
5600 B STREET, SUITE 100, ANCHORAGE, ALASKA 99518-1641
(907) 562-3366 FAX: (907) 562-1297

RECEIVED
AUG 17 1993
R W BECK & ASSOC
SEATTLE WA

August 16, 1993

ACTION COPY
File WW1559 4A1 A
Code 3800.3

Mr. Paul E. Dorvel
Principal Engineer
R. W. Beck and Associates, Inc.
2101 Fourth Avenue
Seattle, WA 98121-2375

Preliminary Geotechnical Assessment
Copper Valley Intertie Feasibility Study - Phase I
D&M Job No. 12023-032-020

Dear Mr. Dorvel:

Presented in this Letter Report are the results of our Preliminary Geotechnical Assessment for the proposed Copper Valley Intertie Project between Sutton and Glennallen, Alaska. This assessment was performed as part of Phase I of the Copper Valley Intertie Feasibility Study. The purpose of the assessment was to provide a general overview of the geotechnical conditions expected for the two proposed alignments, as shown on the attached drawings.

Our work was performed in general accordance with the Subconsultant Agreement between R.W. Beck and Associates, Inc. and Dames & Moore, Inc. dated February 15, 1993 and the Amendment to Subconsultant Agreement dated March 12, 1993.

SCOPE OF WORK

Our Scope of Work, as amended, was to include the following four tasks.

- A helicopter overflight of the two proposed alignments in March, 1993.
- A review of the Copper River Basin Study and other readily available information as it pertained to the geotechnical conditions along the two proposed alignments.

- A preliminary plan and feasibility-level cost estimate for performing a detailed geotechnical investigation for the design of the foundations for the transmission tower structures.

- A letter report presenting the results of the above three tasks.

AERIAL RECONNAISSANCE

An aerial reconnaissance of the two proposed alignments was performed on March 16, 1993 using a fixed wing aircraft (Cessna 206) flown by Regal Air of Anchorage. A fixed wing aircraft was used instead of a helicopter. The aerial reconnaissance was performed by Mr. Paul Dorvel of R.W. Beck, Mr. Stan Sieczkowski of the Alaska Energy Authority, and Messrs. Gregg Gault and Jeffrey Stanley of Dames & Moore. The flight departed from Anchorage (Lake Hood) at approximately 9:30 am and proceeded directly to Sutton, the eastern most limit of the two proposed alignments. From Sutton, the flight proceeded eastward along the general alignment of Alternative Route No. 1 to Glennallen. After circling the proposed facility location just south of Glennallen, the flight then proceeded westward towards Sutton along the general alignment of Alternative Route No. 2. Upon returning to Sutton, the flight proceeded directly back to Anchorage, arriving at Lake Hood at approximately 12:30 pm. The average flight speed of the overflight was approximately 100 mph at an altitude of approximately 3,500 to 5,000 feet above ground level (AGL). The weather was generally clear, calm, and sunny. The ground surface was generally covered with snow with the exception of some of the southernly exposed slopes.

DOCUMENT REVIEW

As part of our document review, we reviewed the Copper River Basin Study. This document as a whole contained very little geotechnical information, none of which applied to the two proposed alignments. Other documents which were reviewed included the Copper Valley

Electric Association, Sutton to Glennallen 138 kV Transmission Intertie Project, Volume 2, Final Report, dated January 1993; the Rail Belt Intertie Reconnaissance Study, Volume 8A, Northeast Transmission Intertie Project, dated June 1989; and the U.S.G.S. Miscellaneous Investigations Series Map I-2283, Geologic Map and Summary Geochronology of the Anchorage 1°x3° Quadrangle, Southern Alaska.

GENERAL GEOTECHNICAL CONDITIONS

General

The proposed alignments (Alternative Routes No. 1 & 2) cross broad ridges and low passes in the rugged Talkeetna Mountains, colluvium and benched glacial deposits on valley walls, steep narrow alluvial valleys, and Quaternary deposits in the broad Matanuska River Valley. The regional geology is very complex and the area lies in a Seismic Zone 3 where major structural damage is probable. The alignment generally lies between the Castle Mountain and Border Ranges faults which are two major regional fault systems that include numerous closely spaced faults from the Castle Mountain and related Caribou faults. The area has been subjected to numerous episodes of glaciation, metamorphism, vulcanism, intrusion, uplift, erosion, and deposition of clastic and marine sediments in structural basins formed by subduction thrust faulting, local wrench faulting, and folding. Rock types in the area include a wide variety of diabase, basalt, dacite, andesite, rhyolite, tuff, amphibolite, shale, marble, limestone, conglomerate, sandstone, siltstone, mudstone, claystone, and coal.

Unconsolidated surficial deposits include glacial, colluvial, alluvial, and lacustrian sediments. Rock outcrops and shallow bedrock covered by a thin mantle of rocky colluvium occur on the mountain slopes at the mid to higher elevations in the Talkeetna Mountains. Thick colluvium and steep narrow alluvial valleys characterize the recent sediments in the mountainous drainages where rock glaciers and landslides are common in the area. The lower valley sides and bottoms are typically covered with glacial deposits and modern alluvium. Glacial deposits consist of moraines, outwashes, and terraced benches. Recent lacustrian deposits can locally be hundreds of feet thick where lakes formed by glacier dams once occurred.

In addition to active landslides, avalanches and permafrost are other geotechnical concerns along the proposed alignments. Snow avalanches commonly occur in mountainous terrain in steep gullies and on steep open slopes. Ridges, rock outcrops, and terraces often form natural barriers to avalanches. Avalanches tend to occur on smooth, straight to convex slopes which range in slope angles from approximately 20 to 65°. Rough, rocky, and heavily forested slopes help provide stability to avalanche prone areas. Leeward slopes usually receive more deposited snow and are more dangerous than the scoured windward slopes. South-facing slopes are typically less dangerous than north-facing slopes during the winter, but become more dangerous during the spring when wet-snow avalanches are more likely to occur.

The area lies in the discontinuous permafrost zone. Relatively warm permafrost can be expected to be nearly continuous in sheltered, higher elevation areas, particularly on north-facing slopes. Sparse, dwarf black spruce vegetation provides an indication of permafrost. On southern exposures and at lower elevations, the permafrost may be mostly absent but highly variable and locally sporadic. Near-surface permafrost is generally not expected to occur in the project area in the low, modern, alluvial valley bottoms.

<u>Route Specific</u>

The proposed alignments (Alternative Routes No. 1 & 2) traverse four distinct zones which are describe below.

- Zone 1 extends eastward along Alternative Route No. 1 from Sutton on the west up the Matanuska Valley on the north side of the Glenn Highway towards Pinochle Creek. Soils are expected to be predominantly alluvial and glacial, and not frozen. The risk from snow avalanches is considered to be generally low and occasionally moderate in local areas.

  In Zone 1, Alternative Route No. 2 leaves the Matanuska Valley, diverts to the northeast near Boulder Creek Flats, and continues up Boulder Creek Valley over Chitna Pass. Alluvial and glacial soils are expected to become narrower and thinner up valley. Moderately thin to steeper thin colluvial soils and rock outcrops are expected on the narrow valley walls. The colluvial soils may be locally sporadically frozen on southern exposures to discontinuously frozen on the northern exposures. The risk from snow avalanches is considered to be generally moderate to occasionally high in local areas.

- Along Alternative Route No. 1, Zone 2 extends up the Pinochle Creek drainage, over a low 3,150 foot pass into the Hicks Creek drainage, up Hicks Creek Valley, over the Hicks Lake pass at approximately 3,350 feet in elevation, down the Divide Creek drainage which flows into Caribou Creek, down Caribou Creek Valley for approximately six miles to the confluence of the Squaw Creek tributary, and up Squaw Creek Valley to the northeastern flank of Gunsight Mountain where it meets the Glenn Highway. Alluvial and glacial soils are expected to become narrower and thinner up Hicks Creek Valley. Rock outcrops and moderately thin to less steep, moderately thick colluvial soils are expected on the narrow valley walls. Thicker colluvial soils are expected on the broader valley sides of Caribou and Squaw Creeks, and glacial and alluvial soils are expected along the lower reaches of Caribou and Squaw Creeks. The colluvial soils may be locally sporadically frozen on southern exposes, discontinuously frozen on lower northern exposures, and frozen at higher protected elevations. The risk from snow avalanches is considered to be generally moderate to occasionally high in local areas along Hicks and Divide Creeks, and moderately low in general along the remainder of Alternative Route No. 1 in Zone 2, except along Inoceramus Creek on Squaw Creek which should be spanned.

  Along Alternative Route No. 2, Zone 2 extends down the Chitna Creek drainage which flows into Caribou Creek, down Caribou Creek Valley parallel to Alternative Route No. 1 to the confluence of the Alfred Creek tributary, up the Alfred Creek drainage to the confluence of the small Pass Creek tributary, and up the narrow Pass Creek drainage. Colluvial, alluvial, and glacial soils should thicken down Chitna and Caribou Creeks, and thin up Alfred and Pass Creeks. Rock outcrops are expected at various locations along this portion of the alignment, particularly near both ends of the zone. The colluvial soils may be frozen at the higher protected elevations, discontinuously frozen on lower northern exposures, and locally sporadically frozen on southern exposures. The risk from snow avalanches is considered to be generally moderate to occasionally high in local areas, and low along the short stretch of Caribou Creek.

- Along Alternative Route No. 1, Zone 3 extends along the north side of the Glenn Highway eastward towards Moose and Tolsona Lakes. The proposed alignment is typically a quarter to a mile and a quarter from the highway except near the eastern end of the zone where it diverts about three miles from the highway around the north side of Moose Lake. Soils are expected to be predominantly glacial and lacustrian, and range from being discontinuously frozen to relatively warm ice-rich permafrost. The risk from snow avalanches is considered to be generally very low.

  Along Alternative Route No. 2, Zone 3 extends over a low broad ridge at an elevation of approximately 4,400 feet and down the northeastern flank of Syncline Mountain to where the two alternative routes join approximately 5.5 miles northeast of the Eureka Roadhouse. Fewer rock outcrops, thicker colluvial soils, and glacial and lacustrian soils are expected to be generally frozen down this portion of the alignment. The risk from snow avalanches is considered to be generally moderate to occasionally high in local areas, and diminishing to generally low to very low where the two alternative routes join.

- Zone 4 extends eastward from Moose Lake through Glennallen towards the Trans-Alaska Oil Pipeline and to the Richardson Highway. The proposed alignment typically runs approximately a mile to the north of the Glenn Highway before it turns to the south, crosses the Glenn Highway, and ends about a mile further. The soils are generally expected to be glacial, lacustual, and occasionally alluvial along the few larger drainages that cross the alignment. The soils are expected to be a relatively warm ice-rich permafrost. The risk from snow avalanches is considered to be generally very low.

PRELIMINARY GEOTECHNICAL INVESTIGATION PLAN

The following preliminary geotechnical investigation plan was designed to provide adequate geotechnical information for the design of the foundations for the transmission tower structures.

- A detailed review of available geotechnical information and aerial photographs of the preferred alignment.

- A helicopter and ground reconnaissance survey of the preferred alignment during the summer months.

- A limited drilling program as defined during the ground reconnaissance survey.

- A limited geophysical seismic survey to supplement the drilling program.

- A geotechnical laboratory testing program.

- A geotechnical report which includes foundation recommendations for the transmission tower structures.

Based on the general length of either alignment and on the March 16, 1993 aerial reconnaissance, we have estimated that approximately 50 borings would be required. The actual locations of the borings would be selected based on the findings of the first two tasks described above. We have assumed that a boring would be needed every 2 miles in the mountainous region between Sutton and Slide Mountain and every 5 miles in the flatter region which parallel the Glenn Highway between Slide Mountain and Glennallen. A limited geophysical seismic survey will also be performed to supplement the drilling program. It is anticipated that most of the drilling will be performed using a helicopter supported drill rig. Based on our experience with other helicopter supported drilling programs, we recommend that two drill rigs, supported by one helicopter, be utilized. By doing this, the drill rigs can leap frog along the alignment, thus reducing standby time for both the drill rigs and helicopter.

FEASIBILITY LEVEL COST ESTIMATE

Based on the above scope and assumptions, we estimate that a geotechnical report can be prepared for approximately $837,000. This cost estimate is feasibility level only, and will need to be refined after the alignment is chosen and tasks 1 and 2 above have been completed. A breakdown of the costs by task is presented below.

• A detailed review of available geotechnical information and aerial photographs of the preferred alignment.	$15,000
• A helicopter and ground reconnaissance of the preferred alignment during the summer months. (5 days @ $6,500/day)	$32,500
• A limited drilling program, 50 boreholes @ $8,500/borehole. (Includes helicopter support, drilling equipment, and two drillers and one engineer for each rig)	$425,000
• A limited geophysical seismic survey, 25 lines @ $3,500/line. (Includes helicopter support, seismic equipment, and one engineer and two helpers)	$87,500
• A geotechnical laboratory testing program, 50 boreholes @ $750/borehole.	$37,500
• A geotechnical report which includes foundation recommendations for the transmission tower structures.	$100,000
Subtotal	$697,500
Contingency @ 20%	$139.500
Total	$837.000

CONCLUSION

This letter report completes our Scope of Work as defined herein and in general accordance with our Subconsultant Agreement dated February 15, 1993, and revised March 12, 1993.

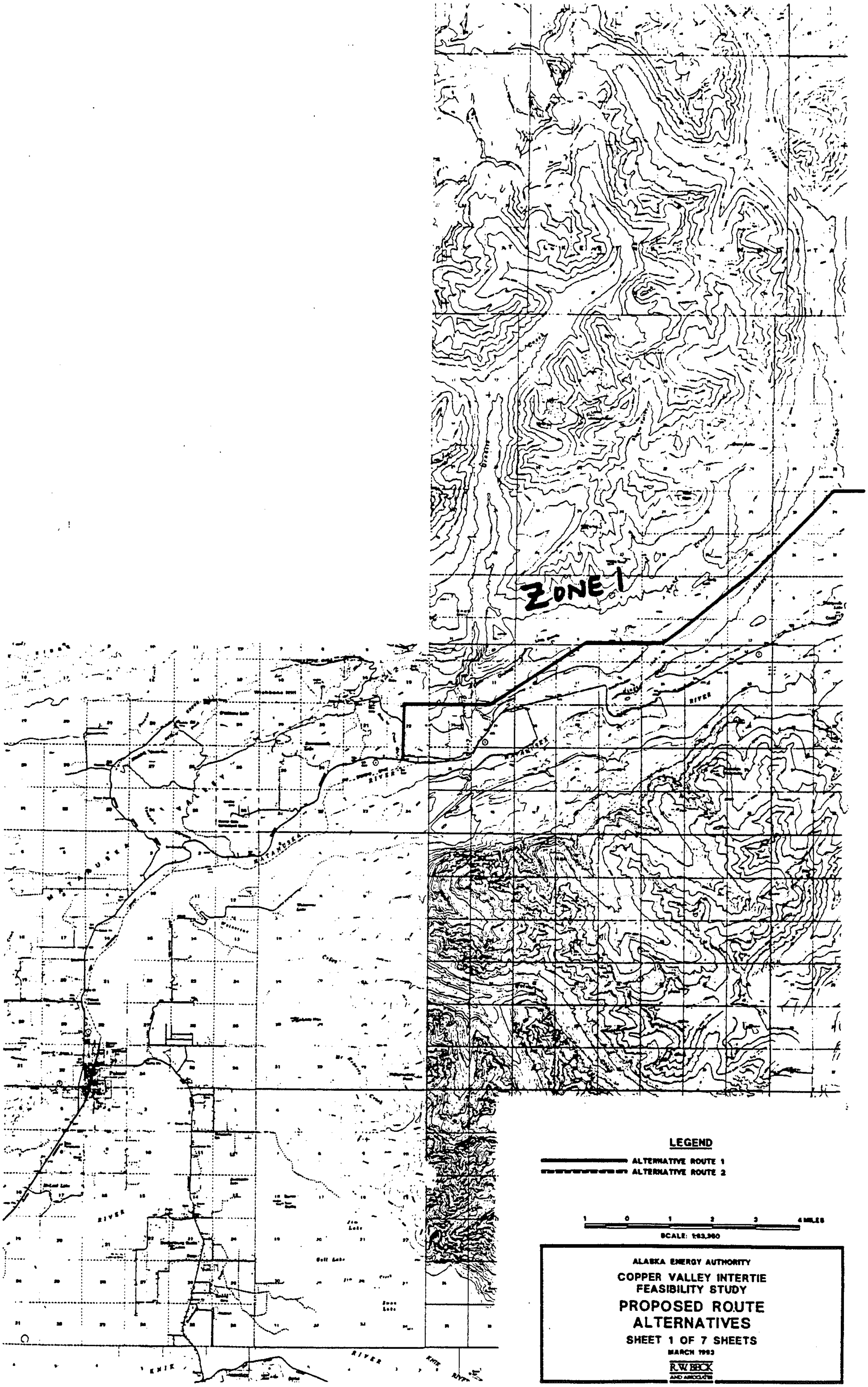
If you have any questions regarding the contents of this letter report, or need any additional information, please do not hesitate to contact us.

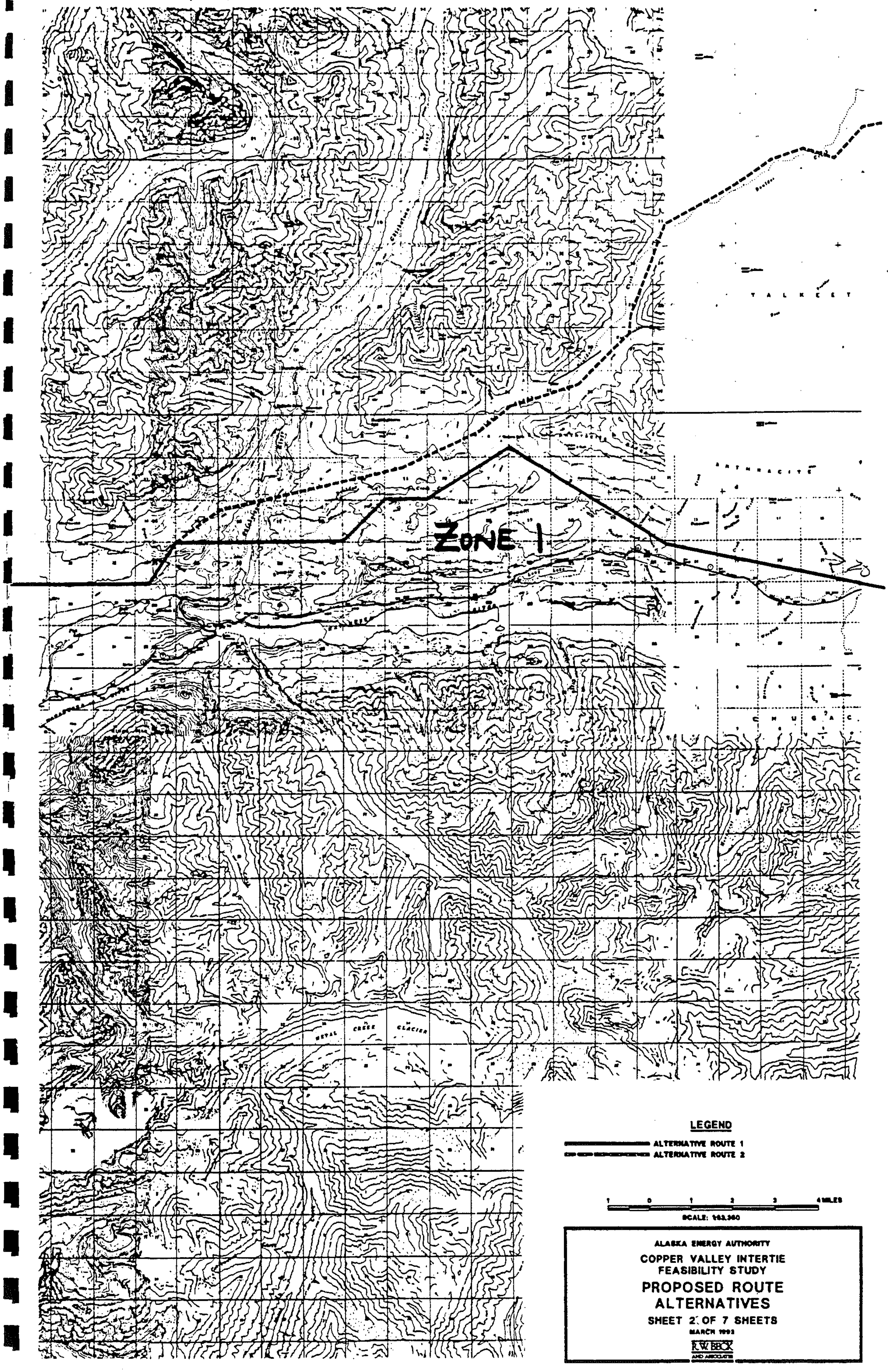
Very truly yours,

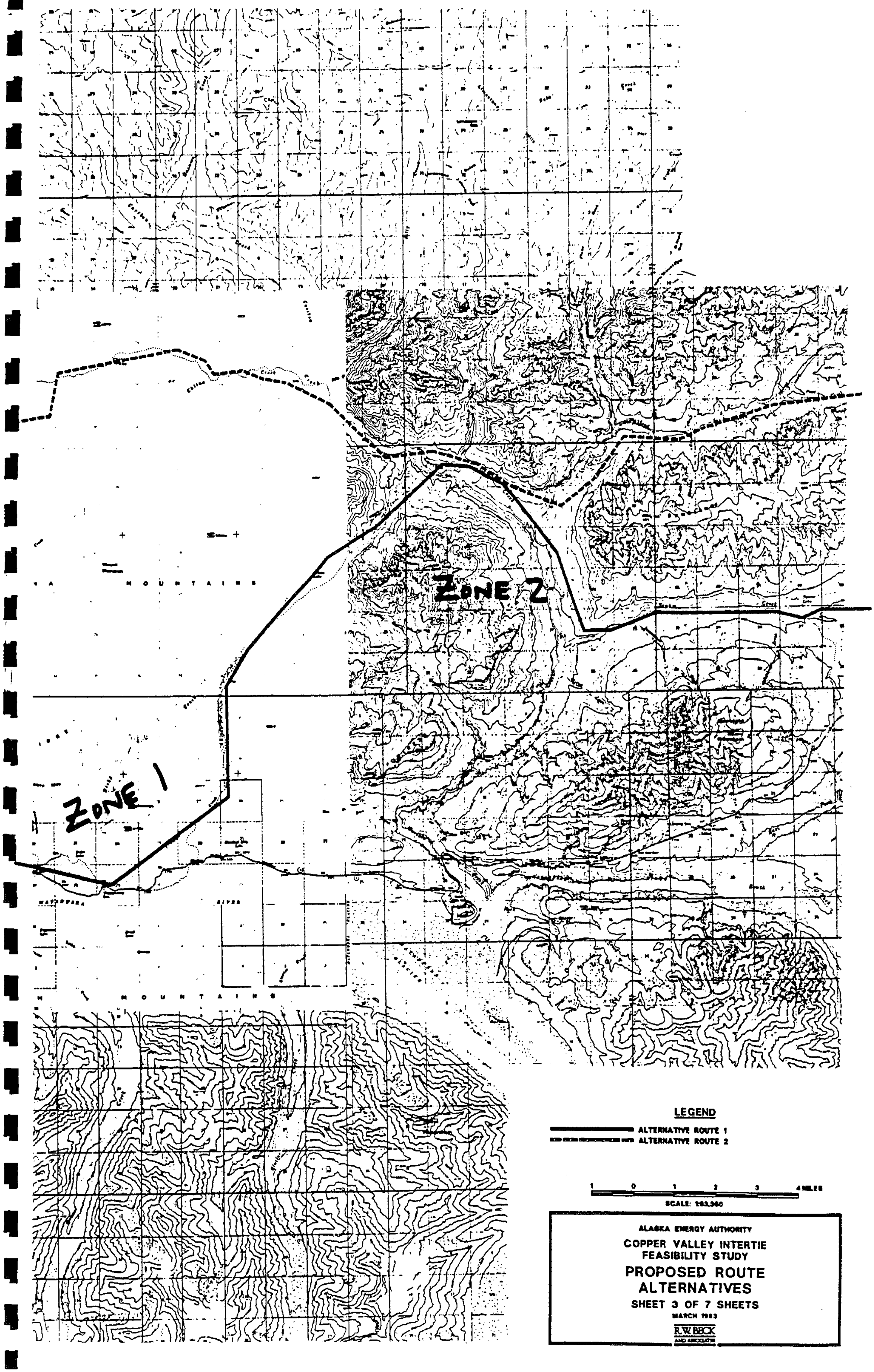
DAMES & MOORE

Michael L. Foster, P.E.
Engineering and Construction Services
Northwest Regional Manager

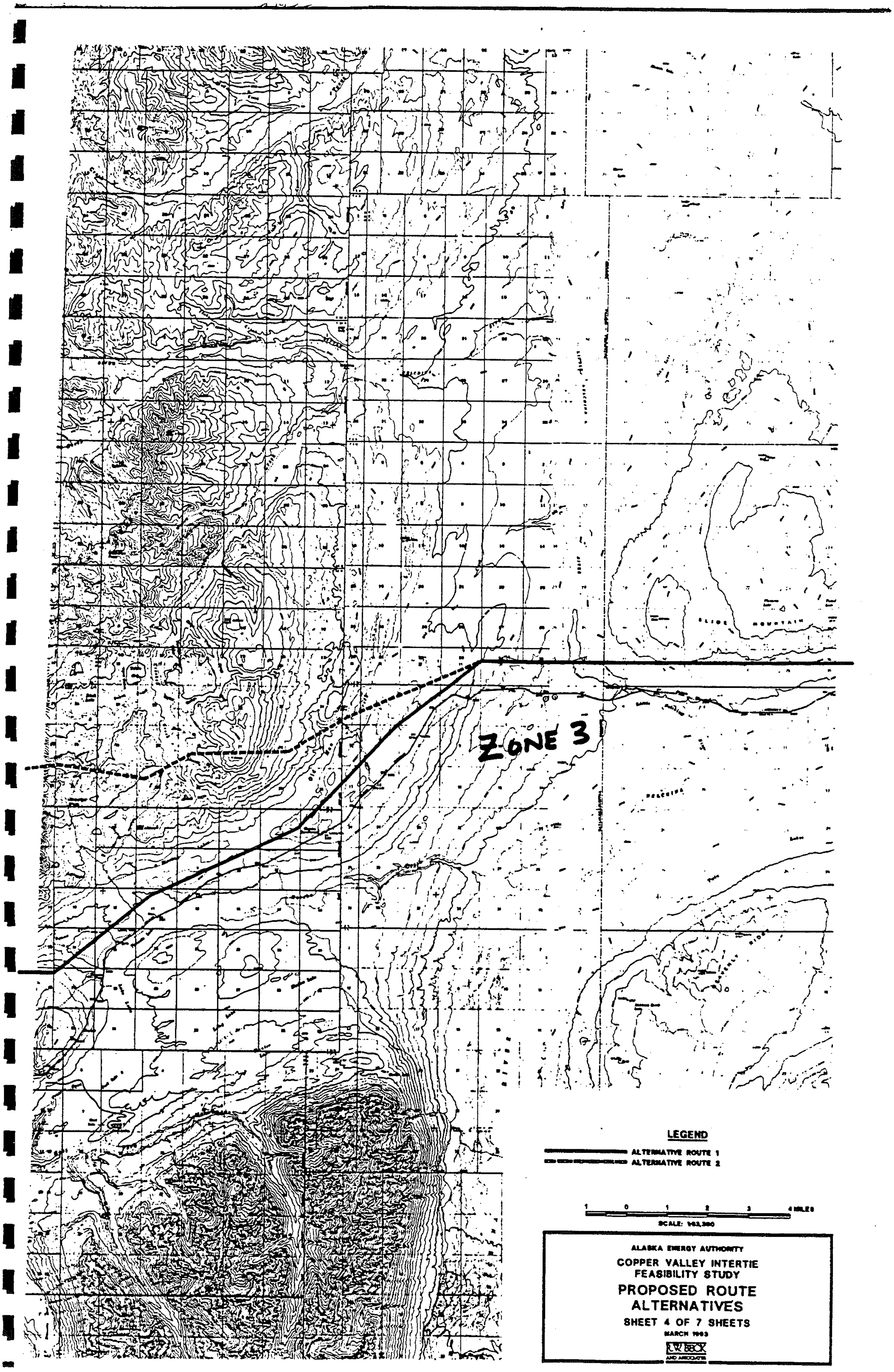
MLF:jj
FEASSTDY.PH1

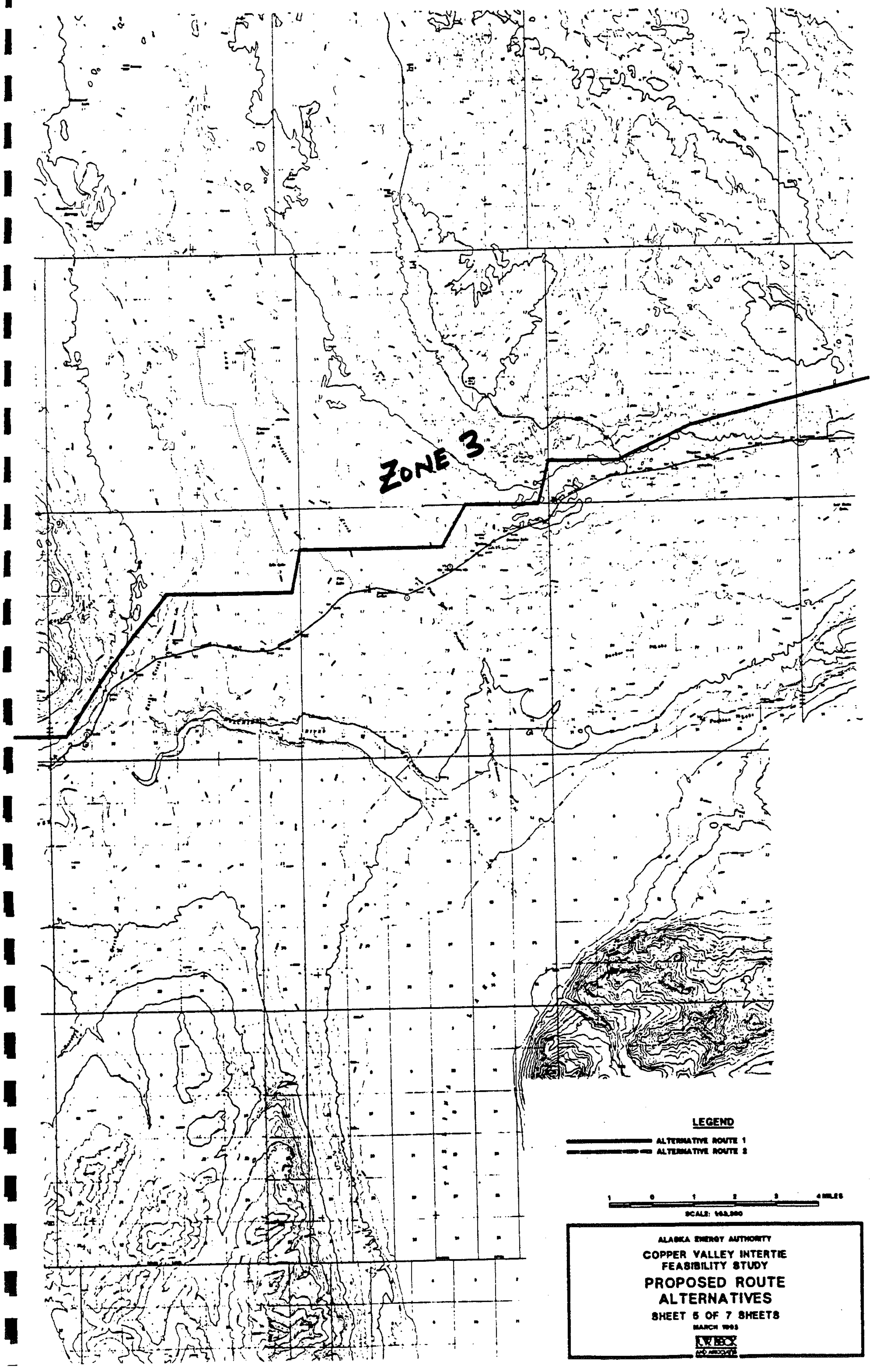

ZONE 1
RIVER
LEGEND
ALTERNATIVE ROUTE 1
ALTERNATIVE ROUTE 2
1 0 1 2 3 4 MILES
ALASKA ENERGY AUTHORITY
COPPER VALLEY INTERTIE
FEASIBILITY STUDY
PROPOSED ROUTE
ALTERNATIVES
SHEET 1 OF 7 SHEETS
R.W. BECK
AND ASSOCIATES

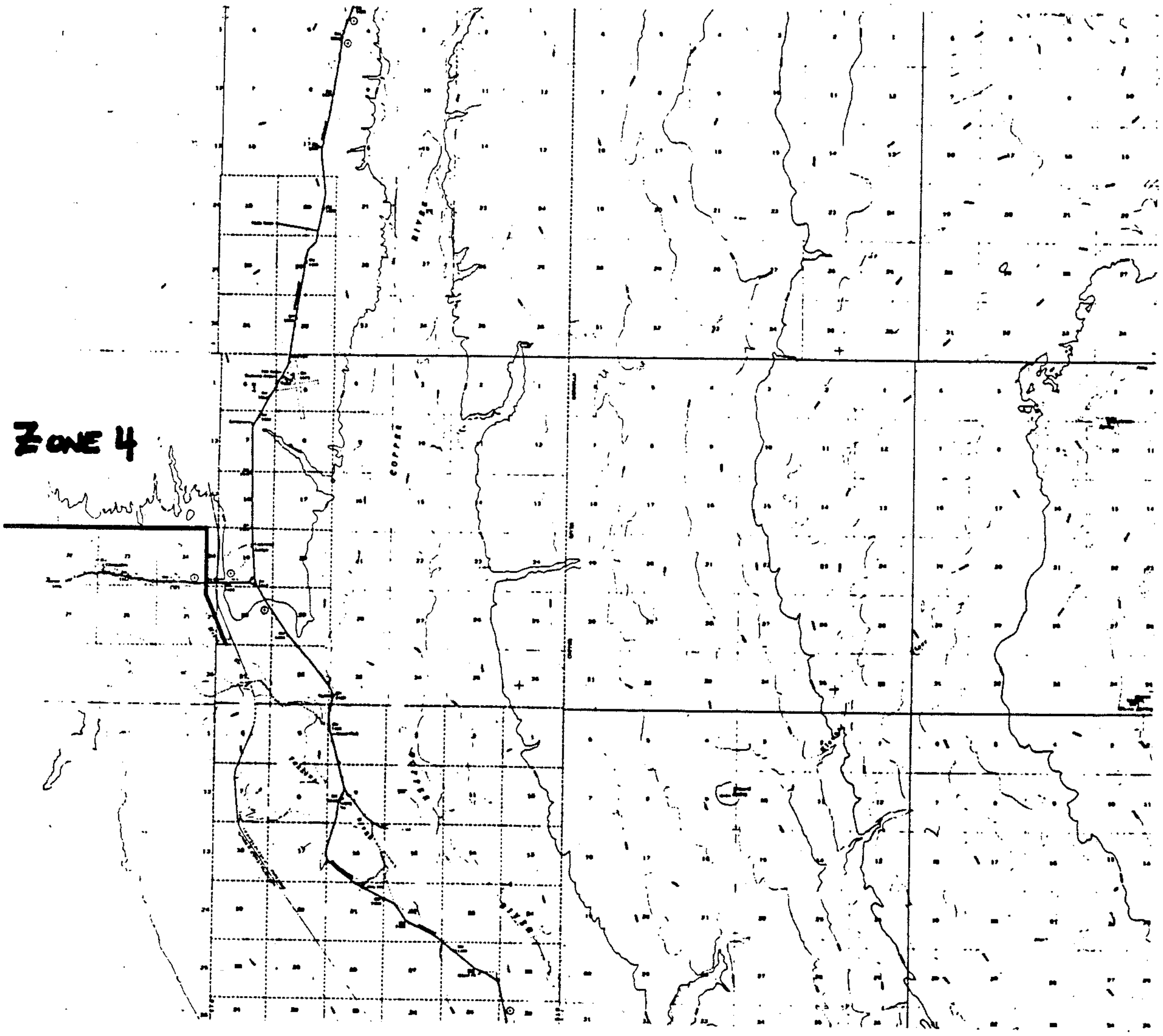

ZONE 1
TALKEET
ANTHRACITE
CHUGAC
LEGEND
ALTERNATIVE ROUTE 1
ALTERNATIVE ROUTE 2
ALASKA ENERGY AUTHORITY
COPPER VALLEY INTERTIE
FEASIBILITY STUDY
PROPOSED ROUTE
ALTERNATIVES
SHEET 2 OF 7 SHEETS
MARCH 1993
R.W. BECK
AND ASSOCIATES



ZONE 1
ZONE 2
MOUNTAINS
MOUNTAINS
LEGEND
ALTERNATIVE ROUTE 1
ALTERNATIVE ROUTE 2
1 0 1 2 3 4 MILES
SCALE: 1:63,360
ALASKA ENERGY AUTHORITY
COPPER VALLEY INTERTIE
FEASIBILITY STUDY
PROPOSED ROUTE
ALTERNATIVES
SHEET 3 OF 7 SHEETS
MARCH 1983
R.W. BECK
AND ASSOCIATES


ZONE 3
SLIDE MOUNTAIN
LEGEND
ALTERNATIVE ROUTE 1
ALTERNATIVE ROUTE 2
ALASKA ENERGY AUTHORITY
COPPER VALLEY INTERTIE
FEASIBILITY STUDY
PROPOSED ROUTE
ALTERNATIVES
SHEET 4 OF 7 SHEETS
MARCH 1993
R.W. BECK
AND ASSOCIATES


ZONE 3
LEGEND
ALTERNATIVE ROUTE 1
ALTERNATIVE ROUTE 2
1 0 1 2 3 4 MILES
ALASKA ENERGY AUTHORITY
COPPER VALLEY INTERTIE
FEASIBILITY STUDY
PROPOSED ROUTE
ALTERNATIVES
SHEET 5 OF 7 SHEETS
R.W. BECK AND ASSOCIATES



LEGEND

ALTERNATIVE ROUTE 1

ALTERNATIVE ROUTE 2

1 0 1 2 3 4 MILES

SCALE: 1:63,360

ALASKA ENERGY AUTHORITY

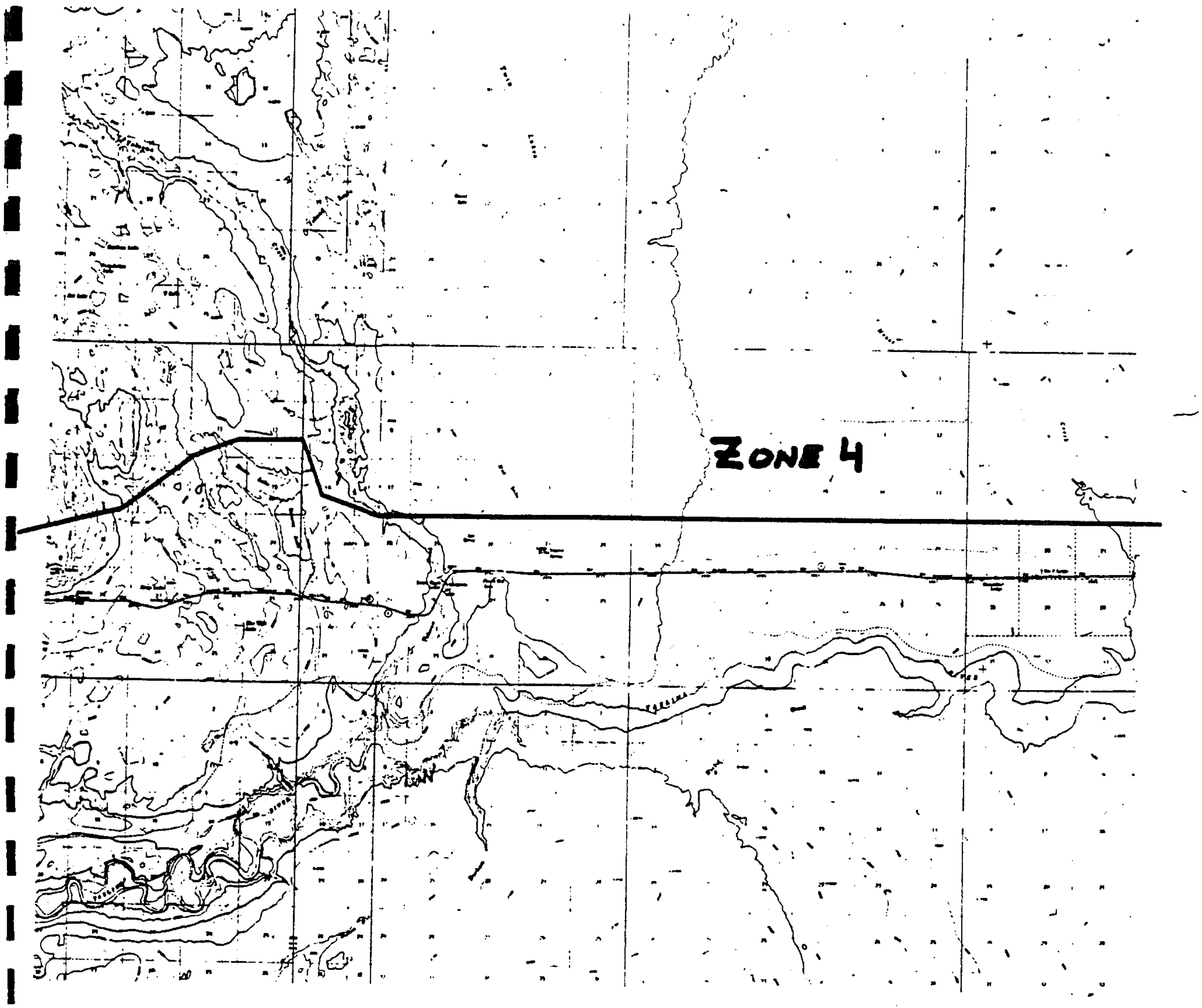
COPPER VALLEY INTERTIE
FEASIBILITY STUDY

**PROPOSED ROUTE
ALTERNATIVES**

SHEET 7 OF 7 SHEETS

MARCH 1983

R.W. BECK AND ASSOCIATES



LEGEND

ALTERNATIVE ROUTE 1
ALTERNATIVE ROUTE 2

1 0 1 2 3 4 MILES

SCALE: 1:63,360

ALASKA ENERGY AUTHORITY

COPPER VALLEY INTERTIE
FEASIBILITY STUDY

PROPOSED ROUTE ALTERNATIVES

SHEET 6 OF 7 SHEETS

MARCH 1993

R.W. BECK AND ASSOCIATES

EXHIBIT F-2

Matanuska Electric Association, Inc.

P.O. Box 2929
Palmer, Alaska 99645
Telephone: (907) 745-3231
Fax: (907) 745-9328

RECEIVED
OCT - 1 1993
R.W. BECK & ASSOC
SEATTLE WA

ACTION COPY
File ww 1559 ITA1 AB
Code 3101.4

September 29, 1993

Mr. Richard Emerman
Senior Economist
Alaska Energy Authority
P.O. Box 190869
Anchorage, Alaska 99519

Dear Mr. Emerman:

Subject: Proposed Sutton to Glennallen Intertie

It was recently pointed out to me by Mr. P. J. Sullivan, President of Land Field Services, Inc., that the proposed routes through the Talkeetna Mountains between Sutton and Eureka Lodge cross numerous unpatented mining claims. Most of them occur in the various drainages including Chickaloon River, Boulder Creek, Hicks Creek, Chitina Pass, Caribou Creek, Squaw Creek, Crooked Creek and others.

As a favor, Mr. Sullivan obtained and gave to me photo copies of index maps from the Alaska Division of Mines office in Fairbanks for the general area of the transmission line alternative routes. The maps depict those sections of land containing unpatented mining claims, and are useful in giving a general picture of the locations where claims are concentrated. Further investigation of the records at the Division of Mines would be required to get more specific information on locations and to identify the claimants.

I have consolidated and reproduced the maps into a single sheet by cutting and pasting, and highlighted the outlined sections that appear to be in the general areas of the various route alternatives. A copy is attached for your information. It should be noted that most mining claims are a maximum of 20 acres in size (individual claims on Federal land), but some can be as large as 40 acres (association claims on Federal land and individual claims on State land). Therefore, judging from the number of 640 acre sections that are shown on the maps as containing claims, there could be as many as several hundred claims either crossed by, or in the immediate vicinity of, the transmission line alternative alignments as they presently exist.

One reason I am bringing this to your attention is in case you may want to include the mining claimants on your mailing list for notifications of future public meetings on the transmission line. As mentioned above, the best source of information on identities of the claimants is the Division of Mines office, which is located in Fairbanks, since, as I understand it, the neither the U. S. Bureau of Land Management nor the Alaska Division of Land maintain complete or accurate data on unpatented mining claims in their public records.

Another factor to consider is that, because a mining claimant has a possessory interest in the land comprising the claim, easement rights need to be negotiated and acquired from the claimant if the transmission line right of way crosses the claim. With knowledge of the specific locations of the claims, a good many of them could no doubt be avoided through a fine tuning of the alignment. However, it appears that some are unavoidably going to be crossed and this should be kept in mind in assessing the right of way acquisition efforts for the line.

Sincerely,

Robert G. Ylvisaker
Right of Way Administrator

BY.418
Enclosure
cc: Ken Ritchey, MEA General Manager, w/enclosure
Clayton Hurless, CVEA General Manager, w/enclosure
Bob Mau, MEA Director of Engineering, w/enclosure
Paul Dorvel, R. W. Beck, w/enclosure

EXHIBIT F-3

RECEIVED
JUN 17 1993

RED CARLOS CONTRACTING, INC.
P.O. BOX 770418
EAGLE RIVER, ALASKA 99577
TELEPHONE (907) 694-2160

Contact Red Carlos at 6/29-6/30
917-766-2891
→ 1-800-354-6009
room 11
Eagles Nest Hotel
Haines, AK

ACTION COPY

File ____
Code 3109.2

16 June 1993

R. W. Beck & Associates Inc.
2101 Fourth Ave., Suite 600
Seattle, Washington 98121-2375

Attn: Paul Dorvel

Subject: Alaska Energy Authority
Copper Valley Intertie Feasibility Study
Sutton-Glennallen 138 kV Transmission Line
Right-of-Way Clearing and Treatment

Avg. Speed 1-1.5 mph
Swath about 12-14'
Crews for 3 R.C. ~6-7 persons total
1, 2 or 3 shifts to take advantage of seasons/windows
Amount brush, delimb, debark critical to cost.

Dear Paul:

The following is some suggestions and information that may help out with the above listed project. I have lived in this state since 1960 and have hunted these areas in the past and am somewhat familiar with the terrain. Without flying and visually looking over the proposed routes and not knowing the specific specifications, you would have to use a percentage exclusion for non cleared terrain. I have came up with these estimated costs and suggestions.

A few suggestions for bidding specifications and assuming this will be Davis-Bacon pay scale. PRE QUALIFY THE CONTRACTOR. Low bidder not necessarily awarded the contract. After reviewal of bidders operational plans, time frame, organization plan, key personnel resume's, staffing plan and equipment available to complete the contract, etc.

Minority quota applies, also ten (10) percent allowance for in State Contractor with reference and with over 5 - 7 years experience.

TYPES OF CLEARING OPTIONS;

(1) <u>SPRUCE</u>: Logs shall be cut into 10 foot maximum length sections. Sections shall be scattered (not piled) in open areas on the right-of-way to permit rapid drying to prevent barkbeetle outbreak. Sections shall not be covered by slash, brush, or other residue.

(2) <u>All other tree species</u>: Logs shall be cut in 10 - 15 foot sections and left scattered to permit rapid drying.

(3). Removal of brush and immature trees will be accomplished by any of the following three methods. (1) Spreading and scattering in the adjacent brush area's without damaging other trees. (2) Chipping and scattering in such a way as to preclude their being washed into any water course. (3) Burning practices established by the Alaska Department of environmental conservation. Burning permit shall be obtained from appropriate agencies.

The Contractor shall attempt to avoid letting any brush enter water way. In the event brush is deposited in a waterway, the Contractor shall remove all brush deposited in the waterways and dispose of it by spreading and scattering in the surrounding forests, or if chipped, on the surrounding ground.

(4) All tree species Roller Crushed, Hydro Axed of Chain Sawed into 24 inch length sections. Sections shall be scattered (not piled) in open areas of right-of-way to permit rapid drying to prevent barkbeetle outbreak.

Note: The Roller Crusher, Hydro Axed of Chain Sawed 24 inch length concept for Zone 3 & 4 (combined) and possibly parts of Zone 1 & 2 left in place would be the most economically and fastest method. The Roller Crushed 24 inch length could be ran over more than once doing a pulverizing affect of down debris at a more efficient cost in lieu of burning. I personally feel that burning would increase the cost. Pictures of the Roller Crusher's effect are enclosed and we also have a factory video available of the Roller Crusher's concept and production if interested.

Using types 1 & 2 of clearing and possibly leaving the timber full length, de-limbed and scattered over the right-of-way in Zone's 1 & 2 would leave usable timber easier to harvest for the local residents or public usage with equipment to transport.

I would also like to suggest the bid units be broken into three/Four separate bid units. Zone 1, Zone 2 and Zone 3 & 4 combined. The three separate units to be bid on would make more equipment available, bonding easier and a better time frame for completion over the long distance of the right-of-way to be cleared.

673 acres straight calc. 1.11

<u>ZONE</u> 1 (yellow) Estimate 37 miles & approximately 605 acres. Recommend: 100% lop and limb. Recommend: Types of clearing to be used: 1, 2, 3 & 4 would easily apply. Burning not feasible due to terrain conditions and logistic support. Burning is possible, however would run the cost up. Year around clearing could not be counted on due to heavy snowfall through out the mountainous terrain. Recommend: Full length delimbed timber left for local residents and public. Combination equipment and hand clearing; Estimated cost $2,117,500 - $2,964,500.

3500/ac - 4900/ac

491 5+ 1.08

ZONE 2 (red) Estimate 27 miles & approximately 455 acres. Recommend: 100% lop and limb. Recommend: Types of clearing used 1, 2, 3 & 4. Burning not feasible due to terrain conditions and logistic support, however possible, would run the cost up. Year around clearing could not be counted on due to the heavy snowfall through out the mountainous terrain. Recommend: Full length delimbed timber left for local residents and public. Combination equipment and hand clearing, Estimated cost: $1,575,500 - 3463/ac $2,180,500 4792/ac

873 1.11

ZONE 3 (green) Estimate 48 miles & approximately 785 acres. Recommend: Types of clearing to be used 4. Burning feasible, cost would increase. Roller Crusher, Hydro Axed, Chain Sawed more efficient. Winter frozen ground ideal conditions. Contractor select time frame: Estimated cost $1,962,500 - $2,983.000 2500/ac 3800/ac 436 1.12

ZONE 4 (blue) Estimate 24 miles & approximately 388 acres. Recommend: Types of clearing to be used 4. Burning feasible, cost would increase. Roller Crusher, Hydro Axed, Chain Saw more efficient. Winter frozen ground, ideal conditions. Contractor select time frame. Estimated cost $970,000 - $1,484,400. 2500/ac 3826/ac

If you need additional information, please advise.

Regards,

RED CARLOS CONTRACTING, INC.

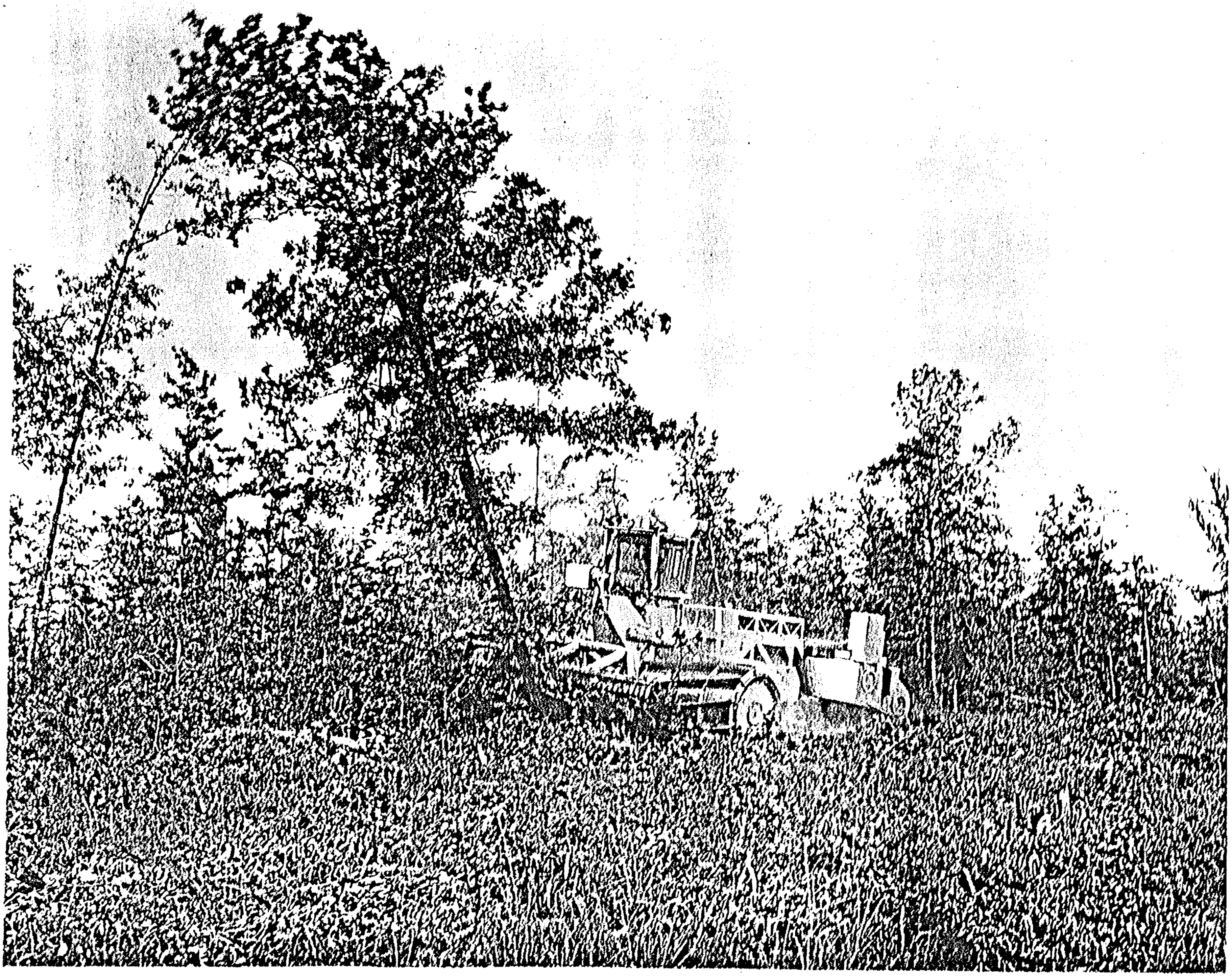
H. L. Carlos

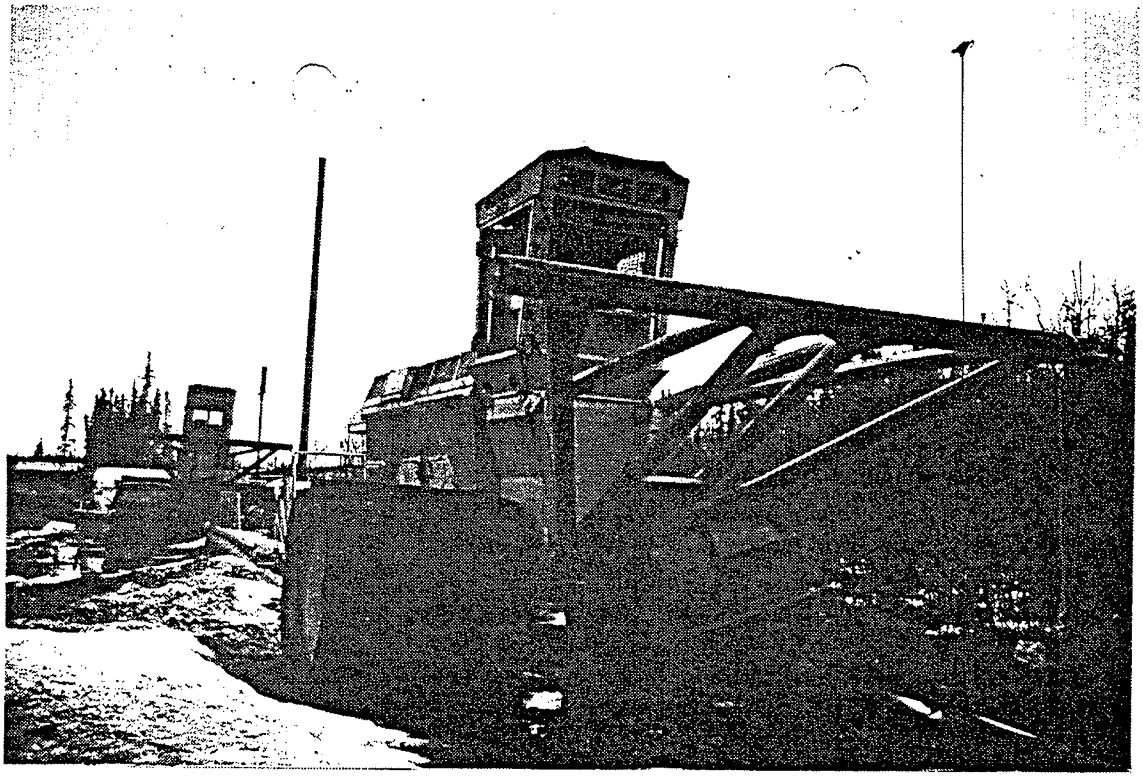
H. L. "Red" Carlos
President

HLC/dmh

encl's

Zone 3 & 4 Type Vegetation
One Roller Crush Pass





LeTourneau Tree Crusher Model 3523

Sample of an Alaska job several months after work completed

EXHIBIT F-4

Alaska Department of NATURAL RESOURCES

Fact sheet: MENTAL HEALTH LAND SETTLEMENT

Division of Land • August, 1991

On June 19, 1991, Governor Hickel signed Senate Bill 65 into law. This law, known as the Alaska Mental Health Trust Settlement Act, proposes a settlement of Weiss v. State of Alaska for the plaintiffs and court to accept. The settlement would reconstitute the mental health land trust created by the Alaska Mental Health Enabling Act of 1956.

Background: Prior to statehood, Alaska was granted title to one million acres of federal land to generate revenue to support Alaska's mental health programs. Over the next ten years, land with high income-producing potential was selected to fulfill this trust entitlement. The original trust lands included coal and mineral deposits, commercial forests and agricultural areas. Additional land was selected in and around existing communities to allow growth and to return income to the trust.

As Alaska's population increased, some Alaskans wanted certain of these lands for non-income-producing activities such as parks, municipal expansion and public facilities. In 1978, the legislature waived the trust status of mental health trust land, and redesignated it as general statehood grant land. In return, the legislature was to appropriate 1.5 percent of all income from state lands to the Mental Health Trust Fund.

No appropriation was made, and in 1982, mental health advocates sued the state (Weiss v. State of Alaska, 4FA-82-2208 Civ.). The suit went to the Alaska Superior and Supreme Courts over the next few years. The Supreme Court ruled in favor of the plaintiffs and ordered the state to "reconstitute, as nearly as possible the holdings which comprised the trust when the 1978 law became effective." The 1990 legislature passed a bill providing a revenue stream to the trust. The plaintiffs considered this only a partial solution and, at their request, in July 1990, the court placed an injunction on all activities and conveyances of title to the original mental health trust land.

It was against this background that SB 65 was crafted by the Hickel administration, the plaintiffs' attorneys, and the 1991 legislature.

The Mental Health Trust Lands Settlement Act establishes an independent Mental Health Trust Authority made up of financial managers appointed by the Governor (after considering nominations by groups representing beneficiaries of the trust) to manage the assets of the trust. It reconstitutes the land trust with all unencumbered land from the original mental health trust and provides replacement land through an exchange process for land conveyed out of the trust. While the Mental Health Trust Lands Settlement Act has become law (Ch. 66, SLA 1991), it is not yet in effect. It will only become effective upon dismissal of Weiss v. State by the Superior Court and the expiration of the time for appeal. Although many questions remain about how the Act will be implemented, this fact sheet gives a general description of how the state will fulfill its obligation to reconstitute the mental health trust.

What lands are available for transfer to the trust?

The Act establishes three categories of lands that can be returned to the trust: (1) certain **original mental health lands;** (2) other state lands to be conveyed to the trust in exchange for original mental health lands not returned to the trust; and (3) **"hypothecated lands"**–lands held as security–that can be transferred to the trust if the state does not make the trust whole within the time specified under the Act.

How much of the original mental health land is available to return to the trust?

More than half of the original one-million acres is available for return to the trust. Land without permits or leases, land leased for oil and gas or coal development, land with current timber contracts, rights-of-way, and land with other encumbrances acceptable to the plaintiffs will be returned to the trust. Land selected under the Municipal Entitlement Act but not yet conveyed will or formally approved for conveyance also return to the trust.

What original mental health land will not be returned to the trust?
Under the Act, land sold to individuals, transferred to a municipality under the Municipal Entitlement Act, and land within legislative designations such as parks and refuges will not be returned to the trust. However, the legislation requires that the original mental health land now within the Haines and Tanana State Forests be returned to the trust. In addition, some lands with long-term use authorizations not specifically listed in the bill are being reviewed by the plaintiffs to see if they are acceptable to be returned to the trust.

What state land is being considered for exchange?
The potential exchange land parcels will be chosen on the basis of similarity to the original trust lands. These parcels should be as similar as possible in character (including terrain, use, location, income and development potential, and accessibility) to the land not being returned to the trust. The land will be exchanged on an equal value basis. The exchanges will be negotiated solely between the commissioner and the plaintiffs in the lawsuit. State tide and submerged land, land within legislative designations and School Trust Lands are not available for exchange.

When will the trust be reconstituted?
The Act specifies that the reconstitution process be completed by December 1, 1994.

What is the Hypothecated Lands List and what is its purpose?
"Lands Hypothecated to the Mental Health Trust, May 1991" in the Act, is a pool of land pledged to the trust without transferring possession or title, and works as security for the land compensation to the trust. If the state does not complete the exchange process by the time specified in the Act, the plaintiffs can have the court "foreclose" appropriate land from the hypothecated lands list and transfer it to the trust.

Department of Natural Resources staff worked with the plaintiffs in the Mental Health Land Trust litigation to assemble this land pool. The land on the hypothecated list will either be used as replacement or exchange lands, or released from the list as exchanges are accomplished.

What lands are on the Hypothecated Lands List?
As with the exchange lands, the hypothecated land pool is primarily made up of land similar to the original trust land. It includes subdivision lots; large tracts of land such as the Willow Capitol site; land with timber or mineral resources; land designated for settlement in area plans; land with existing commercial leases; and land with mental health facilities such as the Alaska Psychiatric Institute in Anchorage and the Fahrenkamp Center in Fairbanks. The complete Hypothecated Lands List is available for inspection at the Department of Natural Resources offices noted below.

If a property is on the hypothecated list, what impact will that have on Department of Natural Resources management decisions?
Although inclusion in the hypothecated list precludes the sale of the parcels, it does not place an injunction on these lands. The department must manage these lands so that their value is not diminished, but this does not preclude development. The department will continue to manage all land in the pool under these guidelines until specific parcels are either conveyed to the trust or released from the list.

Will unsold lots, access lands and/or public or common lands in state subdivision disposals be put in the pool as exchange lands?
Unsold subdivision lots which would otherwise be available for sale "over-the-counter" will be available as exchange land. Not available will be rights-of-way and public or common land which are considered part of the subdivision.

Does the state have sufficient land to reconstitute the trust on a comparable character and equal-value basis, and still meet the other land needs of the state?
Yes. The state's vast holdings (85 million acres not including tide and submerged land), which will soon be augmented by the state's final statehood land selections (an additional 20 million acres), should be sufficient to answer all of the state's needs. The state has more than 76 million acres of land currently available for exchange.

What public notice requirements apply to the transfer of lands into the trust?
The Commissioner of the Department of Natural Resources must give 30 days public notice in local and statewide newspapers and other methods specified by law. These additional requirements can be found in Alaska Statute 38.05.945 (b) and (c). The purpose of the notice is to announce the pending transfers of original mental health land or to announce the decision of the commissioner and the plaintiffs with respect to exchange land. Public hearings are not contemplated in the Act.

What factors will be considered in selecting land for exchange?
The Act specifies that the lands to be exchanged must be of comparable character and equal value. Additional factors to be considered in selecting land for exchange are the resulting diversity of both the trust and state land portfolios, revenue generating potential for the trust, public benefits to both the trust and to the state, and resulting efficiencies of land management. The actual process for these considerations has not yet been determined, but there will be a reviewable administrative record.

Does the commissioner have to reclassify lands or amend land-use plans in order to convey land to the trust?
No. Land-use plans will eventually be amended to reflect the change in land status. When lands currently covered by land-use plans are conveyed to the trust, the lands are exempt from the area plan provisions.

After land is transferred to the Trust, what public notice requirements will apply to decisions made by the Alaska Mental Health Trust Authority?
The Trust Authority must give 30 days notice in statewide and local newspapers and by other methods specified in the law before taking an action. These additional requirements can be found in Alaska Statute 38.05.945 (b) and (c).

Do multiple use requirements on state lands apply to management of the trust?
No. The purpose of the trust is to generate revenue to meet the expenses of its beneficiaries.

For more information, or to review the complete Hypothecated Lands List, contact one of the DNR offices listed below:

Department of Natural Resources
Division of Land

Southcentral Regional Office
3601 C Street, Suite 1080
P.O. Box 107005
Anchorage, AK 99510-7005
(907) 762-2492

Southeast Regional Office
400 Willoughby Avenue, 4th Floor
Juneau, AK 99801
(907) 465-3400

Northern Regional Office
3700 Airport Way
Fairbanks, AK 99709
(907) 451-2700

3.6 Surveying and Mapping

In order to make timely deliveries to R. W. BECK, careful considerations were given to the following in determining the work sections: Flight strip layouts, available horizontal and vertical control with respect to necessary project control, access and estimated degree of difficulty for the centerline staking, and estimates of where a photogrammetric profile, versus field profile could reasonably be obtained. It is *GERA's* intent to deliver survey data in approximate ten (10) mile segments corresponding to flight lines throughout the duration of the project.

It is understood that the ALASKA ENERGY AUTHORITY requires a split-sheet plan and profile map with a photo-map base for the plan map portion. *GERA* proposes the use of an orthophoto map base rather that an average scale (rectified) photo base. Orthophoto maps provide an accurate mapping base for the planimetric mapping features since orthophoto maps are prepared to comply with National Map Accuracy Standards. At a scale of 1 inch = 200 feet, any planimetric feature can be scaled on an orthophoto map to within five (5) feet of its true position. Planimetric drafting features, e.g. transmission line centerline, right-of-way lines, property lines, etc. can be easily and accurately superimposed over the orthophoto image.

The scale of average scale photo bases varies depending on elevation and the proximity of the feature to the center of the photograph or to the overlap of photo images. Planimetric drafting features must be "warped" to provide an accurate relationship to the photo image. For these reasons, the proposed photogrammetric engineering specifications are designed to produce orthophoto images.

Survey field work will commence with the establishment of horizontal and vertical control stations every two (2) miles along the alignment and at angle points. Horizontal and vertical control will also be established for "wing" control points approximately 1,500 to 2,000 feet on both sides of the line every four (4) miles. Control stations and "wing points" will also be established at the end of each flight line. Aerial targets (panels) will be placed on each of the control stations, angle points, and "wing points". Control stations will be limited to public road rights-of-way to mimimize the need for permission from landowners to survey on private ownerships.

Needs thought.

Aerial photography will be scheduled immediately after all panels have been placed. GPS Control surveys will also be initiated at this time for all paneled control stations.

Cadastral retracement surveys will begin immediately after completion of control surveys. A diligent search will be made of all section, quarter section, and property corners lying on each side of the proposed transmission line alignment. All monuments found will be tied into the control network.

After completion of structure spotting by R. W. BECK, the transmission line centerline and structure locations will be staked on the ground. Structure site studies, span clearance checks, supplemental topographic data, and additional property ownership data will be obtained at that time.

Drafting layers of the control network; section, quarter section, and property lines; property ownerships; pertinent topographic features; and, utility, highway and railroad crossing data will be prepared for inclusion on the photo plan and profile maps. Drafting will be completed in an orderly, sequential manner for each work section to facilitate design engineering by R. W. BECK.

3.6.2. Proposed Aerial Photography Specifications

3.6.2.a. Flight Plan, Coverage, and Scale

Photography will be flown at a scale of 1:12,000 for profiling and photo plan work resulting in a photo scale of one inch equals 1,000 feet. In all cases the flight strips will be laid out to achieve maximum economy in both the number of strips and the number of exposures.

The photography will be exposed when the sun is more than three hours above the horizon and under conditions when weather, ground, and lighting are such that the negatives will be satisfactory for photogrammetric applications.

The photographic negatives will be processed using automatic processing equipment and will be inspected for quality, overlap, and completeness of coverage, prior to use in any compilation operations.

3.6.2.b Technical Specifications

The aerial photography will be performed in conformity with national standards as published by the U.S. Geological Survey "Standard Specifications for Aerial Photography for Stereoplotting Instruments".

The performance of the aircraft, crew, and the equipment shall be adequate for the completion of the project in accordance with the specifications and shall conform to all official regulations and ordinances.

The flight strips will be flown at the altitude of 6,000 feet above mean ground. Eastman estar base aerial film or equivalent with a fine grain emulsion will be used. Processing will be done in accordance with standard practice to ensure that the negatives are suitable for use in photogrammetric processes. Each aerial photograph will be clearly marked with identifying numbers. Contact prints from the vertical photographic negatives shall be made on Kodak Poly R.C. paper, or equivalent, size approximately 9" x 9". Adequate grades of contrast emulsion will be used to bring out all details of the negatives.

A Zeiss or Wild, 6-inch focal length, precision aerial mapping camera will be employed. The camera will be equipped with an eight fiducial format, as required to obtain high accuracy results in analytical photogrammetric processes.

Any series of two or more consecutive photographs crabbed in excess of five (5) degrees as measured from the line of flight will be considered unsatisfactory and will be cause for rejection of that particular flight strip.

The overlap will be sufficient to provide full stereoscopic coverage. All the area appearing on the first and last negative in each flight line extending over a boundary will be outside the boundary of the project area. A photography strip along a boundary will extend over the boundary not less than fifteen (15) percent or more than fifty-five (55) percent of the width of the strip.

The endlap will not average less than fifty-seven (57) percent. Endlap of less than fifty-five (55) percent or more than seventy (70) percent in one or more negatives will be cause for rejection of the negative or negatives in which such deficiency or excess of endlap occurs. Wherever there is a change in the direction of the flight lines, vertical photography on the beginning of a forward section will give complete stereoscopic coverage of the area contiguous to the forward and back section.

Tilt of any negative by more than three (3) degrees, an average tilt of more than one (1) degree for the entire project, or tilt between any two successive negatives exceeding four degrees will be cause for rejection.

A photo map index will be prepared by plotting photocenters on quadrangles of the route. This map will be furnished on a transparent material suitable for reproduction.

3.6.2.c Orthophoto Plan Sheets

Orthophoto images will be generated as a mapping base for the split sheet plan and profile maps. The orthophoto image at a scale of 1 inch = 200 feet will be generated on Wild OR-1 equipment from data scanned (subdigital terrain data) on analytical stereoplotters from 1:12,000 aerial photography. Each orthophoto plan sheet will cover an area approximately 6,400 feet long by 2,000 feet wide and will be placed on the upper portion of the plan and profile sheet.

The lateral edges of all photo images will be parallel to and centered on the centerline of the alignment, and provision will be made to provide a minimum image overlap of two (2) inches at both the forward and back edge of the sheet as related to alignment stationing. Special handling will be required at angle points, and depending upon the size of the delta angle, the imagery at angle point locations may not extend throughout the next boundary limits.

3.6.2.d Aerotriangulation

Supplemental horizontal and vertical control for photogrammetric processes, for paneled section corners, if any, and for other field paneled locations will be established by aerotriangulation methods on the Kern DSR Analytical Stereoplotter, or equivalent. A minimum of six photo control points shall be provided for each stereo model. The span between basic control points shall not exceed approximately six models for horizontal and three for vertical.

Aerotriangulation will be performed and adjusted according to standard procedures to yield minimum accuracies of 1 part in 10,000 of the flight height for horizontal positions and 1 part in 8,000 of the flight height for vertical. All aerotriangulation will yield accuracies sufficient to allow performance of the various photogrammetric processes within required and stipulated tolerances.

3.6.2.e Photogrammetric Engineering, Manuscripts, and Profile Measurement

Upon receipt of segments of control survey data, the data will be computed for the Alaska Coordinate System. The alignment will be expressed in terms of both coordinates and stationing, as appropriate for subsequent profiling and photo processing. Horizontal distances computed on sea level datum will be transformed by factor to conform to actual surface lengths as appropriate, changing the factor for predetermined elevation segments within the overall alignment.

Manuscripts

Photo manuscripts will be generated at the scale of 1 inch = 200 feet to fit a three model format (angle configuration permitting), plotting all basic control, supplemental control, and paneled locations, on a five (5) inch rectilinear grid, based on the Alaska Coordinate System. The centerline of the alignment will also be plotted and appropriately identified on the manuscripts, together with angle points.

Each manuscript will be identified at both ends by number and annotation, showing the stationing traversed and the photographs covered.

All manuscript compilation will be performed on the Kern DSR Analytical Stereoplotter, or equivalent, by operators thoroughly experienced in transmission line survey and mapping.

Manuscripts will be provided on 3.5 inch Floppy Disks in an *AutoCAD®* compatible format. Layering conventions will be strictly observed.

Profile Data, Digitizing, and Plotting

The 1:12,000 photography will be used for profiling. Kern DSR Analytical Stereoplotters, or equivalent, and special profile alignment software will be used in conjunction with the previously described field control alignment computations to generate the digitized profile. Profiles will be measured on centerline and 35 feet right and left of centerline at 100 foot intervals and at all breaks. Measurements will be accurate horizontally and vertically to insure that no two adjacent points will vary more than two (2) feet relative to each other, and all points will be within ± two (2) feet of their true position. In the event a side slope extending upward from the outside conductor exceeds thirty (30) degrees, elevations will be determined at a minimum of fifty (50) feet from the conductor line.

Plotted profile will be provided in an *AutoCAD®* compatible format on continuous plots, at a scale of 1 inch = 200 feet horizontal and 1 inch = 20 feet vertical.

3.6.2. Horizontal and Vertical Control Surveys

A control data search along with a field examination will be made of all available NGS and USGS control stations along the transmission line route. A complete plan of the desired control layout will be prepared, including all data for closing the transmission line survey to the NGS or USGS control network. This will be furnished to the field survey crews before beginning any field work.

Horizontal control will be based on the Alaska Coordinate System, NAD 83, and shall meet the Federal Geodetic Committee Standards for Second Order, Class II Surveys. Vertical control will be based on NAVD 88 and shall meet the Federal Geodetic Committee Standards for Second Order, Class II Surveys.

Survey field work will commence with the establishment of horizontal and vertical control stations where practical every two (2) miles along the alignment and at angle points. Horizontal and vertical control will also be established for "wing points" approximately 1,500 to 2,000 feet on both sides of the line every four (4) miles. Control stations and "wing points" will also be established at the end of each flight line. Aerial targets (panels) will be placed on each of the control stations, angle points, and "wing points".

Horizontal and vertical control will be closed to NGS and USGS datum along the transmission line route. These closures will be made in the most practical manner as determined by field reconnaissance, but will not exceed eight (8) lineal miles of the alignment.

All control stations will be monumented with a 5/8" diameter x 30" long iron pin driven flush with the ground. A metal cap will be driven on top of the iron pin and clearly marked with its identity number. Two (2) 1/2"x 18" stakes with the tops painted with fluorescent red paint will be set over each control point monument and marked for identity.

Alaska State Coordinates and Geodetic Coordinates will be determined on all primary control stations utilizing Global Positioning System (GPS) satellite survey methods. *GERA* proposes to perform control surveys by employment of proven technology with a tested system. The program will be conducted by an experienced team of surveyors and technicians who are well versed in the application of GPS techniques in transmission line location.

GPS observations will be collected utilizing the Trimble 4000ST GPS Field Surveyor System®. For this project, *GERA* will utilize four 4000ST receivers, thus occupying one known point and three unknown points simultaneously. The GPS survey traverse network will optimize the use of manpower and equipment. The GPS survey traverse network design will incorporate sufficient redundancy and adequate ties to NGS and USGS control stations and benchmarks. The additional GPS baselines required for this purpose will not cause a significant increase in observation time. Selection of GPS sites free from significant obstructions and multi-path conditions, adequate observation periods, and attention to centering and antenna height measurements are of utmost importance in assuring the accuracy of the GPS survey traverse network.

GERA utilizes Trimble's *TRIMVEC-PLUS GPS SURVEY SOFTWARE®* that enables the surveyors to calculate satellite visibilities for mission planning; load survey data from the 4000ST receivers to a computer; process the initial interstation vectors and baseline computations using triple- and double-difference techniques; test quality of results; and, perform utility functions such as transformations and loop-closure tests. Following baseline computations and the satisfactory resolution of all misclosures, Trimble's *TRIMNET SURVEY NETWORK SOFTWARE®* will be utilized to compute an adjustment of the GPS traverse.

The GPS observational data and "to-reach" descriptions will be coded in the special GPS format specified by the NGS.

Supplemental control survey field measurements will be taken with a Wild T-1600 Electronic Theodolite and Wild DI-5 Electronic Distance Meter and recorded automatically in a Wild GRE-4 Electronic Data Collector. Field data will be collected in a method especially designed to facilitate analysis. The field data collection files will be output on durable paper for a permanent record. A complete sketch of the traverse will be shown.

All observations will be made directly to one (1) second of vertical and horizontal arc, with estimation made to one-half (1/2) second of arc. Four (4) sets of observations will be taken at each control point using the "closed horizon" method in each case. All zenith angles will be double sighted and recorded with the telescope direct and reversed.

All distances will be measured with an electronic distance measuring instruments and will be observed and recorded twice. The mean of the two (2) observations will be used.

All distances and zenith angles will be reciprocated from station to station to assure strict horizontal and vertical closures.

Angular error of closure of any control traverse will not exceed ten (10) seconds of horizontal arc times the square root of the number of angles observed. The unadjusted lineal error of closure will not exceed 1:20,000. The unadjusted vertical error will not exceed .25 feet times the square root of the distance in miles.

3.6.3 Centerline Location Surveys

To attain *GERA*'s objective of providing the highest quality of work with the greatest efficiency, field crews have maintained technological leadership by continuous use of the most up-to-date instrumentation available for expedient, accurate field measurements with a minimum number of personnel. Field surveys are currently conducted utilizing the Leica VIP/Wild Field-to-Finish System®. The Wild System® is composed of an Wild T-1600 electronic theodolite, Wild DI-5 electronic distance meter, and Wild GRE-4 data collector which allows all field survey information to be gathered rapidly and more accurately, eliminating errors in note keeping and data transposition during entry into the computer system. Data collection reduces field time, and the computer system can transfer the data, compute, and plot plan and profile drawings in minutes. Not only is this system state-of-the-art, but it results in one of the most economical systems of field survey data collection in use.

After receipt of the structure site locations from R. W. BECK, the transmission line tangents will be established either by direct sighting between angle points or by single or double-centering methods in all cases possible and tied to the previously established control network. Structure sites will be staked and studied in conjunction with the monumentation of the centerline.

In the event that the terrain, vegetation or length of tangent do not permit use of one of the above methods, the tangents will be projected on the inverse bearing between angle points established by the control coordinates of the angle points. Double-centering methods would be utilized to insure a straight line projection.

This survey would be made utilizing electronic distance measuring (EDM) instruments and theodolites for horizontal distance measurement, horizontal angle, and zenith angle measurement. The vertical traverse and supplemental ground profiles will be determined trigonometrically by computer resolution of the field data.

All points on tangent (P.O.T.s) established during the centerline projection operation will be set at intervisible locations approximately 1,320 feet in distance between points preferably on public road rights-of-way, fence lines, and field divisions. The careful placement of P.O.T.s will facilitate structure site staking and provide permanent centerline monumentation. P.O.T.s will be monumented with a 5/8" dia. x 30" long iron rod driven flush with the ground with a metal cap, steel stamped for station identity and elevation. In areas of cultivation the iron rod will be buried 18" below ground surface. Two (2) 3/8" x 18" painted stakes will be placed over the iron rod and marked for identification. Elevations for all P.O.T.s and angle points will be established to the closest 0.01 foot. All P.O.T.s and angle points will be turning points.

All stations and elevations will be compiled from analytical stereophotography. Photogrammetric line stationing of the P.O.T.s and angle points will be verified in the field. Field survey closures will be included in the map scale factor along with the scale altitude factors to insure a true relationship between grid/ground distances and that the mapped centerline stationing is true ground distance.

Supplemental ground profile data will be taken at intervals not to exceed 200 feet and at all breaks of one (1) foot or more along the centerline to determine elevations to the closest 0.1 foot. In addition, right and left side profile elevations will be taken at a distance of 35 feet at right angles from the centerline where the elevation differs from the centerline elevation by more than one (1) foot. In the event a side slope extending upward from the outside conductor exceeds thirty (30) degrees, elevations will be determined at a minimum of fifty (50) feet from the conductor line.

The field survey will obtain all necessary crossing data for:

- State Highways
- Federal Highways
- Railroad Crossings
- Utility Crossings
- Other State and Local Permits as required

All crossing studies of overhead utilities will be made utilizing electronic distance measuring (EDM) instruments and theodolites for horizontal distance measurement, horizontal angle, and zenith angle measurement. Working from P.O.T.s on the centerline for known station and elevation, the following survey data will be obtained by measurement of distance and horizontal and zenith angles: (1) Station and ground elevation at intersection of crossing with centerline; (2) Intersection angle; (3) Distance to structure on each side of the intersection (If a structure falls within the right-of-way, the distance to the next structure will be obtained); (4) Type, description and identification number of each structure; (5) Number of conductors crossed, voltage, and owner; (6) The elevation of: both ground wires at intersection and at supports, top of structures, ground at base of structures, and bottom conductor at intersection; and, (7) Air temperature at the time elevations of ground wires and conductor were determined. Photographs will be taken to facilitate the transmission line design.

Measurements will not be "dead-ended", but closed to a P.O.T. of known elevation for a check.

All survey data will be both electronically recorded and also recorded on specially designed note sheet. Reduction of the crossing data with a sketch of crossing and supports and other indicated information will be prepared for efficient transfer to the permit application drawings and applications.

All crossing studies of surface or underground crossings will include distances to structures and mile posts; ownership; intersection station and angle; mileage and direction to closest city, etc. Photographs will be taken to facilitate the transmission line design.

The total linear error of closure of any line segment surveyed will not exceed one part in 10,000 with an angular error not exceeding 20 seconds times the square root of the number of observed angles, in any case no greater than two minutes. Maximum vertical error in feet will not exceed 0.25 of the square root of the distance in miles between control points.

3.6.4 Permit Drawings and Application Preparation

GERA will perform field surveys to acquire all the information and data necessary for permit drawings and permit applications for the following permits:

- State Highways
- Federal Highways
- Railroad Crossings
- Utility Crossings
- Other State and Local Permits as required

All crossing data from the field surveys will be shown, including distances to structures and mile posts; ownership; intersection station and angle; voltage, if applicable; vertical clearances; mileage and direction to closest city, etc. The right-of-way widths of each crossing will be researched and obtained from the appropriate agency or utility. All permit drawings and applications will be prepared in strict conformance with ALASKA ENERGY AUTHORITY standards and the standards adopted by the foreign crossing owner.

3.6.5 Structure Site Staking and Site Surveys

Structure sites and site surveys will be conducted in conjunction with the monumentation of the transmission line centerline. The structure sites and elevations will be determined on the ground by electronic distance measurement and trigonometric leveling. The station and elevation will be determined from a previously set and "closed" P.O.T. or A.P. Distance and elevation measurements will not be "dead-ended" but will be closed to a point of known horizontal and vertical position.

Structure sites will be monumented with a 5/8" diameter x 30" long iron rod with a metal cap clearly stamped with the structure center station and elevation. Two (2) 3/8" x 18" painted stakes will be set and marked for identification with the structure station and elevation. The iron rod will be set flush with the ground or buried 18 inches in cultivated fields.

will need more for winter staking

If the field elevation of the structure site center differs more than two (2) feet from the structure list elevation, a new profile line will be run to the next structure site in each direction from the site being surveyed. Profile elevations will be data collected and submitted with structure site study notes. All survey data will be recorded on specifically designed tower study notes for quick computer data entry. All calculations necessary in the structure site field notes will be done in the field and vertical and horizontal closures checked by the party chief.

Pole locations will be staked with a 1"x2" wood stake marked with the pole identifier. Guy catch points will be staked with a wood 1'"x2" wood stake and markded with the guy identifier.

All planimetric features, topography and soil classification within 100 feet of the structure site will be determined and noted in the survey notes.

3.6.6. Cadastral Retracement Surveys and Legal Descriptions

Cadastral retracement surveys will consist of locating in the field all property corners and lines necessary to prepare descriptions of the right-of-way to be used in connection with the acquisition of the right-of-way. This shall include securing the necessary parole or other evidence supporting the location of property corners.

Cadastral retracement surveys will commence after completion of the control surveys and receipt of aerial photography. The early start to property line determinations will assist in the location of the transmission line centerline and will assure that right-of-way acquisition commences as soon as practical.

A diligent search will be made to determine the location of existing monuments or other evidence of section corner, one-quarter section corners, or property corners on each side of the transmission line centerline. The corner recovery operation will be accomplished by thoroughly experienced surveyors directed by a Alaska Registered Land Surveyor. An orderly plan for corner recovery, utilizing G.L.O. plats, G.L.O. notes, surveys of record, aerial photos, and any other available data will be used in the corner monument recovery effort. Alaska Revised Statutes, Board of Examiners Rules and Regulations, and the Minimum Standards for Surveys will be observed for all corner recovery surveys and recording of right-of-way plats.

Field surveys will be conducted utilizing electronic distance measuring (EDM) instruments and theodolites for horizontal distance and horizontal angle measurement. Ties to recovered section, quarter section, and property corners monuments will be completed either by "closed" survey traverse or by multiple direct electronic distance measurements. Two sets of distance measurements and horizontal angle readings will be made and recorded. These ties will be made from A.P.s, P.O.T.s or control points that have a previously determined position. Alaska State Coordinates, NAD-83, will be calculated for all corners tied. Position error of closure will not exceed 1:7,500.

Field notes will be kept on the corner recovery operation indicating corners not recovered as well as evidence found for recovered corners. No corners will be re-established unless otherwise directed by the ALASKA ENERGY AUTHORITY.

County Road widths will be researched from deeds of record and County Road records and, in the absence of recorded right-of-way widths, all available evidence of right-of-way occupation will be obtained. Similarly, State and Federal Highway right-of-way widths will be researched from State Highway Department records.

Descriptions will be written for each right-of-way parcel. The easement descriptions will be follow a strip description format and properly describe the right-of-way tied to GLO and other property corners. Alaska Revised Statutes, Board of Examiners Rules and Regulations, and the Minimum Standards for Surveys will be observed for all right-of-way easement descriptions. *Writing Legal Descriptions*, Gurdon H. Wattles, Parker & Son, Inc., 1979, will serve as a standard reference for description writing.

3.6.7 Survey Note Reductions and Calculations

To attain *GERA*'s objective of providing the highest quality of work with the greatest efficiency, field crews have maintained technological leadership by continuous use of the most up-to-date instrumentation available for expedient, accurate field measurements with a minimum number of personnel. Field surveys are currently conducted utilizing the Leica VIP/Wild Field-to-Finish System®. The Wild System® is composed of an electronic theodolite, distance meter, and data collector which allows all field survey information to be gathered rapidly and more accurately eliminating errors in note keeping and data transposition during entry into the computer system. Data collection reduces field time, and the computer system can transfer the data, compute, and plot plan and profile drawings in minutes. Not only is this system state-of-the-art, but it results in one of the most economical systems of field survey data collection in use.

At the completion of each day, survey crews will download field collected data from the GRE-4 to a Personal Computer. The collection files will be reviewed and edited prior to the start of work the following day and dated and signed for authenticity by the responsible party chief. The field files will be processed the day following the field work and coordinates and plot files added to the survey database.

GERA utilizes Trimble's *TRIMVEC-PLUS GPS SURVEY SOFTWARE®* that enables the surveyors to calculate satellite visibilities for mission planning; load survey data from the 4000ST receivers to a computer; process the initial interstation vectors and baseline computations using triple- and double-difference techniques; test quality of results; and, perform utility functions such as transformations and loop-closure tests. Following baseline computations and the satisfactory resolution of all misclosures, Trimble's *TRIMNET SURVEY NETWORK SOFTWARE®* will be utilized to compute an adjustment of the GPS traverse.

3.6.10. Profile Mapping

Crossing data will be prepared in a *TLCAD®* compatible format for insertion into the profile map. It is understood that the drafting of the profile portion of the split sheet plan and profile map will be the responsibility of R. W. BECK.

3.6.11. Plan Mapping

The plan mapping shall consist of all work necessary to delineate all information obtained from the field surveys that is necessary for the transmission line design and right-of-way acquisition. This will include all computing, traverse adjustment, layout, and checking. The plan mapping will be an AutoCAD® generated drawing observing strict layering conventions. The AutoCAD® drawing will be scaled and plotted on the plan map portion of the split sheet plan and profile drawing over the orthophoto image.

The Alaska Coordinate System grid will be shown with coordinate values on the plan map by a minimum of four (4) 1/2" tick marks located near the edge on both the left and the right sides of the plan map. State plane coordinate values will be shown for all angle points and control points. The grid bearing of each tangent of the centerline will be shown. A combination factor for consideration of Alaska Coordinate System scale factor and elevation will be shown on the map for each section of adjusted alignment. This will allow conversion of grid to ground lengths, or vice-versa. Grid north and True north (geodetic north) will be graphically shown together with the numerical difference (theta).

All lines and topographic features will be noted on the map in exact location with respect to grid. All buildings, fences, topographic and cultural features, and improvements within 200 feet of the centerline will be described. All creeks, ditches, swamps, rock outcrops, cliffs, tree lines, and crops within 100 feet of the centerline will be described. Tree information, including orchard crops, will include species, approximate height, and diameter. Domestic water sources within 200 feet of the centerline will be tied and described.

The width of the right-of-way will be numerically shown at each edge of the map. Station numbering shall increase from left to right on the plan maps. Station tick marks will be placed and labeled on the centerline at intervals of 500 feet.

All land sections and property ownerships through which the transmission line passes will be developed. Corners found and positioned will be plotted and described as to the evidence found for the corner together with the state plane coordinates. Where corners were not found in the field, section and property lines will be developed utilizing surveys of record, deed descriptions, and BLM methods specified in the 1973 Manual of Instructions to Surveyors.

The intersection station of the transmission line centerline with all section and property lines will be calculated for all lines established by corner monument ties and shown on the map, together with the calculated distance and bearing to the nearest land corner along the section or property line. Sections, township lines, range lines, state and county lines will be clearly shown and labeled.

The name of the owner of each parcel of land through which the transmission line passes will be shown together with the right-of-way traverse distance, record description of the parcel, and parcel number.

For roads and highways, pipelines, power and telephone lines, and water crossings, all crossing data from the field survey will be shown, including distances to structures and mile posts, ownership, intersection station, and intersection angle, as specified by THE ALASKA ENERGY AUTHORITY.

All distribution line, telephone line, and CATV crossings and/or connections for joint occupancy will be plotted and labeled.

All maps will be checked for accuracy of numerical data, property ownership, completeness and neatness, prior to submission to THE ALASKA ENERGY AUTHORITY.

CODE ORDINANCE

Introduced by: Borough Manager

EXHIBIT F-6

MATANUSKA-SUSITNA BOROUGH
ORDINANCE SERIAL NO. 91-080

AN ORDINANCE OF THE MATANUSKA-SUSITNA BOROUGH ADOPTING THE CHICKALOON COMPREHENSIVE PLAN.

BE IT ENACTED:

Section 1. Classification. This ordinance is of a general and permanent nature and shall become a part of the Borough Code.

Section 2. Amendment of Section. MSB 15.24.030 (B) is hereby amended as follows:

(6) Chickaloon Comprehensive Plan, adopted 1991, as amended.

Section 3. Effective Date. Ordinance Serial No. 91-080 shall take effect upon adoption by the Matanuska-Susitna Borough Assembly.

Introduction: 7-23-91

Public Hearing: 8-6-91

ADOPTED by the Assembly of the Matanuska-Susitna Borough this 6 day of August, 1991.

Dorothy A. Jones, Borough Mayor

ATTEST:

Linda A. Dahl, Borough Clerk
(SEAL)

ORD 91-080
AM 91-184

PLN/ldk/JD035

MATANUSKA-SUSITNA BOROUGH

ORDINANCE NO. 92-145

AN ORDINANCE OF THE MATANUSKA-SUSITNA BOROUGH ASSEMBLY ADOPTING A NEW CHAPTER 17.18 (CHICKALOON SPECIAL LAND USE DISTRICT) OF THE BOROUGH CODE

* Section 1. Classification. This ordinance is of a general and permanent nature and shall become part of the Borough Code.

* Section 2. Adoption of New Chapter. Chapter 17.18 (Chickaloon Special Land Use District) is hereby adopted to read as follows:

Chapter 17.18

CHICKALOON
SPECIAL LAND USE DISTRICT

Sections

I. General Provisions

17.18.010 Established - Map adopted

(A) There is established a special land use district, which shall include all territory lying within the area designated as the Chickaloon community and further described as:

(B) Where the boundaries of the Chickaloon Community Council area change, the boundaries of the Chickaloon special land use district shall continue to be identical to those of the Chickaloon Community Council area.

17.18.020 Purpose

The area within the boundaries of this special land use district will be utilized so that land uses will be consistent with the objectives of the Chickaloon comprehensive plan and to protect the public health, safety and welfare.

17.18.030 Definitions

(A) General.

(1) Words used in the present tense include the past tense.

(2) The singular number includes the plural.

(3) The masculine gender includes the feminine.

(4) The term "shall" is always mandatory and not discretionary; the word "may" is permissive.

(B) Specific definitions.

(1) "Access." A legal way or means of approach to provide physical entrance or egress to a property.

(2) "Accessory." As applied to a use or a building or a structure, means customarily subordinate or incidental to, and located on the same lot with a principal use, building or structure.

(3) "Alteration." Any change, addition or modification in the construction, location or use classification of any building, structure or use.

(4) "Area, Lot." The total area within the property line, including easements but excluding dedicated rights-of-way.

(5) "Automobile wrecking." The dismantling or wrecking of automobiles or other motor vehicles, and the storage or keeping for commercial sale of dismantled or partially dismantled, obsolete or wrecked motor vehicles, or the parts resulting from such activity.

(6) "Automobile wrecking yard." The location of automobile wrecking activities as defined. See also junkyard.

(7) "Buffer." A means of protection against negative impacts which provides a physical separation or barrier.

(8) "Building." Any structure, including mobile homes, intended for the shelter, housing or enclosure of any person, animal, process, equipment, goods, use, materials or services of any kind or nature.

(9) "Building height." For the purposes of determining the maximum height of a building, means the vertical distance from the average finished grade adjacent to the building to the highest point on the roof, but not including radio antennae, water towers, church spires, penthouses constructed primarily for mechanical equipment, or similar incidental building features.

(10) "Campground." A plot of ground upon which two or more campsites are located, established or maintained for occupancy as temporary living quarters for recreation, education or vacation purposes.

(11) "Church." A building or structure, or a group of buildings or structures, which by design and construction are primarily intended for the conduct of organized religious services and accessory uses associated therewith excluding a single-family dwelling (parsonage) for use

by the pastor or caretaker. Additional on-site quarters for clergy or nuns, facilities for training of religious orders, or for daily educational purposes are excluded from this definition.

(12) "Commercial use." Any activity other than a home occupation where goods or services are offered or provided for sale or for profit.

(13) "Conditional use." A use of a structure of land which may be allowed by the planning commission after a public hearing and review and subject to certain prescribed or imposed conditions.

(14) "Conditional use permit." A written document which may specify additional controls and safeguards to ensure compatibility with permitted principal uses.

(15) "Dwelling." A building designed or used as the living quarters for one or more families.

(16) "Dwelling, Multi-family." A detached building designed for or occupied exclusively by three or more families and constituting three or more dwelling units.

(17) "Dwelling, Single-family." A detached building designed for or occupied by and providing housekeeping facilities for one family, including factory-built and prefabricated dwellings but not mobile homes.

(18) "Dwelling, Two-family." A detached building designed for or occupied exclusively by two families and constituting two dwelling units.

(19) "Dwelling unit." A structure or portion thereof providing independent and complete cooking, living, sleeping and toilet facilities for one family.

(20) "Family." One or more persons occupying a premises and living as a single housekeeping unit, as distinguished from a group occupying a group home, rooming house, club, fraternity house or hotel.

(21) "Grade, Finished." The lowest point of elevation of the finished surface of the ground, paving or sidewalk between the building and a line five feet from the building or, when the property line is less than five feet from the building, between the building and the property line.

(22) "Grade, Natural." The elevation of the ground surface in its natural state, before man-made alterations.

(23) "Gravel pit." An open land area where sand, gravel and rock fragments are

mined or excavated for sale or off-tract use.

(24) "Group home." A legally licensed residential use which is a home for the elderly, or which serves as a dwelling for persons seeking care, rehabilitation or recovery from any physical, mental or emotional infirmity, for rehabilitation of criminals, or any combination thereof, in a family setting.

(25) "Group camp." An organized, often seasonal retreat with or without overnight accommodation which is operated as a profit or nonprofit business with planned recreational or educational activities and to which people come for scheduled visits.

(26) "Home occupation." An activity carried out in a dwelling unit or detached appurtenance provided that:

(a) No more than one other person in addition to members of the family who reside on the premises may engage in such occupation;

(b) The use of the dwelling unit or detached appurtenance for the home occupation is clearly incidental and subordinate to its use for residential purposes;

(c) There is no change in the outside appearance of the building or premises or other visible evidence of the conduct of such home occupation other than one sign, not exceeding two square feet in area, non-illuminated and mounted flat against the wall of the principal building;

(d) Traffic is not generated by such home occupation in greater volumes than would normally be expected in a residential neighborhood;

(e) Equipment or process is not used the home occupation which creates noise, vibration, glare, fumes, odors or commercial electrical interference, in violation of applicable government rules and regulations. In the case of electrical interference, no equipment or process shall be used which creates visual or audible interference in any radio or television receivers off the premises, or causes fluctuations in line voltage off the premises; and

(f) Outdoor storage of materials or equipment is not required.

(27) "Industrial use." Any activity which includes manufacturing, processing, warehousing, storage, distribution, shipping and other related uses.

(28) "Junk." Any worn out, wrecked, scrapped, partially or fully dismantled discarded tangible material, combination of materials or items, including motor vehicles which are inoperable, machinery, metal, rags, rubber, paper, plastics and building materials. The

above-listed materials are not intended to be exclusive; "junk" may include any other materials, which cannot, without further alteration and reconditioning, be used for their original purposes.

(29) "Junkyard." An outdoor location where junk is gathered together and stored for a commercial or public purpose.

(30) "Landfill, Sanitary." See sanitary landfill. Also see Title 8, Sanitary fill sites.

(31) "Landfill site." A dumpsite where only natural, organic materials such as tree stumps, brush and/or topsoil resulting from land development efforts, can be disposed of or dumped.

(32) "Lot." A designated parcel, plot, tract or area of land established by plat, subdivision or, as otherwise permitted by law, to be used, developed or built upon as a unit. See also Title 16.

(33) "Mobile home." A detached single-family dwelling designed for long-term human habitation and having complete living facilities; capable of being transported to a location of use on its own chassis and wheels; identified by a model number and serial number by its manufacturer, and designed primarily for placement on a non-permanent foundation. Travel trailers as defined herein are not to be construed as mobile homes.

(34) "Park." A tract of land, designated and used by the public for active and/or passive recreation.

(35) "Parking space." A space for the parking of a motor vehicle within a public or private parking area.

(36) "Parsonage." The house provided by a church for use by its pastor.

(37) "Permitted use." A use of land or a structure which is allowed within a certain zoning district according to the regulations in this code and subject to the applicable restrictions.

(38) "Principal use." The primary or predominant use of any lot, building or structure.

(39) "Recreational use." Any formal or informal leisure time activity.

(40) "Recreational vehicle park." See travel trailer park.

(41) "Refuse area." See junkyard.

(42) "Right-of-way." A strip of land reserved, used or to be used for a street, alley, walkway, airport or other public or private purpose.

(43) "Salvage yard." See junkyard.

(44) "Sanitary landfill." A legally permitted site which has been designed, constructed and approved to accommodate the disposal of solid waste. See Title 8, Sanitary fill sites.

(45) "Setback." The area of a lot adjacent to a lot line within which structures as herein defined may not be erected.

(46) "Sign." A structure or device for advertising intended to direct attention to a business, which is placed upon or within a building, structure or parcel of land and which can be read from a public right-of-way, excluding:

(a) signs not exceeding one square foot in area and bearing only property numbers, post office box numbers, name of occupants or premises, or other identification of premises not having commercial connotations;

(b) flags and insignia of any governmental agency except when displayed in connection with commercial promotion;

(c) regulatory, identification, informational or directional signs erected or required by governmental bodies or reasonably necessary to regulate parking and traffic flow on private property where such signs have no commercial connotation;

(d) integral decorative or architectural features of buildings; and

(e) holiday or special event banners.

(47) "Signs, Animated." Any sign or part of a sign which uses movement or change of lighting to depict action or to create a special effect or scene.

(48) "Sign, Flashing." Any directly or indirectly illuminated sign which exhibits changing natural or artificial light or color effects by any means whatsoever.

(49) "Sign, Portable." A sign that is not permanent, affixed to a building, structure, the ground, set on wheels or otherwise designed to be moved from one location to another.

(50) "Structure." Anything that is constructed or erected and located on or under the ground, or attached to something fixed to the ground, or an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner. For purposes of minimum setbacks and building separation requirements, the following are not considered structures unless specifically addressed by code: fences; retaining walls;

parking areas; roads; driveways or walkways; window awnings; a temporary building when used for 30 days or less; utility poles and lines; guy wires; clothes lines; flag poles; planters; incidental yard furnishings; water wells; monitoring wells and/or tubes; patios, decks or steps less than 18 inches above average grade.

(51) "Temporary Structure." A structure without any foundation or footings and which is removed when the designated time period, activity or use for which the temporary structure was erected has ceased.

(52) "Travel Trailer." A vehicular type portable structure without permanent foundation, which can be towed, hauled or driven and primarily designed as temporary living accommodations for recreational, camping and travel use, identified by a model number, serial number or vehicle registration number.

(53) "Travel Trailer Park." Any parcel, tract or lot or portion thereof where space for two or more travel trailers is leased, rented or held for rent for occupancy for less than thirty days excluding: automobile or travel trailer sales lots on which unoccupied travel trailers are parked for inspection and sale.

(54) "Use." The purpose for which land, a building or structure is arranged, designated or intended, or for which either land or a building is or may be occupied or maintained.

(55) "Variance." A grant of relief from one or more of the requirements in Title 17 as provided for by state law.

II. Application of Regulations

17.18.040 Conformance required

No building, structure, land or water area located within this special land use district shall hereafter be used or occupied, and no building, structure or part thereof shall hereafter be erected except in conformity with the regulations specified in this chapter.

17.18.050 Permitted uses

Those uses not identified as conditional uses or prohibited uses are permitted.

17.18.060 Conditional uses

The following uses may be permitted by obtaining a conditional use permit in accordance with Sections 17.18.110 through 17.18.150:

(A) Group homes;

(B) Churches and related buildings;

(C) Utility substations and electrical transmission lines;

(D) Highway maintenance yards;

(E) Commercial gravel and quarry pits over one acre in size;

(F) Group camps;

(G) Natural resource extraction or processing;

(H) Mobile home parks;

(I) Uses that cause physical changes to the lot exceeding one acre in size, excluding agricultural uses as well as roads and parking lots when used as ancillary uses.

17.18.070 Prohibited uses

Prohibited uses and structures within the Chickaloon special land use district are all uses and structures not specified as permitted or conditional uses, including:

(A) Junkyards, salvage yards and automobile wrecking yards;

(B) Sanitary landfills and refuse areas.

17.18.080 Compliance

No building, structure, land or water area located within this special land use district shall hereafter be used or occupied, and no building, structure or part thereof shall hereafter be erected, constructed, reconstructed, moved, repaired or structurally altered except in conformity with the regulations specified in this chapter.

17.18.090 Lot area

The minimum lot area for any use shall be five acres.

17.18.100 Setback requirements

The setback requirements specified in Chapter 17.55 shall apply.

III. Conditional Use Permits

17.18.110 Intent

It is recognized that there are certain uses which are generally considered appropriate in this district; provided that controls and safeguards are applied to ensure their compatibility with permitted principal uses and to protect the public health, safety and welfare. The conditional use permit procedure is intended to allow the community and planning commission to consider the impact of the proposed conditional use on surrounding property and the application of controls and safeguards to assure that the conditional use will be compatible with the surrounding area and in keeping with the character and integrity of the Chickaloon community.

17.18.120 Application and fee

(A) An application for a conditional use permit shall be filed by the owner of the property concerned or his authorized agent.

(B) Application for a conditional use permit shall be in writing on forms prescribed by the planning director. The application shall include:

(1) A legal description of the property involved;

(2) A statement of the proposed use; and

(3) A detailed site plan showing the proposed location of all buildings and structures on the site, access points, visual screening, buffering, drainage, vehicular and pedestrian circulation patterns, parking areas and the specific location of the proposed land use or uses, specific location of septic and waste water facilities, together with other information as may be required to comply with the standards for a conditional use listed in this chapter and in other pertinent sections of this chapter. For those conditional uses involving natural resource extraction or gravel pits acceptable groundwater monitoring and reclamation plans shall be submitted for review and consideration by the planning commission.

(C) A nonrefundable fee as prescribed by Chapter 17.99.

17.18.130 Public hearing

The planning commission shall hold a public hearing to consider any conditional use permit application.

(A) Notice of any public hearing required under this code shall be given in accordance with this section.

(B) Forms of notices are as follows:

(1) Publication in a newspaper of general circulation in the borough fifteen (15) days prior to the public hearing;

(2) Mailing a public hearing notice at least fifteen (15) days prior to the public hearing to all record owners of property within a distance of six hundred feet of the exterior

boundary of the property that is the subject of the application, or to the record owners of the five tax parcels nearest the property that is the subject of the application, whichever is the greater number of persons;

(3) In addition to the requirements of Subsection 17.18.130 (B.2) of this chapter, if the public hearing is for a conditional use permit within a recorded subdivision, all persons holding a legal interest in property within that subdivision shall be mailed a public hearing notice.

(C) When the property that is the subject of an application lies within the boundaries of a community council recognized by the assembly, notice shall be mailed to the community council at least fifteen days prior to the public hearing.

(D) Record owners in this section refers to the owners as shown in the records of the borough tax assessor.

(E) The failure of any person to receive any notice required under this section, where the records of the borough indicate the notice was provided in a timely manner, shall not affect the validity of any proceeding under this title.

(F) Every public hearing notice shall state the following information:

(1) Date, time and location of the public hearing;

(2) Brief description of the application;

(3) Description of the property that is the subject of the application and a vicinity map of that land;

(4) Legal description of the application;

(5) The names of the applicants and the owners of the subject property;

(6) Identify the location of where the application and other supporting material will be available for public inspection; and

(7) Identify the planning department's telephone number.

(G) Prior to the date of the public hearing, the applicant shall pay the cost of all mailings or advertisements required by ordinance specific to that action.

17.18.140 Planning commission action

(A) The planning commission shall consider the recommendation of the Chickaloon Community Council, shall hear any interested parties and shall render a decision on the application for a conditional use permit within thirty (30) calendar days from the date of public hearing. In recommending the granting of a conditional use permit, the planning commission shall state in writing the conditions of approval of the permit which it finds necessary to carry out the intent of this chapter. These conditions may increase the required lot or yard size, control the location and number of vehicular access points to the property, require screening and landscaping, and may require the reclamation of property to a character in keeping with surrounding lands. The commission may also impose other conditions and safeguards designed to ensure the compatibility of the conditional use with other lawful uses and the character and integrity of the Chickaloon community.

(B) The Planning director shall incorporate any conditions or requirements stipulated by the commission in the conditional use permit.

17.18.150 General standards

A conditional use may be approved only if it meets the requirements of this section in addition to any other standards required by this chapter.

(A) The conditional use will not detract from the value, character or integrity of the Chickaloon community;

(B) That the conditional use fulfills all other requirements of this chapter pertaining to the conditional use in question;

(C) That granting the conditional use permit will not be harmful to the public health, safety, convenience and welfare;

(D) That sufficient access, setbacks, lot area, parking space, buffers, and other safeguards are being provided to meet the conditions;

(E) If the permit is for a public use or structure, the commission must find that the proposed use or structure is located in a manner which will maximize public benefits.

IV. Variances

17.18.160 Applications and procedures

Applications and procedures for variances under Chapter 17.18 shall be as prescribed in Chapter 17.65.

V. Regulation of Alcoholic Beverage Uses

17.18.170 Applications and procedures

Applications and procedures for alcoholic beverage sales on dispensaries under Chapter 17.18 shall be as prescribed in Chapter 17.70

VI. Flood Damage Prevention and Coastal Management Plan

17.18.180 Flood damage prevention and coastal management plan

Compliance with flood hazard prevention and coastal management under 17.18 shall be as prescribed in Chapter 17.29 and the most recently adopted MSB Coastal Management Plan.

VII. Appeals

17.18.190 Appeals

Appeals from decisions of the planning commission may be made under the provisions of Chapter 15.38 of this Code.

VIII. Amendments

17.18.200 Report

(A) Before any proposed change of this chapter may be acted upon by the borough assembly, the planning commission shall study the proposed change and make a report in writing to the assembly.

(B) The report shall give consideration as to the effect the proposed change would have on the public health, safety, convenience and welfare. It shall also state whether the proposed change:

(1) Will adversely affect the character and integrity of the Chickaloon area;

(2) Is contrary to the established land use pattern;

(3) Will materially alter the population density pattern and thereby increase the demand for public facilities and services;

(4) Will create or excessively increase traffic congestion or otherwise affect public safety;

(5) Will adversely affect property values in the adjacent area;

(6) Will be a deterrent to the improvement or development of adjacent property in accord with existing regulations;

(7) Will constitute a grant of special privilege to an individual owner as contrasted with the public welfare.

(C) The Chickaloon Community Council should consider the request and provide a recommendation to the planning commission.

(D) The report shall incorporate comments heard at the public hearing held by the planning commission and shall recommend as to approval and disapproval of the proposed change.

(E) The report shall be forwarded to the borough assembly.

17.18.210 Public hearings

Before the borough assembly may act on a proposal for amendment to this chapter, the borough clerk shall cause an ordinance to be prepared setting forth the details of the proposed amendment. Such ordinance shall be introduced at a regular or special meeting of the borough assembly and a date for a public hearing established. The clerk shall give notice of the public hearing in the manner prescribed in this title.

IX. Enforcement and Penalties

17.18.220 Violations and enforcement

Violations and enforcement of this chapter shall be consistent with the terms and conditions of Chapter 17.56.

* Section 4. Effective Date. This ordinance becomes effective upon adoption.

Introduction: 12-15-92

Public Hearing: 1-5-93

ADOPTED by the Matanuska-Susitna Borough Assembly this 5 day of January, 1993.

Ernest W. Brannon, Borough Mayor

ATTEST:

Linda Dahl, Borough Clerk

(SEAL)

Allison Lake Reconnaissance Study

Prepared for

State of Alaska
Walter J. Hickel, Governor

Alaska Energy Authority
Charlie Bussell, Executive Director

701 East Tudor Road
PO Box 190869
Anchorage, AK 99519
(907) 561-7877

September 1992

Prepared Under Contract No. 2800483 by:

HDR Engineering, Inc.
Building B
4446 Business Park Blvd.
Anchorage, Alaska 99503-7118

7.0 ENVIRONMENTAL EVALUATION

This section includes a description of the environmental setting, an environmental evaluation of the project alternatives, agency concerns and permitting requirements. The review is not designed as a complete environmental impact assessment or list of all the necessary permits. Rather it reflects the results of preliminary research conducted by HDR staff. Where possible, state and federal agency staff were contacted (see Appendix 5 for list of contacts). However, HDR recommends further consultation with agencies prior to beginning actual project permitting.

7.1 Environmental Setting

Climate. The climate in the project vicinity is characterized by moderate temperatures with cool, rainy summers and high winter snowfall. Precipitation is abundant in all seasons with the majority occurring during the fall. Valdez averages 188 days yearly with precipitation greater than 0.1 inch. Annual precipitation is 62 inches. Annual snowfall is 269 inches. Snowfall constitutes 27% of the precipitation.

The high mountain ridges provide a considerable barrier to the flow of cold continental air from the interior of Alaska during the winter. The coldest temperatures at Valdez occur when cold air flows down the mountain slopes during clear and calm conditions. The lowest temperature was -28 degrees F recorded several times in mid-winter. Summer temperatures are moderated by lower temperatures of nearby snow and ice fields in combination with the ocean. The average daily maximum temperature in June, July, and August is about 60 degrees F. (Reference 8).

Topography. The Port Valdez area is a northeastern extension of Prince William Sound. It is a glacially created fjord, approximately 14 miles long by 3 miles wide with a flat outwash plain and moraine deposits. The terrain has been glaciated and is characterized by cirques, u-shaped valleys, rock-basin lakes, and grooved rock. The Chugach Mountains within the study area are composed mainly of a thick section of alternating dark shales and graywackes known as the Valdez Group (Reference 8).

Vegetation. Allison Creek supports alder with some salmonberry, blueberry, and devil's club. The area of the Alyeska Terminal and pipeline corridor are already disturbed. The slopes surrounding Allison Lake are covered by alpine tundra with a small wetland area at the south end of the lake (Reference 2).

Wetlands. According to the National Wetland Inventory (NWI) map (Reference 9), there are lacustrine, palustrine, riverine, and estuarine wetlands in the general project area. Lacustrine wetlands are found next to both Allison Lake and Solomon Reservoir. However, according to the NWI map, the area proposed for the second powerhouse, staging area and access road at Solomon Reservoir is not in a lacustrine wetland area. There are palustrine wetlands and riverine wetlands found along Allison Creek. Estuarine wetlands occur at the mouth of both Allison and Solomon Creeks.

The riverine system includes all wetlands and deep water habitats contained within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts in excess of 0.5 parts per thousand (ppt). The lacustrine system includes permanently flooded lakes and reservoirs, intermittent lakes, and tidal lakes with ocean-derived salinities below 0.5 ppt. The palustrine system includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. The estuarine system consists of deep water tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land (Reference 9).

Fisheries. Most of the major streams and rivers entering Port Valdez support salmon spawning. According to staff at the Alaska Department of Fish and Game (ADFG), the intertidal areas of many streams are used for spawning by pink and chum salmon (Dennis Gnath and Don McKay, ADFG, personal communication). Much of the intertidal spawning takes place in the sand, gravel, and/or silt fans present at the mouths of many stream, including Solomon Creek and Allison Creek. However, there seems to be some disagreement on exactly where spawning occurs. According to recent discussions with Don McKay of ADFG, spawning may occur as far as 1 mile up Allison Creek. Previous correspondence from ADFG (letter from Cevin Gilleland, January 18, 1990), states that spawning occurs 1.5 miles below the outlet of Allison Lake. In addition, the 1981 COE Feasibility Report states that spawning occurs only 1/4 mile from the mouth of Allison Creek. The location of spawning habitat on Allison Creek may need to be more clearly described during the pre-design phase.

The salmon population in Port Valdez is both wild stock and hatchery fish produced by the Solomon Gulch Hatchery. Dolly Varden are also present in Port Valdez and spawn in the Lowe and Robe River drainages. They do not spawn in intertidal areas. Pacific herring are also seasonally abundant and occasionally available year-round in the Port Valdez area. It is unlikely that the upper reaches of the creeks support fish; there may be some resident sticklebacks in the lakes (Dennis Gnath, ADFG, personal communication).

Wildlife. Most birds in the Port Valdez area are classified as either waterfowl, shorebirds, seabirds, or raptors. Peak populations occur during spring and fall migrations, in April and May and from late August through October. According to the U.S. Fish and Wildlife Service (USFWS), there are no known bald eagle nests in the study area except in the Dayville Road area (Gary Wheeler, USFWS, personal communication). The known nests along Dayville Road are located near Lowe River and are approximately 3 miles from the project area. The USFWS recommends that, prior to construction, AEA conduct a survey of eagle nests; the survey should be conducted between May 15 and June 15 when vegetative cover is minimal. In the event a nest is found, USFWS will work with AEA regarding the location and timing of activities. The USFWS has developed a set of draft guidelines to assist land managers and resource planners in the management of bald eagles (see Appendix 5).

Wildlife species in the project area include brown bear, black bear, mountain goat, wolf, wolverine, marten, porcupine, and snowshoe hare. Wildlife surveys conducted by ADFG in 1978 for the Solomon Gulch Hydroelectric Project FEIS indicated that the Solomon Creek drainage provides relatively good habitat for black bear and that the coastal area was prime habitat. Inland populations of black bear occur in the semi-open forested areas. Brown bears also inhabit the coastal areas, which provide a richer food supply than the upland areas. (Reference 10).

The Allison Creek drainage habitat is similar to that of the Solomon drainage and likely supports similar wildlife. According to the 1981 COE Feasibility Report, the most commonly observed mammal near the proposed Allison Creek site is black bear.

Endangered and Threatened Species of Flora and Fauna. According to the USFWS, there are no known endangered or threatened species of flora and fauna in the study area (Brian Anderson, USFWS, personal communication).

Local Environment -

- Government: Valdez is a home rule municipality incorporated on June 11, 1901. A home rule municipality is a city or borough which has adopted a home rule charter by public vote. Such a charter gives that local government "all legislative powers not prohibited by law or charter" (Article X, Section 11 - Alaska Constitution).

- Population: Population near the project area is concentrated in Valdez. The current population of Valdez, based on figures from the 1990 U.S. Census, is 4,068. The population of Valdez, in contrast to the rest of the state, has quadrupled since 1970. A temporary increase in the local population from the construction work force could result. Construction personnel could be accommodated by existing facilities in the city.
- Economy: The largest employer in Valdez is the Alyeska Marine Terminal. The terminal employs approximately 22 percent of the Valdez work force, followed by government services and education/health sectors, each employing approximately 17 percent of the work force. (Reference 11).

- Land Use: All the proposed project alternatives are located inside the city limits of Valdez. The Allison Lake area is currently vacant. The land around the Solomon Lake area is vacant with the exception of the Solomon Gulch Hydroelectric Project. The entire area present has no land use zoning designation (Dave Dengel, City of Valdez, planning director, personal communication). The study area is located on State of Alaska land under management of the Alaska Department Natural Resources (ADNR). The Dayville Road is under the management authority of the Alaska Department of Transportation and Public Facilities (ADOT&PF).

7.2 Alternatives

The following evaluation is a review of the environmental concerns for the various alternatives under consideration. The evaluation is based on research and agency consultation. Most of the environmental concerns are associated with the main structural alternatives--the tunnel alternative and the stand-alone power generating project on Allison Creek.

7.2.1 Tunnel Alternative

Noise. Noise levels during construction phase of the tunnel alternative will increase temporarily and will decrease to near normal during actual operation.

Fisheries. Impacts to the fish habitats of Solomon and Allison Creeks can be divided into construction and post-construction impacts. Construction impacts will be limited to the tunneling operation. The tunnel spoil will be stockpiled in upland locations, however, drainage associated with the tunnel spoil will need to be managed to minimize erosion into the creeks.

Post-construction impacts will occur as a result of changes to the flow regime in Allison Creek. Diverting water from Allison Lake to Solomon Reservoir will dewater the upper reaches of Allison Creek. Once lake drawdown occurs below normal lake outlet level, no further flow into Allison Creek can be counted on from Allison Lake. There could be times during the winter months when instream flow in Allison Creek could be reduced. Impacts regarding instream flow are difficult to predict because of mixing from streams entering the drainage downstream from where the dam will be placed. However, it is not anticipated that significant dewatering of the creek will occur during the time when spawning occurs or between July and September, and instream flows will be maintained at 3 cfs as required by ADFG in the water rights authorization to APSC (discussed in detail in Section 3).

A water pipeline will reroute water back to Allison Creek and must cross several anadromous fish streams along Dayville Road. A temporary impact to water quality resulting from increased sedimentation may occur during installation of the pipeline. Construction timing windows as well as silt screens may be required to minimize the introduction of silt into these streams. According to ADFG, the in-water construction timing window is June 1 through July 15.

Birds. Impacts to waterfowl using the mouth of Solomon Creek are directly related to the level of activity associated with the construction of the water pipeline along Dayville Road.

Wildlife. Blasting necessary for the tunneling operation could act as a deterrent to migratory or resident mammals and some may be displaced from the area. This is of particular concern to ADFG and the USFWS. Consultation with both agencies is recommended prior to the commencement of construction activities. Upland construction activities can be scheduled to avoid sensitive times (hibernation, nesting, denning, etc.) for nearby wildlife.

Erosion Control. During construction of the tunnel, powerhouse, access road and staging area, dust control measures and silt fences may be required by state and federal agencies to minimize the introduction of additional materials into Solomon Creek and Solomon Reservoir. Agencies may also require a re-contouring and revegetation plan to stabilize disturbed areas. If clearing vegetation is required, it should be performed during the dry season to reduce sedimentation, erosion, and the impact to stream water quality induced by heavy rainfall, a well documented local condition.

Historic, Architectural, Archaeological, and Cultural Resources. Consultation with the ADNR SHPO indicates there may be several historic sites along Solomon Creek below the reservoir. There is one reported historic site near the outlet of Solomon Lake and there are several cabins in lower reaches of the creek. Consultation with SHPO prior to construction at the Solomon Gulch site is recommended. There are no known sites in Sections 28 and 29 between Allison Lake and Solomon Reservoir. However, a pre-construction archaeological and cultural resources survey of the tunnel route may be required as per AS 41.35.070 as part of the permitting phase (Joan Dale, SHPO, personal communication).

Visual Impacts. Allison Lake and Solomon Reservoir can only be viewed by air, and only a few would see the impact of Allison Lake drawdown. The natural landscape could be visually marred by the deposition of tunnel tailings. A revegetation plan could be initiated if this becomes a concern. Other aspects of the project will not likely impact the visual quality of the area because the majority of the structures would not be visible except by air.

Wild and Scenic Rivers. Solomon Creek is not classified as a Wild and Scenic River (Brad Cella, NPS, personal communication).

7.2.2 Stand-alone Power Generating Project

Noise. Valdez is typical of many small Alaska cities with moderate traffic and limited sources of noise. Background noise levels are low except for transient boats and aircraft. The Alyeska Marine Terminal generates some ambient noise. Noise levels during the construction phase of the stand-alone power generating project will increase temporarily but will decrease again during actual operation.

Fisheries. Impacts to the Allison Creek fish habitat may occur as a result of changes in water quality (temperature, dissolved oxygen levels, sedimentation) and flow regime. Allison Creek is a high gradient creek, and fish movement is restricted to the lower reaches. According to the 1981 COE Feasibility Report, spawning habitat for pink and chum salmon occurs approximately 1/4 mile from the mouth. Staff with ADFG have stated that spawning habitat could extend as far as 1 mile upstream. The actual extent of the intertidal spawning area depends on tidal fluctuations. Further study may be warranted to determine the upper spawning limits of the creek.

Instream flow is most critical during the time when spawning occurs. Adult pink and chum salmon spawn from July through September. As was done with the Solomon Gulch Hydroelectric Project, the powerhouse for the Allison Creek alternative would be built as close to tidewater as feasible to maintain as much head as possible; monitoring of instream flows would also be conducted. In addition, if instream flows in Allison Creek are reduced below the 3 cubic feet per second (cfs) required by ADFG for Allison Creek and the Alyeska Pipeline Service Company (APSC) water rights authorization (permit No. LAS 11813), water would be pumped from the Solomon Gulch Plant tailrace back into Allison Creek.

Stream temperatures in Allison Creek may be reduced below the powerhouse during the summer months. The high water temperature of Allison Creek between July and September is from 8 to 11 degrees C. Salmon spawn earlier in the season in colder water and later in the season in warmer water. Although there will be natural flows occurring from the drainage basin below the dam, stream water temperatures could decrease. During years with normal runoff, water temperatures with the proposed project would be within normal limits. During low water years, however, temperatures may decrease below the critical level. Intertidal spawning may also be affected by reduced temperatures although the marine influence may compensate for the colder freshwater from Allison Creek (Reference 2).

The project's impact on water quality is directly related to the natural flushing processes. This process could be affected by the installation of the penstock and tailrace and stream bed scour could be reduced, resulting in increased sedimentation of spawning gravels. However, Allison Creek has a stable stream bed with very small amounts of sands and gravels, so sedimentation of the spawning beds may not occur because very little fine material will enter the system. In addition, during high water years, extra runoff may provide adequate flow for flushing, and tidal fluctuation could keep the spawning area free of sedimentation. In addition, planned drawdown of Allison Lake could increase turbidity and flows. Placement of the lake tap structure should be coordinated with the optimal time for the fishery and water used for the drilling of the penstock should be diverted so as to not reenter Allison Creek.

Birds. According to ADFG, it is not likely waterfowl use Allison Lake; there may be a few puddleducks using it for resting habitat (Dennis Gnath, ADFG, personal communication). Waterfowl and shorebirds found at the mouth of Allison Creek may avoid the immediate area during the construction phase with no long term adverse effects. The possible increase of freshwater into the bay may cause minor shoreline icing during the winter and could reduce available habitat.

Wildlife. A moderate level of human activity associated with construction in the project area could act as a deterrent to migratory or resident mammals. However, construction activity will have varying effects during different phases of construction. For example, the construction of the transmission line associated with the stand-alone power generating project on Allison Creek could increase displacement of some animals.

Erosion Control. During construction of the stand-alone power generating alternative, dust control measures and silt fences may be required by state and federal agencies to minimize the introduction of additional materials into Allison Lake and Allison Creek. Agencies may also require a re-contouring and revegetation plan to stabilize disturbed areas. If clearing vegetation is required, it should be performed during the dry season to reduce sedimentation, erosion, and impact on stream water quality induced by heavy rainfall, a well-documented local condition.

Historic, Architectural, Archaeological, and Cultural Resources. Consultation with the ADNR State Historic Preservation Office (SHPO) indicates there is at least one historic site in the project vicinity; Fort Liscum is located west of the mouth of Allison Creek. There may be other unreported sites in the Allison Creek drainage. The SHPO may require a pre-construction archaeological and cultural resources survey of the area as per AS 41.35.070 as part of the permitting phase (Joan Dale, SHPO, personal communication).

Visual Impacts. Valdez is referred to as the "Switzerland of Alaska" because of the surrounding views of the mountains, glaciers, and rivers around Port Valdez. Views across the water are already obstructed by industrial development along the water's edge. However, the large scale of the mountains tends to overshadow even such developments as the Alyeska Marine Terminal. Allison Lake can only be viewed by air, only a few would see the effect of lake drawdown. The project components will not likely impact the visual quality of the area as the majority of the structures are near an already impacted area--the Alyeska Marine Terminal. Upland structures would not be visible except from the air.

Wild and Scenic Rivers. Allison Creek is not a Wild and Scenic River (Brad Cella, National Park Service (NPS), personal communication).

7.2.3 Diesel Generation at CVEA

Noise. Additional diesel generation is not anticipated to increase noise beyond existing levels.

Fisheries. No impacts to the fisheries resources are anticipated.

Wildlife. No impacts to wildlife resources are anticipated.

Air Quality. It is estimated that additional diesel generation by CVEA will produce 16 pounds of nitrogen oxide for each MwH of power generated. This is based upon representative uncontrolled levels of pollutants for stationary diesel engines. The uncontrolled amounts have been reduced by one-half to account for the cleaner burning engines produced today which would be used for this project.

HDR has estimated the environmental cost for the emissions produced in section 6 previously. Because of the uncertainty of these estimates, environmental costs were not added directly into the economic analysis, but they are presented for information.

Erosion. There are no erosion-related impacts associated with increased diesel generating capacity at CVEA.

State Historic Preservation Office. Expansion of the existing CVEA facilities is not anticipated to impact archaeological and cultural resources.

Visual. No impacts to visual resources are anticipated. The site of the existing CVEA facility is in the general urbanized area of Valdez.

7.2.4 Remaining Alternatives

The remainder of the alternatives evaluated included: raising the Solomon Gulch spillway with an inflatable weir, raising the Solomon Gulch spillway with a rockfill dam, lowering the Solomon Gulch intake to increase reservoir drawdown, and end use conservation. Environmental impacts anticipated with these alternatives include impacts to air quality with increased diesel generation and water quality impacts associated with the placement of a new intake structure to lower the level of the Solomon Gulch Reservoir. Temporary increases in sedimentation of the Solomon Gulch Reservoir could occur during the installation of the intake structure, although silt screens could be installed to minimize the introduction of silts into the reservoir.

7.3 Regulatory Requirements

This section provides a review of the permitting requirements for the various alternatives under consideration. HDR recommends consultation with state and federal agencies prior to beginning actual project permitting.

Federal Energy Regulatory Commission. Federal Energy Regulatory Commission (FERC) approval would be required in various forms for most of the alternatives studied. The Allison Lake Tunnel with Hydro Project would be considered an addition to the Solomon Gulch Project, and would require a "major amendment" to the existing Solomon Gulch FERC License, including the "three stage consultation process" mandated by ECPA (The Environmental Conservation Policy Act of 1986). Obtaining this amendment will be critical to the overall timing of construction of the project, since construction could not begin until final FERC approval of the amendment is obtained.

The alternatives that consist of dam or intake changes at the existing Solomon Gulch Project will also require amendment of the existing FERC License. The lowering of the intake could be determined by FERC to be a "minor amendment" and would therefore be exempt from the three stage consultation process. The raising of the spillway options, either 5 feet or 32 feet, would likely be considered significant actions and would require three stage consultation.

The stand alone Allison Lake Project would be considered a new and separate project, and would therefore likely require its own new FERC License. Due to its size, it would be considered a "Major Unconstructed Project". Three stage consultation and full agency and public involvement would be required throughout the licensing process for such a project.

Diesel system expansion and/or end-use conservation projects could take place without regulatory approvals from FERC.

U.S. Army Corps of Engineers. Allison Creek is not considered by the COE as a navigable creek. Therefore, the stand-alone power generating project would not require a Section 10 Permit for structures or work affecting navigable waters of the United States.

The penstock and powerhouse for the stand-alone power generating project may require a Section 404 permit from the COE if the location of these structures affects wetland areas. The tunnel alternative components (powerhouse, staging area, access road) may require a Section 404 permit. However, it appears from the NWI map that the area selected for location of these project components is not wetlands.

The raising of the Solomon Reservoir with a rockfill dam may also require a COE permit for the placement of fill.

If fill is required to expand the diesel generating facilities at CVEA, a COE Section 404 Permit may be required.

A jurisdictional determination from the COE for these activities should be secured as soon as possible to avoid any delays in project implementation.

U.S. Fish and Wildlife Service. The Fish and Wildlife Coordination Act requires that federal agencies considering modifications to a body of water which requires a federal license or permit, first consult with the USFWS and the National Marine Fisheries Service (NMFS). HDR informally consulted the USFWS regarding potential impacts of each of the proposed alternatives. USFWS had the greatest concern with the stand-alone power generating project on Allison Creek. Fewer environmental impacts to fish and wildlife resources were associated with the other structural alternatives.

In the event a bald eagle nest is found between now and the design phase, HDR recommends that AEA work cooperatively with the USFWS to determine a solution that affords the protection needed for nesting bald eagles while allowing development to proceed. A copy of the draft USFWS guidelines are attached in Appendix 5.

Alaska Coastal Management Program. The project is located within the coastal zone of Alaska. The proposed activities will require review for consistency with the standards of the Alaska Coastal Management Program (ACMP) and enforceable policies of the City of Valdez Coastal Management Program. All projects located within the Alaska coastal zone are required to be reviewed for consistency with ACMP standards. These standards (6 AAC 50) provide for a coordinated interagency review process for reviewing and issuing state permits for proposed development. The Office of the Governor, Division of Governmental Coordination (DGC) coordinates the review of projects by the state resource agencies (Departments of Environmental Conservation, Fish and Game, and Natural Resources) and the City of Valdez if permits are required from two or more state agencies or from a federal agency.

Alaska Department of Environmental Conservation. The Alaska Department of

Environmental Conservation (ADEC) has regulatory authority over a variety of activities. For example, ADEC issues a Section 401 Certificate of Reasonable Assurance if a COE Section 404 permit is required.

If potential air emissions exceed the regulatory thresholds established by the Clean Air Act, additional ADEC air quality permits may be required. Further consultation with ADEC may be necessary to determine if any additional diesel generation emissions require a Prevention of Significant Deterioration (PSD) Permit or if CVEA can operate under a PSD Avoidance Permit.

As a point of information, ADEC is currently preparing a user fee schedule per requirements of the Clean Air Act. If emissions generated per year are between 2000 tons and 4000 tons (a range into which CVEA will likely fall), the proposed permit fee could run as high as $25,000 per year.

In addition, to insure that water and soil are not permanently impacted by the proposed project, the contractor should be held responsible for cleaning up any hazardous materials generated during construction. Any hazardous material discovered or exposed or released into the air, water, or ground during construction shall be reported to ADEC immediately.

Alaska Department of Fish and Game. Allison Creek and Solomon Creek have been designated as important for the spawning and rearing of anadromous fish (pink, chum, and coho salmon) in accordance with AS 16.05.870(a). HDR informally consulted with ADFG staff regarding potential impacts to fisheries resources from the various project alternatives. These concerns are described in the preceding environmental evaluation. A Title 16 Fish Habitat permit may be required for the stand-alone power generating project on Allison Creek and for any changes to Solomon Creek as a result of the tunnel alternative.

Alaska Department of Natural Resources. The proposed project alternatives for the stand-alone power generating project and tunnel alternative are located on ADNR land. Several authorizations from ADNR may be required for the project alternatives.

- The following authorizations may be required stand-alone power generating project:

  a. land lease for the powerhouse, penstock, tailrace, and any staging areas;
  b. rights-of-way for the transmission lines;
  c. water rights authorization for water use;
  d. dam safety permit; and
  e. material sales contract if construction uses state resources.

- The following authorizations may be required tunnel alternative:

  a. land lease for the additional powerhouse and staging area;
  b. right-of-way for the tunnel and access road along Solomon Reservoir;

c. right-of-way for the water pipeline along Dayville Road;
d. water rights authorization for water use; and
e. material sales contract if state resources are used.

The alternatives that raise the level of the reservoir may require additional water rights authorizations and possibly a dam safety permit.

Department of Transportation and Public Facilities. Dayville Road is not a ADOT&PF right-of-way. The land belongs to ADNR, but ADOT&PF has a 300 foot easement from ADNR. Further consultation with ADOT&PF is recommended at the pre-design phase for the tunnel alternative.

Local Requirements. The alternative selected will require a coastal zone consistency determination from the City of Valdez. In addition, the stand-alone power generating project may require a conditional use permit from the City of Valdez Planning Commission.

Appendix G

DIESEL GENERATOR EMISSIONS LIMITATIONS

R.W. BECK
AND ASSOCIATES

WS-1559-HA1-AF **MEMORANDUM** October 20, 1993

TO Barbara Sands

FROM Ed Settle

SUBJECT Air Permitting Requirements at the Valdez and Glennallen Facilities

The proposed addition of a new diesel generating unit at each of CVEA's Valdez and Glennallen facilities would require a modification to each facility's current air permit and probably some method of emissions control for each proposed unit. Each facility would need to be independently reviewed, and depending on its current potential emissions (minor source or major source), may be subject to different permitting criteria, and consequently emissions control.

Source Classification

For attainment areas (areas where the air quality is cleaner than the National Ambient Air Quality Standards), the USEPA has promulgated regulations to prevent further "significant" deterioration of the air quality in that area. A proposed major new or modified source in an attainment or unclassified area must obtain a Prevention of Significant Deterioration (PSD) permit (40 CFR 52.21) before construction is allowed to begin. A "major stationary source", as defined by the PSD regulations, is any source belonging to a list of 28 specified source categories which has potential emissions of 100 tons per year (TPY) or more of any pollutant regulated under the PSD program. A large fossil fuel-fired steam-electric generating unit is an example of one of the 28 specified source categories. Any source category which is not included on the list, but has potential emissions of 250 TPY or more of any pollutant regulated under the PSD program, is also considered a major stationary source. An internal combustion engine, such as a diesel engine or combustion turbine, is an example of a source category subject to the 250 TPY threshold. Potential to emit is based on the maximum capacity of a source to emit a pollutant, taking into account pollution control techniques and devices as well as operational constraints (e.g., limits on the hours of operation) to the extent they are limited by federally enforceable permit conditions.

Determining whether a modification to an existing source is either "major" or "minor" depends on the type of modification and whether the existing source is "major" or "minor" under the PSD regulations. A modification is defined as any physical or operational change that would cause a significant increase in the potential emissions of any regulated pollutant. Certain changes are excluded by the regulations from being defined as a modification. For example, an increase in the number of actual operating hours of an existing source is not considered a modification if such increase is not specifically prohibited by a federally enforceable condition in the existing source permit.

If an existing minor source, as defined by the PSD regulations, is to undergo a physical or operational change that would cause an increase in potential emissions of any pollutant regulated under the PSD program, it would not be considered a major modification unless the net emissions increase, if taken by itself, would constitute a major source (i.e., more than 250 TPY for a diesel engine). A diesel engine could be installed at a generating station with emissions limited to less than 250 TPY and not be subject to PSD review. However, if an existing major source, as defined by the PSD regulations, is to undergo either a physical or operational change that would cause an increase in potential emissions of any pollutant regulated under the PSD program, it is considered a major modification if the net emissions increase at the source is equal to or exceeds the significant emission rates for the regulated pollutants. The significant emission rates for the criteria pollutants regulated by the USEPA under the federal PSD program are as follows:

Pollutant	Emissions Rate (TPY)
Carbon Monoxide	100
Nitrogen Oxides	40
Sulfur Dioxide	40
Particulate Matter (Total/<10-micron)	25/15
Ozone (Volatile Organic Carbons)	40
Lead	0.6

As an example, if there are no restrictions on hours of operation on the diesels currently at the Glennallen facility such that their potential emissions of nitrogen oxides (NO_x) are greater than 250 TPY, then the facility would be considered a major source. Therefore, in order to modify the facility by adding a new diesel unit without triggering PSD review, the new diesel couldn't increase NO_x emissions by more than 40 TPY. On the other hand, if the facility's current potential emissions are such that it is considered a minor source, then the new diesel unit could emit up to 250 TPY without triggering PSD review.

Emissions Control

A new 2.2-MW diesel unit without any emissions control and limited to operate somewhere between 5,000 and 8,000 hours per year (depending upon the particular unit's emissions) could probably be added to an existing minor source without triggering PSD review. However, if the facility is an existing major source, then the unit would have to be limited to approximately 800 to 1,280 hours to avoid PSD review, or undergo PSD review and the associated BACT analysis to operate more hours.

NO_x emissions are the predominant pollutant from diesel engines and are typically the primary focus of BACT for diesels. NO_x are formed in the combustion process through thermal oxidation of nitrogen in the combustion air or the reduction and subsequent oxidation of fuel bound nitrogen. In a diesel engine, the predominant mechanism for NO_x formation is through thermal oxidation of nitrogen. Control of NO_x

emissions is accomplished through combustion modifications (primary controls) or post-combustion techniques (secondary controls). If PSD review is required, the following types of controls for diesel engines may be evaluated for BACT:

Fuel Injecting Timing Retard (FITR) — this is the most common method of reducing NO_x emissions. The technique delays the injection of fuel, thereby limiting peak temperatures and pressures and the associated NO_x formation. The delay is set based on the crankshaft angle of rotation from top-dead center. For example, if standard timing is 22°, a 4° retard would delay fuel injection to 18° from top-dead center. Our recent experience indicates that most permits are issued requiring between 2° and 10° of retard. Tests have demonstrated from 30 to 40 percent NO_x reduction with 6° to 8° of retard on medium-speed diesels. Drawbacks include: (1) a resulting five percent increase in fuel consumption, and (2) additional maintenance costs related to increased engine wear.

Water/Fuel Emulsion — with this technique, fine water droplets are dispersed in the fuel oil prior to injection to the cylinder. Water reduces combustion temperatures in the engine and may also influence the chemistry of the conversion of N_2 and O_2 into NO_x during the combustion process. Engine tests on low-speed diesels have resulted in reductions of NO_x well beyond 15 percent with little degradation in fuel consumption. Drawbacks include: (1) significant engine modifications for more than about 20 percent water in fuel, (2) instability of emulsion with distillate oil requiring mixing immediately prior to injection or chemical additives which can be corrosive; and (3) a requirement for good quality potable water. This method can be used in conjunction with FITR.

Inlet Air Humidification — In this method, water is sprayed into the intake to "humidify" the air charge. The method offers a lower degree of control than FITR and water/fuel emulsion due to the small amount of water that can be carried into the combustion chamber via the combustion air. However, similar to water/fuel emulsion, the method can be used in conjunction with FITR.

Exhaust Gas Recirculation (EGR) — The theory behind EGR is the displacement of oxygen and nitrogen in the intake air by redirecting a portion of exhaust gas back into the inlet ports. This reduces power output and combustion efficiency and can foul or plug flow passages due to build up of solid and condensable particulates. There is little experience with this technique.

Aftercooling — Aftercooling decreases the inlet air temperature after the turbocharger, thus reducing peak temperatures and the associated NO_x formation.

Selective Catalytic Reduction (SCR) — A secondary control technique, SCR is one of the least common of control techniques for diesel engines due to the expense of the systems and the maintenance requirements. It is susceptible to chemical and physical deactivation when firing distillate fuel oil. Further, the catalysts are subject to high physical stress due to mechanical vibration and pulsation of the diesel engine. Other issues include the on-site storage of ammonia and disposal of the catalyst as a hazardous waste. Reductions of NO_x emissions with SCR are typically in excess of 80 percent. For a 2.2-MW diesel engine, the capital expenditure for SCR would be approximately $400 to $600 per kW. O&M expenses are estimated at $75,000 to $100,000 per year if the diesel is operated at base load.

Although, there are other control alternatives, those identified above represent the techniques generally discussed in permitting a diesel engine. Any one or a combination of the aforementioned control methods could be deemed as BACT for the proposed diesel installations. However, it should be noted that the likelihood for requiring SCR as BACT is very slight based on the aforementioned difficulties and costs associated with SCR on diesels, as well as previous BACT determinations for diesels. The most recent BACT determination for diesel units which we are aware of consisted of 8° FITR for four nominal 5-MW units installed at Tenjo, Guam (permitted by R.W. Beck). One diesel engine (nominal 8 MW) located at the Port Allen Generating Station is undergoing an SCR demonstration project until 1995. Thus, the USEPA currently does not consider SCR to be a demonstrated technology for purposes of BACT.

PSD Permitting Cost

The cost associated with preparing a PSD application for procuring permits would probably be in the range of $30k - $50k for each facility. Note that agency negotiations can often exceed the typical scope and such extensive negotiations would necessarily increase the scope and budget of the project.

If you have questions or comments, please call me at 303/299-5280.

cc. Mike Robinson

Appendix H

REVIEW OF VALDEZ AND GLENNALLEN COAL-FIRED GENERATION PLANTS

REVIEW OF VALDEZ AND GLENNALLEN COAL-FIRED GENERATION PLANTS

A. REVIEW OF VALDEZ CLEAN COAL PROJECT

Alaska Cogeneration Systems, Inc. (ACSI) has indicated to the Division that it is proposing to develop a 22-MW coal-fired cogeneration project to be located in Valdez. In its proposal to the Division dated February 25, 1994, ACSI indicates that the Valdez Clean Coal Project (the "Project") is to replace the Glennallen Coal Project previously proposed by Hobbs Industries Inc. (HII) for evaluation as a resource alternative to the Intertie. Reasons given by ACSI for the move of the HII/ACSI coal project to Valdez from Glennallen include closer proximity to CVEA's major load center, better sub-soil conditions and a high-quality and plentiful water supply. The Project is also intended to provide hot water or steam heat to local public facilities which are greater in number and in size than in Glennallen.

A review of the Glennallen Coal Project was provided for the draft feasibility study and the Division requested that a review of the Valdez Coal Project be included as part of the final report. At the present time, the Valdez Coal Project is still in the conceptual design stage and information provided by ACSI for our review has been very limited. Based on this limited information and our experience with other small coal-fired generating projects, a review of the proposed development has been performed and capital costs, operating costs and operating characteristics for the Project have been estimated. These parameters were then used in formulating a Valdez Coal Project resource scenario to be compared to the other CVEA resource alternatives included in the feasibility study.

It should be noted that the review of the Project was intended to evaluate the Project from the perspective of its viability as a resource regardless of who eventually were to develop and operate the Project. Consequently, the costs of the Project, including capital repayment, are expected to be fully recovered through the sale of power and steam or hot water on an annual basis. The Project, as presently defined by ACSI is a very unique development, and consideration should be given for the fact that it is proposed as an independent power project rather than a utility or State developed power project. The review of the Project did not include review of the proposed fuel supply or cost. ACSI has proposed to use coal fuel from a proprietary source of which we have no ability to evaluate the cost or the quantity of coal reserves at the present time.

1. Project Description

The Project is proposed as a coal-fired generating plant to be located in Valdez adjacent to CVEA's existing diesel power plant. ACSI also intends to construct a district heating system as part of the Project to provide hot water for heating purposes to several public buildings and other facilities in the general vicinity of the Project. Steam extracted from the steam turbine-generator will be used as the source of heat for the district heating system. Because the Project will be used to provide both electricity and district heat, it will be a cogeneration system.

Primary components of the Project are a coal-fired boiler and two steam turbine-generators sized at 6 MW and 18 MW. A second, oil-fired boiler is also to be installed to increase the maximum capacity of the Project and to serve as a backup to the primary coal-fired boiler. Each of the boilers is expected to be capable of providing steam sufficient to generate approximately 11 MW of electrical power. A limestone injection system is to be employed to reduce sulfur emissions. A pulse-jet baghouse is also to be installed for the collection of sulfur dioxide captured by the limestone injection process and for the collection of particulate emissions which are in the form of fly ash, sorbent salts and uncombusted materials. A three-cell cooling tower is also to be installed to cool water supply to the condensor.

The coal-fired boiler and both of the turbine generators have all been previously used and are to be refurbished and overhauled as necessary. The coal boiler was installed at the Knik Arm power plant in Anchorage where it was operated for 26 years using both coal and natural gas as fuel. The boiler was dismantled several years ago and partially restored for use in a power plant that was to have been constructed for the U.S. Air Force's OTH-B backscatter radar station to have been located near Gulkana. The 18-MW steam turbine, manufactured by the Elliot Company, was also to have been used at the OTH-B powerplant. Both turbine-generators and the coal-fired boiler are presently located in either Anchorage or Gulkana. The coal-fired boiler and the larger turbine-generator were proposed to have been included in the Glennallen Coal Project which was previously proposed by HII.

ACSI indicates that it intends to retrofit the coal-fired boiler with a fluidized bed combustion system and a limestone injection system. Several questions can be raised related to this concept, including:

- Is the boiler structurally capable of handling the increased pressure and loads, including bed inventory, associated with this type of system?
- Are the gas passes adequately sized for the increased gas flows without incurring high gas volumes?
- Is the residence time of the bed inventory adequate to achieve the desired sulfur capture?

Due to the number of years the boiler was in service, its unknown condition resulting from long-term storage and concerns associated with the installation of a fluidized bed combustion system and limestone injection system in the boiler, the feasibility of refurbishing the used boiler for this purpose may be questionable. In addition, depending on the current condition of the boiler and the level of refurbishment needed, the reliability of the boiler may also be of concern. The costs of refurbishing the boiler to a condition adequate to provide 25 years of reliable service may exceed the cost of a new boiler.

The two turbines to be installed in the Project are also used and are expected to be refurbished. The turbines are reported to be multi-stage and have several extraction points that could be used for feedwater heating or district heating. The current condition of these turbines is not fully known, however, the useful life of steam turbine generators , if properly operated and maintained, have exceeded 40 years.

ACSI has proposed to develop a district hot water heating system conjointly with the power plant. This district heating system will use steam extracted from the turbine-generator units to heat water which will then be piped to various facilities located in downtown Valdez. The hot water heating system is expected to integrate with the existing heating systems already installed in the various buildings and facilities. Construction of the district heating system will require the placement of piping underground between the Project location and the potential heating customers. The City of Fairbanks has owned and operated a district steam heating system for many years using steam extracted from its coal-fired power plant located in downtown Fairbanks.

ACSI has provided a list of potential heating customers in Valdez. To our knowledge, none of these customers has committed to purchasing heat from ACSI nor are we aware that the particular heating needs of any of these potential customers has been fully investigated. The list of potential heating customers includes the following:

- All municipal buildings including the Visitor Center.
- All schools.
- All Department of Transportation buildings.
- Prince William Sound Community College.
- Harbor View and hospital facilities.
- Valdez retirement home.
- The four seafood processors located in Valdez.
- All State of Alaska buildings.
- The U.S. Coast Guard.
- The U.S. Post Office buildings.
- The majority of downtown Valdez merchants.

In its proposal, ACSI estimated that it can provide approximately 300,000 million Btu per year of heat to these local facilities in Valdez which ACSI estimates would offset the use of 2,400,000 gallons of heating oil per year. The estimated fuel offset is based on the heat content of oil at 132,000 Btu per gallon and an assumed boiler efficiency of 95%. In subsequent conversations with ACSI, the quantity of district heating to be supplied by the Project was indicated to be estimated at 220,000 million Btu per year at the time the Project first becomes operational.

Coal fuel for the Project is expected to be provided from a mine located in the Matanuska Valley near Sutton that HII had previously proposed to operate. Coal would be transported in containers by road from the mine to Palmer where the containers would then be loaded on to railroad cars for transport to Whittier. From Whittier the coal containers would then be sent to Valdez on barges, offloaded at existing dock facilities and delivered to the Project site. ACSI estimates that the cost of coal delivered to the Project site is $50 per ton. This estimate includes approximately $15 per ton for delivery from Palmer to Valdez based on an estimate received by ACSI from a shipping company. ACSI indicates that the cost of coal for the Project will be less than the cost of delivered coal to the earlier proposed Glennallen Coal Project because of lower delivery costs. Further, ACSI has included the costs to initially open its coal mine in its capital cost estimate for the Project rather than including these costs in the delivered fuel cost as had been done for the Glennallen Coal Project coal price. ACSI indicates that alternative fuel supples have been considered, namely the Usibelli coal mine in Healy.

Water requirements of the Project are expected to be supplied from the local water system in Valdez. ACSI indicates that local water availability is more than adequate to meet the needs of the Project. Process and sanitary wastewater, estimated to be generated at a rate of approximately 10,000 gallons per day is to be pretreated, cooled and discharged directly into the Valdez waste water system. It will be necessary to investigate the adequacy of these facilities to provide the services needed by the Project. The costs to upgrade these systems, if required, may be the responsibility of the Project.

ACSI proposes to operate the Project in conjunction with CVEA's existing generating resources. It is expected that the Project will be available to provide 10 MW of firm capacity throughout the winter months and that it will essentially be shut down between mid-June and mid-August. During the summer period between June and September, the Solomon Gulch hydroelectric project will continue to provide most of CVEA's power requirements, limiting the use of the Project. The minimum operating level of the Project is indicated to be between 1.0 and 1.5 MW. The operation of the Project should integrate well with CVEA's existing generation plant, primarily offsetting the need for diesel generation and permitting greater flexibility in the operation of the Solomon Gulch project. Detailed analyses of the operation of CVEA's system with the Project have not been conducted as a part of this review, however.

The ACSI proposal anticipates full operation of the Project beginning in January 1997. This commercial operation date is based upon the presumption that engineering is completed in 1994 and that construction of the Project begins in January 1995. The schedule also assumes that a firm power sales contract between ACSI and CVEA is completed by July 1994 and that Project financing is secured by August 1994. For the purpose of our analysis, we have assumed that the Project is not operational until January 1998 allowing more time than presently allowed by ACSI for contract negotiations, environmental studies, permitting, engineering and other up-front activities. ACSI proposes to operate the Project for 25 years.

It should be noted that ACSI has indicated in its proposal that it may also select a location for the Project adjacent to the Alyeska Terminal Facility although the basis to be used by ACSI for final site selection is not identified. Waste heat from the Project at this location would be supplied to the Terminal Facility. We have not evaluated the issues related to siting of the Project near the Terminal Facility.

2. Construction Costs

ACSI has provided a preliminary cost estimate for the Project reportedly in 1997 dollars although no allowance for inflation is indicated. We have presumed that the cost estimate is in 1993 dollars. The cost estimate includes a "Contractor Cost" component of $18,500,000 and an "Owner's Cost" component of $4,000,000 for a total construction cost budget of $22,500,000.

The use of used and refurbished equipment makes it extremely difficult to evaluate the cost of constructing a project of the type proposed by ACSI. The boiler and steam turbines are a critical aspect of a power plant's cost and performance and a detailed analysis of used components would generally be required by a qualified inspector. We have not completed a detailed analysis of the used equipment nor have we been provided with such reports upon which to base our review.

The ACSI cost estimate includes a contingency of $2,000,000 which represents approximately 10% of the estimated total cost of the Project. It is typical that power projects at this stage of development use a contingency greater than 10% until detailed design is approximately 90% complete. Refurbishing used equipment can be costly and the amount of work required often escalates as the work progresses which should be factored in to the level of contingency. Beyond the discussion of contingency, our limited review of the cost estimate for the Project resulted in the following questions and comments:

- There is no apparent allowance in the cost estimate for the costs of electrical, water or sewer interconnections. These costs can be significant.

- There is no mention of major systems such as coal handling, ID fans, limestone handling and ash handling in the cost estimate.

- Start-up costs related to operator training, start-up utilities, fuel, operator labor and other items are not included. These costs can be significant.

- The amount budgeted for environmental permitting appears low in comparison with other projects.

- General contractor overhead and profit seems low in comparison to other projects and with consideration of the particular requirements of the Project location.

- Specific quotes for materials and labor have not been obtained nor has complete quantification of these items been formulated.

Based on our limited review of the information provided and our experience with other similar projects, we are of the opinion that the cost estimate provided by ACSI is lower than would be anticipated in comparison to the costs of other projects that are similar in size and technology with which we are familiar. We would anticipate the construction cost of the Project, excluding all Owner's costs and contingency, to be in the range of $22,500,000 to $26,000,000. This estimated cost represents a range of approximately $1,000 to $1,200 per installed KW which is considerably less than typical experience with constructing small coal-fired generating projects. The cost estimate allows for the savings anticipated by ACSI in acquiring certain equipment for the Project at basically salvage costs. The following table shows the estimated construction costs of the Project as provided by ACSI and as adjusted by R.W. Beck for the mid point of our estimated range of construction costs.

Table H-1
Valdez Coal Project
Estimated Cost of Construction
(1993 $000)

	ACSI(1)	R.W. Beck (2)
Contractor Costs		
Site Acquisition	500	(3)
Foundations and Buildings	1,200	(3)
Mechanical Equipment:		(3)
Boilers	4,000	(3)
Turbine Generator Package	2,000	(3)
Utility Integration	500	(3)
Other	1,000	(3)
Subtotal - Mechanical	$7,500	(3)
Power Plant Piping	1,000	(3)
Electrical Equipment	2,200	(3)
Identified Subcontractor Services	600	(3)
Misc. Support Equipment & Freight	400	(3)
District Heating System	3,000	(3)
Water Supply and Treatment System	500	(3)
General Contractor Overhead & Profit	1,600	(3)
Total Contractor Costs	$18,500	$24,200
Owners Costs		
Environmental Permitting	150	250
Engineering and Design	850	850
Construction Management	1,000	1,000
Contingency	2,000	6,100
Acquisition of Coal Reserves	2,300	2,300
Legal & Development Costs	1,900	1,900
Total Owner's Cost	$8,200	$12,400
Total Construction Cost	$26,700	$36,600

(1) As estimated by ACSI in February 1994.
(2) Project cost estimate as adjusted by R.W. Beck. Includes 20% contingency on all Contractor and Owner's Costs.
(3) R.W. Beck has not estimated various components of the Project cost estimate.

3. Permits, Licenses and Approvals

As stated in the ACSI proposal, the Project would be required to obtain an air quality permit from the State. ACSI intends to amend and relocate an existing permit which was issued to Slana Energy, Inc. for the OTH-B power plant. Air emission permits are typically issued for a specific site and project configuration. Therefore, a site specific permit would have to be issued for the Project based on the intended design and operation of the facility. The existing permit may have little relevance to obtaining an air emissions permit for the Project. Work done previously towards permitting the OTH-B powerplant may be of value, however, in providing the necessary information for permitting the Project.

Various other permits will be needed including permits to provide for water and wastewater services and local building codes will need to be adhered to. Local restrictions may limit building height, noise levels, fugitive dust emissions and on truck traffic through town. For example, the stack height of the

Project is known to exceed the building height restrictions in Valdez and a variance of this restriction would need to be obtained.

4. Costs of Operation

ACSI is proposing to operate the Project with a staff of 12 employees, supplemented with contract labor. Based on our experience with similar small coal-fired facilities, we estimate that the Project could be operated effectively with a staff of 16 full-time employees. The employees would include a plant manager, an administrative assistant, 12 operators, a mechanic and an electrician. There would be three operators on duty at all times. ACSI also indicated to us that fuel preparation, crushing and screening, would occur at the mine prior to shipment. Should fuel preparation work be conducted at the Project site, two additional fuel handlers should be included in the estimated labor costs. The variable cost of operation is assumed to be $.01 per KWh of generation which should be adequate to operate the facility and provide for the accrual of funds for periodic overhauls of plant equipment.

ACSI assumed a net plant heat rate when firing coal of 13,000 Btu per Kwh. The heat rate of this type of facility is severly impacted by startups and shutdowns of the system and part load operations, as would be encountered if the Project were to provide load following service to CVEA. In addition, the extraction of steam for the district heating system will also factor in to the net heat rate. Although we have not been provided with detailed information on the specific turbines to be used in the Project nor does it appear that a heat balance analysis for the Project has been performed, we believe that a net heat rate of 15,000 to 16,000 BTu/KWh for the coal-fired system is a more appropriate assumption at this time. No information on the oil-fired boiler has been provided, however ACSI's assumed heat rate of 12,143 Btu per Kwh appears reasonable. ACSI expects to use the coal-fired boiler 90% of the time and the oil-fired boiler 10% of the time.

The cost of coal is estimated by ACSI to $50 per ton delivered to the Project site. This is based on ACSI's estimated cost to mine, process and deliver the coal. We are unable to address this cost estimate at the present time although, as previously mentioned, it is lower than HII had proposed for a coal cost for the Glennallen Coal Project. Coal from ACSI's mine is assumed to have a heat content of 12,500 Btu per pound which is in the range for coal in the Sutton area. ACSI indicates that it may rely upon coal from other sources such as the Usibelli mine if necessary. The heat content of coal from the Usibelli mine is much lower than that from the Sutton area which would mean that a greater quantity of coal would be needed by the Project if Usibelli coal rather than Sutton coal were used. The cost of coal is assumed to increase at the rate of general inflation.

As a part of the boiler refurbishment, ACSI proposes to replace the combustion system with a fluidized bed combustion system which includes limestone injection to control sulfur dioxide emissions. ACSI estimates that the cost of limestone is negligible and is included in the variable O&M costs. Limestone utilization is dependent on several variables including the sulfur content of the coal, the emission limits dictated in the air permit and the sulfur capture ration achieved in the boiler. Depending on these variables and the availability and price of crushed limestone, the limestone costs may not be negligible, however, we have not included any additional costs for limestone in the cost of operations due to the limited information available at this time.

Sales of steam or hot water heat are expected by ACSI to contribute significantly to the revenues of the Project. ACSI estimates that the district heating system will offset the use of 2,400,000 gallons of oil a year by the various facilities that are expected to be connected to the district heating system. This estimate assumes a 95% boiler efficiency of the various heating customers' existing heating systems which is a relatively high efficiency. If an 80% efficiency were used, either the amount of offset oil would be increased or the quantity of heat required by the potential customers would be decreased, depending on which number was used to formulate the estimated offset. We are unaware of the basis for ACSI's estimated heating load estimates and the estimated heat quantity should be investigated further. For the purposes of our analysis, we have assumed that the heating load of the potential district heating customers is 250,000 MMBtu per year which would equate to a fuel oil offset of 2,400,000 gallons per year at 132,000 Btu per gallon and an 80% boiler efficiency. The value of the district heat is estimated to be equivalent to the assumed cost of oil. At $0.70 per gallon, the value of the district heat would be $1,680,000 per year. We have also assumed that operations and maintenance costs on the district heating system will be $0.50 per MMBtu or $125,000 per year.

Table H-2
Valdez Coal Project
Estimated Cost of Operation (1)
(1993 $)

Fuel	
Coal (2)	$1,080,000
Oil (3)	258,000
Operations and Maintenance	
Variable(4)	400,000
Fixed(5)	1,440,000
Insurance(6)	60,000
General and Administrative(6)	150,000
Renewals and Replacements(6)	150,000
Taxes(7)	0
Total Operating Cost	$3,538,000
Unit Cost of Production (cents/KWh)	8.9
Less: Net District Heat Revenues(8)	(1,555,000)
Net Cost of Production	$1,983,000
Net Cost of Power Production (cents/KWh)	5.0

(1) At an assumed operating level of 40,000 Mwh annually. Before depreciation and income taxes.
(2) Assumes 90% availability of the coal-fired boiler, 12,500 Btu per pound heat content of fuel, 15,000 Btu per Kwh heat rate and $50 per ton cost of coal.
(3) Assumes oi-fired boiler heat rate of 12,143 Btu per KWh, cost of oil at $0.70 per gallon and 132,000 Btu per gallon.
(4) Includes normal parts and consumables. Estiamted to be $.01 per kWh.
(5) Estimated cost of salary and benefits for 16 plant personnel.
(6) As estimated by ACSI.
(7) No local taxes are assumed to be paid by the Project.
(8) Assumes 2,400,000 gallons of fuel oil offset at $0.70 per gallon. Assumes annual operations and maintenance cost of the district heating system of $125,000.

B. REVIEW OF GLENNALLEN COAL-FIRED GENERATION PLANT

1. Description

Hobbs Industries, Inc. ("Hobbs") has proposed to construct and operate an 11-MW coal-fired generation project in Glennallen. Hobbs has proposed to generate electrical power for sale to CVEA and produce steam for district heating of various public facilities in Glennallen. The project may use various components of a coal project which was to have been constructed near Gulkana, Alaska to supply power to the proposed U.S. OTH-B radar station, but that was terminated prior to completion.

Hobbs provided an overview of the costs and characteristics of the proposed Glennallen coal project to us in a report dated May 5, 1993. Subsequent information was provided in a letter dated September 3, 1993. Although the coal project is still in the very early stages of development, Hobbs has relied extensively upon the design and cost estimating work that was done for the previously designed and terminated power plant. The Authority requested that a review of Hobbs' report be conducted and that adjustments be made to the estimated costs of the project as necessary to provide a cost estimate that is compatible with estimates used for the other generation options being considered as alternatives to the Intertie.

Most of our review has focused on the May 5, 1993 data submitted by Hobbs, but we have included certain data in our analysis supplied by Hobbs since the initial report was provided. In more recent information provided by Hobbs, alternative conceptual configurations of the coal project have been proposed. We have been unable to fully consider the alternative configurations which, according to Hobbs, should improve the ability of the coal project to serve the power needs of CVEA. It is not known what impact the alternative configurations would have on the total construction cost of the coal project.

An important consideration with regard to the coal project is that it is proposed as an independent power project that will be independently constructed and financed. For the purposes of this report all generation options are compared on an equivalent basis with no regard to how or by whom they are financed.

The primary components of Hobbs' proposed coal project, namely the boiler and turbine generator, are both used and were partly refurbished at the time the previous power plant was underway. The boiler identified by Hobbs was previously used in Anchorage at the Knik Arm power plant; however, for most of its 26-year operation period it was fired with natural gas rather than coal. The steam turbine-generator was manufactured by the Elliot Company and is rated at 18 MW. Initially commissioned in 1962, the turbine was removed from service in 1979. Although the turbine generator has been refurbished to a condition which should permit at least 20 years of additional operation, the condition of the boiler is suspect and a new boiler may be needed to ensure effective long-term operation in the future. Other project equipment such as the stoker, storage silo, conveyor and condenser are also reported by Hobbs to be used equipment that is to be refurbished.

Coal fuel is expected to be provided from mines located in the Matanuska Valley near Sutton that Hobbs has previously proposed to operate. Coal would be delivered to the power plant via belly dump trucks and approximately 30 days of fuel supply will be stored on site in a storage silo. Water requirements, estimated to be approximately 150 gallons per minute (gpm) during full operation are to be supplied from deep wells indicated by Hobbs to already be in existence in the Glennallen area. The approximately 10,000 gallons per day of process and sanitary waste water are to be treated, cooled and discharged directly into the Glennallen waste water system. A closed-circuit glycol cooling system would be installed and would be operated when the outside temperature drops below -20 degrees F to prevent a cooling tower plume which could produce ice fog. Air pollution control equipment to be installed includes a new overfire air system to reduce nitrous oxides (NOx) emissions and a sorbent injection system to reduce sulfur oxides (SOx) emissions. A baghouse is also to be installed to control particulate emissions.

Hobbs indicated that if power sales negotiations with CVEA were to have begun in the summer of 1993 (which they were not), the coal project could be operational by October 1996. Based on this estimated completion date, construction would begin in November 1994 and clearing and subgrade foundation work would be conducted early in 1995. It is not known how the timing of power sales negotiations would ultimately affect the project completion date although it can probably be presumed that since no discussions between Hobbs and CVEA have been conducted that the estimated completion date of the coal project may have slipped at least a year from that originally anticipated by Hobbs.

Hobbs proposes to operate the coal project in integration with CVEA's other generators. The size of the turbine-generator to be included with the coal project is such that the project will not be able to efficiently operate below approximately 3 MW. At times when the Solomon Gulch Project is generating at or near full capacity, the coal project will most likely not be generating. Hobbs anticipates that the coal project will be shutdown for 2 months during the summer for annual maintenance. During this period, the Solomon Gulch project will supply most if not all of the power needs of CVEA and the coal project will not be needed. The coal project may be shut down for a longer period of time each year depending on the level of generation at the Solomon Gulch Project. The coal project would offset diesel generation only and would not offset generation from the Solomon Gulch Project on an annual basis.

Hobbs has also proposed to provide steam or hot water from the coal project for use in a local district heating system in Glennallen. Possible customers for the steam heat, according to Hobbs, would be nearby Copper Valley schools, a local bible college, certain businesses in the immediate vicinity and public facilities.

2. Construction Costs

Hobbs has provided a cost estimate for the coal project. It must be noted that the nature of Hobbs proposal with its specifically identified used equipment components and location make it difficult to comment on without a detailed review. Further, the status of development is such that many issues are outstanding that could significantly impact the cost of construction. Nevertheless, we have reviewed the cost estimate and have provided adjustments as deemed appropriate based on our experience with similar small coal fired generating plants. Hobbs estimates that the total cost of construction and development is $18,200,000 in 1993 dollars. We estimate that this cost may be low and that construction costs are more appropriately estimated at $23,500,000. Approximately $500,000 of the difference is accounted for in higher estimated costs for the boiler to accommodate either higher refurbishment costs or the purchase of a new boiler. We have also increased the construction contingency from less than 10% as provided by Hobbs to 20%, a more appropriate value based on the present stage of project development. It is typical that power projects at this stage of development use a contingency greater than 10% until detailed design is approximately 90% complete. We are unaware of the cost to be paid for the specific used equipment components specified by Hobbs and have relied on csts of which we are familiar in our estimate for typical used equipment.

The cost estimate does not include any costs for the development of the coal mine to be used to provide fuel to the project. It is consequently expected that the development costs of the mine would be accounted for separately and would be recovered through the cost of coal fuel that will be charged to the project.

Table H-1 shows the estimated costs of construction of the coal project as estimated by Hobbs and adjusted by us.

Table H-3
Glennallen Coal Project
Estimated Cost of Construction
(1993 $000)

	Hobbs[1]	R.W. Beck[2]
CONTRACTOR COSTS		
Site Preparation and Acquisition	$ 800	$1,000
Foundations and Buildings	1,700	1,900
Mechanical Equipment:		
Boiler[3]	3,400	4,000
Turbine Generator Package [4]	600	700
Utility Integration [5]	500	500
Other	1,500	1,500
Subtotal - Mechanical	$6,000	$6,700
Power Plant Piping	$ 400	$ 600
Electrical Equipment	1,500	2,000
Identified Subcontractor Services	500	500
Misc. Support Equipment and Freight	200	200
District Heating System [6]	1,800	1,800
Water Supply and Treatment System	700	700
General Contractor Overhead and Profit	1,600	1,600
Subtotal	$6,700	$7,400
Total Contractor Costs	$15,200	$17,000
OWNER'S COSTS		
Environmental Permitting	$ 100	$ 200
Engineering and Design	600	800
Construction Management	800	800
Startup and Testing Costs	0	500
Initial Spare Parts	0	300
Contingency [7]	1,500	3,900
Total Owner's Costs	$3,000	$6,500
Total Construction Cost	$18,200	$23,500

Footnotes on following page.

(1) As estimated by Hobbs Industries in May 1993.
(2) Project cost estimate as adjusted by R.W. Beck and Associates.
(3) Based on estimated cost of a single boiler system.
(4) Assumes use of previously used and refurbished turbine generator.
(5) Estimated cost to integrate the coal project with CVEA's electric system.
(6) Estimated costs are for a 1.5 mile maximum length heating system.
(7) R.W. Beck estimate assumes 20% contingency on construction and owner's costs.

3. Costs of Operation

In its May 1993 proposal, Hobbs proposed that a staff of 18 full-time employees would be required to operate and maintain the coal project. Subsequent to its original proposal, Hobbs has indicated that it would propose to operate the coal project on an integrated basis with CVEA's diesel power plant and could reduce the total number of operating staff for the coal project to 12 employees if this were to occur. CVEA has indicated that it would not enter into an integrated operating agreement so we have not included any potential reduction in operating costs with integrated operation. Based on our experience with similar small coal-fired projects, we estimate that the coal project could operate effectively with 16 full-time employees. These would include a plant manager, an administrative assistant, 12 operators, a mechanic and an electrician. Three operators would be on duty at all times.

As an independent power project, Hobbs has proposed that power from the coal project be sold to CVEA with a monthly fixed charge plus a per kWh energy charge. The rate to be charged will allow for the repayment of the capital costs of the project, operations and maintenance costs and fuel costs. For the purpose of this analysis, the nature of the actual contractual payment requirements is not important. Rather, the costs of operation have been estimated and are included in the economic analysis used to compare the costs of the various resource alternatives.

Table H-2 shows the estimated costs of operation for the coal project based on annual energy production of 48,000 MWh, a generation amount used simply as an example. The costs shown in Table H-2 are different than costs provided by Hobbs for several reasons. Our review of Hobbs' estimate indicated that variable costs of operation, typically in the range of $.01 per kWh were not included. The variable costs in our estimate include a provision for the accrual of funds for periodic overhauls of the plant.

The actual energy production of the coal project that can be used by CVEA depends on CVEA's load requirements and the generation at the Solomon Gulch Project. As previously mentioned, it will be unacceptably inefficient for the coal project, as currently configured, to operate much below 3 MW. Consequently, CVEA's hourly load requirement must be above 3 MW on a daily basis before the coal project would operate. During the late summer and early fall, the Solomon Gulch Project is typically capable of generating all of CVEA's power needs. The coal project would not operate at these times since CVEA must either use the water in the Solomon Gulch reservoir to generate power or spill water from the reservoir. The power supply and economic analysis described in Sections IX and X of the report factor this limitation into account when projecting how much energy the coal project would actually produce for CVEA's load requirements. Based on an 85% annual availability factor the coal project could produce approximately 82,000 MWh per year.

The cost of fuel was initially proposed by Hobbs to be $80 per ton delivered or $3.20 per million BTUs, in 1993 dollars. Subsequently, Hobbs has proposed that the cost of fuel would be $70 per ton or $2.80 per million BTUs. The cost of fuel is also indicated by Hobbs to include ash disposal costs. The cost of fuel is proposed to remain constant through 2001 and then escalate at the general rate of inflation. No specifics for the determination of the fuel costs has been provided; however, this cost is somewhat higher than the cost of fuel that Hobbs included in its estimate of costs for another coal-fired power plant several years ago. Since fuel is to be supplied from a new mine that will be presumably owned and operated by Hobbs, the cost of fuel will most likely be negotiated. The estimate of $70 per ton should be adequate, however, to pay for the costs of mining, processing and delivering the coal.

Table H-4
Glennallen Coal Project
Estimated Costs of Operation(1)
(1993 $)

Fuel(2)	2,016,000
Operations and Maintenance	
Variable(3)	480,000
Fixed(4)	1,430,000
Insurance	100,000
General and Administrative	100,000
Taxes(5)	0
Renewals and Replacements	100,000
Total Operating Cost	4,226,000
Energy Production (MWh)(6)	48,000
Unit Cost of Production (cents/kWh)(7)	8.80

(1) At an assumed generating level of 48,000 MWh annually. Before depreciation and income taxes.
(2) Estimated cost of fuel at $70 per ton, heat content of 12,500 Btu/lb. and a plant heat rate of 15,000 Btu/kWh.
(3) Includes normal parts and consumables, and allowance for periodic overhauls. Estimated to be $.01 per kWh.
(4) Estimated salary and benefits costs for 16 plant personnel.
(5) No local taxes are estimated to be paid by the coal project.
(6) Assumed level of generation for illustrative purposes. Actual generation will vary depending on CVEA load requirements and Solomon Gulch Project generation.
(7) Total operating costs divided by energy generation.

Hobbs estimates that local steam or hot water sales for heating purposes in the winter months could be approximately 25 million BTU per hour based on discussions with certain local facilities that may be able to use the steam for heating purposes. We have not verified this estimate. Assuming that this level of heating requirement would be maintained for six months per year, the total annual heating sales would be 109,500 million BTUs. At $1.00 per gallon for heating fuel ($7.14 per million BTU) and an assumed oil-fired boiler efficiency of 80%, the value of the district heat from the coal project would be approximately $980,000 per year. The cost to maintain and operate the district heating system would need to be funded through the revenues received from heat sales. For the purpose of the economic analysis, we have assumed that the net revenues from the sale of heat from the coal project would be $800,000 per year which indicates a provision of $180,000 for operation and maintenance costs.

C. OUTSTANDING ISSUES

In reviewing the proposed coal project as outlined by Hobbs, we have identified several issues which could significantly impact the costs of constructing and operating the project. It is not unusual that many of these issues would be unresolved at this stage of project development. They will need to be addressed before the project can be expected to proceed much farther and would almost undoubtedly need to be resolved before financing for the project can be secured. In addition, CVEA would need to be fully satisfied that these issues can be resolved before committing to purchase power from the project, particularly if the project is to provide firm power whereby CVEA forgoes development of other resource options. Following are the issues identified in our review:

- The coal project may not be able to effectively integrate efficiently with CVEA's existing hydroelectric resource under certain load conditions. In particular, the size of the coal project may restrict it from operating at times when loads fall below certain levels during the day. A detailed production cost model should be used to model the CVEA load dispatch on an hourly basis to determine if the coal project would be expected to ramp up and down several times on a daily basis. If it is determined that the coal project cannot be operated as much as presently estimated, its unit cost of operation may become prohibitive.

- Water supply and waste water discharge issues may be critical since the existing disposal system in the area may be inadequate to handle the proposed additional load. Hobbs' assumptions on these issues should be researched further.

- Permitting issues should be specifically identified. The ability of the coal project to obtain the necessary air emissions permits should be verified.

- The coal supply issues should be investigated further. Certain lands within Alaska identified as "mental health lands" have not permitted coal mining within recent years. This issue should be investigated further. In addition, the environmental and societal impacts of mining and regular coal delivery along the Glenn Highway should be investigated.

Appendix I

CONSERVATION ANALYSIS

Alaska Energy Authority - Copper Valley Intertie Feasibility Study
Summary of DSM Program Savings and Costs

		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Energy Savings in MWh													
Res:High Efficiency Refrigerators		0	1	5	9	14	20	26	32	39	45	51	57
Res:High Efficiency Freezers		0	1	3	4	8	11	14	17	20	23	27	30
Res:Compact Fluorescent Lighting		0	14	32	61	90	146	147	148	150	151	152	154
Com:High Ef. Fluorescents		0	22	43	65	86	108	151	195	238	281	324	400
Com:Compact Fluorescent Lighting		0	18	27	36	63	91	118	136	163	190	217	244
Total		0	56	110	175	262	376	456	528	609	690	771	885
Demand Savings in KW													
Res:High Efficiency Refrigerators		0.0	0.2	0.6	1.1	1.8	2.6	3.3	4.1	4.8	5.6	6.4	7.1
Res:High Efficiency Freezers		0.0	0.1	0.3	0.5	0.8	1.1	1.5	1.8	2.1	2.5	2.8	3.2
Res:Compact Fluorescent Lighting		0.0	5.1	11.8	22.8	33.9	54.7	55.1	55.6	56.1	56.6	57.1	57.6
Com:High Ef. Fluorescents		0.0	7.5	15.0	22.5	30.0	37.5	52.6	67.6	82.6	97.6	112.6	138.9
Com:Compact Fluorescent Lighting		0.0	6.3	9.4	12.6	22.0	31.4	40.9	47.2	56.6	66.0	75.4	84.9
Total		0.0	19.2	37.2	59.5	88.5	127.3	153.3	176.2	202.2	228.3	254.3	291.7
Total Savings by Load Center													
Valdez	Energy in MWh	0	37	72	114	170	241	297	346	401	457	512	591
	Demand in KW	0.0	12.8	24.5	38.6	57.5	82.0	100.0	115.9	133.9	152.0	170.1	196.0
Glennallen	Energy in MWh	0	18	37	62	92	134	160	182	208	233	259	294
	Demand in KW	0.0	6.4	12.6	20.8	31.0	45.3	53.3	60.3	68.3	76.3	84.2	95.6
Total Requirements													
Energy in MWh		71,857	75,624	82,542	86,171	88,322	89,235	90,159	91,097	92,054	92,812	93,472	94,107
Demand in KW		12,686	13,295	14,353	14,951	15,266	15,425	15,586	15,750	15,917	16,049	16,163	16,274
Savings as a Percent of Requirements													
Energy		0.0%	0.1%	0.1%	0.2%	0.3%	0.4%	0.5%	0.6%	0.7%	0.7%	0.8%	0.9%
Demand		0.0%	0.1%	0.3%	0.4%	0.6%	0.8%	1.0%	1.1%	1.3%	1.4%	1.6%	1.8%
Total Costs		$0	$14,231	$14,838	$17,378	$25,244	$32,283	$28,608	$35,986	$36,044	$44,703	$38,723	$59,151

Alaska Energy Authority - Copper Valley Intertie Feasibility Study
Summary of DSM Program Savings and Costs

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Energy Savings in MWh													
Res:High Efficiency Refrigerators	63	70	76	83	89	96	102	109	116	123	129	136	143
Res:High Efficiency Freezers	33	36	40	43	46	50	53	57	60	64	68	71	75
Res:Compact Fluorescent Lighting	155	156	158	159	161	162	163	165	166	168	169	171	172
Com:High Ef. Fluorescents	476	551	627	703	778	854	930	1,006	1,081	1,081	1,081	1,081	1,081
Com:Compact Fluorescent Lighting	244	244	244	244	244	244	244	244	244	244	244	244	244
Total	972	1,058	1,145	1,232	1,319	1,406	1,493	1,581	1,668	1,680	1,692	1,704	1,716
Demand Savings in KW													
Res:High Efficiency Refrigerators	7.9	8.7	9.5	10.3	11.1	12.0	12.8	13.6	14.5	15.3	16.2	17.0	17.9
Res:High Efficiency Freezers	3.5	3.9	4.2	4.6	4.9	5.3	5.7	6.0	6.4	6.8	7.2	7.6	8.0
Res:Compact Fluorescent Lighting	58.1	58.6	59.1	59.6	60.1	60.7	61.2	61.7	62.3	62.8	63.3	63.9	64.5
Com:High Ef. Fluorescents	165.2	191.5	217.7	244.0	270.3	296.6	322.9	349.1	375.4	375.4	375.4	375.4	375.4
Com:Compact Fluorescent Lighting	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9
Total	319.6	347.5	375.4	403.4	431.4	459.4	487.4	515.4	543.4	545.2	547.0	548.8	550.6
Total Savings by Load Center													
Valdez Energy in MWh	650	710	769	829	888	948	1008	1068	1128	1135	1142	1149	1156
Valdez Demand in KW	215.4	234.8	254.2	273.6	293.0	312.5	331.9	351.3	370.8	371.9	373.0	374.1	375.2
Glennallen Energy in MWh	322	349	376	403	431	458	485	513	540	545	550	555	560
Glennallen Demand in KW	104.1	112.7	121.2	129.8	138.4	146.9	155.5	164.1	172.6	173.3	174.0	174.8	175.5
Total Requirements													
Energy in MWh	94,733	95,359	95,989	96,626	97,269	97,921	98,581	99,250	99,927	100,601	101,279	101,962	102,650
Demand in KW	16,383	16,492	16,602	16,712	16,824	16,938	17,053	17,169	17,287	17,404	17,522	17,641	17,761
Savings as a Percent of Requirements													
Energy	1.0%	1.1%	1.2%	1.3%	1.4%	1.4%	1.5%	1.6%	1.7%	1.7%	1.7%	1.7%	1.7%
Demand	2.0%	2.1%	2.3%	2.4%	2.6%	2.7%	2.9%	3.0%	3.1%	3.1%	3.1%	3.1%	3.1%
Total Costs	$54,363	$67,876	$57,050	$54,735	$66,810	$75,476	$59,804	$67,193	$67,263	$63,925	$57,957	$60,500	$55,724

Alaska Energy Authority - Copper Valley Intertie Feasibility Study
Residential DSM Programs

High Efficiency Refrigerators	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
VALDEZ												
Estimated Participants												
Eligible Units	71	71	72	73	73	74	75	75	76	77	78	78
New Participants	0	7	18	18	29	30	30	30	30	31	31	31
Estimated Savings												
Incremental (Adj for Losses)												
Energy Savings (MWh)	0.0	0.9	2.2	2.2	3.6	3.6	3.6	3.7	3.7	3.7	3.8	3.8
Demand Savings (KW)	0.0	0.1	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Cumulative												
Energy Savings (MWh)	0.0	0.9	3.1	5.3	8.8	12.4	16.1	19.7	23.5	27.2	31.0	34.8
Demand Savings (KW)	0.0	0.1	0.4	0.7	1.1	1.6	2.0	2.5	2.9	3.4	3.9	4.4
Cumulative Adjusted for Free Riders												
Energy Savings (MWh)	0.0	0.8	2.9	5.0	8.4	11.8	15.3	18.8	22.3	25.8	29.4	33.1
Demand Savings (KW)	0.0	0.1	0.4	0.6	1.0	1.5	1.9	2.3	2.8	3.2	3.7	4.1
Estimated Costs												
Measure	$0	$227	$572	$578	$933	$942	$951	$960	$970	$979	$988	$998
Administrative	0	136	343	347	560	565	571	576	582	587	593	599
Total	$0	$363	$915	$924	$1,493	$1,507	$1,522	$1,537	$1,551	$1,566	$1,582	$1,597
GLENNALLEN												
Estimated Participants												
Eligible Units	48	50	51	53	54	54	55	55	55	56	56	57
New Participants	0	5	13	13	21	22	22	22	22	22	22	23
Estimated Savings												
Incremental (Adj for Losses)												
Energy Savings (MWh)	0.0	0.6	1.6	1.6	2.6	2.6	2.7	2.7	2.7	2.7	2.7	2.8
Demand Savings (KW)	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Cumulative												
Energy Savings (MWh)	0.0	0.6	2.2	3.8	6.4	9.0	11.7	14.4	17.1	19.8	22.5	25.3
Demand Savings (KW)	0.0	0.1	0.3	0.5	0.8	1.1	1.5	1.8	2.1	2.5	2.8	3.2
Cumulative Adjusted for Free Riders												
Energy Savings (MWh)	0.0	0.6	2.1	3.6	6.1	8.6	11.1	13.7	16.2	18.8	21.4	24.0
Demand Savings (KW)	0.0	0.1	0.3	0.5	0.8	1.1	1.4	1.7	2.0	2.3	2.7	3.0
Estimated Costs												
Measure	$0	$158	$409	$424	$684	$689	$694	$699	$705	$710	$715	$720
Administrative	0	95	245	255	410	414	417	420	423	426	429	432
Total	$0	$252	$655	$679	$1,095	$1,103	$1,111	$1,119	$1,127	$1,136	$1,144	$1,153
TOTAL												
Estimated Participants												
Eligible Units	119	121	123	126	127	128	129	130	132	133	134	135
New Participants	0	12	31	31	51	51	52	52	53	53	54	54
Estimated Savings												
Incremental (Adj for Losses)												
Energy Savings (MWh)	0.0	1.5	3.8	3.8	6.2	6.2	6.3	6.3	6.4	6.5	6.5	6.6
Demand Savings (KW)	0.0	0.2	0.5	0.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Cumulative												
Energy Savings (MWh)	0.0	1.5	5.2	9.1	15.2	21.5	27.8	34.1	40.5	47.0	53.5	60.1
Demand Savings (KW)	0.0	0.2	0.7	1.1	1.9	2.7	3.5	4.3	5.1	5.9	6.7	7.5
Cumulative Adjusted for Free Riders												
Energy Savings (MWh)	0.0	1.4	5.0	8.6	14.5	20.4	26.4	32.4	38.5	44.6	50.8	57.1
Demand Savings (KW)	0.0	0.2	0.6	1.1	1.8	2.6	3.3	4.1	4.8	5.6	6.4	7.1
Estimated Costs												
Measure	$0	$384	$981	$1,002	$1,617	$1,631	$1,646	$1,660	$1,674	$1,689	$1,704	$1,718
Administrative	0	231	589	601	970	979	987	996	1,005	1,013	1,022	1,031
Total	$0	$615	$1,570	$1,603	$2,588	$2,610	$2,633	$2,656	$2,679	$2,702	$2,726	$2,750

Alaska Energy Authority - Copper Valley Intertie Feasibility Study
Residential DSM Programs

High Efficiency Refrigerators	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
VALDEZ													
Estimated Participants													
Eligible Units	79	80	81	81	82	83	84	85	85	86	87	88	89
New Participants	32	32	32	33	33	33	34	34	34	35	35	35	36
Estimated Savings													
Incremental (Adj for Losses)													
Energy Savings (MWh)	3.9	3.9	3.9	4.0	4.0	4.0	4.1	4.1	4.2	4.2	4.2	4.3	4.3
Demand Savings (KW)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Cumulative													
Energy Savings (MWh)	38.7	42.5	46.5	50.4	54.4	58.5	62.6	66.7	70.9	75.1	79.3	83.6	87.9
Demand Savings (KW)	4.8	5.3	5.8	6.3	6.8	7.3	7.8	8.3	8.9	9.4	9.9	10.4	11.0
Cumulative Adjusted for Free Riders													
Energy Savings (MWh)	36.7	40.4	44.2	47.9	51.7	55.6	59.4	63.4	67.3	71.3	75.3	79.4	83.5
Demand Savings (KW)	4.6	5.1	5.5	6.0	6.5	6.9	7.4	7.9	8.4	8.9	9.4	9.9	10.4
Estimated Costs													
Measure	$1,008	$1,017	$1,027	$1,037	$1,047	$1,057	$1,067	$1,078	$1,088	$1,099	$1,109	$1,120	$1,131
Administrative	605	610	616	622	628	634	640	647	653	659	665	672	678
Total	$1,612	$1,628	$1,643	$1,659	$1,675	$1,691	$1,708	$1,724	$1,741	$1,758	$1,775	$1,792	$1,809
GLENNALLEN													
Estimated Participants													
Eligible Units	57	57	58	58	59	59	60	60	60	61	61	62	62
New Participants	23	23	23	23	23	24	24	24	24	24	25	25	25
Estimated Savings													
Incremental (Adj for Losses)													
Energy Savings (MWh)	2.8	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.9	3.0	3.0	3.0	3.0
Demand Savings (KW)	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Cumulative													
Energy Savings (MWh)	28.1	30.9	33.7	36.5	39.4	42.2	45.2	48.1	51.0	54.0	57.0	60.0	63.0
Demand Savings (KW)	3.5	3.9	4.2	4.6	4.9	5.3	5.6	6.0	6.4	6.7	7.1	7.5	7.9
Cumulative Adjusted for Free Riders													
Energy Savings (MWh)	26.7	29.3	32.0	34.7	37.4	40.1	42.9	45.7	48.5	51.3	54.1	57.0	59.9
Demand Savings (KW)	3.3	3.7	4.0	4.3	4.7	5.0	5.4	5.7	6.1	6.4	6.8	7.1	7.5
Estimated Costs													
Measure	$726	$731	$737	$742	$748	$753	$759	$764	$770	$776	$782	$787	$793
Administrative	436	439	442	445	449	452	455	459	462	465	469	472	476
Total	$1,161	$1,170	$1,179	$1,187	$1,196	$1,205	$1,214	$1,223	$1,232	$1,241	$1,251	$1,260	$1,269
TOTAL													
Estimated Participants													
Eligible Units	136	137	139	140	141	142	143	145	146	147	149	150	151
New Participants	54	55	55	56	56	57	57	58	58	59	59	60	60
Estimated Savings													
Incremental (Adj for Losses)													
Energy Savings (MWh)	6.6	6.7	6.7	6.8	6.9	6.9	7.0	7.0	7.1	7.2	7.2	7.3	7.4
Demand Savings (KW)	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Cumulative													
Energy Savings (MWh)	66.7	73.4	80.1	86.9	93.8	100.7	107.7	114.8	121.9	129.0	136.3	143.6	150.9
Demand Savings (KW)	8.3	9.2	10.0	10.9	11.7	12.6	13.5	14.3	15.2	16.1	17.0	17.9	18.9
Cumulative Adjusted for Free Riders													
Energy Savings (MWh)	63.4	69.7	76.1	82.6	89.1	95.7	102.3	109.0	115.8	122.6	129.5	136.4	143.4
Demand Savings (KW)	7.9	8.7	9.5	10.3	11.1	12.0	12.8	13.6	14.5	15.3	16.2	17.0	17.9
Estimated Costs													
Measure	$1,733	$1,749	$1,764	$1,779	$1,795	$1,810	$1,626	$1,842	$1,858	$1,874	$1,891	$1,907	$1,924
Administrative	1,040	1,049	1,058	1,067	1,077	1,086	1,096	1,105	1,115	1,125	1,134	1,144	1,154
Total	$2,773	$2,798	$2,822	$2,847	$2,871	$2,897	$2,922	$2,947	$2,973	$2,999	$3,025	$3,051	$3,076

Alaska Energy Authority - Copper Valley Intertie Feasibility Study
Residential DSM Programs

High Efficiency Freezers	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
VALDEZ												
Estimated Participants												
Eligible Units	44	44	45	45	46	46	48	47	47	48	48	49
New Participants	0	4	11	11	18	18	19	19	19	19	19	19
Estimated Savings												
Incremental (Adj for Losses)												
Energy Savings (MWh)	0.0	0.5	1.1	1.2	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0
Demand Savings (KW)	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Cumulative												
Energy Savings (MWh)	0.0	0.5	1.6	2.7	4.6	6.5	8.4	10.3	12.2	14.2	16.2	18.1
Demand Savings (KW)	0.0	0.0	0.2	0.3	0.5	0.7	0.9	1.1	1.3	1.5	1.7	1.9
Cumulative Adjusted for Free Riders												
Energy Savings (MWh)	0.0	0.4	1.5	2.6	4.4	6.2	8.0	9.8	11.6	13.5	15.4	17.2
Demand Savings (KW)	0.0	0.0	0.2	0.3	0.5	0.7	0.8	1.0	1.2	1.4	1.6	1.8
Estimated Costs												
Measure	$0	$90	$228	$230	$371	$375	$378	$382	$386	$389	$393	$397
Administrative	0	54	137	138	223	225	227	229	231	234	236	238
Total	$0	$144	$364	$368	$594	$599	$605	$611	$617	$623	$629	$635
GLENNALLEN												
Estimated Participants												
Eligible Units	30	31	32	33	33	34	34	34	34	35	35	35
New Participants	0	3	8	8	13	13	14	14	14	14	14	14
Estimated Savings												
Incremental (Adj for Losses)												
Energy Savings (MWh)	0.0	0.3	0.8	0.8	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Demand Savings (KW)	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
Cumulative												
Energy Savings (MWh)	0.0	0.3	1.1	2.0	3.3	4.7	6.1	7.5	8.9	10.3	11.7	13.2
Demand Savings (KW)	0.0	0.0	0.1	0.2	0.4	0.5	0.6	0.8	0.9	1.1	1.2	1.4
Cumulative Adjusted for Free Riders												
Energy Savings (MWh)	0.0	0.3	1.1	1.9	3.2	4.5	5.8	7.1	8.5	9.8	11.2	12.5
Demand Savings (KW)	0.0	0.0	0.1	0.2	0.3	0.5	0.6	0.8	0.9	1.0	1.2	1.3
Estimated Costs												
Measure	$0	$63	$163	$169	$272	$274	$276	$278	$280	$282	$284	$287
Administrative	0	38	98	101	163	164	166	167	168	169	171	172
Total	$0	$100	$260	$270	$435	$439	$442	$445	$448	$452	$455	$458
TOTAL												
Estimated Participants												
Eligible Units	74	75	77	78	79	80	80	81	82	82	83	84
New Participants	0	8	19	20	32	32	32	32	33	33	33	34
Estimated Savings												
Incremental (Adj for Losses)												
Energy Savings (MWh)	0.0	0.8	2.0	2.0	3.2	3.3	3.3	3.3	3.3	3.4	3.4	3.4
Demand Savings (KW)	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
Cumulative												
Energy Savings (MWh)	0.0	0.8	2.7	4.7	7.9	11.2	14.5	17.8	21.1	24.5	27.9	31.3
Demand Savings (KW)	0.0	0.1	0.3	0.5	0.8	1.2	1.5	1.9	2.2	2.6	3.0	3.3
Cumulative Adjusted for Free Riders												
Energy Savings (MWh)	0.0	0.7	2.6	4.5	7.6	10.6	13.8	16.9	20.1	23.3	26.5	29.8
Demand Savings (KW)	0.0	0.1	0.3	0.5	0.8	1.1	1.5	1.8	2.1	2.5	2.8	3.2
Estimated Costs												
Measure	$0	$153	$390	$398	$643	$649	$654	$660	$666	$672	$677	$683
Administrative	0	92	234	239	386	389	393	396	399	403	406	410
Total	$0	$244	$624	$638	$1,029	$1,038	$1,047	$1,056	$1,065	$1,075	$1,084	$1,093

Alaska Energy Authority - Copper Valley Intertie Feasibility Study
Residential DSM Programs

High Efficiency Freezers	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
VALDEZ													
Estimated Participants													
Eligible Units	49	50	50	51	51	52	52	53	53	54	54	55	55
New Participants	20	20	20	20	20	21	21	21	21	21	22	22	22
Estimated Savings													
Incremental (Adj for Losses)													
Energy Savings (MWh)	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3
Demand Savings (KW)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Cumulative													
Energy Savings (MWh)	20.2	22.2	24.2	26.3	28.4	30.5	32.6	34.8	37.0	39.1	41.4	43.6	45.8
Demand Savings (KW)	2.1	2.4	2.6	2.8	3.0	3.2	3.5	3.7	3.9	4.2	4.4	4.6	4.9
Cumulative Adjusted for Free Riders													
Energy Savings (MWh)	19.2	21.1	23.0	25.0	27.0	29.0	31.0	33.0	35.1	37.2	39.3	41.4	43.6
Demand Savings (KW)	2.0	2.2	2.4	2.7	2.9	3.1	3.3	3.5	3.7	4.0	4.2	4.4	4.6
Estimated Costs													
Measure	$401	$405	$408	$412	$416	$420	$424	$429	$433	$437	$441	$445	$450
Administrative	240	243	245	247	250	252	255	257	260	262	265	267	270
Total	$641	$647	$654	$660	$666	$673	$679	$686	$692	$699	$706	$713	$719
GLENNALLEN													
Estimated Participants													
Eligible Units	35	36	36	36	36	37	37	37	38	38	38	38	39
New Participants	14	14	14	14	15	15	15	15	15	15	15	15	15
Estimated Savings													
Incremental (Adj for Losses)													
Energy Savings (MWh)	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6
Demand Savings (KW)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Cumulative													
Energy Savings (MWh)	14.6	16.1	17.6	19.0	20.5	22.0	23.5	25.1	26.6	28.2	29.7	31.3	32.9
Demand Savings (KW)	1.6	1.7	1.9	2.0	2.2	2.3	2.5	2.7	2.8	3.0	3.2	3.3	3.5
Cumulative Adjusted for Free Riders													
Energy Savings (MWh)	13.9	15.3	16.7	18.1	19.5	20.9	22.4	23.8	25.3	26.7	28.2	29.7	31.2
Demand Savings (KW)	1.5	1.6	1.8	1.9	2.1	2.2	2.4	2.5	2.7	2.8	3.0	3.2	3.3
Estimated Costs													
Measure	$289	$291	$293	$295	$297	$300	$302	$304	$306	$309	$311	$313	$315
Administrative	173	174	176	177	178	180	181	182	184	185	186	188	189
Total	$462	$465	$469	$472	$476	$479	$483	$486	$490	$494	$497	$501	$505
TOTAL													
Estimated Participants													
Eligible Units	85	85	86	87	88	88	89	90	91	91	92	93	94
New Participants	34	34	34	35	35	35	36	36	36	37	37	37	38
Estimated Savings													
Incremental (Adj for Losses)													
Energy Savings (MWh)	3.5	3.5	3.5	3.5	3.6	3.6	3.6	3.7	3.7	3.7	3.8	3.8	3.8
Demand Savings (KW)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Cumulative													
Energy Savings (MWh)	34.8	38.3	41.8	45.3	48.9	52.5	56.2	59.9	63.6	67.3	71.1	74.9	78.7
Demand Savings (KW)	3.7	4.1	4.4	4.8	5.2	5.6	6.0	6.4	6.8	7.2	7.6	8.0	8.4
Cumulative Adjusted for Free Riders													
Energy Savings (MWh)	33.0	36.4	39.7	43.1	46.5	49.9	53.4	56.9	60.4	63.9	67.5	71.1	74.8
Demand Savings (KW)	3.5	3.9	4.2	4.6	4.9	5.3	5.7	6.0	6.4	6.8	7.2	7.6	8.0
Estimated Costs													
Measure	$689	$695	$701	$708	$714	$720	$726	$733	$739	$745	$752	$758	$765
Administrative	414	417	421	425	428	432	436	440	443	447	451	455	459
Total	$1,103	$1,113	$1,122	$1,132	$1,142	$1,152	$1,162	$1,172	$1,182	$1,193	$1,203	$1,213	$1,224

Compact Fluorescent Lighting	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
VALDEZ												
Estimated Participants												
Eligible Units	1380	1383	1396	1410	1423	1437	1451	1465	1479	1493	1508	1522
Total Participants	0	55	126	240	356	575	580	586	592	597	603	609
New Participants	0	55	70	114	116	219	6	6	6	6	6	6
ReNew Participants	0	0	0	0	0	55	70	114	116	274	76	120
Estimated Savings												
Incremental (Adj for Losses)												
Energy Savings (MWh)	0.0	8.5	10.9	17.6	17.9	33.8	0.9	0.9	0.9	0.9	0.9	0.9
Demand Savings (KW)	0.0	3.2	4.1	6.6	6.7	12.7	0.3	0.3	0.3	0.3	0.3	0.3
Cumulative												
Energy Savings (MWh)	0.0	8.5	19.4	37.0	54.9	88.7	89.6	90.4	91.3	92.2	93.1	94.0
Demand Savings (KW)	0.0	3.2	7.3	13.9	20.6	33.2	33.5	33.9	34.2	34.5	34.9	35.2
Cumulative Adjusted for Free Riders												
Energy Savings (MWh)	0.0	8.1	18.4	35.1	52.2	64.3	85.1	85.9	86.7	67.6	88.4	89.3
Demand Savings (KW)	0.0	3.0	6.9	13.2	19.5	31.6	31.9	32.2	32.5	32.8	33.1	33.4
Estimated Costs												
Measure	$0	$1,099	$1,397	$2,264	$2,307	$5,447	$1,507	$2,375	$2,419	$5,561	$1,622	$2,490
Administrative	0	659	838	1,358	1,384	3,268	904	1,425	1,452	3,336	973	1,494
Total	$0	$1,758	$2,235	$3,622	$3,691	$8,716	$2,411	$3,800	$3,871	$8,897	$2,594	$3,985
GLENNALLEN												
Estimated Participants												
Eligible Units	924	961	998	1036	1043	1051	1059	1067	1075	1083	1091	1099
Total Participants	0	38	90	176	261	420	424	427	430	433	436	440
New Participants	0	38	51	86	85	160	3	3	3	3	3	3
ReNew Participants	0	0	0	0	0	38	51	86	85	198	55	89
Estimated Savings												
Incremental (Adj for Losses)												
Energy Savings (MWh)	0.0	5.9	7.9	13.3	13.1	24.6	0.5	0.5	0.5	0.5	0.5	0.5
Demand Savings (KW)	0.0	2.2	3.0	5.0	4.9	9.2	0.2	0.2	0.2	0.2	0.2	0.2
Cumulative												
Energy Savings (MWh)	0.0	5.9	13.9	27.2	40.3	64.9	65.4	65.9	66.4	66.8	67.3	67.8
Demand Savings (KW)	0.0	2.2	5.2	10.2	15.1	24.3	24.5	24.7	24.9	25.0	25.2	25.4
Cumulative Adjusted for Free Riders												
Energy Savings (MWh)	0.0	5.6	13.2	25.8	38.3	61.7	62.1	62.6	63.0	63.5	64.0	64.5
Demand Savings (KW)	0.0	2.1	4.9	9.7	14.3	23.1	23.3	23.4	23.6	23.8	24.0	24.1
Estimated Costs												
Measure	$0	$764	$1,021	$1,712	$1,684	$3,934	$1,083	$1,775	$1,747	$3,997	$1,147	$1,839
Administrative	0	458	613	1,027	1,010	2,360	650	1,065	1,048	2,398	688	1,104
Total	$0	$1,222	$1,633	$2,740	$2,694	$6,294	$1,733	$2,840	$2,795	$6,395	$1,835	$2,943
TOTAL												
Estimated Participants												
Eligible Units	2304	2344	2395	2445	2467	2488	2510	2532	2554	2576	2598	2621
Total Participants	0	94	216	416	617	995	1004	1013	1021	1030	1039	1048
New Participants	0	94	122	200	201	379	9	9	9	9	9	9
ReNew Participants	0	0	0	0	0	94	122	200	201	472	130	209
Estimated Savings												
Incremental (Adj for Losses)												
Energy Savings (MWh)	0.0	14.5	18.8	30.9	31.0	58.4	1.3	1.3	1.4	1.4	1.4	1.4
Demand Savings (KW)	0.0	5.4	7.0	11.6	11.6	21.9	0.5	0.5	0.5	0.5	0.5	0.5
Cumulative												
Energy Savings (MWh)	0.0	14.5	33.3	64.2	95.2	153.6	155.0	156.3	157.7	159.0	160.4	161.8
Demand Savings (KW)	0.0	5.4	12.5	24.0	35.6	57.5	58.0	58.5	59.1	59.6	60.1	60.6
Cumulative Adjusted for Free Riders												
Energy Savings (MWh)	0.0	13.7	31.6	61.0	90.4	145.9	147.2	148.5	149.8	151.1	152.4	153.7
Demand Savings (KW)	0.0	5.1	11.8	22.8	33.9	54.7	55.1	55.6	56.1	56.6	57.1	57.6
Estimated Costs												
Measure	$0	$1,862	$2,418	$3,976	$3,991	$9,381	$2,590	$4,150	$4,166	$9,558	$2,768	$4,330
Administrative	0	1,117	1,451	2,386	2,395	5,629	1,554	2,490	2,500	5,735	1,661	2,598
Total	$0	$2,979	$3,869	$6,362	$6,386	$15,010	$4,144	$6,640	$6,666	$15,292	$4,429	$6,927

Alaska Energy Authority - Copper Valley Intertie Feasibility Study
Residential DSM Programs

Compact Fluorescent Lighting	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
VALDEZ													
Estimated Participants													
Eligible Units	1537	1552	1567	1582	1597	1612	1628	1644	1659	1675	1692	1708	1724
Total Participants	615	621	627	633	639	645	651	657	664	670	677	683	690
New Participants	6	6	6	6	6	6	6	6	6	6	6	7	7
ReNew Participants	122	280	82	125	128	286	88	131	134	292	94	138	140
Estimated Savings													
Incremental (Adj for Losses)													
Energy Savings (MWh)	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Demand Savings (KW)	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Cumulative													
Energy Savings (MWh)	94.9	95.8	96.7	97.7	98.6	99.5	100.5	101.5	102.5	103.4	104.4	105.4	106.5
Demand Savings (KW)	35.5	35.9	36.2	36.6	36.9	37.3	37.6	38.0	38.4	38.7	39.1	39.5	39.9
Cumulative Adjusted for Free Riders													
Energy Savings (MWh)	90.1	91.0	91.9	92.8	93.7	94.6	95.5	96.4	97.3	98.3	99.2	100.2	101.1
Demand Savings (KW)	33.8	34.1	34.4	34.7	35.1	35.4	35.8	36.1	36.5	36.8	37.2	37.5	37.9
Estimated Costs													
Measure	$2,536	$5,678	$1,740	$2,610	$2,657	$5,801	$1,864	$2,735	$2,783	$5,928	$1,992	$2,865	$2,914
Administrative	1,522	3,407	1,044	1,566	1,594	3,480	1,118	1,641	1,670	3,557	1,195	1,719	1,748
Total	$4,058	$9,086	$2,785	$4,177	$4,252	$9,281	$2,982	$4,376	$4,453	$9,485	$3,188	$4,584	$4,662
GLENNALLEN													
Estimated Participants													
Eligible Units	1107	1115	1124	1132	1140	1149	1157	1166	1175	1183	1192	1201	1210
Total Participants	443	446	449	453	456	460	463	466	470	473	477	480	484
New Participants	3	3	3	3	3	3	3	3	3	3	4	4	4
ReNew Participants	88	201	58	93	91	205	61	96	95	208	64	99	98
Estimated Savings													
Incremental (Adj for Losses)													
Energy Savings (MWh)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6
Demand Savings (KW)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Cumulative													
Energy Savings (MWh)	68.3	68.9	69.4	69.9	70.4	70.9	71.5	72.0	72.5	73.1	73.6	74.1	74.7
Demand Savings (KW)	25.6	25.8	26.0	26.2	26.4	26.8	26.8	27.0	27.2	27.4	27.6	27.8	28.0
Cumulative Adjusted for Free Riders													
Energy Savings (MWh)	64.9	65.4	65.9	66.4	66.9	67.4	67.9	68.4	68.9	69.4	69.9	70.4	71.0
Demand Savings (KW)	24.3	24.5	24.7	24.9	25.0	25.2	25.4	25.6	25.8	26.0	26.2	26.4	26.6
Estimated Costs													
Measure	$1,812	$4,062	$1,213	$1,906	$1,878	$4,130	$1,280	$1,974	$1,947	$4,199	$1,350	$2,044	$2,018
Administrative	1,087	2,437	728	1,143	1,127	2,478	768	1,184	1,168	2,519	810	1,226	1,211
Total	$2,898	$6,500	$1,940	$3,049	$3,005	$6,607	$2,048	$3,158	$3,115	$6,718	$2,160	$3,271	$3,229
TOTAL													
Estimated Participants													
Eligible Units	2644	2667	2690	2714	2737	2761	2785	2810	2834	2859	2884	2909	2934
Total Participants	1058	1067	1076	1085	1095	1104	1114	1124	1134	1144	1153	1164	1174
New Participants	9	9	9	9	9	10	10	10	10	10	10	10	10
ReNew Participants	210	481	139	218	219	490	149	227	228	500	158	237	238
Estimated Savings													
Incremental (Adj for Losses)													
Energy Savings (MWh)	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6
Demand Savings (KW)	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Cumulative													
Energy Savings (MWh)	163.2	164.7	166.1	167.5	169.0	170.5	172.0	173.5	175.0	176.5	178.0	179.6	181.2
Demand Savings (KW)	61.1	61.7	62.2	62.7	63.3	63.8	64.4	65.0	65.5	66.1	66.7	67.3	67.9
Cumulative Adjusted for Free Riders													
Energy Savings (MWh)	155.1	156.4	157.8	159.2	160.5	161.9	163.4	164.8	166.2	167.7	169.1	170.6	172.1
Demand Savings (KW)	58.1	58.6	59.1	59.6	60.1	60.7	61.2	61.7	62.3	62.8	63.3	63.9	64.5
Estimated Costs													
Measure	$4,348	$9,741	$2,953	$4,516	$4,536	$9,930	$3,144	$4,709	$4,730	$10,127	$3,342	$4,909	$4,932
Administrative	2,609	5,844	1,772	2,710	2,721	5,958	1,887	2,825	2,838	6,076	2,005	2,945	2,959
Total	$6,956	$15,585	$4,725	$7,226	$7,257	$15,889	$5,031	$7,534	$7,568	$16,203	$5,348	$7,854	$7,891

Alaska Energy Authority - Copper Valley Intertie Feasibility Study
Commercial DSM Programs

Commercial Programs		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Energy Savings in MWh (Adj for Loss)													
High Efficiency Fluorescents		0	22	43	65	86	108	151	195	238	281	324	400
Compact Fluorescent		0	18	27	36	63	91	118	136	163	190	217	244
Total		0	40	70	101	150	199	269	330	401	471	542	644
Demand Savings in KW													
High Efficiency Fluorescents													
Incremental		0.0	7.5	7.5	7.5	7.5	7.5	15.0	15.0	15.0	15.0	15.0	26.3
Total		0.0	7.5	15.0	22.5	30.0	37.5	52.6	67.6	82.6	97.6	112.6	138.9
Compact Fluorescent													
Incremental		0.0	6.3	3.1	3.1	9.4	9.4	9.4	6.3	9.4	9.4	9.4	9.4
Total		0.0	6.3	9.4	12.6	22.0	31.4	40.9	47.2	56.6	66.0	75.4	84.9
Total		0.0	13.8	24.4	35.1	52.0	69.0	93.4	114.7	139.2	163.6	188.1	223.8
Estimated Savings by Load Center													
Energy Savings in MWh													
Valdez	70%	0	28	49	71	105	139	188	231	281	330	379	451
Glennallen	30%	0	12	21	30	45	60	81	99	120	141	162	193
Demand Savings in KW													
Valdez	70%	0	10	17	25	36	48	65	80	97	115	132	157
Glennallen	30%	0	4.1	7.3	10.5	15.6	20.7	28.0	34.4	41.8	49.1	56.4	67.1
Cost													
High Efficiency Fluorescents													
Incremental		$0	$7,159	$7,159	$7,159	$7,159	$7,159	$14,317	$14,317	$14,317	$14,317	$14,317	$25,055
ReNew		0	0	0	0	0	0	0	0	0	0	0	7,159
Total		$0	$7,159	$7,159	$7,159	$7,159	$7,159	$14,317	$14,317	$14,317	$14,317	$14,317	$32,214
Compact Fluorescent													
Incremental		$0	$3,233	$1,617	$1,617	$4,850	$4,850	$4,850	$3,233	$4,850	$4,850	$4,850	$4,850
ReNew		0	0	0	0	3,233	1,617	1,617	8,083	6,467	6,467	11,317	11,317
Total		$0	$3,233	$1,617	$1,617	$8,083	$6,467	$6,467	$11,317	$11,317	$11,317	$16,167	$16,167
Valdez Cost	70%	$0	$7,274	$6,143	$6,143	$10,669	$9,538	$14,549	$17,944	$17,944	$17,944	$21,339	$33,867
Glennallen Cost	30%	0	3,118	2,633	2,633	4,573	4,088	6,235	7,690	7,690	7,690	9,145	14,514
Total Commercial Cost		$0	$10,392	$8,775	$8,775	$15,242	$13,625	$20,784	$25,634	$25,634	$25,634	$30,484	$48,381

Alaska Energy Authority - Copper Valley Intertie Feasibility Study
Commercial DSM Programs

Commercial Programs		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Energy Savings in MWh (Adj for Loss)														
High Efficiency Fluorescents		476	551	627	703	778	854	930	1006	1081	1081	1081	1081	1081
Compact Fluorescent		244	244	244	244	244	244	244	244	244	244	244	244	244
Total		720	796	872	947	1023	1099	1174	1250	1326	1326	1326	1326	1326
Demand Savings in KW														
High Efficiency Fluorescents														
Incremental		26.3	26.3	26.3	26.3	26.3	26.3	26.3	26.3	26.3	0.0	0.0	0.0	0.0
Total		165.2	191.5	217.7	244.0	270.3	296.6	322.9	349.1	375.4	375.4	375.4	375.4	375.4
Compact Fluorescent														
Incremental		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total		84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9
Total		250.1	276.3	302.6	328.9	355.2	381.4	407.7	434.0	460.3	460.3	460.3	460.3	460.3
Estimated Savings by Load Center														
Energy Savings in MWh														
Valdez	70%	504	557	610	663	716	769	822	875	928	928	928	928	928
Glennallen	30%	216	239	261	284	307	330	352	375	398	398	398	398	398
Demand Savings in KW														
Valdez	70%	175	193	212	230	249	267	285	304	322	322	322	322	322
Glennallen	30%	75.0	82.9	90.8	98.7	106.6	114.4	122.3	130.2	138.1	138.1	138.1	138.1	138.1
Cost														
High Efficiency Fluorescents														
Incremental		$25,055	$25,055	$25,055	$25,055	$25,055	$25,055	$25,055	$25,055	$25,055	$0	$0	$0	$0
ReNew		7,159	7,159	7,159	7,159	14,317	14,317	14,317	14,317	14,317	32,214	32,214	32,214	32,214
Total		$32,214	$32,214	$32,214	$32,214	$39,372	$39,372	$39,372	$39,372	$39,372	$32,214	$32,214	$32,214	$32,214
Compact Fluorescent														
Incremental		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ReNew		11,317	16,167	16,167	11,317	16,167	16,167	11,317	16,167	16,167	11,317	16,167	16,167	11,317
Total		$11,317	$16,167	$16,167	$11,317	$16,167	$16,167	$11,317	$16,167	$16,167	$11,317	$16,167	$16,167	$11,317
Valdez Cost	70%	$30,471	$33,867	$33,867	$30,471	$38,878	$38,878	$35,482	$38,878	$38,878	$30,471	$33,867	$33,867	$30,471
Glennallen Cost	30%	13,059	14,514	14,514	13,059	16,662	16,662	15,207	16,662	16,662	13,059	14,514	14,514	13,059
Total Commercial Cost		$43,531	$48,381	$48,381	$43,531	$55,539	$55,539	$50,689	$55,539	$55,539	$43,531	$48,381	$48,381	$43,531

DSM Assumptions Saving Estimate

	KWh Savings Per Unit			KW Savings Per Unit			Per Unit Costs			Unit		Annual
	Tech	Achieve		Tech	Achieve	CPI	Measure	Admin	Total	Life	Sat Rate	Turnover
Residential												
Refrigerators	150	112			0.014	1.06	31.83	19.10	50.92	20	103%	5%
Freezers	119	94			0.010	1.06	20.37	12.22	32.59		64%	5%
Compact Fluorescent	284	142			0.053	1.06	19.86	11.92	31.78		130%	
		Adj Factor										
Commercial	1991	1993	1993	1991	1993	Hrs		Per KW Costs				
Efficient Fluorescent	2094108	1.11	2326787	654	727	3200	615	369	985			
Compact Fluorescent	876695	1.11	974106	274	304	3200	321	193	514			

System Losses 8.0%

Commercial Load by Load Center

Valdez	70%
Glennallen	30%

Residential Refrigerator program => Designed to encourage the purchase of high efficiency units (i) provide direct customer financial incentives and (ii) work with local appliance distributors to identify and promote high efficiency units. This program is not designed to replace units before the end of their useful life.

Residential Freezer Program => Designed to encourage the purchase of high efficiency units (i) provide direct customer financial incentives and (ii) work with local appliance distributors to identify and promote high efficiency units. This program is not designed to replace units before the end of their useful life.

Residential Compact Fluorescent => Annual residential lighting is estimated to require 1,300 KWh per year. The annual average savings per household are estimated to be 284 KWh, or 111 KWh per bulb for 2.6 bulbs per household. The program estimated savings are based on participants replacing 1/2 of their eligible bulbs.

Commercial Efficient Fluorescent => Replace standard T-12 fluorescent lamps with T-8 lamps and ballasts

Commercial Compact Fluorescent => Replace incandescent lamps with compact fluorescent lamps . Assumes 52.5% of existing stock can be replaced

Note: Based on estimates pro vided in the Stone & Webster 1991 Report. Costs increased from 1991 dollars to 1993 dollars based on CPI. Savings for commercial class adjusted based on the ratio of 1993 commercal sales to 1991 commercial sales. Savings for all programs adjusted for losses and an estimated 5% free riders.
Also, approximately 70 % of the residential lighting savings are assumed to occur during the winter period. The seasonal savings for the other programs are assumed to be 50/50 for winter/summer.

ergy Authority - Copper Valley Intertie Feasibility Study

DSM Assumptions Saving Estimate

Participation Rates

	1	2	3	4	5	6	7	8	9	10	11	12
Residential												
Refrigerators	0%	10%	25%	25%	40%							
Freezers	0%	10%	25%	25%	40%							
Compact Fluorescent	0%	4%	9%	17%	25%	40%	40%	40%	40%	40%	40%	40%
Commercial												
Efficient Fluorescent	0%	1%	2%	3%	4%	5%	7%	9%	11%	13%	15%	19%
Compact Fluorescent	0%	2%	3%	4%	7%	10%	13%	15%	18%	21%	24%	27%

Efficient Fluorescent	22%	26%	29%	33%	36%	40%	43%	47%	50%	50%	50%	50%	50%	50%
Compact Fluorescent	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%

Appendix J

RESOURCE MODEL OUTPUTS

This page intentionally left blank.

All Diesel Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Glennallen Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Total CVEA Demand	12,682	13,286	14,337	14,927	15,234	15,385	15,537	15,692	15,850	15,976	16,089	16,198	16,306
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	2,150	4,300	4,300	6,450	6,450	6,450	6,450	6,450	6,450
New Diesel Glennallen	0	0	0	2,150	2,150	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	9,750	9,750	9,750	9,750	8,050	7,100	7,100	4,600	4,600	4,600	4,600	4,600	4,600
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	21,550	21,550	21,550	23,700	24,150	25,350	25,000	24,650	24,650	24,650	24,650	24,650	24,650
Valdez													
Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,150	2,150	2,150	2,150	2,150	2,150
Total Capacity Requirements	11,293	11,734	12,631	13,060	13,337	13,458	13,579	13,352	13,478	13,586	13,679	13,769	13,857
Local Resources	14,750	14,750	14,750	14,750	15,200	16,400	16,400	16,050	16,050	16,050	16,050	16,050	16,050
Surplus/(Deficit)	3,457	3,016	2,119	1,690	1,863	2,942	2,821	2,698	2,572	2,464	2,371	2,281	2,193
Glennallen													
Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,390	6,552	6,706	6,866	6,897	6,927	6,958	6,990	7,022	7,041	7,060	7,079	7,099
Local Resources	6,800	6,800	6,800	8,950	8,950	8,950	8,600	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	410	248	94	2,084	2,053	2,023	1,642	1,610	1,578	1,559	1,540	1,521	1,501

All Diesel Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	12,929
Glennallen Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Total CVEA Demand	16,414	16,523	16,633	16,744	16,857	16,971	17,087	17,204	17,321	17,438	17,556	17,676	17,796
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450
New Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600
Existing Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	24,650	24,650	24,650	24,650	24,650	24,650	24,650	24,650	24,650	24,650	24,650	24,650	24,650
Valdez													
Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	12,929
Reserves	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Total Capacity Requirements	13,946	14,035	14,125	14,216	14,308	14,402	14,497	14,593	14,689	14,785	14,882	14,980	15,079
Local Resources	16,050	16,050	16,050	16,050	16,050	16,050	16,050	16,050	16,050	16,050	16,050	16,050	16,050
Surplus/(Deficit)	2,104	2,015	1,925	1,834	1,742	1,648	1,553	1,457	1,361	1,265	1,168	1,070	971
Glennallen													
Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	7,118	7,138	7,158	7,178	7,199	7,219	7,240	7,261	7,282	7,303	7,324	7,345	7,366
Local Resources	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	1,482	1,462	1,442	1,422	1,401	1,381	1,360	1,339	1,318	1,297	1,276	1,255	1,234

All Diesel Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,328	54,622	61,149	64,357	66,324	67,034	67,750	68,477	69,216	69,850	70,400	70,928	71,449
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,398	41,387	43,345	44,307	44,897	45,110	45,325	45,543	45,765	45,955	46,120	46,278	46,435
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	10,229	20,828	21,304	21,787	22,279	22,700	23,066	23,417	23,764
Existing Diesel Valdez	10,930	13,236	17,804	20,050	11,198	1,096	1,121	1,147	1,173	1,195	1,214	1,232	1,251
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	20,509	20,949	21,301	21,678	21,817	21,972	22,130	22,290	22,453	22,550	22,647	22,746	22,845
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,153	6,285	6,390	6,504	6,545	6,592	6,639	6,687	6,636	6,452	6,292	6,138	5,986
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	11,300	11,300	11,300	15,491	15,603	15,817	16,098	16,356	16,608	16,858
Existing Diesel Glennallen	14,356	14,664	14,910	3,874	3,972	4,080	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,741	47,866	49,933	51,012	51,645	51,906	52,169	52,437	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	0	0	0	11,300	21,529	32,128	36,795	37,390	38,095	38,799	39,422	40,025	40,622
Existing Diesel CVEA	25,286	27,900	32,715	23,924	15,170	5,176	1,121	1,147	1,173	1,195	1,214	1,232	1,251
Less Transmission Losses V-G	190	194	198	201	202	204	205	207	205	200	195	190	185
Total	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

All Diesel Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	71,970	72,495	73,025	73,562	74,105	74,657	75,215	75,782	76,346	76,914	77,486	78,063	78,643
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,591	46,748	46,908	47,068	47,232	47,397	47,565	47,735	47,904	48,074	48,246	48,419	48,593
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	24,110	24,459	24,812	25,169	25,530	25,897	26,268	26,645	27,020	27,398	27,778	28,162	28,548
Existing Diesel Valdez	1,269	1,287	1,306	1,325	1,344	1,363	1,383	1,402	1,422	1,442	1,462	1,482	1,503
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	22,945	23,046	23,147	23,250	23,354	23,459	23,565	23,671	23,777	23,884	23,991	24,099	24,207
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,835	5,682	5,528	5,372	5,213	5,053	4,890	4,725	4,561	4,396	4,230	4,062	3,893
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	17,110	17,364	17,620	17,879	18,141	18,406	18,674	18,946	19,216	19,488	19,762	20,037	20,314
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	102,850
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	41,220	41,823	42,431	43,047	43,671	44,303	44,943	45,591	46,236	46,886	47,540	48,199	48,862
Existing Diesel CVEA	1,269	1,287	1,306	1,325	1,344	1,363	1,383	1,402	1,422	1,442	1,462	1,482	1,503
Less Transmission Losses V-G	180	176	171	166	161	156	151	146	141	136	131	126	120
Total	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	102,850
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

All Diesel Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,384	$1,555	$1,875	$2,022	$1,990	$1,974	$2,017	$2,085	$2,161	$2,239	$2,314	$2,390	$2,468
Variable O&M	786	867	1,017	861	695	494	416	423	431	439	446	453	460
Existing Diesel O&M Adjustment	0	0	0	0	0	0	291	291	291	291	291	291	291
Additional Building and Equipment	0	0	0	0	0	0	126	126	126	126	126	157	157
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	0	0	0	136	271	407	542	678	678	678	678	678	678
Total Diesel Costs	$2,169	$2,422	$2,892	$3,044	$2,982	$2,900	$3,417	$3,628	$3,712	$3,798	$3,881	$3,994	$4,078
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$2,169	$2,422	$2,892	$3,044	$2,982	$2,900	$3,417	$3,628	$3,712	$3,798	$3,881	$3,994	$4,078
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,169	$2,422	$2,892	$3,044	$2,982	$2,900	$3,417	$3,628	$3,712	$3,798	$3,881	$3,994	$4,078

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$56,700	(in thousands)
30 Year (2019 - 2048) with no additional growth	28,070	(in thousands)
Total Net Present Value	$84,770	(in thousands)

All Diesel Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$2,547	$2,629	$2,713	$2,800	$2,890	$2,982	$3,078	$3,176	$3,277	$3,380	$3,487	$3,596	$3,708
Variable O&M	466	473	480	487	494	501	509	516	523	531	538	545	553
Existing Diesel O&M Adjustment	291	291	291	291	291	291	291	291	291	291	291	291	291
Additional Building and Equipment	157	157	157	157	157	157	157	157	157	157	157	157	157
New Diesel Fixed O&M	26	26	26	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	678	678	678	678	678	678	678	678	678	678	678	678	678
Total Diesel Costs	$4,165	$4,253	$4,345	$4,439	$4,535	$4,635	$4,737	$4,843	$4,951	$5,062	$5,175	$5,292	$5,412
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$4,165	$4,253	$4,345	$4,439	$4,535	$4,635	$4,737	$4,843	$4,951	$5,062	$5,175	$5,292	$5,412
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$4,165	$4,253	$4,345	$4,439	$4,535	$4,635	$4,737	$4,843	$4,951	$5,062	$5,175	$5,292	$5,412

All Diesel Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Glennallen Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Total CVEA Demand	12,682	13,286	14,337	14,927	15,234	15,385	15,537	15,692	15,850	15,976	16,089	16,198	16,306
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	2,150	4,300	4,300	6,450	6,450	6,450	6,450	6,450	6,450
New Diesel Glennallen	0	0	0	2,150	2,150	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	9,750	9,750	9,750	9,750	8,050	7,100	7,100	4,600	4,600	4,600	4,600	4,600	4,600
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	21,550	21,550	21,550	23,700	24,150	25,350	25,000	24,650	24,650	24,650	24,650	24,650	24,650
Valdez													
Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,150	2,150	2,150	2,150	2,150	2,150
Total Capacity Requirements	11,293	11,734	12,631	13,060	13,337	13,458	13,579	13,352	13,478	13,586	13,679	13,769	13,857
Local Resources	14,750	14,750	14,750	14,750	15,200	16,400	16,400	16,050	16,050	16,050	16,050	16,050	16,050
Surplus/(Deficit)	3,457	3,016	2,119	1,690	1,863	2,942	2,821	2,698	2,572	2,464	2,371	2,281	2,193
Glennallen													
Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,390	6,552	6,706	6,866	6,897	6,927	6,958	6,990	7,022	7,041	7,060	7,079	7,099
Local Resources	6,800	6,800	6,800	8,950	8,950	8,950	8,600	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	410	248	94	2,084	2,053	2,023	1,642	1,610	1,578	1,559	1,540	1,521	1,501

All Diesel Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	10,079
Glennallen Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Total CVEA Demand	16,414	16,523	16,633	16,744	16,857	16,971	17,087	17,204	17,321	17,438	17,556	17,676	14,946
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450
New Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600
Existing Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	24,650	24,650	24,650	24,650	24,650	24,650	24,650	24,650	24,650	24,650	24,650	24,650	24,650
Valdez													
Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	10,079
Reserves	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Total Capacity Requirements	13,946	14,035	14,125	14,216	14,308	14,402	14,497	14,593	14,689	14,785	14,882	14,980	12,229
Local Resources	16,050	16,050	16,050	16,050	16,050	16,050	16,050	16,050	16,050	16,050	16,050	16,050	16,050
Surplus/(Deficit)	2,104	2,015	1,925	1,834	1,742	1,648	1,553	1,457	1,361	1,265	1,168	1,070	3,821
Glennallen													
Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	7,118	7,138	7,158	7,178	7,199	7,219	7,240	7,261	7,282	7,303	7,324	7,345	7,366
Local Resources	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	1,482	1,462	1,442	1,422	1,401	1,381	1,360	1,339	1,318	1,297	1,276	1,255	1,234

All Diesel Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,328	54,622	61,149	64,357	66,324	67,034	67,750	68,477	69,216	69,850	70,400	70,928	71,449
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,398	41,387	43,345	44,307	44,897	45,110	45,325	45,543	45,765	45,955	46,120	46,278	46,435
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	10,229	20,828	21,304	21,787	22,279	22,700	23,066	23,417	23,764
Existing Diesel Valdez	10,930	13,236	17,804	20,050	11,198	1,096	1,121	1,147	1,173	1,195	1,214	1,232	1,251
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	20,509	20,949	21,301	21,678	21,817	21,972	22,130	22,290	22,453	22,550	22,647	22,746	22,845
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,153	6,285	6,390	6,504	6,545	6,592	6,639	6,687	6,636	6,452	6,292	6,138	5,986
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	11,300	11,300	11,300	15,491	15,603	15,817	16,098	16,356	16,608	16,858
Existing Diesel Glennallen	14,356	14,664	14,910	3,874	3,972	4,080	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,741	47,866	49,933	51,012	51,645	51,906	52,169	52,437	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	0	0	0	11,300	21,529	32,128	36,795	37,390	38,095	38,799	39,422	40,025	40,622
Existing Diesel CVEA	25,286	27,900	32,715	23,924	15,170	5,176	1,121	1,147	1,173	1,195	1,214	1,232	1,251
Less Transmission Losses V-G	190	194	198	201	202	204	205	207	205	200	195	190	185
Total	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

All Diesel Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	71,970	72,495	73,025	73,562	74,105	74,657	75,215	75,782	76,346	76,914	77,486	78,063	56,174
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,591	46,748	46,908	47,068	47,232	47,397	47,565	47,735	47,904	48,074	48,246	48,419	41,852
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	24,110	24,459	24,812	25,169	25,530	25,897	26,268	26,645	27,020	27,398	27,778	28,162	13,606
Existing Diesel Valdez	1,269	1,287	1,306	1,325	1,344	1,363	1,383	1,402	1,422	1,442	1,462	1,482	716
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	22,945	23,046	23,147	23,250	23,354	23,459	23,565	23,671	23,777	23,884	23,991	24,099	24,207
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,835	5,682	5,528	5,372	5,213	5,053	4,890	4,725	4,561	4,396	4,230	4,062	7,262
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	17,110	17,364	17,620	17,879	18,141	18,406	18,674	18,946	19,216	19,488	19,762	20,037	16,945
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	80,381
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	49,339
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	41,220	41,823	42,431	43,047	43,671	44,303	44,943	45,591	46,236	46,886	47,540	48,199	30,551
Existing Diesel CVEA	1,269	1,287	1,306	1,325	1,344	1,363	1,383	1,402	1,422	1,442	1,462	1,482	716
Less Transmission Losses V-G	180	176	171	166	161	156	151	146	141	136	131	126	225
Total	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	80,381
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

All Diesel Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,384	$1,535	$1,828	$1,947	$1,892	$1,852	$1,868	$1,907	$1,952	$1,997	$2,038	$2,078	$2,119
Variable O&M	786	867	1,017	861	695	494	416	423	431	439	446	453	460
Existing Diesel O&M Adjustment	0	0	0	0	0	0	291	291	291	291	291	291	291
Additional Building and Equipment	0	0	0	0	0	0	126	126	126	126	126	157	157
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	0	0	0	136	271	407	542	678	678	678	678	678	678
Total Diesel Costs	$2,169	$2,403	$2,845	$2,969	$2,883	$2,778	$3,269	$3,451	$3,503	$3,556	$3,604	$3,682	$3,729
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$2,169	$2,403	$2,845	$2,969	$2,883	$2,778	$3,269	$3,451	$3,503	$3,556	$3,604	$3,682	$3,729
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,169	$2,403	$2,845	$2,969	$2,883	$2,778	$3,269	$3,451	$3,503	$3,556	$3,604	$3,682	$3,729

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$51,413	(in thousands)
30 Year (2019 - 2048) with no additional growth	16,440	(in thousands)
Total Net Present Value	$67,853	(in thousands)

All Diesel Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$2,159	$2,200	$2,242	$2,285	$2,328	$2,372	$2,417	$2,463	$2,509	$2,555	$2,603	$2,650	$1,680
Variable O&M	466	473	480	487	494	501	509	516	523	531	538	545	339
Existing Diesel O&M Adjustment	291	291	291	291	291	291	291	291	291	291	291	291	291
Additional Building and Equipment	157	157	157	157	157	157	157	157	157	157	157	157	157
New Diesel Fixed O&M	26	26	26	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	678	678	678	678	678	678	678	678	678	678	678	678	678
Total Diesel Costs	$3,777	$3,825	$3,874	$3,923	$3,974	$4,025	$4,077	$4,130	$4,183	$4,237	$4,292	$4,347	$3,170
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$3,777	$3,825	$3,874	$3,923	$3,974	$4,025	$4,077	$4,130	$4,183	$4,237	$4,292	$4,347	$3,170
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$3,777	$3,825	$3,874	$3,923	$3,974	$4,025	$4,077	$4,130	$4,183	$4,237	$4,292	$4,347	$3,170

All Diesel Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,748	9,086	9,876	9,892	9,727	9,559	9,566	9,573	9,580	9,575	9,561	9,543	9,525
Glennallen Peak Demand	3,885	3,976	4,057	4,143	4,117	4,093	4,070	4,049	4,029	4,001	3,974	3,948	3,922
Total CVEA Demand	12,633	13,063	13,933	14,035	13,844	13,651	13,637	13,622	13,609	13,576	13,534	13,491	13,448
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
New Diesel Glennallen	0	0	0	2,150	2,150	2,150	2,150	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	9,750	9,750	9,750	9,750	8,050	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	21,550	21,550	21,550	23,700	24,150	25,350	25,350	25,000	25,000	25,000	25,000	25,000	25,000
Valdez													
Peak Demand	8,748	9,086	9,876	9,892	9,727	9,559	9,566	9,573	9,580	9,575	9,561	9,543	9,525
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,248	11,586	12,376	12,392	12,227	12,059	12,066	12,073	12,080	12,075	12,061	12,043	12,025
Local Resources	14,750	14,750	14,750	14,750	15,200	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400
Surplus/(Deficit)	3,502	3,164	2,374	2,358	2,973	4,341	4,334	4,327	4,320	4,325	4,339	4,357	4,375
Glennallen													
Peak Demand	3,885	3,976	4,057	4,143	4,117	4,093	4,070	4,049	4,029	4,001	3,974	3,948	3,922
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,385	6,476	6,557	6,643	6,617	6,593	6,570	6,549	6,529	6,501	6,474	6,448	6,422
Local Resources	6,800	6,800	6,800	8,950	8,950	8,950	8,950	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	415	324	243	2,307	2,333	2,357	2,380	2,051	2,071	2,099	2,126	2,152	2,178

All Diesel Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	9,507	9,488	9,470	9,452	9,404	9,306	9,233	6,760	6,760	6,760	6,760	6,760	6,760
Glennallen Peak Demand	3,898	3,875	3,852	3,830	3,809	3,245	2,967	2,689	2,689	2,689	2,689	2,689	2,689
Total CVEA Demand	13,405	13,363	13,322	13,282	13,212	12,550	12,200	9,449	9,449	9,449	9,449	9,449	9,449
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
New Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100
Existing Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Valdez													
Peak Demand	9,507	9,488	9,470	9,452	9,404	9,306	9,233	6,760	6,760	6,760	6,760	6,760	6,760
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	12,007	11,988	11,970	11,952	11,904	11,806	11,733	9,260	9,260	9,260	9,260	9,260	9,260
Local Resources	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400
Surplus/(Deficit)	4,393	4,412	4,430	4,448	4,496	4,594	4,667	7,140	7,140	7,140	7,140	7,140	7,140
Glennallen													
Peak Demand	3,898	3,875	3,852	3,830	3,809	3,245	2,967	2,689	2,689	2,689	2,689	2,689	2,689
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,398	6,375	6,352	6,330	6,309	5,745	5,467	5,189	5,189	5,189	5,189	5,189	5,189
Local Resources	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	2,202	2,225	2,248	2,270	2,291	2,855	3,133	3,411	3,411	3,411	3,411	3,411	3,411

All Diesel Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,067	53,750	59,639	59,736	58,764	57,776	57,818	57,858	57,896	57,865	57,779	57,677	57,569
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,320	41,125	42,892	42,921	42,629	42,333	42,345	42,357	42,369	42,360	42,334	42,303	42,271
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	10,494	14,671	14,699	14,725	14,751	14,730	14,673	14,605	14,534
Existing Diesel Valdez	10,747	12,625	16,747	16,815	5,641	772	774	775	776	775	772	769	765
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	20,484	20,554	20,540	20,583	20,451	20,326	20,214	20,109	20,008	19,869	19,733	19,603	19,476
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,145	6,166	6,162	6,175	6,135	6,098	6,064	6,033	6,002	5,961	5,920	5,881	5,843
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	11,300	11,300	11,300	11,300	14,076	14,006	13,908	13,813	13,722	13,633
Existing Diesel Glennallen	14,339	14,388	14,378	3,107	3,016	2,928	2,850	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	71,550	74,304	80,179	80,319	79,215	78,102	78,033	77,966	77,904	77,734	77,512	77,280	77,046
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,655	47,482	49,244	49,287	48,954	48,619	48,597	48,576	48,557	48,504	48,437	48,366	48,294
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	0	0	0	11,300	21,794	25,972	26,000	28,801	28,757	28,638	28,486	28,327	28,167
Existing Diesel CVEA	25,085	27,013	31,125	19,923	8,656	3,700	3,623	775	776	775	772	769	765
Less Transmission Losses V-G	190	191	191	191	190	189	188	187	186	184	183	182	181
Total	71,550	74,304	80,179	80,319	79,215	78,102	78,033	77,966	77,904	77,734	77,512	77,280	77,046
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

All Diesel Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	57,459	57,349	57,240	57,133	56,846	56,235	55,791	35,791	35,791	35,791	35,791	35,791	35,791
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	42,238	42,205	42,172	42,140	42,054	41,871	41,737	35,737	35,737	35,737	35,737	35,737	35,737
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	14,460	14,387	14,315	14,244	14,053	13,647	13,351	51	51	51	51	51	51
Existing Diesel Valdez	761	757	753	750	740	718	703	3	3	3	3	3	3
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	19,354	19,237	19,123	19,014	18,907	16,094	14,709	13,570	13,570	13,570	13,570	13,570	13,570
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,806	5,771	5,737	5,704	5,672	4,828	4,413	4,071	4,071	4,071	4,071	4,071	4,071
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	13,548	13,466	13,386	13,310	13,235	11,266	10,297	9,499	9,499	9,499	9,499	9,499	9,499
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	76,814	76,586	76,364	76,147	75,754	72,330	70,500	49,360	49,360	49,360	49,360	49,360	49,360
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	48,224	48,154	48,086	48,020	47,901	46,848	46,286	39,934	39,934	39,934	39,934	39,934	39,934
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	28,009	27,853	27,701	27,553	27,288	24,913	23,647	9,550	9,550	9,550	9,550	9,550	9,550
Existing Diesel CVEA	761	757	753	750	740	718	703	3	3	3	3	3	3
Less Transmission Losses V-G	180	178	177	176	175	149	136	126	126	126	126	126	126
Total	76,814	76,586	76,364	76,147	75,754	72,330	70,500	49,360	49,360	49,360	49,360	49,360	49,360
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

All Diesel Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,373	$1,484	$1,730	$1,646	$1,539	$1,473	$1,477	$1,466	$1,470	$1,471	$1,469	$1,468	$1,466
Variable O&M	780	840	967	736	495	384	382	322	322	321	319	317	316
Existing Diesel O&M Adjustment	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	31	31
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	0	0	0	136	271	407	407	542	542	542	542	542	542
Total Diesel Costs	$2,152	$2,324	$2,698	$2,544	$2,330	$2,290	$2,291	$2,356	$2,360	$2,359	$2,356	$2,384	$2,380
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$2,152	$2,324	$2,698	$2,544	$2,330	$2,290	$2,291	$2,356	$2,360	$2,359	$2,356	$2,384	$2,380
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,152	$2,324	$2,698	$2,544	$2,330	$2,290	$2,291	$2,356	$2,360	$2,359	$2,356	$2,384	$2,380

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$33,261	(in thousands)
30 Year (2019 - 2048) with no additional growth	6,304	(in thousands)
Total Net Present Value	$39,565	(in thousands)

All Diesel Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$1,464	$1,462	$1,461	$1,459	$1,452	$1,333	$1,271	$507	$509	$511	$513	$516	$518
Variable O&M	314	312	310	309	306	280	267	99	99	99	99	99	99
Existing Diesel O&M Adjustment	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Building and Equipment	31	31	31	31	31	31	31	31	31	31	31	31	31
New Diesel Fixed O&M	26	26	26	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	542	542	542	542	542	542	542	542	542	542	542	542	542
Total Diesel Costs	$2,376	$2,373	$2,370	$2,367	$2,356	$2,212	$2,137	$1,204	$1,207	$1,209	$1,211	$1,213	$1,216
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$2,376	$2,373	$2,370	$2,367	$2,356	$2,212	$2,137	$1,204	$1,207	$1,209	$1,211	$1,213	$1,216
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,376	$2,373	$2,370	$2,367	$2,356	$2,212	$2,137	$1,204	$1,207	$1,209	$1,211	$1,213	$1,216

All Diesel Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,847	9,365	10,345	10,864	11,487	11,700	11,918	12,143	12,375	12,587	12,781	12,974	13,967
Glennallen Peak Demand	4,043	4,293	4,541	4,802	4,911	5,024	5,139	5,258	5,379	5,485	5,594	5,705	6,103
Total CVEA Demand	12,890	13,658	14,885	15,666	16,398	16,723	17,058	17,401	17,755	18,072	18,375	18,679	20,070
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	4,300	6,450	6,450	6,450	6,450	6,450	6,450	6,450	8,600
New Diesel Glennallen	0	0	0	2,150	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300	6,450
Existing Diesel Valdez	9,750	9,750	9,750	9,750	7,100	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	21,550	21,550	21,550	23,700	25,350	24,650	24,650	24,650	24,650	24,650	24,650	24,650	28,950
Valdez													
Peak Demand	8,847	9,365	10,345	10,864	11,487	11,700	11,918	12,143	12,375	12,587	12,781	12,974	13,967
Reserves	2,500	2,500	2,500	2,500	2,500	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Total Capacity Requirements	11,347	11,865	12,845	13,364	13,987	13,850	14,068	14,293	14,525	14,737	14,931	15,124	16,117
Local Resources	14,750	14,750	14,750	14,750	16,400	16,050	16,050	16,050	16,050	16,050	16,050	16,050	18,200
Surplus/(Deficit)	3,403	2,885	1,905	1,386	2,413	2,200	1,982	1,757	1,525	1,313	1,119	926	2,083
Glennallen													
Peak Demand	4,043	4,293	4,541	4,802	4,911	5,024	5,139	5,258	5,379	5,485	5,594	5,705	6,103
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,543	6,793	7,041	7,302	7,411	7,524	7,639	7,758	7,879	7,985	8,094	8,205	8,603
Local Resources	6,800	6,800	6,800	8,950	8,950	8,600	8,600	8,600	8,600	8,600	8,600	8,600	10,750
Surplus/(Deficit)	257	7	(241)	1,648	1,539	1,076	961	842	721	615	506	395	2,147

All Diesel Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	14,984	15,123	15,265	15,015	14,639	14,814	14,994	15,180	15,365	15,552	15,741	15,933	16,126
Glennallen Peak Demand	6,572	6,665	6,761	6,619	6,389	6,519	6,652	6,789	6,927	7,069	7,213	7,360	7,511
Total CVEA Demand	21,556	21,788	22,026	21,633	21,028	21,333	21,646	21,969	22,292	22,621	22,954	23,293	23,637
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	10,750
New Diesel Glennallen	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450
Existing Diesel Valdez	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600
Existing Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	28,950	28,950	28,950	28,950	28,950	28,950	28,950	28,950	28,950	28,950	28,950	28,950	31,100
Valdez													
Peak Demand	14,984	15,123	15,265	15,015	14,639	14,814	14,994	15,180	15,365	15,552	15,741	15,933	16,126
Reserves	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Total Capacity Requirements	17,134	17,273	17,415	17,165	16,789	16,964	17,144	17,330	17,515	17,702	17,891	18,083	18,276
Local Resources	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	20,350
Surplus/(Deficit)	1,066	927	785	1,035	1,411	1,236	1,056	870	685	498	309	117	2,074
Glennallen													
Peak Demand	6,572	6,665	6,761	6,619	6,389	6,519	6,652	6,789	6,927	7,069	7,213	7,360	7,511
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	9,072	9,165	9,261	9,119	8,889	9,019	9,152	9,289	9,427	9,569	9,713	9,860	10,011
Local Resources	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750
Surplus/(Deficit)	1,678	1,585	1,489	1,631	1,861	1,731	1,598	1,461	1,323	1,181	1,037	890	739

All Diesel Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,653	55,402	62,422	66,167	70,739	71,998	73,289	74,618	75,988	77,235	78,386	79,526	85,383
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,496	41,621	43,727	44,850	46,222	46,599	46,987	47,385	47,796	48,171	48,516	48,858	50,615
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	21,375	24,129	24,987	25,871	26,782	27,611	28,376	29,135	33,030
Existing Diesel Valdez	11,157	13,781	18,696	21,317	3,142	1,270	1,315	1,362	1,410	1,453	1,493	1,533	1,738
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	21,321	22,203	23,009	23,857	24,368	24,934	25,515	26,111	26,724	27,257	27,803	28,363	30,372
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,396	6,661	6,903	7,157	6,193	5,827	5,451	5,064	4,665	4,303	3,968	3,636	1,932
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	11,300	11,300	19,107	20,064	21,047	22,059	22,601	22,601	22,601	28,441
Existing Diesel Glennallen	14,925	15,542	16,106	5,399	6,875	0	0	0	0	354	1,235	2,126	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	72,974	77,605	85,431	90,024	95,107	96,932	98,804	100,729	102,712	104,492	106,189	107,889	115,755
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	47,090	48,487	50,843	52,229	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	0	0	0	11,300	32,675	43,236	45,051	46,918	48,841	50,212	50,977	51,735	61,470
Existing Diesel CVEA	26,082	29,324	34,802	26,716	10,017	1,270	1,315	1,362	1,410	1,807	2,728	3,660	1,738
Less Transmission Losses V-G	198	206	213	221	192	180	169	157	144	133	123	112	60
Total	72,974	77,605	85,431	90,024	95,107	96,932	98,804	100,729	102,712	104,492	106,189	107,889	115,755
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

All Diesel Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	91,383	92,202	93,045	91,564	89,347	90,380	91,446	92,546	93,637	94,742	95,859	96,990	98,133
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,415	52,606	52,606	52,469	51,804	52,114	52,434	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	37,019	37,619	38,433	37,140	35,666	36,353	37,062	37,951	39,004	40,070	41,148	42,239	43,343
Existing Diesel Valdez	1,948	1,977	2,007	1,955	1,877	1,913	1,951	1,989	2,027	2,066	2,105	2,145	2,185
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	32,736	33,204	33,686	32,970	31,816	32,468	33,137	33,823	34,520	35,232	35,958	36,699	37,455
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	186	0	0	133	778	477	167	0	0	0	0	0	0
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	32,550	33,204	33,686	32,837	31,038	31,990	32,970	33,823	33,901	33,901	33,901	33,901	33,901
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	619	1,331	2,057	2,798	3,554
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	124,118	125,405	126,731	124,534	121,163	122,848	124,583	126,369	128,158	129,973	131,817	133,688	135,588
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	69,569	70,822	72,118	69,977	66,704	68,343	70,031	71,774	72,905	73,971	75,049	76,140	77,244
Existing Diesel CVEA	1,948	1,977	2,007	1,955	1,877	1,913	1,951	1,989	2,646	3,396	4,162	4,942	5,738
Less Transmission Losses V-G	6	0	0	4	24	15	5	0	0	0	0	0	0
Total	124,118	125,405	126,731	124,534	121,163	122,848	124,583	126,369	128,158	129,973	131,817	133,688	135,588
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

All Diesel Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,431	$1,641	$2,027	$2,230	$2,248	$2,328	$2,467	$2,614	$2,767	$2,918	$3,075	$3,237	$3,729
Variable O&M	811	911	1,082	947	650	487	508	528	550	576	613	650	691
Existing Diesel O&M Adjustment	0	0	0	0	0	0	291	291	291	291	291	291	291
Additional Building and Equipment	0	0	0	0	0	0	126	126	126	126	126	157	157
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	77
New Diesel Capital Costs	0	0	0	136	407	678	678	678	678	678	678	678	949
Total Diesel Costs	$2,242	$2,553	$3,109	$3,339	$3,330	$3,519	$4,095	$4,262	$4,437	$4,615	$4,808	$5,038	$5,893
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$2,242	$2,553	$3,109	$3,339	$3,330	$3,519	$4,095	$4,262	$4,437	$4,615	$4,808	$5,038	$5,893
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,242	$2,553	$3,109	$3,339	$3,330	$3,519	$4,095	$4,262	$4,437	$4,615	$4,808	$5,038	$5,893

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$76,046	(in thousands)
30 Year (2019 - 2048) with no additional growth	45,516	(in thousands)
Total Net Present Value	$121,562	(in thousands)

All Diesel Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$4,292	$4,444	$4,603	$4,545	$4,407	$4,593	$4,788	$4,990	$5,207	$5,433	$5,667	$5,910	$6,162
Variable O&M	781	795	810	786	749	768	786	805	838	872	907	942	979
Existing Diesel O&M Adjustment	291	291	291	291	291	291	291	291	291	291	291	291	291
Additional Building and Equipment	157	157	157	157	157	157	157	157	157	157	157	157	157
New Diesel Fixed O&M	77	77	77	77	77	77	77	77	77	77	77	77	103
New Diesel Capital Costs	949	949	949	949	949	949	949	949	949	949	949	949	1,084
Total Diesel Costs	$6,547	$6,713	$6,886	$6,804	$6,630	$6,835	$7,048	$7,270	$7,518	$7,779	$8,048	$8,326	$8,776
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$6,547	$6,713	$6,886	$6,804	$6,630	$6,835	$7,048	$7,270	$7,518	$7,779	$8,048	$8,326	$8,776
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$6,547	$6,713	$6,886	$6,804	$6,630	$6,835	$7,048	$7,270	$7,518	$7,779	$8,048	$8,326	$8,776

Intertie Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Glennallen Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Total CVEA Demand	12,682	13,286	14,337	14,927	15,234	15,385	15,537	15,692	15,850	15,976	16,089	16,198	16,306
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	---	---	---	---	---	---	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	21,550	21,550	21,550	21,550	21,550	21,550	23,050	23,050	23,050	23,050	23,050	23,050	23,050
Valdez													
Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,293	11,734	12,631	13,060	13,337	13,458	13,579	13,702	13,828	13,936	14,029	14,119	14,207
Local Resources	14,750	14,750	14,750	14,750	14,750	14,750	16,250	16,250	16,250	16,250	16,250	16,250	16,250
Surplus/(Deficit)	3,457	3,016	2,119	1,690	1,413	1,292	2,671	2,548	2,422	2,314	2,221	2,131	2,043
Glennallen													
Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	0	0	0	0	0	0	0
Total Capacity Requirements	6,390	6,552	6,706	6,866	6,897	6,927	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Local Resources	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Surplus/(Deficit)	410	248	94	(66)	(97)	(127)	2,342	2,310	2,278	2,259	2,240	2,221	2,201

Intertie Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	12,929
Glennallen Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Total CVEA Demand	16,414	16,523	16,633	16,744	16,857	16,971	17,087	17,204	17,321	17,438	17,556	17,676	17,796
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050
Valdez													
Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	12,929
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	14,296	14,385	14,475	14,566	14,658	14,752	14,847	14,943	15,039	15,135	15,232	15,330	15,429
Local Resources	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250
Surplus/(Deficit)	1,954	1,865	1,775	1,684	1,592	1,498	1,403	1,307	1,211	1,115	1,018	920	821
Glennallen													
Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Capacity Requirements	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Local Resources	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Surplus/(Deficit)	2,182	2,162	2,142	2,122	2,101	2,081	2,060	2,039	2,018	1,997	1,976	1,955	1,934

Intertie Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,328	54,622	61,149	64,357	66,324	67,034	67,750	68,477	69,216	69,850	70,400	70,928	71,449
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,398	41,387	43,345	44,307	44,897	45,110	45,325	45,543	45,765	45,955	46,120	46,278	46,435
Intertie	0	0	0	0	0	0	21,977	22,475	22,982	23,417	23,794	24,157	24,514
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	10,930	13,236	17,804	20,050	21,427	21,924	449	459	469	478	486	493	500
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	20,509	20,949	21,301	21,678	21,817	21,972	22,130	22,290	22,453	22,550	22,647	22,746	22,845
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,153	6,285	6,390	6,504	6,545	6,592	6,639	6,687	6,636	6,452	6,292	6,138	5,986
Intertie	0	0	0	0	0	0	15,181	15,291	15,500	15,776	16,029	16,276	16,521
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	14,356	14,664	14,910	15,175	15,272	15,381	310	312	316	322	327	332	337
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,741	47,866	49,933	51,012	51,645	51,906	52,169	52,437	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	37,838	38,461	39,193	39,918	40,559	41,180	41,794
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel CVEA	25,286	27,900	32,715	35,225	36,699	37,305	758	771	785	800	813	825	837
Less Transmission Losses V-G	190	194	198	201	202	204	885	902	916	924	930	937	943
Total	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Intertie Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	71,970	72,495	73,025	73,562	74,105	74,657	75,215	75,782	76,346	76,914	77,486	78,063	78,643
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,591	46,748	46,908	47,068	47,232	47,397	47,565	47,735	47,904	48,074	48,246	48,419	48,593
Intertie	24,872	25,232	25,595	25,963	26,336	26,714	27,098	27,487	27,873	28,263	28,656	29,051	29,449
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	508	515	522	530	537	545	553	561	569	577	585	593	601
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	22,945	23,046	23,147	23,250	23,354	23,459	23,565	23,671	23,777	23,884	23,991	24,099	24,207
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,835	5,682	5,528	5,372	5,213	5,053	4,890	4,725	4,561	4,396	4,230	4,062	3,893
Intertie	16,768	17,016	17,267	17,521	17,778	18,038	18,301	18,567	18,832	19,098	19,367	19,636	19,908
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	342	347	352	358	363	368	373	379	384	390	395	401	406
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	102,850
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	42,409	43,028	43,654	44,287	44,929	45,578	46,237	46,904	47,567	48,235	48,908	49,586	50,268
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel CVEA	850	862	875	887	900	913	927	940	953	967	980	994	1,007
Less Transmission Losses V-G	950	956	963	969	976	982	989	996	1,003	1,010	1,017	1,024	1,031
Total	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	102,850
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Intertie Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,384	$1,555	$1,875	$2,131	$2,308	$2,404	$45	$47	$49	$50	$52	$54	$55
Variable O&M	786	867	1,017	1,095	1,141	1,159	24	24	24	25	25	26	26
Existing Diesel O&M Adjustment	0	0	0	0	0	0	(560)	(560)	(560)	(560)	(560)	(560)	(560)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Capital Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Diesel Costs	$2,169	$2,422	$2,892	$3,226	$3,448	$3,564	($491)	($489)	($487)	($485)	($483)	($481)	($479)
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	---	---	---	---	---	---	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409
Annual O&M Costs	---	---	---	---	---	---	207	207	207	282	207	207	207
Economy Energy	0	0	0	0	0	0	1,083	1,119	1,159	1,199	1,238	1,277	1,317
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$3,699	$3,734	$3,774	$3,890	$3,854	$3,893	$3,933
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$2,169	$2,422	$2,892	$3,226	$3,448	$3,564	$3,208	$3,245	$3,287	$3,405	$3,371	$3,412	$3,454
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	437	169	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	($11)	($4)	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,169	$2,422	$2,892	$3,226	$3,448	$3,564	$3,196	$3,241	$3,287	$3,405	$3,371	$3,412	$3,454

Present Value in 1993 dollars (Discounted @4.5%)

Cumulative (1993 - 2018)	$50,884	(in thousands)
30 Year (2019 - 2048) with no additional growth	21,719	(in thousands)
Total Net Present Value	$72,604	(in thousands)

Intertie Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$57	$59	$61	$63	$65	$67	$69	$71	$74	$76	$78	$81	$83
Variable O&M	26	27	27	28	28	28	29	29	30	30	30	31	31
Existing Diesel O&M Adjustment	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Capital Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Diesel Costs	($476)	($474)	($472)	($469)	($467)	($465)	($462)	($459)	($457)	($454)	($451)	($449)	($446)
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409
Annual O&M Costs	207	282	221	221	221	221	346	240	240	240	240	269	269
Economy Energy	1,359	1,401	1,444	1,489	1,535	1,583	1,632	1,682	1,734	1,787	1,842	1,898	1,956
Total Intertie Costs	$3,974	$4,091	$4,074	$4,119	$4,165	$4,213	$4,387	$4,332	$4,383	$4,436	$4,491	$4,576	$4,633
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$3,498	$3,617	$3,602	$3,649	$3,698	$3,748	$3,925	$3,872	$3,926	$3,982	$4,040	$4,127	$4,188
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$3,498	$3,617	$3,602	$3,649	$3,698	$3,748	$3,925	$3,872	$3,926	$3,982	$4,040	$4,127	$4,188

Intertie Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Glennallen Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Total CVEA Demand	12,682	13,286	14,337	14,927	15,234	15,385	15,537	15,692	15,850	15,976	16,089	16,198	16,306
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	---	---	---	---	---	---	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	21,550	21,550	21,550	21,550	21,550	21,550	23,050	23,050	23,050	23,050	23,050	23,050	23,050
Valdez													
Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,293	11,734	12,631	13,060	13,337	13,458	13,579	13,702	13,828	13,936	14,029	14,119	14,207
Local Resources	14,750	14,750	14,750	14,750	14,750	14,750	16,250	16,250	16,250	16,250	16,250	16,250	16,250
Surplus/(Deficit)	3,457	3,016	2,119	1,690	1,413	1,292	2,671	2,548	2,422	2,314	2,221	2,131	2,043
Glennallen													
Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	0	0	0	0	0	0	0
Total Capacity Requirements	6,390	6,552	6,706	6,866	6,897	6,927	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Local Resources	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Surplus/(Deficit)	410	248	94	(66)	(97)	(127)	2,342	2,310	2,278	2,259	2,240	2,221	2,201

Intertie Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	10,079
Glennallen Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Total CVEA Demand	16,414	16,523	16,633	16,744	16,857	16,971	17,087	17,204	17,321	17,438	17,556	17,676	14,946
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050
Valdez													
Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	10,079
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	14,296	14,385	14,475	14,566	14,658	14,752	14,847	14,943	15,039	15,135	15,232	15,330	12,579
Local Resources	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250
Surplus/(Deficit)	1,954	1,865	1,775	1,684	1,592	1,498	1,403	1,307	1,211	1,115	1,018	920	3,671
Glennallen													
Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Capacity Requirements	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Local Resources	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Surplus/(Deficit)	2,182	2,162	2,142	2,122	2,101	2,081	2,060	2,039	2,018	1,997	1,976	1,955	1,934

Intertie Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,328	54,622	61,149	64,357	66,324	67,034	67,750	68,477	69,216	69,850	70,400	70,928	71,449
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,398	41,387	43,345	44,307	44,897	45,110	45,325	45,543	45,765	45,955	46,120	46,278	46,435
Intertie	0	0	0	0	0	0	21,977	22,475	22,982	23,417	23,794	24,157	24,514
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	10,930	13,236	17,804	20,050	21,427	21,924	449	459	469	478	486	493	500
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	20,509	20,949	21,301	21,678	21,817	21,972	22,130	22,290	22,453	22,550	22,647	22,746	22,845
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,153	6,285	6,390	6,504	6,545	6,592	6,639	6,687	6,636	6,452	6,292	6,138	5,986
Intertie	0	0	0	0	0	0	15,181	15,291	15,500	15,776	16,029	16,276	16,521
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	14,356	14,664	14,910	15,175	15,272	15,381	310	312	316	322	327	332	337
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,741	47,866	49,933	51,012	51,645	51,906	52,169	52,437	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	37,838	38,461	39,193	39,918	40,559	41,180	41,794
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel CVEA	25,286	27,900	32,715	35,225	36,699	37,305	758	771	785	800	813	825	837
Less Transmission Losses V-G	190	194	198	201	202	204	885	902	916	924	930	937	943
Total	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Intertie Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	71,970	72,495	73,025	73,562	74,105	74,657	75,215	75,782	76,346	76,914	77,486	78,063	56,174
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,591	46,748	46,908	47,068	47,232	47,397	47,565	47,735	47,904	48,074	48,246	48,419	41,852
Intertie	24,872	25,232	25,595	25,963	26,336	26,714	27,098	27,487	27,873	28,263	28,656	29,051	14,036
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	508	515	522	530	537	545	553	561	569	577	585	593	286
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	22,945	23,046	23,147	23,250	23,354	23,459	23,565	23,671	23,777	23,884	23,991	24,099	24,207
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,835	5,682	5,528	5,372	5,213	5,053	4,890	4,725	4,561	4,396	4,230	4,062	7,262
Intertie	16,768	17,016	17,267	17,521	17,778	18,038	18,301	18,567	18,832	19,098	19,367	19,636	16,606
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	342	347	352	358	363	368	373	379	384	390	395	401	339
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	80,381
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	49,339
Intertie	42,409	43,028	43,654	44,287	44,929	45,578	46,237	46,904	47,567	48,235	48,908	49,586	31,076
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel CVEA	850	862	875	887	900	913	927	940	953	967	980	994	625
Less Transmission Losses V-G	950	956	963	969	976	982	989	996	1,003	1,010	1,017	1,024	659
Total	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	80,381
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Intertie Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,384	$1,535	$1,828	$2,051	$2,193	$2,256	$42	$43	$44	$45	$46	$47	$48
Variable O&M	786	867	1,017	1,095	1,141	1,159	24	24	24	25	25	26	26
Existing Diesel O&M Adjustment	0	0	0	0	0	0	(560)	(560)	(560)	(560)	(560)	(560)	(560)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Capital Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Diesel Costs	$2,169	$2,403	$2,845	$3,146	$3,334	$3,416	($494)	($493)	($492)	($490)	($489)	($488)	($486)
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	---	---	---	---	---	---	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409
Annual O&M Costs	---	---	---	---	---	---	207	207	207	282	207	207	207
Economy Energy	0	0	0	0	0	0	1,009	1,030	1,054	1,078	1,100	1,121	1,142
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$3,625	$3,645	$3,669	$3,768	$3,715	$3,736	$3,758
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$2,169	$2,403	$2,845	$3,146	$3,334	$3,416	$3,130	$3,152	$3,178	$3,278	$3,226	$3,249	$3,272
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	437	169	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	($11)	($4)	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,169	$2,403	$2,845	$3,146	$3,334	$3,416	$3,120	$3,148	$3,178	$3,278	$3,226	$3,249	$3,272

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$47,930	(in thousands)
30 Year (2019 - 2048) with no additional growth	15,485	(in thousands)
Total Net Present Value	$63,415	(in thousands)

Intertie Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$49	$49	$50	$51	$52	$53	$54	$55	$56	$57	$58	$59	$38
Variable O&M	26	27	27	28	28	28	29	29	30	30	30	31	19
Existing Diesel O&M Adjustment	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Capital Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Diesel Costs	($485)	($484)	($482)	($481)	($480)	($478)	($477)	($475)	($474)	($473)	($471)	($470)	($503)
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409
Annual O&M Costs	207	282	221	221	221	221	346	240	240	240	240	269	269
Economy Energy	1,164	1,186	1,208	1,231	1,254	1,277	1,301	1,325	1,349	1,374	1,399	1,424	896
Total Intertie Costs	$3,779	$3,876	$3,838	$3,860	$3,883	$3,907	$4,056	$3,974	$3,998	$4,023	$4,048	$4,102	$3,574
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$3,294	$3,393	$3,356	$3,379	$3,404	$3,429	$3,579	$3,498	$3,524	$3,550	$3,577	$3,632	$3,071
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	3,267
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($85)
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$3,294	$3,393	$3,356	$3,379	$3,404	$3,429	$3,579	$3,498	$3,524	$3,550	$3,577	$3,632	$2,986

Intertie Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,748	9,086	9,876	9,892	9,727	9,559	9,566	9,573	9,580	9,575	9,561	9,543	9,525
Glennallen Peak Demand	3,885	3,976	4,057	4,143	4,117	4,093	4,070	4,049	4,029	4,001	3,974	3,948	3,922
Total CVEA Demand	12,633	13,063	13,933	14,035	13,844	13,651	13,637	13,622	13,609	13,576	13,534	13,491	13,448
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	---	---	---	---	---	---	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	21,550	21,550	21,550	21,550	21,550	21,550	23,050	23,050	23,050	23,050	23,050	23,050	23,050
Valdez													
Peak Demand	8,748	9,086	9,876	9,892	9,727	9,559	9,566	9,573	9,580	9,575	9,561	9,543	9,525
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,248	11,586	12,376	12,392	12,227	12,059	12,066	12,073	12,080	12,075	12,061	12,043	12,025
Local Resources	14,750	14,750	14,750	14,750	14,750	14,750	16,250	16,250	16,250	16,250	16,250	16,250	16,250
Surplus/(Deficit)	3,502	3,164	2,374	2,358	2,523	2,691	4,184	4,177	4,170	4,175	4,189	4,207	4,225
Glennallen													
Peak Demand	3,885	3,976	4,057	4,143	4,117	4,093	4,070	4,049	4,029	4,001	3,974	3,948	3,922
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	0	0	0	0	0	0	0
Total Capacity Requirements	6,385	6,476	6,557	6,643	6,617	6,593	4,070	4,049	4,029	4,001	3,974	3,948	3,922
Local Resources	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Surplus/(Deficit)	415	324	243	157	183	207	2,730	2,751	2,771	2,799	2,826	2,852	2,878

Intertie Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	9,507	9,488	9,470	9,452	9,404	9,306	9,233	6,760	6,760	6,760	6,760	6,760	6,760
Glennallen Peak Demand	3,898	3,875	3,852	3,830	3,809	3,245	2,967	2,689	2,689	2,689	2,689	2,689	2,689
Total CVEA Demand	13,405	13,363	13,322	13,282	13,212	12,550	12,200	9,449	9,449	9,449	9,449	9,449	9,449
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050	23,050
Valdez													
Peak Demand	9,507	9,488	9,470	9,452	9,404	9,306	9,233	6,760	6,760	6,760	6,760	6,760	6,760
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	12,007	11,988	11,970	11,952	11,904	11,806	11,733	9,260	9,260	9,260	9,260	9,260	9,260
Local Resources	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250
Surplus/(Deficit)	4,243	4,262	4,280	4,298	4,346	4,444	4,517	6,990	6,990	6,990	6,990	6,990	6,990
Glennallen													
Peak Demand	3,898	3,875	3,852	3,830	3,809	3,245	2,967	2,689	2,689	2,689	2,689	2,689	2,689
Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Capacity Requirements	3,898	3,875	3,852	3,830	3,809	3,245	2,967	2,689	2,689	2,689	2,689	2,689	2,689
Local Resources	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Surplus/(Deficit)	2,902	2,925	2,948	2,970	2,991	3,555	3,833	4,111	4,111	4,111	4,111	4,111	4,111

Intertie Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,067	53,750	59,639	59,736	58,764	57,776	57,818	57,858	57,896	57,865	57,779	57,677	57,569
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,320	41,125	42,892	42,921	42,629	42,333	42,345	42,357	42,369	42,360	42,334	42,303	42,271
Intertie	0	0	0	0	0	0	15,163	15,190	15,217	15,195	15,136	15,067	14,992
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	10,747	12,625	16,747	16,815	16,135	15,443	309	310	311	310	309	307	306
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	20,484	20,554	20,540	20,583	20,451	20,326	20,214	20,109	20,008	19,869	19,733	19,603	19,476
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,145	6,166	6,162	6,175	6,135	6,098	6,064	6,033	6,002	5,961	5,920	5,881	5,843
Intertie	0	0	0	0	0	0	13,867	13,794	13,726	13,630	13,537	13,447	13,361
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	14,339	14,388	14,378	14,408	14,316	14,228	283	282	280	278	276	274	273
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	71,550	74,304	80,179	80,319	79,215	78,102	78,033	77,966	77,904	77,734	77,512	77,280	77,046
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,655	47,482	49,244	49,287	48,954	48,619	48,597	48,576	48,557	48,504	48,437	48,366	48,294
Intertie	0	0	0	0	0	0	29,499	29,455	29,413	29,295	29,141	28,980	28,817
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel CVEA	25,085	27,013	31,125	31,223	30,451	29,671	592	592	591	588	585	582	579
Less Transmission Losses V-G	190	191	191	191	190	189	657	656	656	654	651	648	644
Total	71,550	74,304	80,179	80,319	79,215	78,102	78,033	77,966	77,904	77,734	77,512	77,280	77,046
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Intertie Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	57,459	57,349	57,240	57,133	56,846	56,235	55,791	35,791	35,791	35,791	35,791	35,791	35,791
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	42,238	42,205	42,172	42,140	42,054	41,871	41,737	35,737	35,737	35,737	35,737	35,737	35,737
Intertie	14,917	14,842	14,767	14,693	14,497	14,077	13,772	52	52	52	52	52	52
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	304	303	301	300	296	287	281	1	1	1	1	1	1
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	19,354	19,237	19,123	19,014	18,907	16,094	14,709	13,570	13,570	13,570	13,570	13,570	13,570
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,806	5,771	5,737	5,704	5,672	4,828	4,413	4,071	4,071	4,071	4,071	4,071	4,071
Intertie	13,277	13,196	13,119	13,043	12,970	11,041	10,091	9,309	9,309	9,309	9,309	9,309	9,309
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	271	269	268	266	265	225	206	190	190	190	190	190	190
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	76,814	76,586	76,364	76,147	75,754	72,330	70,500	49,360	49,360	49,360	49,360	49,360	49,360
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	48,224	48,154	48,086	48,020	47,901	46,848	46,286	39,934	39,934	39,934	39,934	39,934	39,934
Intertie	28,656	28,497	28,342	28,191	27,915	25,554	24,289	9,363	9,363	9,363	9,363	9,363	9,363
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel CVEA	575	572	569	566	561	513	487	191	191	191	191	191	191
Less Transmission Losses V-G	641	638	634	631	624	585	562	128	128	128	128	128	128
Total	76,814	76,586	76,364	76,147	75,754	72,330	70,500	49,360	49,360	49,360	49,360	49,360	49,360
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Intertie Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,373	$1,484	$1,730	$1,744	$1,704	$1,663	$33	$33	$33	$33	$33	$33	$33
Variable O&M	780	840	967	970	946	922	18	18	18	18	18	18	18
Existing Diesel O&M Adjustment	0	0	0	0	0	0	(560)	(560)	(560)	(560)	(560)	(560)	(560)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Capital Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Diesel Costs	$2,152	$2,324	$2,698	$2,714	$2,650	$2,585	($509)	($509)	($509)	($509)	($509)	($509)	($509)
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	---	---	---	---	---	---	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409
Annual O&M Costs	---	---	---	---	---	---	207	207	207	282	207	207	207
Economy Energy	0	0	0	0	0	0	787	789	791	791	790	789	788
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$3,402	$3,404	$3,406	$3,481	$3,406	$3,404	$3,403
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$2,152	$2,324	$2,698	$2,714	$2,650	$2,585	$2,893	$2,896	$2,898	$2,973	$2,897	$2,895	$2,894
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	4,009	4,030	4,049	4,102	4,169	4,240	4,312
Revenues from Sale	$0	$0	$0	$0	$0	$0	($97)	($97)	($98)	($100)	($102)	($104)	($106)
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,152	$2,324	$2,698	$2,714	$2,650	$2,585	$2,797	$2,798	$2,799	$2,873	$2,795	$2,791	$2,788

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$39,280	(in thousands)
30 Year (2019 - 2048) with no additional growth	10,762	(in thousands)
Total Net Present Value	$50,042	(in thousands)

Intertie Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$33	$33	$33	$33	$33	$30	$29	$11	$11	$11	$11	$11	$11
Variable O&M	18	18	18	18	17	16	15	6	6	6	6	6	6
Existing Diesel O&M Adjustment	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Capital Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Diesel Costs	($509)	($509)	($510)	($510)	($510)	($514)	($516)	($543)	($543)	($543)	($543)	($543)	($543)
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409
Annual O&M Costs	207	282	221	221	221	221	346	240	240	240	240	269	269
Economy Energy	786	785	784	783	779	716	683	264	266	267	268	269	270
Total Intertie Costs	$3,402	$3,476	$3,414	$3,413	$3,409	$3,346	$3,438	$2,914	$2,915	$2,916	$2,917	$2,947	$2,948
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$2,893	$2,966	$2,905	$2,904	$2,899	$2,832	$2,922	$2,371	$2,372	$2,373	$2,374	$2,404	$2,405
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	4,382	4,452	4,520	4,586	4,705	5,758	6,320	12,672	12,672	12,672	12,672	12,672	12,672
Revenues from Sale	($109)	($111)	($113)	($115)	($119)	($146)	($161)	($323)	($325)	($326)	($327)	($329)	($330)
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,784	$2,856	$2,792	$2,789	$2,780	$2,686	$2,761	$2,048	$2,047	$2,047	$2,047	$2,075	$2,075

Intertie Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,847	9,365	10,345	10,864	11,487	11,700	11,918	12,143	12,375	12,587	12,781	12,974	13,967
Glennallen Peak Demand	4,043	4,293	4,541	4,802	4,911	5,024	5,139	5,258	5,379	5,485	5,594	5,705	6,103
Total CVEA Demand	12,890	13,658	14,885	15,666	16,398	16,723	17,058	17,401	17,755	18,072	18,375	18,679	20,070
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	---	---	---	---	---	---	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	2,150
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	21,550	21,550	21,550	21,550	21,550	21,550	23,050	23,050	23,050	23,050	23,050	23,050	25,200
Valdez													
Peak Demand	8,847	9,365	10,345	10,864	11,487	11,700	11,918	12,143	12,375	12,587	12,781	12,974	13,967
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,347	11,865	12,845	13,364	13,987	14,200	14,418	14,643	14,875	15,087	15,281	15,474	16,467
Local Resources	14,750	14,750	14,750	14,750	14,750	14,750	16,250	16,250	16,250	16,250	16,250	16,250	18,400
Surplus/(Deficit)	3,403	2,885	1,905	1,386	763	550	1,832	1,607	1,375	1,163	969	776	1,933
Glennallen													
Peak Demand	4,043	4,293	4,541	4,802	4,911	5,024	5,139	5,258	5,379	5,485	5,594	5,705	6,103
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	0	0	0	0	0	0	0
Total Capacity Requirements	6,543	6,793	7,041	7,302	7,411	7,524	5,139	5,258	5,379	5,485	5,594	5,705	6,103
Local Resources	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Surplus/(Deficit)	257	7	(241)	(502)	(611)	(724)	1,661	1,542	1,421	1,315	1,206	1,095	697

Intertie Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	14,984	15,123	15,265	15,015	14,639	14,814	14,994	15,180	15,365	15,552	15,741	15,933	16,126
Glennallen Peak Demand	6,572	6,665	6,761	6,619	6,389	6,519	6,652	6,789	6,927	7,069	7,213	7,360	7,511
Total CVEA Demand	21,556	21,788	22,026	21,633	21,028	21,333	21,646	21,969	22,292	22,621	22,954	23,293	23,637
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
New Diesel Glennallen	0	0	0	0	0	0	0	0	2,150	2,150	2,150	2,150	2,150
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	25,200	25,200	25,200	25,200	25,200	25,200	25,200	25,200	27,350	27,350	27,350	27,350	27,350
Valdez													
Peak Demand	14,984	15,123	15,265	15,015	14,639	14,814	14,994	15,180	15,365	15,552	15,741	15,933	16,126
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	17,484	17,623	17,765	17,515	17,139	17,314	17,494	17,680	17,865	18,052	18,241	18,433	18,626
Local Resources	18,400	18,400	18,400	18,400	18,400	18,400	18,400	18,400	18,400	18,400	18,400	18,400	18,400
Surplus/(Deficit)	916	777	635	885	1,261	1,086	906	720	535	348	159	(33)	(226)
Glennallen													
Peak Demand	6,572	6,665	6,761	6,619	6,389	6,519	6,652	6,789	6,927	7,069	7,213	7,360	7,511
Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Capacity Requirements	6,572	6,665	6,761	6,619	6,389	6,519	6,652	6,789	6,927	7,069	7,213	7,360	7,511
Local Resources	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	8,950	8,950	8,950	8,950	8,950
Surplus/(Deficit)	228	135	39	181	411	281	148	11	2,023	1,881	1,737	1,590	1,439

Intertie Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,653	55,402	62,422	66,167	70,739	71,998	73,289	74,618	75,988	77,235	78,386	79,526	85,383
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,496	41,621	43,727	44,850	46,222	46,599	46,987	47,385	47,796	48,171	48,516	48,858	50,615
Intertie	0	0	0	0	0	0	25,777	26,688	27,628	28,483	29,273	30,055	34,073
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	661
Existing Diesel Valdez	11,157	13,781	18,696	21,317	24,517	25,399	526	545	564	581	597	613	35
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	21,321	22,203	23,009	23,857	24,368	24,934	25,515	26,111	26,724	27,257	27,803	28,363	30,372
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,396	6,661	6,903	7,157	6,193	5,827	5,451	5,064	4,665	4,303	3,968	3,636	1,932
Intertie	0	0	0	0	0	0	19,662	20,626	21,617	22,496	23,359	24,233	27,872
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	14,925	15,542	16,106	16,700	18,089	18,089	401	421	441	459	477	495	569
Deficit	0	0	0	0	(86)	(1,018)	0	0	0	0	0	0	0
CVEA System Requirements	72,974	77,605	85,431	90,024	95,107	96,932	98,804	100,729	102,712	104,492	106,189	107,889	115,755
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	47,090	48,487	50,843	52,229	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	46,236	48,140	50,100	51,860	53,537	55,217	62,998
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	661
Existing Diesel CVEA	26,082	29,324	34,802	38,017	42,607	43,488	927	966	1,005	1,040	1,074	1,108	604
Less Transmission Losses V-G	198	206	213	221	192	180	966	982	999	1,014	1,028	1,042	1,114
Total	72,974	77,605	85,431	90,024	95,021	95,914	98,804	100,729	102,712	104,492	106,189	107,889	115,755
Deficit	0	0	0	0	(86)	(1,018)	0	0	0	0	0	0	0

Intertie Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	91,383	92,202	93,045	91,564	89,347	90,380	91,446	92,546	93,637	94,742	95,859	96,990	98,133
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,415	52,606	52,606	52,469	51,804	52,114	52,434	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	38,188	38,804	39,630	38,313	36,792	37,501	38,232	39,141	40,211	41,293	42,388	43,496	44,617
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	740	752	769	743	713	727	741	759	780	801	823	845	867
Existing Diesel Valdez	39	40	40	39	38	38	39	40	41	41	42	43	44
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	32,736	33,204	33,686	32,970	31,816	32,468	33,137	33,823	34,520	35,232	35,958	36,699	37,455
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	186	0	0	133	778	477	167	0	0	0	0	0	0
Intertie	31,899	32,540	33,012	32,181	30,417	31,351	32,310	33,147	33,830	34,527	35,239	35,965	36,706
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	0	0	0	0	0	690	705	719	734	749
Existing Diesel Glennallen	651	664	674	657	621	640	659	676	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	124,118	125,405	126,731	124,534	121,163	122,848	124,583	126,369	128,158	129,973	131,817	133,688	135,588
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	71,269	72,543	73,868	71,679	68,347	70,011	71,725	73,498	75,284	77,097	78,937	80,806	82,703
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel CVEA	740	752	769	743	713	727	741	759	1,470	1,506	1,542	1,579	1,616
Existing Diesel CVEA	690	704	714	696	658	678	698	716	41	41	42	43	44
Less Transmission Losses V-G	1,187	1,200	1,226	1,189	1,162	1,175	1,188	1,211	1,244	1,277	1,311	1,345	1,380
Total	124,118	125,405	126,731	124,534	121,163	122,848	124,583	126,369	128,158	129,973	131,817	133,688	135,588
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Intertie Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,431	$1,641	$2,027	$2,352	$2,798	$2,878	$55	$59	$62	$65	$69	$72	$78
Variable O&M	811	911	1,082	1,182	1,324	1,334	29	30	31	32	33	34	26
Existing Diesel O&M Adjustment	0	0	0	0	0	0	(560)	(560)	(560)	(560)	(560)	(560)	(560)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	0	0	0	0	0	0	0	0	0	26
New Diesel Capital Costs	0	0	0	0	0	0	0	0	0	0	0	0	136
Total Diesel Costs	$2,242	$2,553	$3,109	$3,533	$4,122	$4,212	($476)	($471)	($467)	($462)	($458)	($454)	($295)
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	---	---	---	---	---	---	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409
Annual O&M Costs	---	---	---	---	---	---	207	207	207	282	207	207	207
Economy Energy	0	0	0	0	0	0	1,324	1,401	1,481	1,558	1,634	1,713	1,986
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$3,939	$4,016	$4,097	$4,248	$4,250	$4,328	$4,601
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$2,242	$2,553	$3,109	$3,533	$4,122	$4,212	$3,464	$3,545	$3,630	$3,786	$3,792	$3,875	$4,307
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,242	$2,553	$3,109	$3,533	$4,122	$4,212	$3,464	$3,545	$3,630	$3,786	$3,792	$3,875	$4,307

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$61,156	(in thousands)
30 Year (2019 - 2048) with no additional growth	30,072	(in thousands)
Total Net Present Value	$91,227	(in thousands)

Intertie Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$90	$93	$97	$95	$92	$96	$101	$105	$104	$108	$113	$117	$122
Variable O&M	29	30	30	29	28	29	29	30	16	17	17	18	18
Existing Diesel O&M Adjustment	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)	(560)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	26	26	26	26	26	26	26	26	52	52	52	52	52
New Diesel Capital Costs	136	136	136	136	136	136	136	136	271	271	271	271	271
Total Diesel Costs	($279)	($276)	($272)	($274)	($278)	($274)	($269)	($264)	($117)	($112)	($107)	($102)	($97)
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409	$2,409
Annual O&M Costs	207	282	221	221	221	221	346	240	240	240	240	269	269
Economy Energy	2,283	2,362	2,444	2,410	2,335	2,431	2,531	2,636	2,745	2,857	2,973	3,093	3,218
Total Intertie Costs	$4,899	$5,052	$5,074	$5,040	$4,965	$5,061	$5,286	$5,285	$5,394	$5,506	$5,622	$5,771	$5,895
Other													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Power	$4,619	$4,776	$4,802	$4,766	$4,687	$4,787	$5,018	$5,022	$5,277	$5,394	$5,515	$5,668	$5,798
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$4,619	$4,776	$4,802	$4,766	$4,687	$4,787	$5,018	$5,022	$5,277	$5,394	$5,515	$5,668	$5,798

Allison Lake Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Glennallen Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Total CVEA Demand	12,682	13,286	14,337	14,927	15,234	15,385	15,537	15,692	15,850	15,976	16,089	16,198	16,306
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	3,067	3,067	3,067	3,067	3,067	3,067
New Diesel Valdez	0	0	0	0	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
New Diesel Glennallen	0	0	0	2,150	2,150	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	9,750	9,750	9,750	9,750	8,050	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	21,550	21,550	21,550	23,700	24,150	25,350	25,000	29,567	29,567	29,567	29,567	29,567	29,567
Valdez													
Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,293	11,734	12,631	13,060	13,337	13,458	13,579	13,702	13,828	13,936	14,029	14,119	14,207
Local Resources	14,750	14,750	14,750	14,750	15,200	16,400	16,400	20,967	20,967	20,967	20,967	20,967	20,967
Surplus/(Deficit)	3,457	3,016	2,119	1,690	1,863	2,942	2,821	7,264	7,139	7,031	6,938	6,848	6,760
Glennallen													
Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,390	6,552	6,706	6,866	6,897	6,927	6,958	6,990	7,022	7,041	7,060	7,079	7,099
Local Resources	6,800	6,800	6,800	8,950	8,950	8,950	8,600	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	410	248	94	2,084	2,053	2,023	1,642	1,610	1,578	1,559	1,540	1,521	1,501

Allison Lake Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	12,929
Glennallen Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Total CVEA Demand	16,414	16,523	16,633	16,744	16,857	16,971	17,087	17,204	17,321	17,438	17,556	17,676	17,796
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067
New Diesel Valdez	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
New Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100
Existing Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	29,567	29,567	29,567	29,567	29,567	29,567	29,567	29,567	29,567	29,567	29,567	29,567	29,567
Valdez													
Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	12,929
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	14,296	14,385	14,475	14,566	14,658	14,752	14,847	14,943	15,039	15,135	15,232	15,330	15,429
Local Resources	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967
Surplus/(Deficit)	6,671	6,582	6,492	6,401	6,309	6,215	6,120	6,024	5,928	5,832	5,734	5,636	5,538
Glennallen													
Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	7,118	7,138	7,158	7,178	7,199	7,219	7,240	7,261	7,282	7,303	7,324	7,345	7,366
Local Resources	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	1,482	1,462	1,442	1,422	1,401	1,381	1,360	1,339	1,318	1,297	1,276	1,255	1,234

Allison Lake Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,328	54,622	61,149	64,357	66,324	67,034	67,750	68,477	69,216	69,850	70,400	70,928	71,449
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,398	41,387	43,345	44,307	44,897	45,110	45,325	45,543	45,765	45,955	46,120	46,278	46,435
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	22,934	23,451	23,895	24,280	24,650	25,015
New Diesel Valdez	0	0	0	0	10,229	20,828	21,304	0	0	0	0	0	0
Existing Diesel Valdez	10,930	13,236	17,804	20,050	11,198	1,096	1,121	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	20,509	20,949	21,301	21,678	21,817	21,972	22,130	22,290	22,453	22,550	22,647	22,746	22,845
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,153	6,285	6,390	6,504	6,545	6,592	6,639	6,687	6,636	6,452	6,292	6,138	5,986
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	3,668	3,166	2,735	2,362	2,003	1,650
New Diesel Glennallen	0	0	0	11,300	11,300	11,300	15,491	11,935	12,651	13,363	13,994	14,604	15,209
Existing Diesel Glennallen	14,356	14,664	14,910	3,874	3,972	4,080	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,741	47,866	49,933	51,012	51,645	51,906	52,169	52,437	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	26,715	26,715	26,715	26,715	26,715	26,715
New Diesel CVEA	0	0	0	11,300	21,529	32,128	36,795	11,935	12,651	13,363	13,994	14,604	15,209
Existing Diesel CVEA	25,286	27,900	32,715	23,924	15,170	5,176	1,121	0	0	0	0	0	0
Less Transmission Losses V-G	190	194	198	201	202	204	205	320	303	284	268	252	236
Total	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Allison Lake Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	71,970	72,495	73,025	73,562	74,105	74,657	75,215	75,782	76,346	76,914	77,486	78,063	78,643
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,591	46,748	46,908	47,068	47,232	47,397	47,565	47,735	47,904	48,074	48,246	48,419	48,593
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	25,379	25,747	26,118	26,493	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715
New Diesel Valdez	0	0	0	0	151	517	889	1,266	1,641	2,018	2,399	2,782	3,168
Existing Diesel Valdez	0	0	0	0	8	27	47	67	86	106	126	146	167
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	22,945	23,046	23,147	23,250	23,354	23,459	23,565	23,671	23,777	23,884	23,991	24,099	24,207
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,835	5,682	5,528	5,372	5,213	5,053	4,890	4,725	4,561	4,396	4,230	4,062	3,893
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	1,296	940	580	215	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	15,814	16,424	17,040	17,663	18,141	18,406	18,674	18,946	19,216	19,488	19,762	20,037	20,314
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	102,850
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715
New Diesel CVEA	15,814	16,424	17,040	17,663	18,291	18,923	19,563	20,212	20,857	21,506	22,161	22,819	23,483
Existing Diesel CVEA	0	0	0	0	8	27	47	67	86	106	126	146	167
Less Transmission Losses V-G	221	205	189	173	161	156	151	146	141	136	131	126	120
Total	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	102,850
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Allison Lake Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,384	$1,555	$1,875	$2,022	$1,990	$1,974	$2,017	$653	$705	$757	$807	$856	$907
Variable O&M	786	867	1,017	861	695	494	416	124	131	138	145	151	158
Existing Diesel O&M Adjustment	0	0	0	0	0	0	0	(146)	(146)	(146)	(146)	(146)	(146)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	0	0	0	136	271	407	542	542	542	542	542	542	542
Total Diesel Costs	$2,169	$2,422	$2,892	$3,044	$2,982	$2,900	$3,001	$1,199	$1,258	$1,318	$1,374	$1,430	$1,487
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Allison Lake													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631
Annual O&M Costs	0	0	0	0	0	0	0	284	284	284	284	284	284
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915
Total Cost of Power	$2,169	$2,422	$2,892	$3,044	$2,982	$2,900	$3,001	$3,115	$3,173	$3,233	$3,289	$3,345	$3,402
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,169	$2,422	$2,892	$3,044	$2,982	$2,900	$3,001	$3,115	$3,173	$3,233	$3,289	$3,345	$3,402

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$49,463	(in thousands)
30 Year (2019 - 2048) with no additional growth	22,527	(in thousands)
Total Net Present Value	$71,989	(in thousands)

Allison Lake Case
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$959	$1,014	$1,070	$1,128	$1,189	$1,252	$1,317	$1,385	$1,455	$1,527	$1,601	$1,678	$1,757
Variable O&M	164	170	177	183	190	197	204	211	219	226	234	241	248
Existing Diesel O&M Adjustment	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	26	26	26	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	542	542	542	542	542	542	542	542	542	542	542	542	542
Total Diesel Costs	$1,546	$1,606	$1,669	$1,734	$1,801	$1,871	$1,944	$2,019	$2,096	$2,175	$2,257	$2,341	$2,428
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Allison Lake													
Annual Carrying Charge	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631
Annual O&M Costs	284	284	284	284	284	284	284	284	284	284	284	284	284
Total Other Costs	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915
Total Cost of Power	$3,461	$3,521	$3,584	$3,649	$3,716	$3,786	$3,859	$3,934	$4,011	$4,091	$4,172	$4,257	$4,343
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$3,461	$3,521	$3,584	$3,649	$3,716	$3,786	$3,859	$3,934	$4,011	$4,091	$4,172	$4,257	$4,343

Allison Lake Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Glennallen Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Total CVEA Demand	12,682	13,286	14,337	14,927	15,234	15,385	15,537	15,692	15,850	15,976	16,089	16,198	16,306
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	3,067	3,067	3,067	3,067	3,067	3,067
New Diesel Valdez	0	0	0	0	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
New Diesel Glennallen	0	0	0	2,150	2,150	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	9,750	9,750	9,750	9,750	8,050	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	21,550	21,550	21,550	23,700	24,150	25,350	25,000	29,567	29,567	29,567	29,567	29,567	29,567
Valdez													
Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,293	11,734	12,631	13,060	13,337	13,458	13,579	13,702	13,828	13,936	14,029	14,119	14,207
Local Resources	14,750	14,750	14,750	14,750	15,200	16,400	16,400	20,967	20,967	20,967	20,967	20,967	20,967
Surplus/(Deficit)	3,457	3,016	2,119	1,690	1,863	2,942	2,821	7,264	7,139	7,031	6,938	6,848	6,760
Glennallen													
Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,390	6,552	6,706	6,866	6,897	6,927	6,958	6,990	7,022	7,041	7,060	7,079	7,099
Local Resources	6,800	6,800	6,800	8,950	8,950	8,950	8,600	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	410	248	94	2,084	2,053	2,023	1,642	1,610	1,578	1,559	1,540	1,521	1,501

Allison Lake Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	10,079
Glennallen Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Total CVEA Demand	16,414	16,523	16,633	16,744	16,857	16,971	17,087	17,204	17,321	17,438	17,556	17,676	14,946
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067
New Diesel Valdez	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
New Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100
Existing Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	29,567	29,567	29,567	29,567	29,567	29,567	29,567	29,567	29,567	29,567	29,567	29,567	29,567
Valdez													
Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	10,079
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	14,296	14,385	14,475	14,566	14,658	14,752	14,847	14,943	15,039	15,135	15,232	15,330	12,579
Local Resources	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967
Surplus/(Deficit)	6,671	6,582	6,492	6,401	6,309	6,215	6,120	6,024	5,928	5,832	5,734	5,636	8,388
Glennallen													
Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	7,118	7,138	7,158	7,178	7,199	7,219	7,240	7,261	7,282	7,303	7,324	7,345	7,366
Local Resources	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	1,482	1,462	1,442	1,422	1,401	1,381	1,360	1,339	1,318	1,297	1,276	1,255	1,234

Allison Lake Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,328	54,622	61,149	64,357	66,324	67,034	67,750	68,477	69,216	69,850	70,400	70,928	71,449
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,398	41,387	43,345	44,307	44,897	45,110	45,325	45,543	45,765	45,955	46,120	46,278	46,435
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	22,934	23,451	23,895	24,280	24,650	25,015
New Diesel Valdez	0	0	0	0	10,229	20,828	21,304	0	0	0	0	0	0
Existing Diesel Valdez	10,930	13,236	17,804	20,050	11,198	1,096	1,121	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	20,509	20,949	21,301	21,678	21,817	21,972	22,130	22,290	22,453	22,550	22,647	22,746	22,845
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,153	6,285	6,390	6,504	6,545	6,592	6,639	6,687	6,636	6,452	6,292	6,138	5,986
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	3,668	3,166	2,735	2,362	2,003	1,650
New Diesel Glennallen	0	0	0	11,300	11,300	11,300	15,491	11,935	12,651	13,363	13,994	14,604	15,209
Existing Diesel Glennallen	14,356	14,664	14,910	3,874	3,972	4,080	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,741	47,866	49,933	51,012	51,645	51,906	52,169	52,437	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	26,715	26,715	26,715	26,715	26,715	26,715
New Diesel CVEA	0	0	0	11,300	21,529	32,128	36,795	11,935	12,651	13,363	13,994	14,604	15,209
Existing Diesel CVEA	25,286	27,900	32,715	23,924	15,170	5,176	1,121	0	0	0	0	0	0
Less Transmission Losses V-G	190	194	198	201	202	204	205	320	303	284	268	252	236
Total	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Allison Lake Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	71,970	72,495	73,025	73,562	74,105	74,657	75,215	75,782	76,346	76,914	77,486	78,063	56,174
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,591	46,748	46,908	47,068	47,232	47,397	47,565	47,735	47,904	48,074	48,246	48,419	41,852
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	25,379	25,747	26,118	26,493	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	14,322
New Diesel Valdez	0	0	0	0	151	517	889	1,266	1,641	2,018	2,399	2,782	0
Existing Diesel Valdez	0	0	0	0	8	27	47	67	86	106	126	146	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	22,945	23,046	23,147	23,250	23,354	23,459	23,565	23,671	23,777	23,884	23,991	24,099	24,207
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,835	5,682	5,528	5,372	5,213	5,053	4,890	4,725	4,561	4,396	4,230	4,062	7,262
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	1,296	940	580	215	0	0	0	0	0	0	0	0	12,021
New Diesel Glennallen	15,814	16,424	17,040	17,663	18,141	18,406	18,674	18,946	19,216	19,488	19,762	20,037	4,924
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	80,381
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	49,339
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715
New Diesel CVEA	15,814	16,424	17,040	17,663	18,291	18,923	19,563	20,212	20,857	21,506	22,161	22,819	4,924
Existing Diesel CVEA	0	0	0	0	8	27	47	67	86	106	126	146	0
Less Transmission Losses V-G	221	205	189	173	161	156	151	146	141	136	131	126	596
Total	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	80,381
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Allison Lake Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,384	$1,535	$1,828	$1,947	$1,892	$1,852	$1,868	$598	$636	$675	$710	$744	$779
Variable O&M	786	867	1,017	861	695	494	416	124	131	138	145	151	158
Existing Diesel O&M Adjustment	0	0	0	0	0	0	0	(146)	(146)	(146)	(146)	(146)	(146)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	0	0	0	136	271	407	542	542	542	542	542	542	542
Total Diesel Costs	$2,169	$2,403	$2,845	$2,969	$2,883	$2,778	$2,852	$1,144	$1,190	$1,236	$1,278	$1,318	$1,359
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Allison Lake													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631
Annual O&M Costs	0	0	0	0	0	0	0	284	284	284	284	284	284
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915
Total Cost of Power	$2,169	$2,403	$2,845	$2,969	$2,883	$2,778	$2,852	$3,059	$3,105	$3,151	$3,193	$3,233	$3,274
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,169	$2,403	$2,845	$2,969	$2,883	$2,778	$2,852	$3,059	$3,105	$3,151	$3,193	$3,233	$3,274

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$46,823	(in thousands)
30 Year (2019 - 2048) with no additional growth	13,773	(in thousands)
Total Net Present Value	$60,596	(in thousands)

Allison Lake Case
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$813	$848	$884	$921	$958	$996	$1,035	$1,074	$1,114	$1,154	$1,195	$1,237	$267
Variable O&M	164	170	177	183	190	197	204	211	219	226	234	241	51
Existing Diesel O&M Adjustment	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	26	26	26	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	542	542	542	542	542	542	542	542	542	542	542	542	542
Total Diesel Costs	$1,400	$1,441	$1,483	$1,526	$1,570	$1,615	$1,661	$1,708	$1,755	$1,803	$1,851	$1,900	$740
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Allison Lake													
Annual Carrying Charge	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631
Annual O&M Costs	284	284	284	284	284	284	284	284	284	284	284	284	284
Total Other Costs	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915
Total Cost of Power	$3,315	$3,356	$3,398	$3,441	$3,485	$3,530	$3,576	$3,623	$3,670	$3,718	$3,766	$3,815	$2,656
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$3,315	$3,356	$3,398	$3,441	$3,485	$3,530	$3,576	$3,623	$3,670	$3,718	$3,766	$3,815	$2,656

Allison Lake Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,748	9,086	9,876	9,892	9,727	9,559	9,566	9,573	9,580	9,575	9,561	9,543	9,525
Glennallen Peak Demand	3,885	3,976	4,057	4,143	4,117	4,093	4,070	4,049	4,029	4,001	3,974	3,948	3,922
Total CVEA Demand	12,633	13,063	13,933	14,035	13,844	13,651	13,637	13,622	13,609	13,576	13,534	13,491	13,448
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	3,067	3,067	3,067	3,067	3,067	3,067
New Diesel Valdez	0	0	0	0	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
New Diesel Glennallen	0	0	0	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Existing Diesel Valdez	9,750	9,750	9,750	9,750	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	21,550	21,550	21,550	23,700	24,150	24,150	24,150	28,717	28,717	28,717	28,717	28,717	28,717
Valdez													
Peak Demand	8,748	9,086	9,876	9,892	9,727	9,559	9,566	9,573	9,580	9,575	9,561	9,543	9,525
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,248	11,586	12,376	12,392	12,227	12,059	12,066	12,073	12,080	12,075	12,061	12,043	12,025
Local Resources	14,750	14,750	14,750	14,750	15,200	15,200	15,200	19,767	19,767	19,767	19,767	19,767	19,767
Surplus/(Deficit)	3,502	3,164	2,374	2,358	2,973	3,141	3,134	7,694	7,687	7,692	7,706	7,723	7,741
Glennallen													
Peak Demand	3,885	3,976	4,057	4,143	4,117	4,093	4,070	4,049	4,029	4,001	3,974	3,948	3,922
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,385	6,476	6,557	6,643	6,617	6,593	6,570	6,549	6,529	6,501	6,474	6,448	6,422
Local Resources	6,800	6,800	6,800	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950
Surplus/(Deficit)	415	324	243	2,307	2,333	2,357	2,380	2,401	2,421	2,449	2,476	2,502	2,528

Allison Lake Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	9,507	9,488	9,470	9,452	9,404	9,306	9,233	6,760	6,760	6,760	6,760	6,760	6,760
Glennallen Peak Demand	3,898	3,875	3,852	3,830	3,809	3,245	2,967	2,689	2,689	2,689	2,689	2,689	2,689
Total CVEA Demand	13,405	13,363	13,322	13,282	13,212	12,550	12,200	9,449	9,449	9,449	9,449	9,449	9,449
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067
New Diesel Valdez	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
New Diesel Glennallen	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Existing Diesel Valdez	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	28,717	28,717	28,717	28,717	28,717	28,717	28,717	28,717	28,717	28,717	28,717	28,717	28,717
Valdez													
Peak Demand	9,507	9,488	9,470	9,452	9,404	9,306	9,233	6,760	6,760	6,760	6,760	6,760	6,760
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	12,007	11,988	11,970	11,952	11,904	11,806	11,733	9,260	9,260	9,260	9,260	9,260	9,260
Local Resources	19,767	19,767	19,767	19,767	19,767	19,767	19,767	19,767	19,767	19,767	19,767	19,767	19,767
Surplus/(Deficit)	7,760	7,778	7,797	7,815	7,863	7,961	8,034	10,506	10,506	10,506	10,506	10,506	10,506
Glennallen													
Peak Demand	3,898	3,875	3,852	3,830	3,809	3,245	2,967	2,689	2,689	2,689	2,689	2,689	2,689
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,398	6,375	6,352	6,330	6,309	5,745	5,467	5,189	5,189	5,189	5,189	5,189	5,189
Local Resources	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950
Surplus/(Deficit)	2,552	2,575	2,598	2,620	2,641	3,205	3,483	3,761	3,761	3,761	3,761	3,761	3,761

Allison Lake Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,067	53,750	59,639	59,736	58,764	57,776	57,818	57,858	57,896	57,865	57,779	57,677	57,569
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,320	41,125	42,892	42,921	42,629	42,333	42,345	42,357	42,369	42,360	42,334	42,303	42,271
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	15,500	15,527	15,506	15,445	15,374	15,298
New Diesel Valdez	0	0	0	0	10,494	10,528	10,527	0	0	0	0	0	0
Existing Diesel Valdez	10,747	12,625	16,747	16,815	5,641	4,915	4,946	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	20,484	20,554	20,540	20,583	20,451	20,326	20,214	20,109	20,008	19,869	19,733	19,603	19,476
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,145	6,166	6,162	6,175	6,135	6,098	6,064	6,033	6,002	5,961	5,920	5,881	5,843
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	10,878	10,852	10,873	10,932	11,001	11,074
New Diesel Glennallen	0	0	0	11,300	11,300	11,300	11,300	3,198	3,153	3,035	2,881	2,721	2,559
Existing Diesel Glennallen	14,339	14,388	14,378	3,107	3,016	2,928	2,850	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	71,550	74,304	80,179	80,319	79,215	78,102	78,033	77,966	77,904	77,734	77,512	77,280	77,046
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,655	47,482	49,244	49,287	48,954	48,619	48,597	48,576	48,557	48,504	48,437	48,366	48,294
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	26,715	26,715	26,715	26,715	26,715	26,715
New Diesel CVEA	0	0	0	11,300	21,794	21,829	21,827	3,198	3,153	3,035	2,881	2,721	2,559
Existing Diesel CVEA	25,085	27,013	31,125	19,923	8,656	7,843	7,796	0	0	0	0	0	0
Less Transmission Losses V-G	190	191	191	191	190	189	188	523	521	521	521	522	523
Total	71,550	74,304	80,179	80,319	79,215	78,102	78,033	77,966	77,904	77,734	77,512	77,280	77,046
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Allison Lake Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	57,459	57,349	57,240	57,133	56,846	56,235	55,791	35,791	35,791	35,791	35,791	35,791	35,791
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	42,238	42,205	42,172	42,140	42,054	41,871	41,737	35,737	35,737	35,737	35,737	35,737	35,737
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	15,221	15,145	15,068	14,993	14,792	14,365	14,054	53	53	53	53	53	53
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	19,354	19,237	19,123	19,014	18,907	16,094	14,709	13,570	13,570	13,570	13,570	13,570	13,570
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,806	5,771	5,737	5,704	5,672	4,828	4,413	4,071	4,071	4,071	4,071	4,071	4,071
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	11,149	11,224	11,297	11,370	11,565	11,266	10,297	9,499	9,499	9,499	9,499	9,499	9,499
New Diesel Glennallen	2,399	2,242	2,089	1,939	1,670	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	76,814	76,586	76,364	76,147	75,754	72,330	70,500	49,360	49,360	49,360	49,360	49,360	49,360
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	48,224	48,154	48,086	48,020	47,901	46,848	46,286	39,934	39,934	39,934	39,934	39,934	39,934
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	26,715	26,715	26,715	26,715	26,715	25,979	24,669	9,846	9,846	9,846	9,846	9,846	9,846
New Diesel CVEA	2,399	2,242	2,089	1,939	1,670	0	0	0	0	0	0	0	0
Existing Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Less Transmission Losses V-G	524	526	527	528	533	498	455	420	420	420	420	420	420
Total	76,814	76,586	76,364	76,147	75,754	72,330	70,500	49,360	49,360	49,360	49,360	49,360	49,360
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Allison Lake Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,373	$1,484	$1,730	$1,646	$1,539	$1,502	$1,506	$160	$159	$153	$146	$139	$131
Variable O&M	780	840	967	736	495	470	468	33	33	31	30	28	27
Existing Diesel O&M Adjustment	0	0	0	0	0	0	0	(146)	(146)	(146)	(146)	(146)	(146)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	0	0	0	136	271	271	271	271	271	271	271	271	271
Total Diesel Costs	$2,152	$2,324	$2,698	$2,544	$2,330	$2,269	$2,271	$345	$343	$336	$327	$318	$309
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Allison Lake													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631
Annual O&M Costs	0	0	0	0	0	0	0	284	284	284	284	284	284
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915
Total Cost of Power	$2,152	$2,324	$2,698	$2,544	$2,330	$2,269	$2,271	$2,260	$2,258	$2,251	$2,243	$2,233	$2,224
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,152	$2,324	$2,698	$2,544	$2,330	$2,269	$2,271	$2,260	$2,258	$2,251	$2,243	$2,233	$2,224

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$34,090	(in thousands)
30 Year (2019 - 2048) with no additional growth	10,718	(in thousands)
Total Net Present Value	$44,808	(in thousands)

Allison Lake Case
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$123	$116	$108	$101	$87	$0	$0	$0	$0	$0	$0	$0	$0
Variable O&M	25	23	22	20	17	0	0	0	0	0	0	0	0
Existing Diesel O&M Adjustment	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	26	26	26	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	271	271	271	271	271	271	271	271	271	271	271	271	271
Total Diesel Costs	$300	$290	$281	$273	$256	$151	$151	$151	$151	$151	$151	$151	$151
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Allison Lake													
Annual Carrying Charge	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631
Annual O&M Costs	284	284	284	284	284	284	284	284	284	284	284	284	284
Total Other Costs	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915
Total Cost of Power	$2,215	$2,206	$2,197	$2,188	$2,171	$2,067	$2,067	$2,067	$2,067	$2,067	$2,067	$2,067	$2,067
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,215	$2,206	$2,197	$2,188	$2,171	$2,067	$2,067	$2,067	$2,067	$2,067	$2,067	$2,067	$2,067

Allison Lake Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,847	9,365	10,345	10,864	11,487	11,700	11,918	12,143	12,375	12,587	12,781	12,974	13,967
Glennallen Peak Demand	4,043	4,293	4,541	4,802	4,911	5,024	5,139	5,258	5,379	5,485	5,594	5,705	6,103
Total CVEA Demand	12,890	13,658	14,885	15,666	16,398	16,723	17,058	17,401	17,755	18,072	18,375	18,679	20,070
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	3,067	3,067	3,067	3,067	3,067	3,067
New Diesel Valdez	0	0	0	0	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
New Diesel Glennallen	0	0	0	2,150	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	9,750	9,750	9,750	9,750	8,050	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	21,550	21,550	21,550	23,700	24,150	25,000	25,000	29,567	29,567	29,567	29,567	29,567	29,567
Valdez													
Peak Demand	8,847	9,365	10,345	10,864	11,487	11,700	11,918	12,143	12,375	12,587	12,781	12,974	13,967
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,347	11,865	12,845	13,364	13,987	14,200	14,418	14,643	14,875	15,087	15,281	15,474	16,467
Local Resources	14,750	14,750	14,750	14,750	15,200	16,400	16,400	20,967	20,967	20,967	20,967	20,967	20,967
Surplus/(Deficit)	3,403	2,885	1,905	1,386	1,213	2,200	1,982	6,323	6,091	5,880	5,686	5,493	4,499
Glennallen													
Peak Demand	4,043	4,293	4,541	4,802	4,911	5,024	5,139	5,258	5,379	5,485	5,594	5,705	6,103
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,543	6,793	7,041	7,302	7,411	7,524	7,639	7,758	7,879	7,985	8,094	8,205	8,603
Local Resources	6,800	6,800	6,800	8,950	8,950	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	257	7	(241)	1,648	1,539	1,076	961	842	721	615	506	395	(3)

Allison Lake Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	14,984	15,123	15,265	15,015	14,639	14,814	14,994	15,180	15,365	15,552	15,741	15,933	16,126
Glennallen Peak Demand	6,572	6,665	6,761	6,619	6,389	6,519	6,652	6,789	6,927	7,069	7,213	7,360	7,511
Total CVEA Demand	21,556	21,788	22,026	21,633	21,028	21,333	21,646	21,969	22,292	22,621	22,954	23,293	23,637
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067
New Diesel Valdez	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
New Diesel Glennallen	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450
Existing Diesel Valdez	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100
Existing Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	31,717	31,717	31,717	31,717	31,717	31,717	31,717	31,717	31,717	31,717	31,717	31,717	31,717
Valdez													
Peak Demand	14,984	15,123	15,265	15,015	14,639	14,814	14,994	15,180	15,365	15,552	15,741	15,933	16,126
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	17,484	17,623	17,765	17,515	17,139	17,314	17,494	17,680	17,865	18,052	18,241	18,433	18,626
Local Resources	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967	20,967
Surplus/(Deficit)	3,483	3,344	3,201	3,452	3,827	3,653	3,473	3,287	3,102	2,915	2,726	2,534	2,340
Glennallen													
Peak Demand	6,572	6,665	6,761	6,619	6,389	6,519	6,652	6,789	6,927	7,069	7,213	7,360	7,511
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	9,072	9,165	9,261	9,119	8,889	9,019	9,152	9,289	9,427	9,569	9,713	9,860	10,011
Local Resources	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750
Surplus/(Deficit)	1,678	1,585	1,489	1,631	1,861	1,731	1,598	1,461	1,323	1,181	1,037	890	739

Allison Lake Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,653	55,402	62,422	66,167	70,739	71,998	73,289	74,618	75,988	77,235	78,386	79,526	85,383
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,496	41,621	43,727	44,850	46,222	46,599	46,987	47,385	47,796	48,171	48,516	48,858	50,615
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	26,715	26,715	26,715	26,715	26,715	26,715
New Diesel Valdez	0	0	0	0	10,075	21,331	21,286	492	1,403	2,232	2,997	3,755	7,650
Existing Diesel Valdez	11,157	13,781	18,696	21,317	14,443	4,068	5,017	26	74	117	158	198	403
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	21,321	22,203	23,009	23,857	24,368	24,934	25,515	26,111	26,724	27,257	27,803	28,363	30,372
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,396	6,661	6,903	7,157	6,193	5,827	5,451	5,064	4,665	4,303	3,968	3,636	1,932
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	11,300	11,300	19,107	20,064	21,047	22,059	22,601	22,601	22,601	22,601
Existing Diesel Glennallen	14,925	15,542	16,106	5,399	6,875	0	0	0	0	354	1,235	2,126	5,840
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	72,974	77,605	85,431	90,024	95,107	96,932	98,804	100,729	102,712	104,492	106,189	107,889	115,755
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	47,090	48,487	50,843	52,229	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	26,715	26,715	26,715	26,715	26,715	26,715
New Diesel CVEA	0	0	0	11,300	21,375	40,438	41,349	21,539	23,461	24,833	25,598	26,356	30,251
Existing Diesel CVEA	26,082	29,324	34,802	26,716	21,318	4,068	5,017	26	74	471	1,393	2,324	6,243
Less Transmission Losses V-G	198	206	213	221	192	180	169	157	144	133	123	112	60
Total	72,974	77,605	85,431	90,024	95,107	96,932	98,804	100,729	102,712	104,492	106,189	107,889	115,755
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Allison Lake Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	91,383	92,202	93,045	91,564	89,347	90,380	91,446	92,546	93,637	94,742	95,859	96,990	98,133
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,415	52,606	52,606	52,469	51,804	52,114	52,434	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715
New Diesel Valdez	11,640	12,239	13,053	11,761	10,287	10,974	11,682	12,571	13,625	14,690	15,768	16,859	17,963
Existing Diesel Valdez	613	641	671	619	541	578	615	653	692	730	769	809	849
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	32,736	33,204	33,686	32,970	31,816	32,468	33,137	33,823	34,520	35,232	35,958	36,699	37,455
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	186	0	0	133	778	477	167	0	0	0	0	0	0
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	32,550	33,204	33,686	32,837	31,038	31,990	32,970	33,823	33,901	33,901	33,901	33,901	33,901
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	619	1,331	2,057	2,798	3,554
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	124,118	125,405	126,731	124,534	121,163	122,848	124,583	126,369	128,158	129,973	131,817	133,688	135,588
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Allison Lake	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715	26,715
New Diesel CVEA	44,190	45,443	46,739	44,598	41,324	42,964	44,652	46,395	47,526	48,591	49,670	50,761	51,864
Existing Diesel CVEA	613	641	671	619	541	578	615	653	1,311	2,061	2,826	3,606	4,403
Less Transmission Losses V-G	6	0	0	4	24	15	5	0	0	0	0	0	0
Total	124,118	125,405	126,731	124,534	121,163	122,848	124,583	126,369	128,158	129,973	131,817	133,688	135,588
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Allison Lake Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,431	$1,641	$2,027	$2,230	$2,383	$2,348	$2,495	$1,180	$1,309	$1,435	$1,566	$1,702	$2,237
Variable O&M	811	911	1,082	947	884	545	584	224	245	272	308	345	507
Existing Diesel O&M Adjustment	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	0	0	0	136	271	542	542	542	542	542	542	542	542
Total Diesel Costs	$2,242	$2,553	$3,109	$3,339	$3,563	$3,462	$3,647	$1,972	$2,122	$2,275	$2,443	$2,615	$3,312
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Allison Lake													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631
Annual O&M Costs	0	0	0	0	0	0	0	284	284	284	284	284	284
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915
Total Cost of Power	$2,242	$2,553	$3,109	$3,339	$3,563	$3,462	$3,647	$3,887	$4,038	$4,190	$4,358	$4,530	$5,227
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,242	$2,553	$3,109	$3,339	$3,563	$3,462	$3,647	$3,887	$4,038	$4,190	$4,358	$4,530	$5,227

Present Value in 1993 dollars (Discounted @4.5%)

Cumulative (1993 - 2018)	$69,246	(in thousands)
30 Year (2019 - 2048) with no additional growth	39,053	(in thousands)
Total Net Present Value	$108,299	(in thousands)

Allison Lake Case
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$2,703	$2,828	$2,959	$2,872	$2,706	$2,863	$3,027	$3,200	$3,385	$3,580	$3,782	$3,992	$4,211
Variable O&M	477	491	505	481	445	463	482	501	533	567	602	638	674
Existing Diesel O&M Adjustment	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	52	52	52	52	52	52	52	52	52	52	52	52	52
New Diesel Capital Costs	678	678	678	678	678	678	678	678	678	678	678	678	678
Total Diesel Costs	$3,910	$4,048	$4,193	$4,083	$3,880	$4,055	$4,238	$4,430	$4,648	$4,876	$5,114	$5,360	$5,615
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Allison Lake													
Annual Carrying Charge	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631	$1,631
Annual O&M Costs	284	284	284	284	284	284	284	284	284	284	284	284	284
Total Other Costs	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915	$1,915
Total Cost of Power	$5,825	$5,964	$6,108	$5,998	$5,796	$5,970	$6,153	$6,345	$6,563	$6,792	$7,029	$7,275	$7,530
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$5,825	$5,964	$6,108	$5,998	$5,796	$5,970	$6,153	$6,345	$6,563	$6,792	$7,029	$7,275	$7,530

Silver Lake Case - A
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Glennallen Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Total CVEA Demand	12,682	13,286	14,337	14,927	15,234	15,385	15,537	15,692	15,850	15,976	16,089	16,198	16,306
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
New Diesel Glennallen	0	0	0	2,150	2,150	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	9,750	9,750	9,750	9,750	8,050	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	21,550	21,550	21,550	23,700	24,150	25,350	25,000	25,000	26,500	26,500	26,500	26,500	26,500
Valdez													
Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,293	11,734	12,631	13,060	13,337	13,458	13,579	13,702	13,828	13,936	14,029	14,119	14,207
Local Resources	14,750	14,750	14,750	14,750	15,200	16,400	16,400	16,400	17,900	17,900	17,900	17,900	17,900
Surplus/(Deficit)	3,457	3,016	2,119	1,690	1,863	2,942	2,821	2,698	4,072	3,964	3,871	3,781	3,693
Glennallen													
Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,390	6,552	6,706	6,866	6,897	6,927	6,958	6,990	7,022	7,041	7,060	7,079	7,099
Local Resources	6,800	6,800	6,800	8,950	8,950	8,950	8,600	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	410	248	94	2,084	2,053	2,023	1,642	1,610	1,578	1,559	1,540	1,521	1,501

Silver Lake Case - A
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	12,929
Glennallen Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Total CVEA Demand	16,414	16,523	16,633	16,744	16,857	16,971	17,087	17,204	17,321	17,438	17,556	17,676	17,796
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
New Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100
Existing Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	26,500	26,500	26,500	26,500	26,500	26,500	26,500	26,500	26,500	26,500	26,500	26,500	26,500
Valdez													
Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	12,929
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	14,296	14,385	14,475	14,566	14,658	14,752	14,847	14,943	15,039	15,135	15,232	15,330	15,429
Local Resources	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900
Surplus/(Deficit)	3,604	3,515	3,425	3,334	3,242	3,148	3,053	2,957	2,861	2,765	2,668	2,570	2,471
Glennallen													
Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	7,118	7,138	7,158	7,178	7,199	7,219	7,240	7,261	7,282	7,303	7,324	7,345	7,366
Local Resources	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	1,482	1,462	1,442	1,422	1,401	1,381	1,360	1,339	1,318	1,297	1,276	1,255	1,234

Silver Lake Case - A
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,328	54,622	61,149	64,357	66,324	67,034	67,750	68,477	69,216	69,850	70,400	70,928	71,449
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,398	41,387	43,345	44,307	44,897	45,110	45,325	45,543	45,765	45,955	46,120	46,278	46,435
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	23,451	23,895	24,280	24,650	25,015
New Diesel Valdez	0	0	0	0	10,229	20,828	21,304	21,454	0	0	0	0	0
Existing Diesel Valdez	10,930	13,236	17,804	20,050	11,198	1,096	1,121	1,480	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	20,509	20,949	21,301	21,678	21,817	21,972	22,130	22,290	22,453	22,550	22,647	22,746	22,845
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,153	6,285	6,390	6,504	6,545	6,592	6,639	6,687	6,636	6,452	6,292	6,138	5,986
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	15,817	16,098	16,356	16,608	16,858
New Diesel Glennallen	0	0	0	11,300	11,300	11,300	15,491	15,603	0	0	0	0	0
Existing Diesel Glennallen	14,356	14,664	14,910	3,874	3,972	4,080	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,741	47,866	49,933	51,012	51,645	51,906	52,169	52,437	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	39,757	40,491	41,142	41,771	42,394
New Diesel CVEA	0	0	0	11,300	21,529	32,128	36,795	37,057	0	0	0	0	0
Existing Diesel CVEA	25,286	27,900	32,715	23,924	15,170	5,176	1,121	1,480	0	0	0	0	0
Less Transmission Losses V-G	190	194	198	201	202	204	205	207	694	697	700	703	707
Total	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Silver Lake Case - A
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	71,970	72,495	73,025	73,562	74,105	74,657	75,215	75,782	76,346	76,914	77,486	78,063	78,643
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,591	46,748	46,908	47,068	47,232	47,397	47,565	47,735	47,904	48,074	48,246	48,419	48,593
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	25,379	25,747	26,118	26,493	26,874	27,260	27,651	28,048	28,442	28,840	29,240	29,644	30,050
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	22,945	23,046	23,147	23,250	23,354	23,459	23,565	23,671	23,777	23,884	23,991	24,099	24,207
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,835	5,682	5,528	5,372	5,213	5,053	4,890	4,725	4,561	4,396	4,230	4,062	3,893
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	17,022	16,712	16,352	15,988	15,618	15,244	14,865	14,480	14,097	13,712	13,323	12,932	12,537
New Diesel Glennallen	89	652	1,268	1,891	2,522	3,162	3,809	4,466	5,119	5,777	6,439	7,106	7,777
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	102,850
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	42,927	42,975	42,975	42,975	42,975	42,975	42,975	42,975	42,975	42,975	42,975	42,975	42,975
New Diesel CVEA	89	652	1,268	1,891	2,522	3,162	3,809	4,466	5,119	5,777	6,439	7,106	7,777
Existing Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Less Transmission Losses V-G	707	693	677	661	644	628	611	594	577	560	543	526	508
Total	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	102,850
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Silver Lake Case - A
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,384	$1,555	$1,875	$2,022	$1,990	$1,974	$2,017	$2,087	$0	$0	$0	$0	$0
Variable O&M	786	867	1,017	861	695	494	416	430	0	0	0	0	0
Existing Diesel O&M Adjustment	0	0	0	0	0	0	0	0	(146)	(146)	(146)	(146)	(146)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	0	0	0	136	271	407	542	542	542	542	542	542	542
Total Diesel Costs	$2,169	$2,422	$2,892	$3,044	$2,982	$2,900	$3,001	$3,085	$422	$422	$422	$422	$422
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Silver Lake													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$2,742	$2,742	$2,742	$2,742	$2,742
Annual O&M Costs	0	0	0	0	0	0	0	0	593	593	593	593	593
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$3,335	$3,335	$3,335	$3,335	$3,335
Total Cost of Power	$2,169	$2,422	$2,892	$3,044	$2,982	$2,900	$3,001	$3,085	$3,758	$3,758	$3,758	$3,758	$3,758
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,169	$2,422	$2,892	$3,044	$2,982	$2,900	$3,001	$3,085	$3,758	$3,758	$3,758	$3,758	$3,758

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$52,017	(in thousands)
30 Year (2019 - 2048) with no additional growth	22,913	(in thousands)
Total Net Present Value	$74,929	(in thousands)

Silver Lake Case - A
Med-Hi Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$5	$40	$80	$121	$164	$209	$256	$305	$356	$409	$464	$520	$580
Variable O&M	1	7	13	20	26	33	39	46	53	60	67	74	81
Existing Diesel O&M Adjustment	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	26	26	26	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	542	542	542	542	542	542	542	542	542	542	542	542	542
Total Diesel Costs	$429	$469	$515	$563	$612	$664	$718	$774	$832	$891	$953	$1,017	$1,083
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Silver Lake													
Annual Carrying Charge	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742
Annual O&M Costs	593	593	593	593	593	593	593	593	593	593	593	593	593
Total Other Costs	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335
Total Cost of Power	$3,764	$3,805	$3,850	$3,898	$3,948	$3,999	$4,053	$4,109	$4,167	$4,226	$4,288	$4,352	$4,418
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$3,764	$3,805	$3,850	$3,898	$3,948	$3,999	$4,053	$4,109	$4,167	$4,226	$4,288	$4,352	$4,418

Silver Lake Case - A
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Glennallen Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Total CVEA Demand	12,682	13,286	14,337	14,927	15,234	15,385	15,537	15,692	15,850	15,976	16,089	16,198	16,306
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
New Diesel Glennallen	0	0	0	2,150	2,150	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	9,750	9,750	9,750	9,750	8,050	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	21,550	21,550	21,550	23,700	24,150	25,350	25,000	25,000	26,500	26,500	26,500	26,500	26,500
Valdez													
Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,293	11,734	12,631	13,060	13,337	13,458	13,579	13,702	13,828	13,936	14,029	14,119	14,207
Local Resources	14,750	14,750	14,750	14,750	15,200	16,400	16,400	16,400	17,900	17,900	17,900	17,900	17,900
Surplus/(Deficit)	3,457	3,016	2,119	1,690	1,863	2,942	2,821	2,698	4,072	3,964	3,871	3,781	3,693
Glennallen													
Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,390	6,552	6,706	6,866	6,897	6,927	6,958	6,990	7,022	7,041	7,060	7,079	7,099
Local Resources	6,800	6,800	6,800	8,950	8,950	8,950	8,600	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	410	248	94	2,084	2,053	2,023	1,642	1,610	1,578	1,559	1,540	1,521	1,501

Silver Lake Case - A
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	10,079
Glennallen Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Total CVEA Demand	16,414	16,523	16,633	16,744	16,857	16,971	17,087	17,204	17,321	17,438	17,556	17,676	14,946
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
New Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100
Existing Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	26,500	26,500	26,500	26,500	26,500	26,500	26,500	26,500	26,500	26,500	26,500	26,500	26,500
Valdez													
Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	10,079
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	14,296	14,385	14,475	14,566	14,658	14,752	14,847	14,943	15,039	15,135	15,232	15,330	12,579
Local Resources	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900
Surplus/(Deficit)	3,604	3,515	3,425	3,334	3,242	3,148	3,053	2,957	2,861	2,765	2,668	2,570	5,321
Glennallen													
Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	7,118	7,138	7,158	7,178	7,199	7,219	7,240	7,261	7,282	7,303	7,324	7,345	7,366
Local Resources	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	1,482	1,462	1,442	1,422	1,401	1,381	1,360	1,339	1,318	1,297	1,276	1,255	1,234

Silver Lake Case - A
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,328	54,622	61,149	64,357	66,324	67,034	67,750	68,477	69,216	69,850	70,400	70,928	71,449
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,398	41,387	43,345	44,307	44,897	45,110	45,325	45,543	45,765	45,955	46,120	46,278	46,435
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	23,451	23,895	24,280	24,650	25,015
New Diesel Valdez	0	0	0	0	10,229	20,828	21,304	21,454	0	0	0	0	0
Existing Diesel Valdez	10,930	13,236	17,804	20,050	11,198	1,096	1,121	1,480	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	20,509	20,949	21,301	21,678	21,817	21,972	22,130	22,290	22,453	22,550	22,647	22,746	22,845
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,153	6,285	6,390	6,504	6,545	6,592	6,639	6,687	6,636	6,452	6,292	6,138	5,986
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	15,817	16,098	16,356	16,608	16,858
New Diesel Glennallen	0	0	0	11,300	11,300	11,300	15,491	15,603	0	0	0	0	0
Existing Diesel Glennallen	14,356	14,664	14,910	3,874	3,972	4,080	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,741	47,866	49,933	51,012	51,645	51,906	52,169	52,437	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	39,757	40,491	41,142	41,771	42,394
New Diesel CVEA	0	0	0	11,300	21,529	32,128	36,795	37,057	0	0	0	0	0
Existing Diesel CVEA	25,286	27,900	32,715	23,924	15,170	5,176	1,121	1,480	0	0	0	0	0
Less Transmission Losses V-G	190	194	198	201	202	204	205	207	694	697	700	703	707
Total	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Silver Lake Case - A
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	71,970	72,495	73,025	73,562	74,105	74,657	75,215	75,782	76,346	76,914	77,486	78,063	56,174
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,591	46,748	46,908	47,068	47,232	47,397	47,565	47,735	47,904	48,074	48,246	48,419	41,852
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	25,379	25,747	26,118	26,493	26,874	27,260	27,651	28,048	28,442	28,840	29,240	29,644	14,322
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	22,945	23,046	23,147	23,250	23,354	23,459	23,565	23,671	23,777	23,884	23,991	24,099	24,207
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,835	5,682	5,528	5,372	5,213	5,053	4,890	4,725	4,561	4,396	4,230	4,062	7,262
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	17,022	16,712	16,352	15,988	15,618	15,244	14,865	14,480	14,097	13,712	13,323	12,932	16,945
New Diesel Glennallen	89	652	1,268	1,891	2,522	3,162	3,809	4,466	5,119	5,777	6,439	7,106	0
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	80,381
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	49,339
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	42,927	42,975	42,975	42,975	42,975	42,975	42,975	42,975	42,975	42,975	42,975	42,975	31,791
New Diesel CVEA	89	652	1,268	1,891	2,522	3,162	3,809	4,466	5,119	5,777	6,439	7,106	0
Existing Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Less Transmission Losses V-G	707	693	677	661	644	628	611	594	577	560	543	526	749
Total	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	80,381
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Silver Lake Case - A
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,384	$1,535	$1,828	$1,947	$1,892	$1,852	$1,868	$1,910	$0	$0	$0	$0	$0
Variable O&M	786	867	1,017	861	695	494	416	430	0	0	0	0	0
Existing Diesel O&M Adjustment	0	0	0	0	0	0	0	0	(146)	(146)	(146)	(146)	(146)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	0	0	0	136	271	407	542	542	542	542	542	542	542
Total Diesel Costs	$2,169	$2,403	$2,845	$2,969	$2,883	$2,778	$2,852	$2,907	$422	$422	$422	$422	$422
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Silver Lake													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$2,742	$2,742	$2,742	$2,742	$2,742
Annual O&M Costs	0	0	0	0	0	0	0	0	593	593	593	593	593
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$3,335	$3,335	$3,335	$3,335	$3,335
Total Cost of Power	$2,169	$2,403	$2,845	$2,969	$2,883	$2,778	$2,852	$2,907	$3,758	$3,758	$3,758	$3,758	$3,758
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,169	$2,403	$2,845	$2,969	$2,883	$2,778	$2,852	$2,907	$3,758	$3,758	$3,758	$3,758	$3,758

Present Value in 1993 dollars (Discounted @4.5%)

Cumulative (1993 - 2018)	$51,019	(in thousands)
30 Year (2019 - 2048) with no additional growth	19,489	(in thousands)
Total Net Present Value	$70,508	(in thousands)

Silver Lake Case - A
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$5	$34	$66	$99	$132	$166	$201	$237	$273	$309	$346	$384	$0
Variable O&M	1	7	13	20	26	33	39	46	53	60	67	74	0
Existing Diesel O&M Adjustment	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	26	26	26	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	542	542	542	542	542	542	542	542	542	542	542	542	542
Total Diesel Costs	$428	$463	$501	$541	$581	$621	$663	$706	$748	$791	$835	$880	$422
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Silver Lake													
Annual Carrying Charge	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742
Annual O&M Costs	593	593	593	593	593	593	593	593	593	593	593	593	593
Total Other Costs	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335
Total Cost of Power	$3,763	$3,798	$3,837	$3,876	$3,916	$3,957	$3,998	$4,041	$4,083	$4,127	$4,171	$4,215	$3,758
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$3,763	$3,798	$3,837	$3,876	$3,916	$3,957	$3,998	$4,041	$4,083	$4,127	$4,171	$4,215	$3,758

Silver Lake Case - A
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,748	9,086	9,876	9,892	9,727	9,559	9,566	9,573	9,580	9,575	9,561	9,543	9,525
Glennallen Peak Demand	3,885	3,976	4,057	4,143	4,117	4,093	4,070	4,049	4,029	4,001	3,974	3,948	3,922
Total CVEA Demand	12,633	13,063	13,933	14,035	13,844	13,651	13,637	13,622	13,609	13,576	13,534	13,491	13,448
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
New Diesel Glennallen	0	0	0	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Existing Diesel Valdez	9,750	9,750	9,750	9,750	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	21,550	21,550	21,550	23,700	24,150	24,150	24,150	24,150	25,650	25,650	25,650	25,650	25,650
Valdez													
Peak Demand	8,748	9,086	9,876	9,892	9,727	9,559	9,566	9,573	9,580	9,575	9,561	9,543	9,525
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,248	11,586	12,376	12,392	12,227	12,059	12,066	12,073	12,080	12,075	12,061	12,043	12,025
Local Resources	14,750	14,750	14,750	14,750	15,200	15,200	15,200	15,200	16,700	16,700	16,700	16,700	16,700
Surplus/(Deficit)	3,502	3,164	2,374	2,358	2,973	3,141	3,134	3,127	4,620	4,625	4,639	4,657	4,675
Glennallen													
Peak Demand	3,885	3,976	4,057	4,143	4,117	4,093	4,070	4,049	4,029	4,001	3,974	3,948	3,922
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,385	6,476	6,557	6,643	6,617	6,593	6,570	6,549	6,529	6,501	6,474	6,448	6,422
Local Resources	6,800	6,800	6,800	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950
Surplus/(Deficit)	415	324	243	2,307	2,333	2,357	2,380	2,401	2,421	2,449	2,476	2,502	2,528

Silver Lake Case - A
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	9,507	9,488	9,470	9,452	9,404	9,306	9,233	6,760	6,760	6,760	6,760	6,760	6,760
Glennallen Peak Demand	3,898	3,875	3,852	3,830	3,809	3,245	2,967	2,689	2,689	2,689	2,689	2,689	2,689
Total CVEA Demand	13,405	13,363	13,322	13,282	13,212	12,550	12,200	9,449	9,449	9,449	9,449	9,449	9,449
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
New Diesel Glennallen	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Existing Diesel Valdez	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050	8,050
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	25,650	25,650	25,650	25,650	25,650	25,650	25,650	25,650	25,650	25,650	25,650	25,650	25,650
Valdez													
Peak Demand	9,507	9,488	9,470	9,452	9,404	9,306	9,233	6,760	6,760	6,760	6,760	6,760	6,760
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	12,007	11,988	11,970	11,952	11,904	11,806	11,733	9,260	9,260	9,260	9,260	9,260	9,260
Local Resources	16,700	16,700	16,700	16,700	16,700	16,700	16,700	16,700	16,700	16,700	16,700	16,700	16,700
Surplus/(Deficit)	4,693	4,712	4,730	4,748	4,796	4,894	4,967	7,440	7,440	7,440	7,440	7,440	7,440
Glennallen													
Peak Demand	3,898	3,875	3,852	3,830	3,809	3,245	2,967	2,689	2,689	2,689	2,689	2,689	2,689
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,398	6,375	6,352	6,330	6,309	5,745	5,467	5,189	5,189	5,189	5,189	5,189	5,189
Local Resources	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950
Surplus/(Deficit)	2,552	2,575	2,598	2,620	2,641	3,205	3,483	3,761	3,761	3,761	3,761	3,761	3,761

Silver Lake Case - A
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,067	53,750	59,639	59,736	58,764	57,776	57,818	57,858	57,896	57,865	57,779	57,677	57,569
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,320	41,125	42,892	42,921	42,629	42,333	42,345	42,357	42,369	42,360	42,334	42,303	42,271
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	15,527	15,506	15,445	15,374	15,298
New Diesel Valdez	0	0	0	0	10,494	10,528	10,527	10,525	0	0	0	0	0
Existing Diesel Valdez	10,747	12,625	16,747	16,815	5,641	4,915	4,946	4,975	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	20,484	20,554	20,540	20,583	20,451	20,326	20,214	20,109	20,008	19,869	19,733	19,603	19,476
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,145	6,166	6,162	6,175	6,135	6,098	6,064	6,033	6,002	5,961	5,920	5,881	5,843
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	14,006	13,908	13,813	13,722	13,633
New Diesel Glennallen	0	0	0	11,300	11,300	11,300	11,300	11,300	0	0	0	0	0
Existing Diesel Glennallen	14,339	14,388	14,378	3,107	3,016	2,928	2,850	2,776	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	71,550	74,304	80,179	80,319	79,215	78,102	78,033	77,966	77,904	77,734	77,512	77,280	77,046
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,655	47,482	49,244	49,287	48,954	48,619	48,597	48,576	48,557	48,504	48,437	48,366	48,294
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	29,966	29,844	29,686	29,520	29,354
New Diesel CVEA	0	0	0	11,300	21,794	21,829	21,827	21,826	0	0	0	0	0
Existing Diesel CVEA	25,085	27,013	31,125	19,923	8,656	7,843	7,796	7,750	0	0	0	0	0
Less Transmission Losses V-G	190	191	191	191	190	189	188	187	619	614	610	606	602
Total	71,550	74,304	80,179	80,319	79,215	78,102	78,033	77,966	77,904	77,734	77,512	77,280	77,046
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Silver Lake Case - A
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	57,459	57,349	57,240	57,133	56,846	56,235	55,791	35,791	35,791	35,791	35,791	35,791	35,791
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	42,238	42,205	42,172	42,140	42,054	41,871	41,737	35,737	35,737	35,737	35,737	35,737	35,737
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	15,221	15,145	15,068	14,993	14,792	14,365	14,054	53	53	53	53	53	53
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	19,354	19,237	19,123	19,014	18,907	16,094	14,709	13,570	13,570	13,570	13,570	13,570	13,570
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,806	5,771	5,737	5,704	5,672	4,828	4,413	4,071	4,071	4,071	4,071	4,071	4,071
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	13,548	13,466	13,386	13,310	13,235	11,266	10,297	9,499	9,499	9,499	9,499	9,499	9,499
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	76,814	76,586	76,364	76,147	75,754	72,330	70,500	49,360	49,360	49,360	49,360	49,360	49,360
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	48,224	48,154	48,086	48,020	47,901	46,848	46,286	39,934	39,934	39,934	39,934	39,934	39,934
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	29,189	29,027	28,869	28,714	28,437	25,979	24,669	9,846	9,846	9,846	9,846	9,846	9,846
New Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Less Transmission Losses V-G	599	595	591	588	585	498	455	420	420	420	420	420	420
Total	76,814	76,586	76,364	76,147	75,754	72,330	70,500	49,360	49,360	49,360	49,360	49,360	49,360
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Silver Lake Case - A
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,373	$1,484	$1,730	$1,646	$1,539	$1,502	$1,506	$1,510	$0	$0	$0	$0	$0
Variable O&M	780	840	967	736	495	470	468	467	0	0	0	0	0
Existing Diesel O&M Adjustment	0	0	0	0	0	0	0	0	(146)	(146)	(146)	(146)	(146)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	0	0	0	136	271	271	271	271	271	271	271	271	271
Total Diesel Costs	$2,152	$2,324	$2,698	$2,544	$2,330	$2,269	$2,271	$2,274	$151	$151	$151	$151	$151
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Silver Lake													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$2,742	$2,742	$2,742	$2,742	$2,742
Annual O&M Costs	0	0	0	0	0	0	0	0	593	593	593	593	593
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$3,335	$3,335	$3,335	$3,335	$3,335
Total Cost of Power	$2,152	$2,324	$2,698	$2,544	$2,330	$2,269	$2,271	$2,274	$3,487	$3,487	$3,487	$3,487	$3,487
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,152	$2,324	$2,698	$2,544	$2,330	$2,269	$2,271	$2,274	$3,487	$3,487	$3,487	$3,487	$3,487

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$45,378	(in thousands)
30 Year (2019 - 2048) with no additional growth	18,083	(in thousands)
Total Net Present Value	$63,461	(in thousands)

Silver Lake Case - A
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Variable O&M	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel O&M Adjustment	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	26	26	26	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	271	271	271	271	271	271	271	271	271	271	271	271	271
Total Diesel Costs	$151	$151	$151	$151	$151	$151	$151	$151	$151	$151	$151	$151	$151
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Silver Lake													
Annual Carrying Charge	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742
Annual O&M Costs	593	593	593	593	593	593	593	593	593	593	593	593	593
Total Other Costs	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335
Total Cost of Power	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487	$3,487

Silver Lake Case - A
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,847	9,365	10,345	10,864	11,487	11,700	11,918	12,143	12,375	12,587	12,781	12,974	13,967
Glennallen Peak Demand	4,043	4,293	4,541	4,802	4,911	5,024	5,139	5,258	5,379	5,485	5,594	5,705	6,103
Total CVEA Demand	12,890	13,658	14,885	15,666	16,398	16,723	17,058	17,401	17,755	18,072	18,375	18,679	20,070
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	0	0	0	0	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
New Diesel Glennallen	0	0	0	2,150	2,150	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	9,750	9,750	9,750	9,750	8,050	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	21,550	21,550	21,550	23,700	24,150	25,000	25,000	25,000	26,500	26,500	26,500	26,500	26,500
Valdez													
Peak Demand	8,847	9,365	10,345	10,864	11,487	11,700	11,918	12,143	12,375	12,587	12,781	12,974	13,967
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,347	11,865	12,845	13,364	13,987	14,200	14,418	14,643	14,875	15,087	15,281	15,474	16,467
Local Resources	14,750	14,750	14,750	14,750	15,200	16,400	16,400	16,400	17,900	17,900	17,900	17,900	17,900
Surplus/(Deficit)	3,403	2,885	1,905	1,386	1,213	2,200	1,982	1,757	3,025	2,813	2,619	2,426	1,433
Glennallen													
Peak Demand	4,043	4,293	4,541	4,802	4,911	5,024	5,139	5,258	5,379	5,485	5,594	5,705	6,103
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,543	6,793	7,041	7,302	7,411	7,524	7,639	7,758	7,879	7,985	8,094	8,205	8,603
Local Resources	6,800	6,800	6,800	8,950	8,950	8,600	8,600	8,600	8,600	8,600	8,600	8,600	8,600
Surplus/(Deficit)	257	7	(241)	1,648	1,539	1,076	961	842	721	615	506	395	(3)

Silver Lake Case - A
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	14,984	15,123	15,265	15,015	14,639	14,814	14,994	15,180	15,365	15,552	15,741	15,933	16,126
Glennallen Peak Demand	6,572	6,665	6,761	6,619	6,389	6,519	6,652	6,789	6,927	7,069	7,213	7,360	7,511
Total CVEA Demand	21,556	21,788	22,026	21,633	21,028	21,333	21,646	21,969	22,292	22,621	22,954	23,293	23,637
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Valdez	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
New Diesel Glennallen	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450
Existing Diesel Valdez	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100	7,100
Existing Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Total Firm Capacity	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650
Valdez													
Peak Demand	14,984	15,123	15,265	15,015	14,639	14,814	14,994	15,180	15,365	15,552	15,741	15,933	16,126
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	17,484	17,623	17,765	17,515	17,139	17,314	17,494	17,680	17,865	18,052	18,241	18,433	18,626
Local Resources	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900	17,900
Surplus/(Deficit)	416	277	135	385	761	586	406	220	35	(152)	(341)	(533)	(726)
Glennallen													
Peak Demand	6,572	6,665	6,761	6,619	6,389	6,519	6,652	6,789	6,927	7,069	7,213	7,360	7,511
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	9,072	9,165	9,261	9,119	8,889	9,019	9,152	9,289	9,427	9,569	9,713	9,860	10,011
Local Resources	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750	10,750
Surplus/(Deficit)	1,678	1,585	1,489	1,631	1,861	1,731	1,598	1,461	1,323	1,181	1,037	890	739

Silver Lake Case - A
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,653	55,402	62,422	66,167	70,739	71,998	73,289	74,618	75,988	77,235	78,386	79,526	85,383
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,496	41,621	43,727	44,850	46,222	46,599	46,987	47,385	47,796	48,171	48,516	48,858	50,615
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	28,192	29,065	29,870	30,668	34,768
New Diesel Valdez	0	0	0	0	10,075	21,331	21,286	21,239	0	0	0	0	0
Existing Diesel Valdez	11,157	13,781	18,696	21,317	14,443	4,068	5,017	5,994	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	21,321	22,203	23,009	23,857	24,368	24,934	25,515	26,111	26,724	27,257	27,803	28,363	30,372
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,396	6,661	6,903	7,157	6,193	5,827	5,451	5,064	4,665	4,303	3,968	3,636	1,932
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	14,340	13,493	12,712	11,938	7,961
New Diesel Glennallen	0	0	0	11,300	11,300	19,107	20,064	21,047	7,719	9,461	11,123	12,789	20,480
Existing Diesel Glennallen	14,925	15,542	16,106	5,399	6,875	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	72,974	77,605	85,431	90,024	95,107	96,932	98,804	100,729	102,712	104,492	106,189	107,889	115,755
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	47,090	48,487	50,843	52,229	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	0	0	0	0	0	0	0	0	42,975	42,975	42,975	42,975	42,975
New Diesel CVEA	0	0	0	11,300	21,375	40,438	41,349	42,286	7,719	9,461	11,123	12,789	20,480
Existing Diesel CVEA	26,082	29,324	34,802	26,716	21,318	4,068	5,017	5,994	0	0	0	0	0
Less Transmission Losses V-G	198	206	213	221	192	180	169	157	588	550	516	482	306
Total	72,974	77,605	85,431	90,024	95,107	96,932	98,804	100,729	102,712	104,492	106,189	107,889	115,755
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Silver Lake Case - A
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	91,383	92,202	93,045	91,564	89,347	90,380	91,446	92,546	93,637	94,742	95,859	96,990	98,133
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,415	52,606	52,606	52,469	51,804	52,114	52,434	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	38,968	39,596	40,439	39,095	37,543	38,266	39,012	39,940	41,031	42,136	42,975	42,975	42,975
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	265	1,356	2,460
Existing Diesel Valdez	0	0	0	0	0	0	0	0	0	0	13	52	92
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	32,736	33,204	33,686	32,970	31,816	32,468	33,137	33,823	34,520	35,232	35,958	36,699	37,455
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	186	0	0	133	778	477	167	0	0	0	0	0	0
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	3,887	3,278	2,460	3,764	5,269	4,568	3,844	2,944	1,886	815	0	0	0
New Diesel Glennallen	28,663	29,925	31,225	29,073	25,769	27,423	29,125	30,879	32,635	33,901	33,901	33,901	33,901
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	0	516	2,057	2,798	3,554
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	124,118	125,405	126,731	124,534	121,163	122,848	124,583	126,369	128,158	129,973	131,817	133,688	135,588
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Lake	42,975	42,975	42,975	42,975	42,975	42,975	42,975	42,975	42,975	42,975	42,975	42,975	42,975
New Diesel CVEA	28,663	29,925	31,225	29,073	25,769	27,423	29,125	30,879	32,635	33,901	34,166	35,257	36,361
Existing Diesel CVEA	0	0	0	0	0	0	0	0	0	516	2,069	2,850	3,646
Less Transmission Losses V-G	126	101	76	121	187	156	124	91	58	25	0	0	0
Total	124,118	125,405	126,731	124,534	121,163	122,848	124,583	126,369	128,158	129,973	131,817	133,688	135,588
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0

Silver Lake Case - A
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,431	$1,641	$2,027	$2,230	$2,383	$2,348	$2,495	$2,649	$430	$536	$641	$750	$1,221
Variable O&M	811	911	1,082	947	884	545	584	624	80	98	115	132	212
Existing Diesel O&M Adjustment	0	0	0	0	0	0	0	0	(146)	(146)	(146)	(146)	(146)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	0	0	0	136	271	542	542	542	542	542	542	542	542
Total Diesel Costs	$2,242	$2,553	$3,109	$3,339	$3,563	$3,462	$3,647	$3,841	$932	$1,056	$1,179	$1,305	$1,856
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Silver Lake													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$2,742	$2,742	$2,742	$2,742	$2,742
Annual O&M Costs	0	0	0	0	0	0	0	0	593	593	593	593	593
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0	$3,335	$3,335	$3,335	$3,335	$3,335
Total Cost of Power	$2,242	$2,553	$3,109	$3,339	$3,563	$3,462	$3,647	$3,841	$4,268	$4,392	$4,514	$4,640	$5,191
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$2,242	$2,553	$3,109	$3,339	$3,563	$3,462	$3,647	$3,841	$4,268	$4,392	$4,514	$4,640	$5,191

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$69,806	(in thousands)
30 Year (2019 - 2048) with no additional growth	38,570	(in thousands)
Total Net Present Value	$108,376	(in thousands)

Silver Lake Case - A
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$1,739	$1,847	$1,961	$1,857	$1,674	$1,813	$1,958	$2,112	$2,271	$2,443	$2,638	$2,829	$3,028
Variable O&M	297	310	323	301	267	284	302	320	338	367	418	454	490
Existing Diesel O&M Adjustment	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)	(146)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	52	52	52	52	52	52	52	52	52	52	52	52	52
New Diesel Capital Costs	678	678	678	678	678	678	678	678	678	678	678	678	678
Total Diesel Costs	$2,620	$2,741	$2,868	$2,742	$2,525	$2,680	$2,844	$3,016	$3,193	$3,394	$3,640	$3,867	$4,102
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Silver Lake													
Annual Carrying Charge	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742	$2,742
Annual O&M Costs	593	593	593	593	593	593	593	593	593	593	593	593	593
Total Other Costs	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335	$3,335
Total Cost of Power	$5,955	$6,076	$6,203	$6,077	$5,860	$6,016	$6,179	$6,351	$6,528	$6,730	$6,976	$7,202	$7,437
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Annual Cost of Power	$5,955	$6,076	$6,203	$6,077	$5,860	$6,016	$6,179	$6,351	$6,528	$6,730	$6,976	$7,202	$7,437

Valdez Coal Project
Med-High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Glennallen Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Total CVEA Demand	12,682	13,286	14,337	14,927	15,234	15,385	15,537	15,692	15,850	15,976	16,089	16,198	16,306
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	21,550	21,550	21,550	23,700	23,700	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200
Valdez													
Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,293	11,734	12,631	13,060	13,337	13,458	13,579	13,702	13,828	13,936	14,029	14,119	14,207
Local Resources	14,750	14,750	14,750	14,750	14,750	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250
Surplus/(Deficit)	3,457	3,016	2,119	1,690	1,413	24,792	24,671	24,548	24,422	24,314	24,221	24,131	24,043
Glennallen													
Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,390	6,552	6,706	6,866	6,897	6,927	6,958	6,990	7,022	7,041	7,060	7,079	7,099
Local Resources	6,800	6,800	6,800	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950
Surplus/(Deficit)	410	248	94	2,084	2,053	2,023	1,992	1,960	1,928	1,909	1,890	1,871	1,851

Valdez Coal Project
Med-High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	12,929
Glennallen Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Total CVEA Demand	16,414	16,523	16,633	16,744	16,857	16,971	17,087	17,204	17,321	17,438	17,556	17,676	17,796
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200
Valdez													
Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	12,929
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	14,296	14,385	14,475	14,566	14,658	14,752	14,847	14,943	15,039	15,135	15,232	15,330	15,429
Local Resources	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250
Surplus/(Deficit)	23,954	23,865	23,775	23,684	23,592	23,498	23,403	23,307	23,211	23,115	23,018	22,920	22,821
Glennallen													
Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	7,118	7,138	7,158	7,178	7,199	7,219	7,240	7,261	7,282	7,303	7,324	7,345	7,366
Local Resources	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950
Surplus/(Deficit)	1,832	1,812	1,792	1,772	1,751	1,731	1,710	1,689	1,668	1,647	1,626	1,605	1,584

Valdez Coal Project
Med-High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,328	54,622	61,149	64,357	66,324	67,034	67,750	68,477	69,216	69,850	70,400	70,928	71,449
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,398	41,387	43,345	44,307	44,897	45,110	45,325	45,543	45,765	45,955	46,120	46,278	46,435
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	21,924	22,425	22,934	23,451	23,895	24,280	24,650	25,015
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	10,930	13,236	17,804	20,050	21,427	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	20,509	20,949	21,301	21,678	21,817	21,972	22,130	22,290	22,453	22,550	22,647	22,746	22,845
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,153	6,285	6,390	6,504	6,545	6,592	6,639	6,687	6,636	6,452	6,292	6,138	5,986
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	15,381	15,491	15,603	15,817	16,098	16,356	16,608	16,858
New Diesel Glennallen	0	0	0	11,300	11,300	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	14,356	14,664	14,910	3,874	3,972	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,741	47,866	49,933	51,012	51,645	51,906	52,169	52,437	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	37,983	38,610	39,246	39,993	40,732	41,387	42,020	42,647
New Diesel CVEA	0	0	0	11,300	11,300	0	0	0	0	0	0	0	0
Existing Diesel CVEA	25,286	27,900	32,715	23,924	25,399	0	0	0	0	0	0	0	0
Less Transmission Losses V-G	190	194	198	201	202	680	684	689	694	697	700	703	707
Total	71,837	75,571	82,450	86,035	88,141	89,209	90,095	90,994	91,905	92,641	93,292	93,923	94,546
Deficit	0	0	0	0	0	202	214	227	236	241	245	249	252

Valdez Coal Project
Med-High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	71,970	72,495	73,025	73,562	74,105	74,657	75,215	75,782	76,346	76,914	77,486	78,063	78,643
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,591	46,748	46,908	47,068	47,232	47,397	47,565	47,735	47,904	48,074	48,246	48,419	48,593
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	25,379	25,747	26,118	26,493	26,874	27,260	27,651	28,048	28,442	28,840	29,240	29,644	30,050
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	22,945	23,046	23,147	23,250	23,354	23,459	23,565	23,671	23,777	23,884	23,991	24,099	24,207
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,835	5,682	5,528	5,372	5,213	5,053	4,890	4,725	4,561	4,396	4,230	4,062	3,893
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	17,110	17,364	17,620	17,879	18,141	18,406	18,674	18,946	19,216	19,488	19,762	20,037	20,314
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	102,850
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	43,274	43,906	44,545	45,191	45,846	46,509	47,180	47,861	48,538	49,220	49,906	50,598	51,294
New Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Less Transmission Losses V-G	710	713	716	719	722	726	729	732	735	739	742	745	749
Total	95,171	95,800	96,435	97,078	97,730	98,389	99,058	99,735	100,409	101,087	101,771	102,459	103,152
Deficit	256	259	263	266	270	274	278	281	285	289	293	297	301

Valdez Coal Project
Med-High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,384	$1,555	$1,875	$2,022	$2,197	$0	$0	$0	$0	$0	$0	$0	$0
Variable O&M	786	867	1,017	861	906	0	0	0	0	0	0	0	0
Existing Diesel O&M Adjustment	0	0	0	0	0	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	0	0	0	136	136	136	136	136	136	136	136	136	136
Total Diesel Costs	$2,169	$2,422	$2,892	$3,044	$3,265	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Coal Facility													
Annual Carrying Charge	$0	$0	$0	$0	$0	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247
Annual O&M Costs	0	0	0	0	0	3,606	3,640	3,676	3,717	3,758	3,795	3,832	3,868
Total Other Costs	$0	$0	$0	$0	$0	$5,852	$5,887	$5,923	$5,964	$6,005	$6,042	$6,079	$6,115
Total Cost of Power	$2,169	$2,422	$2,892	$3,044	$3,265	$5,723	$5,758	$5,793	$5,834	$5,875	$5,913	$5,949	$5,986
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	($1,705)	($1,737)	($1,769)	($1,802)	($1,835)	($1,869)	($1,903)	($1,938)
Net Annual Cost of Power	$2,169	$2,422	$2,892	$3,044	$3,265	$4,018	$4,021	$4,024	$4,033	$4,040	$4,044	$4,046	$4,047

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$55,502	(in thousands)
30 Year (2019 - 2048) with no additional growth	21,065	(in thousands)
Total Net Present Value	$76,567	(in thousands)

Valdez Coal Project
Med-High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Variable O&M	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel O&M Adjustment	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	26	26	26	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	136	136	136	136	136	136	136	136	136	136	136	136	136
Total Diesel Costs	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Coal Facility													
Annual Carrying Charge	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247
Annual O&M Costs	3,905	3,943	3,981	4,019	4,059	4,099	4,140	4,181	4,223	4,266	4,309	4,353	4,397
Total Other Costs	$6,152	$6,190	$6,227	$6,266	$6,306	$6,346	$6,387	$6,428	$6,470	$6,513	$6,556	$6,600	$6,644
Total Cost of Power	$6,023	$6,060	$6,098	$6,136	$6,176	$6,216	$6,257	$6,299	$6,341	$6,383	$6,426	$6,470	$6,514
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	($1,974)	($2,010)	($2,047)	($2,085)	($2,123)	($2,162)	($2,201)	($2,241)	($2,282)	($2,324)	($2,366)	($2,409)	($2,453)
Net Annual Cost of Power	$4,049	$4,050	$4,051	$4,052	$4,053	$4,054	$4,056	$4,057	$4,058	$4,059	$4,060	$4,061	$4,062

Valdez Coal Project
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Glennallen Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Total CVEA Demand	12,682	13,286	14,337	14,927	15,234	15,385	15,537	15,692	15,850	15,976	16,089	16,198	16,306
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	21,550	21,550	21,550	23,700	23,700	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200
Valdez													
Peak Demand	8,793	9,234	10,131	10,560	10,837	10,958	11,079	11,202	11,328	11,436	11,529	11,619	11,707
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,293	11,734	12,631	13,060	13,337	13,458	13,579	13,702	13,828	13,936	14,029	14,119	14,207
Local Resources	14,750	14,750	14,750	14,750	14,750	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250
Surplus/(Deficit)	3,457	3,016	2,119	1,690	1,413	24,792	24,671	24,548	24,422	24,314	24,221	24,131	24,043
Glennallen													
Peak Demand	3,890	4,052	4,206	4,366	4,397	4,427	4,458	4,490	4,522	4,541	4,560	4,579	4,599
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,390	6,552	6,706	6,866	6,897	6,927	6,958	6,990	7,022	7,041	7,060	7,079	7,099
Local Resources	6,800	6,800	6,800	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950
Surplus/(Deficit)	410	248	94	2,084	2,053	2,023	1,992	1,960	1,928	1,909	1,890	1,871	1,851

Valdez Coal Project
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	10,079
Glennallen Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Total CVEA Demand	16,414	16,523	16,633	16,744	16,857	16,971	17,087	17,204	17,321	17,438	17,556	17,676	14,946
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200
Valdez													
Peak Demand	11,796	11,885	11,975	12,066	12,158	12,252	12,347	12,443	12,539	12,635	12,732	12,830	10,079
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	14,296	14,385	14,475	14,566	14,658	14,752	14,847	14,943	15,039	15,135	15,232	15,330	12,579
Local Resources	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250
Surplus/(Deficit)	23,954	23,865	23,775	23,684	23,592	23,498	23,403	23,307	23,211	23,115	23,018	22,920	25,671
Glennallen													
Peak Demand	4,618	4,638	4,658	4,678	4,699	4,719	4,740	4,761	4,782	4,803	4,824	4,845	4,866
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	7,118	7,138	7,158	7,178	7,199	7,219	7,240	7,261	7,282	7,303	7,324	7,345	7,366
Local Resources	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950
Surplus/(Deficit)	1,832	1,812	1,792	1,772	1,751	1,731	1,710	1,689	1,668	1,647	1,626	1,605	1,584

Valdez Coal Project
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,328	54,622	61,149	64,357	66,324	67,034	67,750	68,477	69,216	69,850	70,400	70,928	71,449
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,398	41,387	43,345	44,307	44,897	45,110	45,325	45,543	45,765	45,955	46,120	46,278	46,435
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	21,924	22,425	22,934	23,451	23,895	24,280	24,650	25,015
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	10,930	13,236	17,804	20,050	21,427	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	20,509	20,949	21,301	21,678	21,817	21,972	22,130	22,290	22,453	22,550	22,647	22,746	22,845
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,153	6,285	6,390	6,504	6,545	6,592	6,639	6,687	6,636	6,452	6,292	6,138	5,986
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	15,381	15,491	15,603	15,817	16,098	16,356	16,608	16,858
New Diesel Glennallen	0	0	0	11,300	11,300	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	14,356	14,664	14,910	3,874	3,972	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	71,837	75,571	82,450	86,035	88,141	89,007	89,880	90,767	91,669	92,400	93,047	93,674	94,294
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,741	47,866	49,933	51,012	51,645	51,906	52,169	52,437	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	37,983	38,610	39,246	39,993	40,732	41,387	42,020	42,647
New Diesel CVEA	0	0	0	11,300	11,300	0	0	0	0	0	0	0	0
Existing Diesel CVEA	25,286	27,900	32,715	23,924	25,399	0	0	0	0	0	0	0	0
Less Transmission Losses V-G	190	194	198	201	202	680	684	689	694	697	700	703	707
Total	71,837	75,571	82,450	86,035	88,141	89,209	90,095	90,994	91,905	92,641	93,292	93,923	94,546
Deficit	0	0	0	0	0	202	214	227	236	241	245	249	252

Valdez Coal Project
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	71,970	72,495	73,025	73,562	74,105	74,657	75,215	75,782	76,346	76,914	77,486	78,063	56,174
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,591	46,748	46,908	47,068	47,232	47,397	47,565	47,735	47,904	48,074	48,246	48,419	41,852
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	25,379	25,747	26,118	26,493	26,874	27,260	27,651	28,048	28,442	28,840	29,240	29,644	14,322
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	22,945	23,046	23,147	23,250	23,354	23,459	23,565	23,671	23,777	23,884	23,991	24,099	24,207
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,835	5,682	5,528	5,372	5,213	5,053	4,890	4,725	4,561	4,396	4,230	4,062	7,262
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	17,110	17,364	17,620	17,879	18,141	18,406	18,674	18,946	19,216	19,488	19,762	20,037	16,945
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	94,915	95,541	96,172	96,812	97,459	98,115	98,780	99,453	100,123	100,798	101,477	102,162	80,381
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	49,339
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	43,274	43,906	44,545	45,191	45,846	46,509	47,180	47,861	48,538	49,220	49,906	50,598	31,710
New Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Less Transmission Losses V-G	710	713	716	719	722	726	729	732	735	739	742	745	749
Total	95,171	95,800	96,435	97,078	97,730	98,389	99,058	99,735	100,409	101,087	101,771	102,459	80,300
Deficit	256	259	263	266	270	274	278	281	285	289	293	297	(81)

Valdez Coal Project
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,384	$1,535	$1,828	$1,947	$2,088	$0	$0	$0	$0	$0	$0	$0	$0
Variable O&M	786	867	1,017	861	906	0	0	0	0	0	0	0	0
Existing Diesel O&M Adjustment	0	0	0	0	0	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	0	0	0	136	136	136	136	136	136	136	136	136	136
Total Diesel Costs	$2,169	$2,403	$2,845	$2,969	$3,156	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Coal Facility													
Annual Carrying Charge	$0	$0	$0	$0	$0	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247
Annual O&M Costs	0	0	0	0	0	3,588	3,619	3,650	3,686	3,722	3,755	3,786	3,817
Total Other Costs	$0	$0	$0	$0	$0	$5,835	$5,866	$5,897	$5,933	$5,969	$6,002	$6,033	$6,064
Total Cost of Power	$2,169	$2,403	$2,845	$2,969	$3,156	$5,705	$5,736	$5,767	$5,804	$5,840	$5,872	$5,903	$5,934
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	($1,592)	($1,600)	($1,608)	($1,615)	($1,623)	($1,631)	($1,639)	($1,646)
Net Annual Cost of Power	$2,169	$2,403	$2,845	$2,969	$3,156	$4,113	$4,136	$4,159	$4,188	$4,217	$4,241	$4,265	$4,288

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$57,977	(in thousands)
30 Year (2019 - 2048) with no additional growth	19,085	(in thousands)
Total Net Present Value	$77,062	(in thousands)

Valdez Coal Project
Med-Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Variable O&M	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel O&M Adjustment	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	26	26	26	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	136	136	136	136	136	136	136	136	136	136	136	136	136
Total Diesel Costs	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Coal Facility													
Annual Carrying Charge	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247
Annual O&M Costs	3,848	3,879	3,911	3,943	3,976	4,009	4,042	4,076	4,110	4,144	4,178	4,213	3,313
Total Other Costs	$6,095	$6,126	$6,158	$6,190	$6,223	$6,256	$6,289	$6,323	$6,357	$6,391	$6,425	$6,460	$5,560
Total Cost of Power	$5,965	$5,997	$6,028	$6,060	$6,093	$6,126	$6,159	$6,193	$6,227	$6,261	$6,296	$6,330	$5,431
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	($1,654)	($1,662)	($1,670)	($1,678)	($1,686)	($1,694)	($1,702)	($1,710)	($1,718)	($1,726)	($1,734)	($1,743)	($1,751)
Net Annual Cost of Power	$4,311	$4,335	$4,358	$4,382	$4,407	$4,432	$4,457	$4,483	$4,509	$4,535	$4,561	$4,588	$3,680

Valdez Coal Project
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,748	9,086	9,876	9,892	9,727	9,559	9,566	9,573	9,580	9,575	9,561	9,543	9,525
Glennallen Peak Demand	3,885	3,976	4,057	4,143	4,117	4,093	4,070	4,049	4,029	4,001	3,974	3,948	3,922
Total CVEA Demand	12,633	13,063	13,933	14,035	13,844	13,651	13,637	13,622	13,609	13,576	13,534	13,491	13,448
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	21,550	21,550	21,550	23,700	23,700	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200
Valdez													
Peak Demand	8,748	9,086	9,876	9,892	9,727	9,559	9,566	9,573	9,580	9,575	9,561	9,543	9,525
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,248	11,586	12,376	12,392	12,227	12,059	12,066	12,073	12,080	12,075	12,061	12,043	12,025
Local Resources	14,750	14,750	14,750	14,750	14,750	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250
Surplus/(Deficit)	3,502	3,164	2,374	2,358	2,523	26,191	26,184	26,177	26,170	26,175	26,189	26,207	26,225
Glennallen													
Peak Demand	3,885	3,976	4,057	4,143	4,117	4,093	4,070	4,049	4,029	4,001	3,974	3,948	3,922
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,385	6,476	6,557	6,643	6,617	6,593	6,570	6,549	6,529	6,501	6,474	6,448	6,422
Local Resources	6,800	6,800	6,800	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950
Surplus/(Deficit)	415	324	243	2,307	2,333	2,357	2,380	2,401	2,421	2,449	2,476	2,502	2,528

Valdez Coal Project
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	9,507	9,488	9,470	9,452	9,404	9,306	9,233	6,760	6,760	6,760	6,760	6,760	6,760
Glennallen Peak Demand	3,898	3,875	3,852	3,830	3,809	3,245	2,967	2,689	2,689	2,689	2,689	2,689	2,689
Total CVEA Demand	13,405	13,363	13,322	13,282	13,212	12,550	12,200	9,449	9,449	9,449	9,449	9,449	9,449
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200
Valdez													
Peak Demand	9,507	9,488	9,470	9,452	9,404	9,306	9,233	6,760	6,760	6,760	6,760	6,760	6,760
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	12,007	11,988	11,970	11,952	11,904	11,806	11,733	9,260	9,260	9,260	9,260	9,260	9,260
Local Resources	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250
Surplus/(Deficit)	26,243	26,262	26,280	26,298	26,346	26,444	26,517	28,990	28,990	28,990	28,990	28,990	28,990
Glennallen													
Peak Demand	3,898	3,875	3,852	3,830	3,809	3,245	2,967	2,689	2,689	2,689	2,689	2,689	2,689
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,398	6,375	6,352	6,330	6,309	5,745	5,467	5,189	5,189	5,189	5,189	5,189	5,189
Local Resources	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950
Surplus/(Deficit)	2,552	2,575	2,598	2,620	2,641	3,205	3,483	3,761	3,761	3,761	3,761	3,761	3,761

Valdez Coal Project
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,067	53,750	59,639	59,736	58,764	57,776	57,818	57,858	57,896	57,865	57,779	57,677	57,569
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,320	41,125	42,892	42,921	42,629	42,333	42,345	42,357	42,369	42,360	42,334	42,303	42,271
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	15,443	15,473	15,500	15,527	15,506	15,445	15,374	15,298
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	10,747	12,625	16,747	16,815	16,135	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	20,484	20,554	20,540	20,583	20,451	20,326	20,214	20,109	20,008	19,869	19,733	19,603	19,476
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,145	6,166	6,162	6,175	6,135	6,098	6,064	6,033	6,002	5,961	5,920	5,881	5,843
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	14,228	14,150	14,076	14,006	13,908	13,813	13,722	13,633
New Diesel Glennallen	0	0	0	11,300	11,300	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	14,339	14,388	14,378	3,107	3,016	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	71,550	74,304	80,179	80,319	79,215	78,102	78,033	77,966	77,904	77,734	77,512	77,280	77,046
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	46,655	47,482	49,244	49,287	48,954	48,619	48,597	48,576	48,557	48,504	48,437	48,366	48,294
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	30,149	30,101	30,056	30,013	29,893	29,736	29,571	29,405
New Diesel CVEA	0	0	0	11,300	11,300	0	0	0	0	0	0	0	0
Existing Diesel CVEA	25,085	27,013	31,125	19,923	19,150	0	0	0	0	0	0	0	0
Less Transmission Losses V-G	190	191	191	191	190	629	625	622	619	614	610	606	602
Total	71,550	74,304	80,179	80,319	79,215	78,140	78,074	78,010	77,951	77,783	77,562	77,331	77,097
Deficit	0	0	0	0	0	38	41	44	47	49	50	51	51

Valdez Coal Project
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	57,459	57,349	57,240	57,133	56,846	56,235	55,791	35,791	35,791	35,791	35,791	35,791	35,791
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	42,238	42,205	42,172	42,140	42,054	41,871	41,737	35,737	35,737	35,737	35,737	35,737	35,737
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	15,221	15,145	15,068	14,993	14,792	14,365	14,054	53	53	53	53	53	53
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	19,354	19,237	19,123	19,014	18,907	16,094	14,709	13,570	13,570	13,570	13,570	13,570	13,570
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,806	5,771	5,737	5,704	5,672	4,828	4,413	4,071	4,071	4,071	4,071	4,071	4,071
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	13,548	13,466	13,386	13,310	13,235	11,266	10,297	9,499	9,499	9,499	9,499	9,499	9,499
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	76,814	76,586	76,364	76,147	75,754	72,330	70,500	49,360	49,360	49,360	49,360	49,360	49,360
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	48,224	48,154	48,086	48,020	47,901	46,848	46,286	39,934	39,934	39,934	39,934	39,934	39,934
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	29,240	29,079	28,921	28,767	28,485	26,075	24,785	9,554	9,554	9,554	9,554	9,554	9,554
New Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Less Transmission Losses V-G	599	595	591	588	585	498	455	420	420	420	420	420	420
Total	76,865	76,638	76,416	76,199	75,802	72,425	70,616	49,068	49,068	49,068	49,068	49,068	49,068
Deficit	52	52	52	52	48	96	116	(292)	(292)	(292)	(292)	(292)	(292)

Valdez Coal Project
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,373	$1,484	$1,730	$1,646	$1,606	$0	$0	$0	$0	$0	$0	$0	$0
Variable O&M	780	840	967	736	712	0	0	0	0	0	0	0	0
Existing Diesel O&M Adjustment	0	0	0	0	0	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	0	0	0	136	136	136	136	136	136	136	136	136	136
Total Diesel Costs	$2,152	$2,324	$2,698	$2,544	$2,480	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Coal Facility													
Annual Carrying Charge	$0	$0	$0	$0	$0	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247
Annual O&M Costs	0	0	0	0	0	3,219	3,218	3,217	3,216	3,211	3,204	3,198	3,191
Total Other Costs	$0	$0	$0	$0	$0	$5,466	$5,465	$5,464	$5,462	$5,458	$5,451	$5,444	$5,438
Total Cost of Power	$2,152	$2,324	$2,698	$2,544	$2,480	$5,336	$5,335	$5,334	$5,333	$5,328	$5,322	$5,315	$5,308
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	($1,592)	($1,600)	($1,608)	($1,615)	($1,623)	($1,631)	($1,639)	($1,646)
Net Annual Cost of Power	$2,152	$2,324	$2,698	$2,544	$2,480	$3,744	$3,735	$3,726	$3,717	$3,705	$3,691	$3,676	$3,662

Present Value in 1993 dollars (Discounted @4.5%)		
Cumulative (1993 - 2018)	$47,832	(in thousands)
30 Year (2019 - 2048) with no additional growth	13,600	(in thousands)
Total Net Present Value	$61,432	(in thousands)

Valdez Coal Project
Low Load; Low Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Variable O&M	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel O&M Adjustment	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	26	26	26	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	136	136	136	136	136	136	136	136	136	136	136	136	136
Total Diesel Costs	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Coal Facility													
Annual Carrying Charge	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247
Annual O&M Costs	3,184	3,177	3,171	3,164	3,152	3,038	2,978	2,254	2,255	2,255	2,255	2,256	2,256
Total Other Costs	$5,431	$5,424	$5,417	$5,411	$5,399	$5,285	$5,225	$4,501	$4,502	$4,502	$4,502	$4,503	$4,503
Total Cost of Power	$5,301	$5,294	$5,288	$5,281	$5,269	$5,156	$5,095	$4,372	$4,372	$4,372	$4,373	$4,373	$4,373
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	($1,654)	($1,662)	($1,670)	($1,678)	($1,686)	($1,694)	($1,702)	($1,710)	($1,718)	($1,726)	($1,734)	($1,743)	($1,751)
Net Annual Cost of Power	$3,647	$3,632	$3,618	$3,604	$3,583	$3,462	$3,393	$2,662	$2,654	$2,646	$2,638	$2,630	$2,622

Valdez Coal Project
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Peak Demand	8,847	9,365	10,345	10,864	11,487	11,700	11,918	12,143	12,375	12,587	12,781	12,974	13,967
Glennallen Peak Demand	4,043	4,293	4,541	4,802	4,911	5,024	5,139	5,258	5,379	5,485	5,594	5,705	6,103
Total CVEA Demand	12,890	13,658	14,885	15,666	16,398	16,723	17,058	17,401	17,755	18,072	18,375	18,679	20,070
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	5,000	5,000	5,000	5,000	5,000	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	0	0	0	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	21,550	21,550	21,550	23,700	23,700	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200
Valdez													
Peak Demand	8,847	9,365	10,345	10,864	11,487	11,700	11,918	12,143	12,375	12,587	12,781	12,974	13,967
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	11,347	11,865	12,845	13,364	13,987	14,200	14,418	14,643	14,875	15,087	15,281	15,474	16,467
Local Resources	14,750	14,750	14,750	14,750	14,750	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250
Surplus/(Deficit)	3,403	2,885	1,905	1,386	763	24,050	23,832	23,607	23,375	23,163	22,969	22,776	21,783
Glennallen													
Peak Demand	4,043	4,293	4,541	4,802	4,911	5,024	5,139	5,258	5,379	5,485	5,594	5,705	6,103
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	6,543	6,793	7,041	7,302	7,411	7,524	7,639	7,758	7,879	7,985	8,094	8,205	8,603
Local Resources	6,800	6,800	6,800	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950
Surplus/(Deficit)	257	7	(241)	1,648	1,539	1,426	1,311	1,192	1,071	965	856	745	347

Valdez Coal Project
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Capacity Balance (KW)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Peak Demand	14,984	15,123	15,265	15,015	14,639	14,814	14,994	15,180	15,365	15,552	15,741	15,933	16,126
Glennallen Peak Demand	6,572	6,665	6,761	6,619	6,389	6,519	6,652	6,789	6,927	7,069	7,213	7,360	7,511
Total CVEA Demand	21,556	21,788	22,026	21,633	21,028	21,333	21,646	21,969	22,292	22,621	22,954	23,293	23,637
Firm Capacity													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Glennallen	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Existing Diesel Valdez	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750	9,750
Existing Diesel Glennallen	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800
Total Firm Capacity	49,350	49,350	49,350	49,350	49,350	49,350	49,350	49,350	49,350	49,350	49,350	49,350	49,350
Valdez													
Peak Demand	14,984	15,123	15,265	15,015	14,639	14,814	14,994	15,180	15,365	15,552	15,741	15,933	16,126
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	17,484	17,623	17,765	17,515	17,139	17,314	17,494	17,680	17,865	18,052	18,241	18,433	18,626
Local Resources	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250	38,250
Surplus/(Deficit)	20,766	20,627	20,485	20,735	21,111	20,936	20,756	20,570	20,385	20,198	20,009	19,817	19,624
Glennallen													
Peak Demand	6,572	6,665	6,761	6,619	6,389	6,519	6,652	6,789	6,927	7,069	7,213	7,360	7,511
Reserves	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total Capacity Requirements	9,072	9,165	9,261	9,119	8,889	9,019	9,152	9,289	9,427	9,569	9,713	9,860	10,011
Local Resources	11,100	11,100	11,100	11,100	11,100	11,100	11,100	11,100	11,100	11,100	11,100	11,100	11,100
Surplus/(Deficit)	2,028	1,935	1,839	1,981	2,211	2,081	1,948	1,811	1,673	1,531	1,387	1,240	1,089

Valdez Coal Project
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Valdez Energy Requirements	51,653	55,402	62,422	66,167	70,739	71,998	73,289	74,618	75,988	77,235	78,386	79,526	85,383
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	40,496	41,621	43,727	44,850	46,222	46,599	46,987	47,385	47,796	48,171	48,516	48,858	50,615
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	25,399	26,303	27,233	28,192	29,065	29,870	30,668	34,768
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	11,157	13,781	18,696	21,317	24,517	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	21,321	22,203	23,009	23,857	24,368	24,934	25,515	26,111	26,724	27,257	27,803	28,363	30,372
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	6,396	6,661	6,903	7,157	6,193	5,827	5,451	5,064	4,665	4,303	3,968	3,636	1,932
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	19,107	20,064	21,047	22,059	22,955	23,836	24,727	28,441
New Diesel Glennallen	0	0	0	11,300	11,300	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	14,925	15,542	16,106	5,399	6,875	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	72,974	77,605	85,431	90,024	95,107	96,932	98,804	100,729	102,712	104,492	106,189	107,889	115,755
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	47,090	48,487	50,843	52,229	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	0	0	0	0	0	45,291	47,180	49,122	51,122	52,918	54,629	56,344	64,284
New Diesel CVEA	0	0	0	11,300	11,300	0	0	0	0	0	0	0	0
Existing Diesel CVEA	26,082	29,324	34,802	26,716	31,392	0	0	0	0	0	0	0	0
Less Transmission Losses V-G	198	206	213	221	192	771	789	808	827	843	860	877	939
Total	72,974	77,605	85,431	90,024	95,107	97,126	98,997	100,921	102,902	104,681	106,376	108,073	115,951
Deficit	0	0	0	0	0	195	193	191	190	189	187	184	196

Valdez Coal Project
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Load and Resource Energy Balance (MWh)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Valdez Energy Requirements	91,383	92,202	93,045	91,564	89,347	90,380	91,446	92,546	93,637	94,742	95,859	96,990	98,133
Generation for Valdez Load													
Conservation Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,415	52,606	52,606	52,469	51,804	52,114	52,434	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	38,968	39,596	40,439	39,095	37,543	38,266	39,012	39,940	41,031	42,136	43,253	44,383	45,527
New Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Valdez	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
Glennallen Energy Requirements	32,736	33,204	33,686	32,970	31,816	32,468	33,137	33,823	34,520	35,232	35,958	36,699	37,455
Generation for Glennallen Load													
Conservation Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	186	0	0	133	778	477	167	0	0	0	0	0	0
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	32,550	33,204	33,686	32,837	31,038	31,990	32,970	33,823	34,520	35,232	35,958	36,699	37,455
New Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel Glennallen	0	0	0	0	0	0	0	0	0	0	0	0	0
Deficit	0	0	0	0	0	0	0	0	0	0	0	0	0
CVEA System Requirements	124,118	125,405	126,731	124,534	121,163	122,848	124,583	126,369	128,158	129,973	131,817	133,688	135,588
Total Generation for CVEA System													
Conservation Copper Valley	0	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Gulch	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606	52,606
Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0
Coal Facility	72,723	74,024	75,375	73,141	69,742	71,440	73,188	74,998	76,821	78,670	80,548	82,455	84,390
New Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel CVEA	0	0	0	0	0	0	0	0	0	0	0	0	0
Less Transmission Losses V-G	1,012	1,027	1,042	1,020	984	1,004	1,025	1,046	1,068	1,090	1,112	1,135	1,158
Total	124,317	125,603	126,940	124,728	121,364	123,042	124,770	126,558	128,359	130,187	132,042	133,926	135,838
Deficit	198	198	209	194	201	194	187	189	201	214	226	238	250

Valdez Coal Project
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Costs													
Fuel	$1,431	$1,641	$2,027	$2,230	$2,665	$0	$0	$0	$0	$0	$0	$0	$0
Variable O&M	811	911	1,082	947	1,093	0	0	0	0	0	0	0	0
Existing Diesel O&M Adjustment	0	0	0	0	0	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	0	0	0	26	26	26	26	26	26	26	26	26	26
New Diesel Capital Costs	0	0	0	136	136	136	136	136	136	136	136	136	136
Total Diesel Costs	$2,242	$2,553	$3,109	$3,339	$3,919	($130)	($130)	($130)	($130)	($130)	($130)	($130)	($130)
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Coal Facility													
Annual Carrying Charge	$0	$0	$0	$0	$0	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247
Annual O&M Costs	0	0	0	0	0	3,953	4,049	4,148	4,251	4,344	4,434	4,525	4,918
Total Other Costs	$0	$0	$0	$0	$0	$6,200	$6,296	$6,395	$6,498	$6,591	$6,681	$6,772	$7,165
Total Cost of Power	$2,242	$2,553	$3,109	$3,339	$3,919	$6,070	$6,166	$6,265	$6,368	$6,461	$6,551	$6,642	$7,035
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	$0	$0	$0	$0	$0	($1,705)	($1,737)	($1,769)	($1,802)	($1,835)	($1,869)	($1,903)	($1,938)
Net Annual Cost of Power	$2,242	$2,553	$3,109	$3,339	$3,919	$4,365	$4,429	$4,496	$4,566	$4,626	$4,682	$4,739	$5,097

Present Value in 1993 dollars (Discounted @4.5%)

Cumulative (1993 - 2018)	$68,305	(in thousands)
30 Year (2019 - 2048) with no additional growth	30,593	(in thousands)
Total Net Present Value	$98,898	(in thousands)

Valdez Coal Project
High Load; High Fuel
Ex Diesel Retire OH

Alaska Energy Authority -- Copper Valley Intertie Feasibility Study
Economic Analysis (Constant 1993 Dollars 000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diesel Costs													
Fuel	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Variable O&M	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diesel O&M Adjustment	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)	(291)
Additional Building and Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0
New Diesel Fixed O&M	52	52	52	52	52	52	52	52	52	52	52	52	52
New Diesel Capital Costs	271	271	271	271	271	271	271	271	271	271	271	271	271
Total Diesel Costs	$32	$32	$32	$32	$32	$32	$32	$32	$32	$32	$32	$32	$32
Total Conservation Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Intertie Cost													
Annual Carrying Charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual O&M Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Economy Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Intertie Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Coal Facility													
Annual Carrying Charge	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247	$2,247
Annual O&M Costs	5,338	5,412	5,490	5,392	5,236	5,331	5,429	5,532	5,635	5,741	5,849	5,960	6,073
Total Other Costs	$7,585	$7,659	$7,737	$7,639	$7,483	$7,578	$7,676	$7,779	$7,882	$7,988	$8,096	$8,207	$8,320
Total Cost of Power	$7,616	$7,691	$7,768	$7,670	$7,514	$7,610	$7,708	$7,810	$7,914	$8,020	$8,128	$8,238	$8,351
Sale of Surplus Solomon Gulch Energy													
Surplus Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenues from Sale	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
District Heat Net Revenue(Coal Case)	($1,974)	($2,010)	($2,047)	($2,085)	($2,123)	($2,162)	($2,201)	($2,241)	($2,282)	($2,324)	($2,366)	($2,409)	($2,453)
Net Annual Cost of Power	$5,643	$5,681	$5,721	$5,586	$5,392	$5,448	$5,507	$5,569	$5,632	$5,696	$5,762	$5,829	$5,899

21-Apr-94
Med-High Load
State Loan - Intertie Only

Copper Valley Intertie Feasibility Study
Cost of Power Analysis

	Base	1993	1994	1995	1996	1997	1998	1999	2000	2001	2010
Diesel Generation											
Capital Cost (93$/KW)	802										
Nominal Size (KW)	2,200										
Net Capacity Available (KW)	2,150										
Total Capital Cost (93$000)	1,764										
Capital Cost (Nom $-Yr Instld)		1,764	1,826	1,890	1,956	2,025	2,096	2,169	2,245	2,323	3,167
Financed Cost		1,800	1,863	1,928	1,995	2,065	2,137	2,212	2,290	2,370	3,230
Annual Capital Recovery		177	183	189	196	203	210	217	225	232	317
Medium-High Scenario											
Total Diesel Costs (93$)		2,169	2,422	2,892	3,044	2,982	2,900	3,417	3,628	3,712	4,535
New Capital Costs (93$)		0	0	0	136	271	407	542	678	678	678
Add. Capital Costs (93$)		0	0	0	0	0	0	126	126	126	157
Subtotal - Op. Costs (93$)		2,169	2,422	2,892	2,908	2,711	2,493	2,749	2,824	2,908	3,700
Annual Costs (Nom $)											
Diesel Operating Costs		2,169	2,507	3,098	3,224	3,111	2,961	3,379	3,593	3,829	6,640
New Diesel Cap. Recovery		0	0	0	188	381	583	790	1,005	1,005	1,005
Add. Diesel Cap Recovery		0	0	0	0	0	0	238	238	238	308
Total		2,169	2,507	3,098	3,412	3,492	3,543	4,407	4,836	5,073	7,953
Scenario Energy (MWh)		25,096	27,705	32,517	35,023	36,496	37,101	37,711	38,330	39,063	44,853
Cost of Power (cents/KWh)		8.6	9.0	9.5	9.7	9.6	9.6	11.7	12.6	13.0	17.7
Medium-Low Scenario											
Total Diesel Costs (93$)		2,169	2,403	2,845	2,969	2,883	2,778	3,269	3,451	3,503	3,974
New Capital Costs (93$)		0	0	0	136	271	407	542	678	678	678
Add. Capital Costs (93$)		0	0	0	0	0	0	126	126	126	157
Subtotal - Op. Costs (93$)		2,169	2,403	2,845	2,833	2,612	2,371	2,601	2,647	2,699	3,139
Annual Costs (Nom $)											
Diesel Operating Costs		2,169	2,487	3,048	3,141	2,997	2,816	3,197	3,368	3,554	5,633
New Diesel Cap. Recovery		0	0	0	188	381	583	790	1,005	1,005	1,005
Add. Diesel Cap Recovery		0	0	0	0	0	0	238	238	238	308
Total		2,169	2,487	3,048	3,329	3,379	3,399	4,225	4,611	4,798	6,947
Scenario Energy (MWh)		25,096	27,705	32,517	35,023	36,496	37,101	37,711	38,330	39,063	44,853
Cost of Power (cents/KWh)		8.6	9.0	9.4	9.5	9.3	9.2	11.2	12.0	12.3	15.5
Intertie											
Percent of Construction	100.00%		5.00%	15.00%	20.00%	40.00%	20.00%				
Capital Cost (93$)	47,604		2,380	7,141	9,521	19,042	9,521				
Capital Cost (Nom$)	53,827		2,464	7,649	10,556	21,851	11,308				
Sources of Capital											
State Loan	35,000		2,464	7,649	10,556	14,331	0				
Bond Proceeds	18,827		0	0	0	7,519	11,308				
Subtotal	53,827		2,464	7,649	10,556	21,851	11,308				
On-Line Date	Jan-99										
Financing Requirements											
Capital Requirement	$18,827		$0	$0	$0	$7,519	$11,308				
Financing Expense	377		0	0	0	150	226				
Interest Cost	2,059		0	0	0	575	1,483				
Total Debt Otstg.(Yr End)	$21,262		$0	$0	$0	$8,245	$21,262				
Project O&M (93$)								207	207	207	221
MEA/CEA Wheeling (Nom c/	0.20	0.20	0.21	0.21	0.22	0.23	0.24	0.25	0.25	0.26	0.36
Cost of Purchased Power (High Oil)											
Economy Rate (93c/KWh) No Marg.		2.35	2.39	2.43	2.46	2.50	2.54	2.59	2.63	2.67	3.09
Economy Rate (Nom c/KWh) No Marg.		2.35	2.47	2.60	2.73	2.87	3.02	3.18	3.35	3.52	5.55
Margin (Nom c/KWh)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total		3.35	3.47	3.60	3.73	3.87	4.02	4.18	4.35	4.52	6.55
Medium-High Scenario											
Total Diesel Costs (93$)		2,169	2,422	2,892	3,226	3,448	3,564	(491)	(489)	(487)	(467)

Copper Valley Intertie Feasibility Study
Cost of Power Analysis

	Base	1993	1994	1995	1996	1997	1998	1999	2000	2001	2010
New Capital Costs (93$)		0	0	0	0	0	0	0	0	0	0
Add. Capital Costs (93$)		0	0	0	0	0	0	0	0	0	0
Subtotal - Op. Costs (93$)		2,169	2,422	2,892	3,226	3,448	3,564	(491)	(489)	(487)	(467)
Annual Costs (Nom $)											
Diesel Operating Costs		2,169	2,507	3,098	3,577	3,957	4,233	(604)	(622)	(641)	(838)
New Diesel Cap. Recovery		0	0	0	0	0	0	0	0	0	0
Add. Diesel Cap Recovery		0	0	0	0	0	0	0	0	0	0
Subtotal-Diesel Costs		2,169	2,507	3,098	3,577	3,957	4,233	(604)	(622)	(641)	(838)
Annual Costs of Project											
Purchased Power		--	--	--	--	--	--	$1,737	$1,834	$1,942	$3,226
Wheeling		--	--	--	--	--	--	102	107	113	177
O&M		--	--	--	--	--	--	254	263	273	397
Subtotal		--	--	--	--	--	--	2,093	2,204	2,327	3,800
State Loan Repayment		--	--	--	--	--	--	700	700	700	700
Additional Debt Service		--	--	--	--	--	--	1,800	1,800	1,800	1,800
Total		$2,169	$2,507	$3,098	$3,577	$3,957	$4,233	$3,990	$4,083	$4,186	$5,462
Scenario Energy (MWh)	MH	25,096	27,705	32,517	35,023	36,496	37,101	37,711	38,330	39,063	44,853
Cost of Power (cents/KWh)		8.6	9.0	9.5	10.2	10.8	11.4	10.6	10.7	10.7	12.2
Medium-Low Scenario											
Cost of Purchased Power (Low Oil)											
Economy Rate (93c/KWh) No Marg.		2.35	2.36	2.37	2.38	2.39	2.40	2.41	2.42	2.43	2.52
Economy Rate (Nom c/KWh) No Marg.		2.35	2.44	2.54	2.64	2.74	2.85	2.96	3.08	3.20	4.52
Margin (Nom c/KWh)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total		3.35	3.44	3.54	3.64	3.74	3.85	3.96	4.08	4.20	5.52
Total Diesel Costs (93$)		2,169	2,403	2,845	3,146	3,334	3,416	(494)	(493)	(492)	(480)
New Capital Costs (93$)		0	0	0	0	0	0	0	0	0	0
Add. Capital Costs (93$)		0	0	0	0	0	0	0	0	0	0
Subtotal - Op. Costs (93$)		2,169	2,403	2,845	3,146	3,334	3,416	(494)	(493)	(492)	(480)
Annual Costs											
Diesel Operating Costs		2,169	2,487	3,048	3,488	3,826	4,057	(607)	(627)	(648)	(861)
New Diesel Cap. Recovery		0	0	0	0	0	0	0	0	0	0
Add. Diesel Cap Recovery		0	0	0	0	0	0	0	0	0	0
Subtotal-Diesel Costs		2,169	2,487	3,048	3,488	3,826	4,057	(607)	(627)	(648)	(861)
Annual Costs of Project											
Purchased Power		--	--	--	--	--	--	$1,645	$1,721	$1,806	$2,722
Wheeling		--	--	--	--	--	--	102	107	113	177
O&M		--	--	--	--	--	--	254	263	273	397
Subtotal		--	--	--	--	--	--	2,001	2,092	2,192	3,295
State Loan Repayment		--	--	--	--	--	--	700	700	700	700
Additional Debt Service		--	--	--	--	--	--	1,800	1,800	1,800	1,800
Total		$2,169	$2,487	$3,048	$3,488	$3,826	$4,057	$3,894	$3,965	$4,044	$4,934
Scenario Energy (MWh)		25,096	27,705	32,517	35,023	36,496	37,101	37,711	38,330	39,063	44,853
Cost of Power (cents/KWh)		8.6	9.0	9.4	10.0	10.5	10.9	10.3	10.3	10.4	11.0

21-Apr-94
Med-High Load
State Loan - Intertie Only

Copper Valley Intertie Feasibility Study
Cost of Power Analysis

	Base	1993	1994	1995	1996	1997	1998	1999	2000	2001	2010
Allison Lake											
Percent of Construction	100.00%		5.00%	10.00%	15.00%	20.00%	30.00%	20.00%			
Capital Cost (93$)	32,240		1,612	3,224	4,836	6,448	9,672	6,448			
Capital Cost (Nom$)	37,297		1,668	3,454	5,362	7,399	11,487	7,926			
Sources of Capital											
State Loan	0		0	0	0	0	0	0			
Bond Proceeds	37,297		1,668	3,454	5,362	7,399	11,487	7,926			
Subtotal	37,297		1,668	3,454	5,362	7,399	11,487	7,926			
On-Line Date	Jan-2000										
Financing Requirements											
Capital Requirement	$37,297		$1,668	$3,454	$5,362	$7,399	$11,487	$7,926			
Financing Expense	746		33	69	107	148	230	159			
Interest Cost	8,552		128	401	842	1,471	2,460	3,251			
Total Debt Otstg.(Yr End)	$46,595		$1,829	$5,754	$12,064	$21,082	$35,259	$46,595			
Project O&M (93$)									284	284	284
Energy Generation (MWh)											
Allison Lake Turbine	13,775								13,775	13,775	13,775
Solomon Gulch Increase	13,621								13,621	13,621	13,621
Medium-High Scenario											
Total Diesel Costs (93$)		2,169	2,422	2,892	3,044	2,982	2,900	3,001	1,199	1,258	1,801
New Capital Costs (93$)		0	0	0	136	271	407	542	542	542	542
Add. Capital Costs (93$)		0	0	0	0	0	0	0	0	0	0
Subtotal - Op. Costs (93$)		2,169	2,422	2,892	2,908	2,711	2,493	2,459	657	716	1,259
Annual Costs (Nom $)											
Diesel Operating Costs		2,169	2,507	3,098	3,224	3,111	2,961	3,023	836	943	2,259
New Diesel Cap. Recovery		0	0	0	188	381	583	790	790	790	790
Add. Diesel Cap Recovery		0	0	0	0	0	0	0	0	0	0
Subtotal-Diesel Costs		2,169	2,507	3,098	3,412	3,492	3,543	3,812	1,625	1,732	3,049
Annual Costs of Project											
Purchased Power		--	--	--	--	--	--	--	$961	$975	$1,132
O&M		--	--	--	--	--	--	--	361	374	510
Subtotal		0	0	0	0	0	0	0	1,322	1,349	1,641
State Loan Repayment		--	--	--	--	--	--	--	0	0	0
Additional Debt Service		--	--	--	--	--	--	--	3,945	3,945	3,945
Total		$2,169	$2,507	$3,098	$3,412	$3,492	$3,543	$3,812	$6,893	$7,027	$8,635
Scenario Energy (MWh)		25,096	27,705	32,517	35,023	36,496	37,101	37,711	38,330	39,063	44,853
Cost of Power (cents/KWh)		8.6	9.0	9.5	9.7	9.6	9.6	10.1	18.0	18.0	19.3
COP w/o 4DP Cost (c/KWh)		--	--	--	--	--	--	--	15.5	15.5	16.7
Medium-Low Scenario											
Total Diesel Costs (93$)		2,169	2,403	2,845	2,969	2,883	2,778	2,852	1,144	1,190	1,570
New Capital Costs (93$)		0	0	0	136	271	407	542	542	542	542
Add. Capital Costs (93$)		0	0	0	0	0	0	0	0	0	0
Subtotal - Op. Costs (93$)		2,169	2,403	2,845	2,833	2,612	2,371	2,310	602	648	1,028
Annual Costs (Nom $)											
Diesel Operating Costs		2,169	2,487	3,048	3,141	2,997	2,816	2,840	766	853	1,845
New Diesel Cap. Recovery		0	0	0	188	381	583	790	790	790	790
Add. Diesel Cap Recovery		0	0	0	0	0	0	0	0	0	0
Subtotal-Diesel Costs		2,169	2,487	3,048	3,329	3,379	3,399	3,629	1,555	1,643	2,634
Annual Costs of Project											
Purchased Power		--	--	--	--	--	--	--	$961	$975	$1,132
O&M		--	--	--	--	--	--	--	361	374	510
Subtotal		0	0	0	0	0	0	0	1,322	1,349	1,641
State Loan Repayment		--	--	--	--	--	--	--	0	0	0
Additional Debt Service		--	--	--	--	--	--	--	3,945	3,945	3,945
Total		$2,169	$2,487	$3,048	$3,329	$3,379	$3,399	$3,629	$6,823	$6,937	$8,221
Scenario Energy (MWh)		25,096	27,705	32,517	35,023	36,496	37,101	37,711	38,330	39,063	44,853
Cost of Power (cents/KWh)		8.6	9.0	9.4	9.5	9.3	9.2	9.6	17.8	17.8	18.3
COP w/o 4DP Cost (c/KWh)		--	--	--	--	--	--	--	15.3	15.3	15.8

21-Apr-94
Med-High Load
State Loan - Intertie Only

Copper Valley Intertie Feasibility Study
Cost of Power Analysis

	Base	1993	1994	1995	1996	1997	1998	1999	2000	2001	2010
Silver Lake A											
Percent of Construction	100.00%		5.00%	10.00%	10.00%	15.00%	20.00%	20.00%	20.00%		
Capital Cost (93$)	54,185		2,709	5,419	5,419	8,128	10,837	10,837	10,837		
Capital Cost (Nom$)	63,923		2,804	5,804	6,008	9,327	12,871	13,321	13,788		
Sources of Capital											
State Loan	0		0	0	0	0	0	0	0		
Bond Proceeds	63,923		2,804	5,804	6,008	9,327	12,871	13,321	13,788		
Subtotal	63,923		2,804	5,804	6,008	9,327	12,871	13,321	13,788		
On-Line Date	Jan-2001										
Financing Requirements											
Capital Requirement	$63,923		$2,804	$5,804	$6,008	$9,327	$12,871	$13,321	$13,788		
Financing Expense	1,278		56	116	120	187	257	266	276		
Interest Cost	17,313		215	675	1,185	1,987	3,121	4,374	5,757		
Total Debt Otstg.(Yr End)	$82,514		$3,075	$9,670	$16,982	$28,483	$44,732	$62,694	$82,514		
Project O&M (93$)										593	593
Medium-High Scenario											
Total Diesel Costs (93$)		2,169	2,422	2,892	3,044	2,982	2,900	3,001	3,085	422	612
New Capital Costs (93$)		0	0	0	136	271	407	542	542	542	542
Add. Capital Costs (93$)		0	0	0	0	0	0	0	0	0	0
Subtotal - Op. Costs (93$)		2,169	2,422	2,892	2,908	2,711	2,493	2,459	2,543	(120)	70
Annual Costs (Nom $)											
Diesel Operating Costs		2,169	2,507	3,098	3,224	3,111	2,961	3,023	3,235	(158)	126
New Diesel Cap. Recovery		0	0	0	188	381	583	790	790	790	790
Add. Diesel Cap Recovery		0	0	0	0	0	0	0	0	0	0
Subtotal-Diesel Costs		2,169	2,507	3,098	3,412	3,492	3,543	3,812	4,025	631	915
Annual Costs of Project											
O&M		--	--	--	--	--	--	--	--	781	1,064
Subtotal		220	220	220	220	220	220	220	220	220	220
State Loan Repayment		--	--	--	--	--	--	--	--	0	0
Additional Debt Service		--	--	--	--	--	--	--	--	6,987	6,987
Total		$2,389	$2,727	$3,318	$3,632	$3,712	$3,763	$4,032	$4,245	$7,838	$8,122
Scenario Energy (MWh)		25,096	27,705	32,517	35,023	36,496	37,101	37,711	38,330	39,063	44,853
Cost of Power (cents/KWh)		9.5	9.8	10.2	10.4	10.2	10.1	10.7	11.1	20.1	18.1
Medium-Low Scenario											
Total Diesel Costs (93$)		2,169	2,403	2,845	2,969	2,883	2,778	2,852	2,907	422	581
New Capital Costs (93$)		0	0	0	136	271	407	542	542	542	542
Add. Capital Costs (93$)		0	0	0	0	0	0	0	0	0	0
Subtotal - Op. Costs (93$)		2,169	2,403	2,845	2,833	2,612	2,371	2,310	2,365	(120)	39
Annual Costs (Nom $)											
Diesel Operating Costs		2,169	2,487	3,048	3,141	2,997	2,816	2,840	3,009	(158)	70
New Diesel Cap. Recovery		0	0	0	188	381	583	790	790	790	790
Add. Diesel Cap Recovery		0	0	0	0	0	0	0	0	0	0
Subtotal-Diesel Costs		2,169	2,487	3,048	3,329	3,379	3,399	3,629	3,798	631	859
Annual Costs of Project											
O&M		--	--	--	--	--	--	--	--	781	1,064
Subtotal		240	240	240	240	240	240	240	240	240	240
State Loan Repayment		--	--	--	--	--	--	--	--	0	0
Additional Debt Service		--	--	--	--	--	--	--	--	6,987	6,987
Total		$2,409	$2,727	$3,288	$3,569	$3,619	$3,639	$3,869	$4,038	$7,858	$8,086
Scenario Energy (MWh)		25,096	27,705	32,517	35,023	36,496	37,101	37,711	38,330	39,063	44,853
Cost of Power (cents/KWh)		9.6	9.8	10.1	10.2	9.9	9.8	10.3	10.5	20.1	18.0

21-Apr-94
Med-High Load
State Loan - Intertie Only

Copper Valley Intertie Feasibility Study
Cost of Power Analysis

	Base	1993	1994	1995	1996	1997	1998	1999	2000	2001	2010
Valdez Coal Facility											
Percent of Construction	100.00%		5.00%	15.00%	30.00%	50.00%	0.00%	0.00%			
Capital Cost (93$)	36,600		1,830	5,490	10,980	18,300	0	0			
Capital Cost (Nom$)	40,948		1,894	5,881	12,174	21,000	0	0			
Sources of Capital											
State Loan	0		0	0	0	0	0	0			
Bond Proceeds	40,948		1,894	5,881	12,174	21,000	0	0			
Subtotal	40,948		1,894	5,881	12,174	21,000	0	0			
On-Line Date	Jan-98										
Financing Requirements											
Capital Requirement	$40,948		$1,894	$5,881	$12,174	$21,000					
Financing Expense	819		38	118	243	420					
Interest Cost	5,640		145	606	1,582	3,308					
Total Debt Otstg.(Yr End)	$47,408		$2,077	$8,681	$22,681	$47,408					
Fixed O&M (93$)	1,800						1,730	1,730	1,730	1,730	1,730
Variable O&M ($93/MWh)	10										
Fuel Cost-Low (93$/MWh)		33.40	33.50	33.50	33.50	33.60	33.60	33.60	33.60	33.70	33.90
Fuel Cost-High (93$/MWh)		33.40	33.60	33.70	33.80	33.90	34.00	34.10	34.30	34.40	35.60
District Heat Rev. -High (93$)		--	--	--	--	--	1,705	1,737	1,769	1,802	2,123
District Heat Rev. -Low (93$)		--	--	--	--	--	1,592	1,600	1,608	1,615	1,686
Medium-High Scenario											
Total Diesel Costs (93$)		2,169	2,422	2,892	3,044	3,265	(130)	(130)	(130)	(130)	(130)
New Capital Costs (93$)		0	0	0	136	136	136	136	136	136	136
Add. Capital Costs (93$)		0	0	0	0	0	0	0	0	0	0
Subtotal - Op. Costs (93$)		2,169	2,422	2,892	2,908	3,129	(266)	(266)	(266)	(266)	(266)
Annual Costs (Nom $)											
Diesel Operating Costs		2,169	2,507	3,098	3,224	3,591	(316)	(327)	(338)	(350)	(477)
New Diesel Cap. Recovery		0	0	0	188	188	188	188	188	188	188
Add. Diesel Cap Recovery		0	0	0	0	0	0	0	0	0	0
Subtotal-Diesel Costs		2,169	2,507	3,098	3,412	3,779	(128)	(139)	(150)	(162)	(289)
Annual Costs of Project											
Fuel		--	--	--	--	--	1,657	1,748	1,850	1,957	3,163
O&M		--	--	--	--	--	2,706	2,809	2,916	3,029	4,242
Less: Dist. Heat Revenue		--	--	--	--	--	(2,025)	(2,135)	(2,251)	(2,373)	(3,810)
Subtotal		0	0	0	0	0	2,338	2,422	2,515	2,613	3,595
State Loan Repayment		--	--	--	--	--	0	0	0	0	0
Additional Debt Service		--	--	--	--	--	4,253	4,253	4,253	4,253	4,253
Total		$2,169	$2,507	$3,098	$3,412	$3,779	$6,463	$6,536	$6,618	$6,703	$7,559
Scenario Energy (MWh)		25,096	27,705	32,517	35,023	36,496	37,101	37,711	38,330	39,063	44,853
Cost of Power (cents/KWh)		8.6	9.0	9.5	9.7	10.4	17.4	17.3	17.3	17.2	16.9
Medium-Low Scenario											
Total Diesel Costs (93$)		2,169	2,403	2,845	2,969	3,156	(130)	(130)	(130)	(130)	(130)
New Capital Costs (93$)		0	0	0	136	136	136	136	136	136	136
Add. Capital Costs (93$)		0	0	0	0	0	0	0	0	0	0
Subtotal - Op. Costs (93$)		2,169	2,403	2,845	2,833	3,020	(266)	(266)	(266)	(266)	(266)
Annual Costs (Nom $)											
Diesel Operating Costs		2,169	2,487	3,048	3,141	3,466	(316)	(327)	(338)	(350)	(477)
New Diesel Cap. Recovery		0	0	0	188	188	188	188	188	188	188
Add. Diesel Cap Recovery		0	0	0	0	0	0	0	0	0	0
Subtotal-Diesel Costs		2,169	2,487	3,048	3,329	3,654	(128)	(139)	(150)	(162)	(289)
Annual Costs of Project											
Fuel		--	--	--	--	--	1,637	1,722	1,812	1,917	3,012
O&M		--	--	--	--	--	2,706	2,809	2,916	3,029	4,242
Less: Dist. Heat Revenue		--	--	--	--	--	(1,891)	(1,967)	(2,046)	(2,127)	(3,026)
Subtotal		0	0	0	0	0	2,453	2,565	2,682	2,819	4,228
State Loan Repayment		--	--	--	--	--	0	0	0	0	0
Additional Debt Service		--	--	--	--	--	4,253	4,253	4,253	4,253	4,253
Total		$2,169	$2,487	$3,048	$3,329	$3,654	$6,578	$6,679	$6,785	$6,910	$8,192
Scenario Energy (MWh)		25,096	27,705	32,517	35,023	36,496	37,101	37,711	38,330	39,063	44,853
Cost of Power (cents/KWh)		8.6	9.0	9.4	9.5	10.0	17.7	17.7	17.7	17.7	18.3

21-Apr-94
Med-High Load
State Loan - Intertie Only

Copper Valley Intertie Feasibility Study
Cost of Power Analysis

	Base	1993	1994	1995	1996	1997	1998	1999	2000	2001	2010
Inflation	3.50%										
Nominal Interest Rate	7.50%										
Short Term Reinv. Rate	3.50%										
Financing Expense	2.00%										
State Loan Interest Rate	0.00%										
Repayment Period (Years)											
Diesel Generators	20										
Intertie	30										
Hydroelectric	30										
Coal Project	25										
State Loan	50										
Capital Recovery Factor											
Diesel Generators	9.81%										
Intertie	8.47%										
Hydroelectric	8.47%										
Coal Project	8.97%										
State Loan	2.00%										
State Loan (Coal)	4.00%										
Capital Recovery Factor (93$)											
Diesel Generators	8.02%										
Diesel Bldg, Imps.	6.51%										
Intertie Loss %	9.70%										
Coal Plant Station Service	8.00%										
4DP Debt Serv.Comp.(Nom c/K	4.00										
4DP O&M Component (93c/KW	2.40										

Appendix K

PETRO STAR VALDEZ REFINERY EXPANSION ASSESSMENT

PETRO STAR VALDEZ REFINERY

EXPANSION ASSESSMENT

FEBRUARY 28, 1994

PREPARED BY

PETROLEUM MARKETING SOLUTIONS

ANCHORAGE, ALASKA

OBJECTIVE

EVALUATE THE PROSPECTS FOR EXPANSION OF THE PETRO STAR VALDEZ REFINERY OVER THE NEXT TEN YEARS.

METHODOLOGY AND KEY ISSUES

REVIEW THE REFINERY AND DISTRIBUTION CAPABILITIES AS THEY NOW EXIST. ACCOMPLISHED THROUGH INTERVIEWS WITH KEY PETRO STAR VALDEZ AND JOINT VENTURE PARTNER EXECUTIVES.

REVIEW THE MARKET NEEDS NOW AND OVER THE NEXT TEN YEARS

- IN STATE CURRENT
- IN STATE PROJECTED GROWTH

ESTIMATE APPROXIMATE COSTS TO ADDRESS EXPANSION AND NEW MARKETS

- EXPANSION OF OUTPUT WITHIN THE EXISTING CAPABILITY OF MAJOR PLANT COMPONENTS.
- ADDITIONAL EXPANSION REQUIRING SUBSTANTIAL NEW INVESTMENT IN PLANT CAPACITY.

ASSESS THE COMPETITIVE ENVIRONMENT IN WHICH ANY EXPANSION MUST BE ACCOMPLISHED.

BASED ON :

- PROJECTED MARKET NEEDS
- COMPETITION
- COST OF EXPANSION
- OTHER CONSIDERATIONS AS UNDERSTOOD TODAY

MAKE AN INFORMED JUDGMENT AS TO WHAT LEVEL OF EXPANSION IS MOST LIKELY TO OCCUR.

EXECUTIVE SUMMARY

AN ASSESSMENT OF POSSIBLE IN-STATE MARKETS AND DISCUSSIONS WITH PETRO STAR AND WITH OTHER PARTNERS IN THE JOINT VENTURE BRINGS ME TO THE CONCLUSION THAT *AN EXPANSION OF THE REFINERY FROM THE PRESENT LEVEL OF 30,000 BARRELS PER DAY TO 50,000 BARRELS PER DAY IS VERY LIKELY IN THE NEXT 2-3 YEARS.*

IT SHOULD BE CAREFULLY NOTED THAT, AT THIS TIME, FUNDS OR PROJECTS TO ACCOMPLISH SUCH EXPANSION HAVE NOT BEEN SPECIFICALLY APPROVED.

THE CAPABILITY TO RUN AT 50,000 BD ON A SUSTAINED BASIS EXISTS IN THE BASIC EQUIPMENT ALREADY IN PLACE AND CAN BE MOBILIZED FOR A MODEST INVESTMENT. THE MONEY SPENT TO DE-BOTTLENECK WOULD PROBABLY BE LESS THAN 1/3 OF THE COST OF BUILDING NEW BASE CAPACITY AND THE COMPETITIVE ENVIRONMENT AND MARKET DEMAND THAT WOULD PERMIT SUCH A MOVE APPEAR TO BE PRESENT. PETRO STAR TELLS ME THAT EXPANSION OF REFINING CAPACITY IN THIS RANGE CAN BE LOOKED AT ON A DIRECT RATIO BASIS WITH THE NEED FOR MORE ELECTRICAL POWER. SO WE ARE LOOKING AT AN ELECTRICAL *LOAD INCREASE OF APPROXIMATELY 67% OVER THE NEXT THREE YEARS.*

THE CURRENT LOAD IS APPROXIMATELY 1.7 MW. THE NEW LOAD WOULD BE APPROXIMATELY 2.84 MW

EXPANSION BEYOND 50,000 BARRELS / DAY IS NOT LIKELY IN THE NEXT FIVE YEARS AND, IN MY JUDGMENT, VERY MUCH IN QUESTION BEYOND THAT.

WHEN THE VENTURE LOOKS BEYOND 50,000 BARRELS PER DAY THEY CROSS THE THRESHOLD FROM AN IN-STATE MARKET TO THE EXPORT MARKET. IN ADDITION, CAPITAL AND PERMITTING REQUIREMENTS BECOME MAJOR SINCE YOU ARE THEN BEYOND DEBOTTLNECKING AND INTO DUPLICATION OF BASIC EQUIPMENT AND THE NEED FOR A LARGE SCALE MARINE TERMINAL.

ASSESSMENT OF REFINERY OUTPUT AND CURRENT MARKETS

CURRENT REFINERY RUNS OF APPROXIMATELY 30,000 BARRELS PER DAY (BD) GIVE THE FOLLOWING GENERAL YIELD PATTERNS.

CRUDE CHARGE	30,000 BD
REFINED PRODUCT PRODUCED	7,200 BD
WINTER CONFIGURATION	
JET A / KEROSENE STREAM	3600 BD
#2 DIESEL STREAM	3600 BD

SUMMER CONFIGURATION

JET A / KEROSENE STREAM	4500 BD
#2 DIESEL STREAM	2700 BD

THE REMAINING 22,800 BD IS RETURNED TO THE PIPELINE AND BECOMES PART OF THE COMMON CRUDE STREAM LOADED AT THE VALDEZ TERMINAL.

THE MARKET FOR THESE PRODUCTS IS EASILY ACCESSIBLE. PRIMARILY THE REFINED PRODUCTS ARE PURCHASED AND ABSORBED INTO THE REQUIREMENTS OF THE JOINT VENTURE PARTNERS. THIS AVAILABILITY AND SECURITY OF SUPPLY WAS A MAJOR FACTOR IN BRINGING THEM TO THE VENTURE IN THE FIRST PLACE.

PRIOR TO THE VALDEZ REFINERY START UP THE PRODUCTS PURCHASED BY THE PARTNERS CAME PRIMARILY FROM TESORO AT KENAI, MAPCO AT ANCHORAGE AND SOME SUPPLEMENTARY PRODUCTS SHIPPED IN FROM PACIFIC NORTHWEST REFINERIES. SINCE THE REFINERY START UP, VERY LITTLE #2 DIESEL IS SHIPPED IN TO THE STATE. THAT COMBINED WITH THE CLOSING OF THE CHEVRON REFINERY AND LOWERED THRUPUTS AT TESORO'S KENAI REFINERY CREATED A PLACE FOR THE CURRENT PRODUCTION.

THE STATE HAS HISTORICALLY BEEN SHORT OF JET A , AND THERE HAS NOT BEEN A PROBLEM FINDING A HOME FOR NEW IN-STATE PRODUCTION.

THE PROFITABILITY OF THE VALDEZ REFINERY HAS BEEN GOOD AFTER AN INITIAL SHAKEDOWN PERIOD AND MARGINS SHOULD REMAIN GOOD MAKING HIGHER THRUPUTS ATTRACTIVE.

CURRENT LOW CRUDE PRICES CREATE A GROSS MARGIN THAT IS BETTER THAN ONE SHOULD EXPECT OVER THE LONG TERM . EVEN AFTER THE WORLD CRUDE MARKET RETURNS TO HISTORICAL NORMS THIS REFINERY SHOULD REMAIN PROFITABLE AND EVERY MOTIVATION TO MOVE TOWARD 50,000 BD SHOULD BE PRESENT.

THE STATE IS NOT SHORT OF #2 DIESEL, BUT IT IS SHORT OF JET A / KEROSENE.
THE COMMONLY ACCEPTED SHORTFALL IS ABOUT 8500 B/D. THAT VOLUME WILL VARY SOMEWHAT FROM SUMMER TO WINTER AND THE YIELD CONFIGURATIONS SHOWN ABOVE REFLECT THAT.

THE JET A DEFICIENCY IS A MATTER OF DEMAND FOR THE PRODUCT OUTSTRIPPING THE MECHANICS AND ECONOMICS OF PRODUCING IT IN STATE. SIMPLY PUT, MAKING MORE JET A IN ALASKA ALSO MEANS MAKING MORE RESIDUAL FUEL OIL WHICH HAS ALMOST NO IN-STATE MARKET AND MORE OF OTHER PRODUCTS THAT ARE CURRENTLY IN BALANCE WITH IN STATE NEEDS AND WOULD HAVE TO BE SHIPPED OUTSIDE.

SUMMARY

AN EXPANSION OF THE PETRO STAR REFINERY FROM 30,000 BARRELS PER DAY TO 50,000 BARRELS PER DAY IS VERY LIKELY TO OCCUR IN THE NEXT 2-3 YEARS.

SUCH AN EXPANSION WILL TAKE THE REFINERY ELECTRICAL CONSUMPTION FROM A CURRENT LEVEL OF APPROXIMATELY 1.7 MW TO 2.84 MW , AN INCREASE OF APPROXIMATELY 67%.

THERE ARE CURRENTLY NO APPROVED PROJECTS OR FUNDS TO ACCOMPLISH THIS EXPANSION, BUT THE BASIC REFINERY COMPONENTS ARE ALREADY IN PLACE AND THE CAPITAL REQUIREMENTS TO DO THE WORK ARE REASONABLE WHEN COMPARED TO NEW BASE CAPACITY.

EXPANSION BEYOND 50,000 BARRELS PER DAY IS NOT LIKELY IN THE NEXT FIVE YEARS AND IN MY JUDGMENT VERY MUCH IN QUESTION BEYOND THAT.

THIS ASSESSMENT IS BASED ON THE JOINT VENTURE AS PRESENTLY STRUCTURED AND WITH THE CURRENT MIX OF PARTNERS IN PLACE.

TABLE 7A – PROJECTED DEMAND FOR OIL

MILLIONS OF GALLONS PER YEAR

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
STATE										
Vehicle Transportation	1,449	1,485	1,511	1,539	1,571	1,601	1,632	1,659	1,682	1,704
Jet Fuel	710	733	752	773	795	818	841	862	884	904
Civilian Domestic	392	411	427	445	464	483	503	521	539	556
Military and International	318	322	325	328	331	335	338	341	345	348
Gasoline	253	256	258	259	262	263	264	265	264	264
Aviation	17	17	17	17	18	18	18	18	18	18
Highway	228	230	232	233	235	236	237	238	237	237
Marine	8	8	9	9	9	9	9	9	9	9
Diesel	486	496	501	507	514	520	527	532	534	536
Highway	281	285	286	288	290	291	293	294	293	292
Marine	205	211	215	219	224	229	234	238	241	244
Space Heat	128	131	133	134	135	135	138	140	140	141
Utility Generation	40	43	45	44	43	43	45	47	48	48
Industry	86	80	76	72	67	63	59	56	53	49
Pipeline Fuel	66	61	57	53	49	45	42	39	36	33
Electricity Generation	20	19	19	19	18	18	17	17	17	16
TOTAL	1,703	1,739	1,765	1,789	1,816	1,842	1,874	1,902	1,923	1,942

	2003	2004	2005	2006	2007	2008	2009	2010	TOTAL	ANNUAL GROWTH
STATE										
Vehicle Transportation	1,730	1,756	1,785	1,815	1,851	1,891	1,931	1,973	30,565	0%
Jet Fuel	927	950	975	1,000	1,029	1,060	1,091	1,125	16,229	3%
Civilian Domestic	575	595	616	638	663	690	718	748	9,984	4%
Military and International	352	355	359	362	366	370	373	377	6,245	1%
Gasoline	264	263	263	264	265	267	269	270	4,733	1%
Aviation	18	18	18	18	19	19	19	19	324	1%
Highway	237	236	236	237	237	239	240	241	4,246	0%
Marine	9	9	9	9	9	9	10	10	162	1%
Diesel	539	543	547	551	557	564	571	578	9,603	1%
Highway	292	292	292	292	293	295	296	298	5,243	0%
Marine	247	251	255	259	264	269	275	280	4,360	2%
Space Heat	142	142	142	143	144	145	146	147	2,506	1%
Utility Generation	49	48	48	48	48	48	49	48	832	2%
Industry	46	44	41	39	37	36	33	32	969	–6%
Pipeline Fuel	30	28	26	24	22	21	19	18	669	–7%
Electricity Generation	16	16	15	15	15	15	14	14	300	–2%
TOTAL	1,967	1,990	2,016	2,045	2,080	2,120	2,159	2,200	34,872	1%

TABLE 7B – PROJECTED DEMAND FOR GAS

BILLION CUBIC FEET PER YEAR

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
STATE										
Vehicle Transportation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Heat	27.4	27.3	27.3	27.6	27.7	27.7	27.0	27.5	27.5	27.6
Utility Generation	36.9	37.9	38.5	39.2	39.9	40.6	41.2	41.7	41.9	42.1
Industry	272.9	267.5	262.3	257.3	252.5	247.8	243.2	238.8	234.5	230.3
Ammonia–Urea Production	54.5	54.5	54.5	54.5	54.5	54.5	54.5	54.5	54.5	54.5
Military Power Generation	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Petroleum Production	213.4	208.0	202.8	197.8	193.0	188.3	183.7	179.3	175.0	170.8
Pipeline Fuel	11.5	10.6	9.8	9.1	8.4	7.8	7.2	6.6	6.2	5.7
Miscellaneous	201.9	197.4	193.0	188.7	184.6	180.5	176.5	172.6	168.8	165.2
TOTAL	337.2	332.7	328.1	324.1	320.1	316.1	311.4	308.0	303.9	300.0

	2003	2004	2005	2006	2007	2008	2009	2010	TOTAL	ANNUAL GROWTH
STATE										
Vehicle Transportation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Space Heat	27.6	27.7	27.9	28.0	28.1	28.1	28.3	28.4	499	0%
Utility Generation	42.4	42.8	43.2	43.7	44.3	44.9	45.7	46.5	753	[illegible]
Industry	226.3	222.4	218.6	214.9	211.3	207.9	204.5	201.2	4,214	[illegible]
Ammonia–Urea Production	54.5	54.5	54.5	54.5	54.5	54.5	54.5	54.5	981	[illegible]
Military Power Generation	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	90	[illegible]
Petroleum Production	166.8	162.9	159.1	155.4	151.8	148.4	145.0	141.7	3,143	[illegible]
Pipeline Fuel	5.3	4.9	4.5	4.2	3.9	3.6	3.3	3.0	[illegible]	[illegible]
Miscellaneous	161.6	158.0	154.6	151.3	148.0	144.8	141.7	138.6	[illegible]	[illegible]
TOTAL	296.3	292.9	289.7	286.6	283.7	280.9	278.5	276.1	[illegible]	[illegible]

1/12/93

THE JET A SHORTFALL IS SUPPLIED FROM OUTSIDE THE STATE IN TWO WAYS:

- 2500 BARRELS PER DAY OUT OF THE PACIFIC NORTHWEST VIA BARGE SALES INTO THE AIRLINE CONSORTIUM. THIS IS GENERALLY ARRANGED BY PACIFIC FUELS TRADING, (JAPAN AIRLINES SUBSIDIARY).

  THE AIRLINE CONSORTIUM IS A COOPERATIVE USER GROUP OF AIRLINES THAT SHARE IN THE OPERATION OF THE BULK FUEL FACILITIES AT THE ANCHORAGE INTERNATIONAL AIRPORT.

  VARIOUS NORTHWEST REFINERIES HAVE BEEN THE SOURCE, BUT ARCO HAS HISTORICALLY BEEN THE MAIN SOURCE.

- 6000 BARRELS PER DAY SHIPPED IN BY CHEVRON. THIS IS FOR THEIR OWN MARKETING SYSTEM AND IS GENERALLY SUPPLIED FROM THEIR RICHMOND, CA. REFINERY WITH OCCASIONAL FOREIGN CARGOES SUPPLEMENTING.

THE CONSTANT SHORTFALL CREATES AN OPPORTUNITY FOR THE PETRO STAR JOINT VENTURE THAT STILL REMAINS LARGELY UNTAPPED AND CONTINUES TO GROW. THE ALASKA DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL AND GAS PROJECTIONS SHOW JET DEMAND GROWING FROM 733,000,000 GALLONS ANNUALLY IN 1994 TO 950,000,000 GALLONS ANNUALLY IN 2004. THAT BECOMES 14,155 BARRELS PER DAY OF NEW JET A DEMAND TEN YEARS FROM NOW. (SEE TABLE 7 A)

IN ADDITION HARBOR ENTERPRISES CONTINUES TO ACQUIRE NEW LOCATIONS AND IS A HIGHLY ACTIVE MARKETER OF #2 DIESEL. THEIR OPERATIONS AT SEWARD, DUTCH HARBOR AND KODIAK CONTINUE TO SELL LARGE VOLUMES AND ARE WELL POSITIONED.
I THINK IT IS SAFE TO ASSUME THAT THEY WILL CONTINUE TO GROW THROUGH ACQUISITION AND WILL EXPAND INTO THE SOUTHEAST TO THE EXTENT THAT TRANSPORTATION ECONOMICS WILL PERMIT.

THE ALASKA DNR PROJECTION FOR DIESEL GROWS FROM 496,000,000 GALLONS IN 1994 TO 543,000,000 GALLONS IN 2004. THAT INCREASE IS 3,066 BARRELS PER DAY OF NEW DEMAND TEN YEARS FROM NOW. (SEE TABLE 7A)

WE NEED TO REMIND OURSELVES THAT THE PETRO STAR EXPANSION WE ARE PREDICTING IS IN REALITY AN ADDED 20,000 BD OF CRUDE FEED STOCK TIMES 24% OR 4800 BD OF REFINED PRODUCTS.

THE MOVE UP FROM 7200 BD TO 12,000 BD OF REFINED PRODUCTS ISN'T ANYTHING THAT WILL OVERWHELM THE MARKET. PRICING SHOULD REMAIN STABLE AND COMPETITORS ARE NOT LIKELY TO OVER REACT AND INITIATE A BIDDING WAR FOR VOLUME THAT REMOVES THE ECONOMIC INCENTIVE TO SUSTAIN THE REFINERY RUNS AT THE 50,000 BD LEVEL.

THE OPPORTUNITIES BRIEFLY OUTLINED ABOVE WILL PROVIDE A HOME FOR THE ADDITIONAL REFINERY OUTPUT UP TO 50.000 BARRELS PER DAY AND REINFORCE MY BELIEF THAT THE EXPANSION TO THAT LEVEL WILL TAKE PLACE.

ONCE THE ADDED CAPACITY IS AVAILABLE THE ACTUAL RUN LEVELS AND THE ATTENDANT NEED FOR ADDITIONAL ELECTRICAL POWER WOULD PROBABLY RAMP UP OVER A PERIOD OF SIX MONTHS TO ONE YEAR.

PERMITTING REQUIREMENTS

PETRO STAR DID ADVISE THAT ANY EXPANSION BEYOND THE CURRENT LEVEL OF 30,000 BARRELS PER DAY WOULD REQUIRE A NEW AIR QUALITY PERMIT FROM THE A.D.E.C. AND A NEW CONDITIONAL USE PERMIT FROM THE CITY OF VALDEZ.

THEY ARE VERY AWARE THAT NO PERMITTING PROCESS OR REGULATORY AGENCY CAN BE TAKEN FOR GRANTED AND I THINK IT IS SAFE TO SAY THEY WOULD PROBABLY ALLOW PLENTY OF LEAD TIME SO THAT THE EXPANSION FROM 30,000 BARRELS PER DAY TO 50,000 BARRELS PER DAY GOES AS SMOOTHLY AS POSSIBLE AND EXPERIENCES NO EXPENSIVE DELAYS.

CAPITAL REQUIREMENTS

THE SCOPE OF THE STUDY AND THE TIME FRAME FOR ACCOMPLISHING IT DO NOT PERMIT A DETAILED LOOK AT THE COSTS INVOLVED IN EXPANDING THE REFINERY, BUT HERE ARE SOME GENERAL RULES OF THUMB THAT HELPED GUIDE ME TO MY CONCLUSIONS OF A PROBABLE YES FOR A MOVE UP TO 50,000 BD AND A PROBABLE NO FOR ANY SIGNIFICANT EXPANSION BEYOND THAT.

WITH THE PRESENCE OF AN OVERSIZED CRUDE TOWER AND OTHER BASIC EQUIPMENT IN PLACE I FEEL THAT THE PLANT CAN PROBABLY EXPAND FOR A COST OF $400 - $500 PER BARREL OF CAPACITY. THEY MIGHT EVEN GET TO 55,000 BD FOR THAT KIND OF INVESTMENT.

BEYOND THAT LEVEL YOU ARE , IN REALITY, BUILDING A NEW PLANT THAT DUPLICATES MUCH OF WHAT YOU ORIGINALLY DID. IF YOU TOOK THE EXTREME CASE AND SAID THAT THE PLANT WOULD TRIPLE IN CAPACITY, YOU WOULD NEED TO ADD 40,000 BD AT A COST THAT IS PROBABLY IN THE RANGE OF $ 1900 PER BARREL, OR A NEW INVESTMENT ON THE ORDER OF $ 76,000,000.

KEEP IN MIND THAT THIS DOES NOT EVEN ADDRESS THE COST OF " OFF SITES " SUCH AS ADDED PIPES ,PUMPS, PRODUCT STORAGE TANKS LARGE ENOUGH TO PERMIT THE ACCUMULATION OF EXPORT SIZE CARGOES AND A FULL BLOWN MARINE TERMINAL THAT WILL ACCOMMODATE OCEAN GOING VESSELS.

ADD TO ALL OF THAT THE WORKING CAPITAL REQUIRED TO CARRY INVENTORY WHILE BUILDING A FULL CARGO AND THE MONEY TIED UP IN THE ACCOUNTS RECEIVABLE THAT GO ALONG WITH THAT LEVEL OF BUSINESS AND YOU HAVE A FORMIDABLE MONEY

CHALLENGE TO OVERCOME BEFORE YOU EVEN TAKE THE FIRST STEP INTO THE INTERNATIONAL ARENA.

ALL THINGS CONSIDERED, I FEEL THAT ANY CHANCE OF A SIGNIFICANT EXPANSION BEYOND 50,000 BARRELS PER DAY IS NOT LIKELY TO HAPPEN.

CHANGES IN BUSINESS ENVIRONMENT OR OWNERSHIP

THERE IS ONE CAVEAT AND THAT IS THAT A MAJOR REFINING AND MARKETING COMPANY COULD BECOME INTERESTED AND BUY OUT THE CURRENT PARTNERS. IF THAT WERE TO HAPPEN WE GO BACK TO SQUARE ONE WITH A WHOLE NEW SET OF CIRCUMSTANCES.

A NEW AND LARGER COMPANY MIGHT NOT FIND THE CAPITAL REQUIREMENTS QUITE SO FORMIDABLE AND COULD POSSIBLY HAVE EXISTING REFINING CAPACITY ELSEWHERE WITH A HIGHER DEGREE OF SOPHISTICATION . THAT PLANT MIGHT BE ABLE TO TAKE AN UNFINISHED STREAM CURRENTLY BEING RETURNED TO THE PIPELINE AND PROCESS IT INTO PROFITABLE FINISHED PRODUCT.

EVEN THEN REGULATORY ISSUES, PERMIT REQUIREMENTS AND TRUE MARKET NEEDS MUST BE CAREFULLY EXAMINED. THE ACCESS TO CAPITAL ALONE IS NOT ENOUGH ASSURE SUCCESS AS AN EXPORT REFINERY.

THIS ASSESSMENT IS BASED ON THE JOINT VENTURE AS PRESENTLY STRUCTURED AND WITH THE CURRENT PARTNERS IN PLACE.

COMPETITIVE ENVIRONMENT

THE REACTION AND LIKELY BEHAVIOR OF PETRO STAR VALDEZ REFINERY'S COMPETITORS NEEDS TO BE ASSESSED.

- WHAT ARE THEY LIKELY TO DO IN THE FACE OF AN EXPANSION TO 50,000 BD

  I WOULD ANTICIPATE VERY LITTLE REACTION FROM EITHER MAPCO OR TESORO. THEIR MARKETING AND DISTRIBUTION PATTERNS ARE NOT LIKELY TO BE UPSET IN ANY SUBSTANTIAL WAY.

- WHAT REACTION CAN BE EXPECTED IN THE FACE OF ANY ANNOUNCED INTENTION TO MOVE BEYOND 50,000 BD.

  I WOULD ANTICIPATE THAT TESORO, IF THEY HAD NOT ALREADY DONE SO , WOULD IMMEDIATELY REEVALUATE IT'S " MARKET DRIVEN " PHILOSOPHY TO BE SURE THAT THERE IS NOT SOME NEW OPPORTUNITY THAT COULD BE SERVED UTILIZING ANY UNUSED CAPACITY AT THEIR KENAI REFINERY.

IT WOULD BE UNREALISTIC TO ASSUME THAT EITHER MAPCO OR TESORO WOULD STAND IDLY BY LET A SECOND EXPANSION GO UNCHALLENGED IN THE MARKETPLACE.

- ADVANTAGE PETRO STAR HAS BY RETURNING THE BOTTOM OF THE BARREL TO THE ALYESKA PIPELINE.

  ACTUAL DOLLARS ARE DIFFICULT TO ASSESS AT THIS TIME SINCE THE FEDERAL REGULATORS ARE CURRENTLY IN THE PROCESS OF CHANGING THE QUALITY BANK CALCULATION. (THE VEHICLE FOR ASSESSING VALUE CHANGE BETWEEN WHOLE CRUDE AND THE TOPPED RETURN OIL.)

  HISTORICALLY THE ADVANTAGE HAS BEEN CONSIDERABLE FOR THE REFINER WHO DID NOT HAVE TO DEAL WITH RESIDUAL FUEL OIL AND AN ESTIMATE OF $1.50 TO $2.00 PER BARREL WOULD NOT BE EXCESSIVE.

- ADVANTAGE TESORO HAS WITH EXCESS REFINING CAPACITY, AND AN IN-PLACE OPERATING MARINE TERMINAL.

  HAS EXISTING, PERMITTED AND PAID FOR REFINING CAPACITY.

  HAS EXISTING INTERNATIONAL MARKET CONTACTS AND EXPERTISE.

  NO NEED TO BUILD A NEW MARINE TERMINAL OR STORAGE.

  ALL OF THE ABOVE MEAN THE POTENTIAL FOR A SPEEDY REACTION TO NEW OPPORTUNITIES IF DECISIVENESS AND THE COMPETITIVE MIND SET IS PRESENT.

REGULATORY ENVIRONMENT

EXPECTATIONS FOR NEW STATE OR FEDERAL REQUIREMENTS THAT WILL IMPACT THE VALDEZ PLANT.

SHIPPING AND TERMINALLING REGULATIONS

POST EXXON VALDEZ REGULATIONS, INSURANCE AND FINANCIAL RESPONSIBILITY REQUIREMENTS ARE BECOMING MORE BURDENSOME BY THE MONTH. (SEE ATTACHED ARTICLE FROM THIS WEEKS ALASKA JOURNAL OF COMMERCE.) THIS TREND WILL CONTINUE AND IT WILL DISCOURAGE SHIPPERS, LENDERS AND TERMINAL OPERATORS WHEN CONSIDERING SUBSTANTIAL INVESTMENT IN NEW FACILITIES.

PRODUCT REGULATIONS

THE MAJOR CHANGES IN THIS AREA HAVE ALREADY TAKEN PLACE. FUTURE SPECIFICATION CHANGES WILL OCCUR, BUT THEY ARE EXPECTED TO BE "FINE TUNING" RATHER THAN MAJOR ADJUSTMENTS. THE STATES OF CALIFORNIA, OREGON AND WASHINGTON WILL HAVE TO BE CAREFULLY WATCHED, SINCE CHANGES IN REFINED PRODUCT SPECIFICATIONS IN THOSE STATES COULD TEND TO BACK EXCESS BARRELS INTO THE ALASKA MARKET AND DRIVE DOWN PROFIT MARGINS AND THE INCENTIVE TO RUN REFINERIES AT HIGHER THRUPUT LEVELS.

Established 1976 Week of February 28, 1994

Oil Pollution Act prompts loud outcry

By Kristen Nelson
For the Journal of Commerce

Federal authorities attempting to implement oil spill financial responsibility requirements of the Oil Pollution Act of 1990 are prompting a chorus of outrage and disaster predictions.

The U.S. Department of Interior Minerals Management Service, in testimony in Anchorage Feb. 16, heard a forecast of dire consequences from representatives of state and local government, Native corporations, rural electric utilities, the fishing and transportation industries, and rural residents.

Federal officials were told about the lights and heat and power being turned off in much of Alaska, and about a statute so poorly crafted that it could do those things—or alternatively about an agency discussing regulations far beyond the scope of Congressional intent.

At issue was implementation of the oil spill financial responsibility requirements of the Oil Pollution Act of 1990.

Minerals Management began with an advance notice of proposed rule making. William S. Cook, chief of the Minerals Management Inspection and Enforcement Branch said the agency does not have the option of not writing regulations, and is prohibited by law from lobbying Congress for changes in the act.

At first it seemed straight-forward,

Continued on Page 4

Pollution Act prompts dire forecast

Continued from Page 1

Cook said. The Oil Pollution Act of 1990 had raised the financial responsibility requirement from $35 million per facility to $150 million per facility. Minerals Management has traditionally dealt with large oil and gas facilities on the outer continental shelf, and the companies running those operations would be able to meet the new requirement, Cook said.

But the act did more than raise the dollar amount. It also extended the financial responsibility requirement from outer continental shelf waters to all the navigable waters in the U.S. Navigable waters, the agency noted in its August advanced notice of proposed rule making, traditionally have been interpreted to include oceans, coastal waters, rivers and streams, and most lakes.

The real kicker came when Interior lawyers advised Minerals Management that navigable waters must be interpreted to include wetlands, Cook said.

Facilities are defined in the act as all structures, equipment, or devices, other than vessels and deep water ports, used for the purposes of exploring for, drilling for, producing, storing, handling, transferring, processing, or transporting oil, the agency said.

And the act placed no minimum on the volume of oil handled, which, combined with the navigable waters and broad facilities description opened up the possibility that almost anyone storing or moving fuel in Alaska would have to demonstrate $150 million in financial responsibility.

One school of thought holds that Minerals Management has the flexibility to write regulations which will make financial responsibility work as legislated; the other holds that the financial responsibility portion of the act is unworkable, requiring a legislative fix, Cook said. Those testifying were divided on who should do the fixing; all agreed fixing was needed.

A legislative fix is opposed by both large oil companies and environmental groups, the one fearing more regulations would be added and the other fearing the act would be gutted, Cook said.

Minerals Management has twice extended its public comment period, now slated to close Feb. 28, and hopes to have a proposed rule published by fall, Cook said. More public hearings would follow and a notice of final rule making would be issued in 1995, he said.

Kristen Nelson is the Alaska correspondent for Petroleum Information Corp.

Appendix L

ECONOMIC ANALYSIS METHODOLOGY ISSUES

Focusing the analysis only on the winners leads to the "Chilkoot Charlie's" rule of cost-benefit analysis: "We cheat the other guy and pass the savings on to you." In the long run this stifles economic growth for the State as a whole. That is why economists, ourselves included, typically favor a broad social perspective for feasibility studies of publicly funded projects; one which avoids treating subsidies as benefits and which includes the costs borne by all affected parties.

If you have any further questions about these issues, please do not hesitate to contact us.

Sincerely,

Scott Goldsmith
Professor of Economics

Steve Colt
Adjunct Professor of Economics

comparison of expected benefits and costs to CVEA, a benefit-cost analysis conducted from the perspective of the State of Alaska must consider all benefits and costs that would be borne by Alaskans. This would necessarily include any costs expected to be paid from the State treasury as well as costs expected to be paid directly by CVEA consumers."

The feasibility study was required by the State legislature as a condition of releasing a State appropriation, and was required to be conducted according to State statutes and regulations governing the conduct of such studies. No feasibility study ever conducted under these statutes and regulations assumed a reduced project cost based on a presumed State contribution. For example, the State paid for the Anchorage-Fairbanks intertie with 100% State grants amounting to about $120 million, but the feasibility study did not assume a zero-cost intertie. The cost for purposes of assessing economic feasibility was estimated at about $120 million. Neither the Susitna nor Bradley Lake feasibility studies assumed reduced project costs based on the anticipated State contributions to these projects.

Including any amount of State contribution on the "cost" side of the ledger says nothing about the political probability of applying the $35 million to another project. The point is, the full cost of the project should be counted whether it is paid by utility consumers paying off debt service or whether it is State government making payments out of the State treasury. Whether the Legislature would ever re-appropriate the $35 million for another project is irrelevant to this issue.

2. As we have previously discussed, the Allison Lake project would consist of a tunnel leading from Allison Lake to the Solomon Gulch reservoir, and a new powerhouse at the outlet of the tunnel. Water from Allison Lake would be used twice to generate power: once as it exits the tunnel and runs through the new powerhouse, and again as it passes through the existing Solomon Gulch powerhouse. Roughly half of the additional 27 million kWh of energy production comes from the new powerhouse and the other half occurs because of the additional water supplied to the existing Solomon Gulch turbines. The total cost of the tunnel and new powerhouse is about $32 million; while no additional capital, operating, or maintenance cost is incurred as a result of passing the additional water through the existing turbines. The total cost to produce the additional 27 million kWh is therefore the $32 million capital cost of the project plus the O&M associated with the new facilities.

   The Four Dam Pool power sales agreement specifies a wholesale power rate for firm energy production from Four Dam Pool facilities, including Solomon

Gulch. That rate is presently 6.4 cents/kWh, including a 4.0 cent/kWh payment to the State for debt service on the initial State loan and a 2.4 cent/kWh payment to cover O&M costs for the four pooled projects. CVEA's argument is that the Four Dam Pool power sales agreement will require that each additional kWh produced at the Solomon Gulch powerhouse will cost CVEA an additional 6.4 cents/kWh (or whatever the wholesale rate is at the time), in addition to the Allison Lake capital and O&M costs. The economic analysis in the draft feasibility study does not add this additional 6.4 cents/kWh to the Allison Lake costs.

It is not clear what, if any, additional charge would be made for this additional Solomon Gulch output per application of the Four Dam Pool power sales agreement. Without getting into a discussion here about what the possibilities might be, let's assume that the full 6.4 cent/kWh rate were charged for the additional output from the Solomon Gulch powerhouse. Of this amount, 4.0 cents would come to the State treasury as an additional debt service payment, and the other 2.4 cents would offset a portion of O&M costs that would otherwise be paid by other Four Dam Pool ratepayers. In other words, while the 6.4 cent charge would constitute an additional cost to CVEA consumers, it would provide an equivalent monetary benefit to other Alaskans: i.e. the State and the other Four Dam Pool consumers. From the Alaska perspective, it would not be an additional cost on the cost side of the ledger, but rather a transfer of benefits from CVEA consumers to other Alaskans.

A similar issue is presented with respect to the profit margins that Anchorage utilities would be expected to charge for energy sold to CVEA over the intertie. These margins are not included in the economic analysis as a cost of the intertie scenario, because they do not represent any additional net cost to Alaskans but rather are transfers from CVEA to Anchorage area utility consumers. In the financial analysis, however, wherein rates to CVEA consumers are estimated rather than lifecycle costs to Alaskans, these margins are added in.

A similar issue also arose in the Tyee-Swan feasibility study conducted under these same statutes and regulations two years ago. The intertie would provide surplus power from Tyee to Ketchikan, where it would displace diesel generation. For the economic analysis, the cost of producing the surplus power at Tyee was assumed to be zero -- no additional capital or labor is needed to generate the power, and any additional charges added on per the Four Dam Pool power sales agreement would represent transfers internal to Alaska rather than net costs. For the Tyee-Swan financial analysis, however, the wholesale power cost of additional generation at Tyee Lake was assumed to be zero in

COPPER VALLEY ELECTRIC ASSOCIATION, INC.
P.O. BOX 45 GLENNALLEN, ALASKA 99588-0045

Glennallen (907) 822-3211
Valdez (907) 835-4301
Telefax # (907) 822-5586

January 31, 1994

MEMORANDUM

SUBJECT: SUTTON-GLENNALLEN INTERTIE FEASIBILITY STUDY

Prepared by Clayton Hurless, General Manager
Copper Valley Electric Association, Inc.

A thorough review of the draft of the Sutton-Glennallen intertie feasibility study recently released by R.W. Beck and Associates of Seattle, Washington, has revealed some significant findings that dramatically change the result of the economic analysis for the proposed intertie project.

The most significant finding is the omission from the primary economic analysis and executive summary of a substantial cost associated with the Allison Lake alternative. Water from Allison Lake would be diverted into the Solomon Gulch (SG) reservoir via a two mile tunnel and run through a 3 mw generator just prior to entering Solomon Lake. Approximately one-half of the energy, or 13,500 mwh, would be produced by this turbine. The other one-half of the energy would be produced by using the water again through the existing facilities at the Solomon Gulch generating plant at a current cost of 6.4¢/kwh (see Exhibit 1).

The Solomon Gulch project is one of four hydroelectric generating projects owned by the State of Alaska that are pooled into an operating group called the Four Dam Pool (FDP). The other projects are Terror Lake on Kodiak Island, and Tyee and Swan Lakes, both in Southeast Alaska. The FDP Group is managed by the Four Dam Pool Project Management Committee (FDP-PMC). There are six members on the PMC, one each from Ketchikan, Wrangell, Petersburg, Kodiak Electric Association, CVEA, and the State of Alaska. The members of the FDP are tied together by a series of complex, long-term contracts and agreements that expire in 2030. All of the utilities pay a levelized 6.4¢ for all power produced at the projects. 2.4¢/kwh of the total cost covers maintenance and operation of the projects with the balance going to the State of Alaska as repayment for their investment in the projects. Any significant change of contract terms requires the unanimous approval of all members.

The Solomon Gulch Project has been a net beneficiary of the cost pooling arrangement every year since the inception of the group in 1985. The benefit has ranged from $250,000 to $400,000 annually. This benefit is a subsidy from the other projects, primarily Terror Lake but with some contribution by Ketchikan, which has reduced the rates CVEA's members would have had to pay by that amount.

The feasibility study project manager for the Division of Energy, has opted not to include the cost of running the power through the Solomon Gulch facilities in the primary economic analysis on the premise that from the State perspective there is not an incremental cost because the Solomon Gulch facilities are in place. There is no precedent of such a contract modification. It is a preposterous stretch of the imagination that the other FDP members would agree to allow CVEA, who has been subsidized by their consumers for years, to run the water from Allison Lake through Solomon Gulch at no charge and continue to subsidize CVEA's costs, particularly at a time when a general rate increase for the FDP projects is imminent. When this unavoidable cost is included in the Allison Lake analysis, it substantially increases the annual cost and the Net Present Value of the project well above that of the intertie.

The Division of Energy has also refused to consider the benefit of the long-term, zero-interest loan authorized and appropriated by the 1993 Legislature in the Intertie analysis even though the legislators have made it absolutely clear the money is available for only that one purpose.

CVEA has requested R.W. Beck to prepare a revised NPV comparison out of the draft study that reflects the change in project comparison values considering the above two indisputable facts and the outcome speaks for itself. The Intertie is the least cost alternative from an economic perspective as well as the only project that provides the necessary capacity to serve the long term needs of CVEA's service area with competively priced energy.

by the group requesting the study. In this case it appears that the Legislature expects a statewide perspective since it is conditioning the release of the State's contribution on the proper completion of the study. Past feasibility studies, such as that of the Anchorage-Fairbanks intertie, used a statewide perspective and did not use State contributions to offset costs.

A project which is economically feasible from a statewide perspective provides net benefits which can theoretically be shared by all citizens. But a project which is *not* feasible from a statewide perspective can only be made feasible to a subgroup if the statewide losers give up more than the winners in the subgroup gain. In the long-run, focusing on the winners as the only group that matters stifles economic growth for the state as a whole.

Discussion

Issue 1: Is the price to CVEA of Allison Lake power generated by Solomon Gulch turbines a valid cost of the Allison Lake project?

Mr. Hurless' first point is that if the Allison Lake project is built, CVEA ratepayers would have to pay a price of 6.4 cents/kwh for the portion of the power from that project which is generated by water flowing through the existing Solomon Gulch turbines. This may or may not turn out to be the case, depending on if and how the contracts were interpreted or re-negotiated to accomodate the unique circumstances of the Allison Lake project. However, no matter what price CVEA ratepayers end up paying for this power, the incremental *resource cost* to the citizens of the State of Alaska is zero. That is, no additional labor, capital, or materials are needed to generate this power beyond those already accounted for as part of the Allison Lake project cost.

Where would the CVEA payments for this Allison/Solomon power go? The answer, of course, is that they would contribute to a faster repayment of the State's capital investments in the four dam pool, and would reduce the required O&M payments by other four dam pool ratepayers. In short, these payments would be transfers from CVEA ratepayers to the State's general fund and/or to the other four dam pool ratepayers. A transfer is a cost to those who give up funds, but a benefit to those receiving the funds.

Note that if CVEA were a statewide utility, its revenue requirements would not change as a result of running more water through the Solomon Gulch turbines, and it would not be arguing that the 6.4 cents per kWh for this power was a "cost" of the Allison Lake alternative.

Issue 2: Should the $35 million state loan be treated as a free gift which offsets

the cost of the intertie but not the cost of other projects?

Mr. Hurless' second point is that because the Legislature targeted a $35 million zero-interest loan for the Sutton-Glenallen intertie, these economic resources should be regarded as a "free gift" which can be used only for the intertie, effectively reducing its cost by about $25 million ($25 million is the approximate value today of the opportunity to borrow $35 million interest-free with a 50-year payback period).

This argument is certainly not valid if the benefits and costs being counted are those to all Alaskans. The rest of Alaska is giving up $25 million so that CVEA can have cheaper power. Giving up $25 million is a cost, and cheaper power is a benefit. The purpose of a feasibility study is to weigh one against the other, not to ignore costs and count benefits.

The argument is also not valid even if the perspective for analysing the project were limited to the Copper Valley *region* rather than the state as a whole. Assuming that residents of the region are earmarked as the beneficiaries, the energy production alternatives should still be analysed on an equal playing field so that the most economically efficient project is chosen. Therefore, even under the narrow view that only CVEA consumers matter, the $25 million should be used to reduce the calculated cost of all alternatives, including the diesel base case. If this is done, the results of the analysis are unchanged from those in the current draft report.

Which Costs and Benefits Should be Counted?

The general issue raised by Mr. Hurless' arguments is: What is the appropriate perspective from which to count costs and benefits? The feasibility study adopts -- and correctly applies --the perspective of all the citizens of Alaska. From this perspective, the rates charged for Allison/Solomon power do not count as project costs. The relevant cost is the incremental resource cost, which equals zero.

Mr. Hurless is arguing that the only costs and benefits which matter are those to CVEA ratepayers. If this perspective were adopted, then the price of Allison Lake/Solomon Gulch power would be a cost, while the benefit of lower rates for other four dam pool members would not count at all. But even from this narrow perspective, the $25 million State contribution should not be used to offset the cost of the intertie only.

If a project is economically feasible for all Alaskans taken together, then it is economically possible to share the net benefits with all members of that group. However, if a project is not feasible for the larger group, then the *only* way it can be feasible for a smaller sub-group, such as CVEA ratepayers, is for other Alaskans to give up more in subsidies than the CVEA ratepayers gain.

one case and 6.4 cents/kWh in another -- exactly the same methodology used thus far with respect to additional generation from Solomon Gulch.

The methodology with respect to these two issues is correct as presented in the economic analysis of the draft feasibility report. Yet both issues are relevant in looking at the rates that CVEA consumers would be expected to pay under the alternative scenarios. As a result, both issues are considered explicitly in the "cost of power" section of the feasibility study and will be considered explicitly in the Plan of Finance.

Finally, I consulted with economists at ISER whom I have worked with in the past on cost-benefit studies to check on the logic of the methodology. Attached is their letter supporting the methodology used in the draft feasibility study, going over many of the same points raised above.

Attachments

UNIVERSITY OF ALASKA ANCHORAGE

3211 Providence Drive
Anchorage, Alaska 99508

SCHOOL OF PUBLIC AFFAIRS

INSTITUTE OF SOCIAL AND
ECONOMIC RESEARCH
(907) 786-7710 FAX (907) 786-7739

February 11, 1994

Mr. Richard Emerman
Senior Economist, Division of Energy
Alaska Department of Community and Regional Affairs
333 W 4th Avenue
Anchorage AK 99501

Dear Mr. Emerman:

This letter is to clarify some concepts of cost-benefit analysis which bear on the interpretation of the Sutton-Glenallen Intertie Feasibility Study. These concepts relate to two arguments made by Mr. Clayton Hurless in his memorandum dated January 31, 1994. First, Mr. Hurless argues that the rates CVEA would have to pay for Allison Lake water run through existing Solomon Gulch turbines should be counted as a cost of the Allison Lake alternative, even though the generation of this power would not consume any additional economic resources. Second, he argues that the $35 million dollar interest-free loan allocated by the Legislature to the intertie should be counted as an offset to the cost of the intertie, but not counted as an offset to the costs of any other alternative.

Summary

Neither of Mr. Hurless' proposed adjustments to the economic analysis are valid if the study's goal is to measure costs and benefits to all Alaskans. From this statewide perspective, the study is correct as it stands.

If one adopts the view that the only costs and benefits that count are those faced by CVEA ratepayers, then Mr. Hurless' first argument would be correct if current rate formulas were applied to Allison/Solomon power. The contractual rates paid for Solomon Gulch power are a cost to CVEA ratepayers, and the resulting reduction in rates paid by other members of the four dam pool do not matter to CVEA ratepayers.

Even from the narrow perspective of CVEA ratepayers, however, Mr. Hurless' second argument is incorrect. The $35 million State loan should be counted as an offset to *all* of the alternatives, not just the intertie. Allocating the funds to any economically viable project serving CVEA ratepayers would provide them $35 million in benefits. If the funds were not used for the intertie, they would still be available for other projects -- even non-energy related -- within the region.

The choice of an accounting perspective for a cost-benefit analysis should be determined

Table X-3
Summary of Economic Analysis
Cumulative Present Value of Comparable System Costs
($000)

Resource Scenario	Load Forecast Scenario: High	Medium-High(1)	Medium-Low(1)	Low
All Diesel Case	125.711	96.616	75.584	57.566
Intertie Case (2)	77,250	61,665	50,029	30,375
Allison Lake Case (3)	125,903	98,264	77,399	52,597
Silver Lake A Case	116.763	88.450	70.055	60.619
Silver Lake B Case	117.493	89.011	72.125	64.964
Coal Facility Case	129.399	101.361	84.176	59.783
Conservation Case	-	95.847	75.006	-

(1) The medium-high and medium-low cases vary only in the estimated energy requirements of the Petro Star refinery.
(2) Adjusted to reflect benefit of $35 million, 0-interest loan
(3) Includes 6.4¢ kwh cost of generation at Solomon Gulch

The results of the economic analysis are highly sensitive to adjustments in the forecasted load growth in CVEA's service area. Many assumptions and estimates have been used in developing the economic analysis and it must be acknowledged that if conditions are different than those that were assumed, the outcome of the analysis would be different. In addition to load growth, other factors which could significantly affect the economic analysis include the capital cost estimates of the various resources including the Intertie, the cost of fuel, the cost of power to be purchased by CVEA from Anchorage utilities and the amount of energy available from the Solomon Gulch Project. For the purpose of evaluating the impacts of varying certain of these assumptions, a sensitivity analysis was conducted. Table X-4 summarizes the results of the sensitivity analysis.

Table X-4
Sensitivity Analysis
Cumulative Present Value of Comparable System Costs(1)
($000)

Resource Scenario	Alternative Fuel Price Scenario: High	Medium	Low	Low Solomon Gulch Project Energy(2)
All Diesel Case	104.599	96.616	81.539	106.007
Intertie Case	83.543	79.076	70.616	83.755
Allison Lake Case	91.954	87.059	77.801	94.606
Silver Lake A Case	91.554	88.450	82.545	95.996
Silver Lake B Case	91.663	89.011	83.954	96.666
Coal Facility	102.470	101.361	99.243	108.167

(1) All cases shown assume medium-high load growth scenarios.
(2) Assumes energy available from the Solomon Gulch Project is limited to 21,000 MWh during the Winter Season, October through May, rather than 26,000 MWh as assumed for the base case assumptions. Assumes medium fuel price escalation.

February 16, 1994

To: Herv Hensley
Director

From: Dick Emerman
Senior Economist

Subject: Copper Valley Intertie Economics -- Reply On Two Issues

The attached memorandum from Clayton Hurless dated January 31, 1994 contains two major criticisms of the economic analysis conducted for the Copper Valley Intertie Feasibility Study:

1. That the subsidy value of the $35 million, zero-interest loan appropriated by the Legislature should be deducted from the cost of the intertie but should not be deducted from any other alternative.

2. That the cost of the Allison Lake alternative should be increased on the assumption that any additional energy produced by running Allison Lake water through the existing Solomon Gulch turbines should be assessed the contract wholesale power rate according to the Four Dam Pool power sales agreement.

These two criticisms are repeated in the attached memorandum from Representative Harley Olberg to All Legislators dated February 7, 1994. The study methodology is correct, however, as explained below:

1. While Copper Valley Electric Association (CVEA) looks at project feasibility strictly from the perspective of its consumers, the Division of Energy looks at project feasibility from the overall Alaska perspective. CVEA would total up all the costs and benefits of the project that accrue to CVEA members, while the Division totals up all the costs and benefits of the project that accrue to Alaskans.

   To CVEA members, the value of the State contribution is not a cost. They do not need to recover it in their rates -- for all practical purposes, they will not pay it. However, the value of the State contribution is absolutely a cost to Alaskans generally -- these are public funds from the State treasury. This is stated in the draft feasibility study (p.X-14):

   > "The Division's reasoning is that, although a benefit-cost analysis conducted solely from the perspective of CVEA consumers would be limited to