Pre-Application Document

Susitna-Watana Hydroelectric Project

FERC Project No. 14241

Alaska Energy Authority

ALASKA ENERGY AUTHORITY

December 2011

VOLUME II OF II

APPENDICES

APPENDIX 4.4-1

EXISTING WATER QUALITY DATA FOR THE SUSITNA RIVER AND TRIBUTARIES

APPENDIX 4.4-1. Existing Water Quality Data (Conventional Parameters) for the Susitna River and Tributaries, Part 1 of 2.

Station Name	Station Susitna River Mile*	Original Data Source	USGS Station Code	Most Recent Sample Date[t]	Years of Record	Season	Mean Instantaneous Discharge (cfs)	Water Quality Parameters										
								Conventional										
								Temp (°C)	DO (mg/L)	Orthophosphates (mg/L)	Nitrate Nitrogen (mg/L)	Bedload Discharge (ton/day)	Suspended Sediment Discharge (ton/day)	Turbidity (NTU)[w]	TSS (mg/L)	Suspended Sediment Load (tons/yr)	TDS (mg/L)	Conductivity (umhos/cm)
Denali	290.8	USGS	15291000	7/25/1986	29	Winter	209	≈0		≤ 0.1	0.05		17			2,965,500		≈351
						Spring	2860	0-8		≤ 0.1	0-0.07		up to 75,000	≈20				121-467
						Summer	7507	2-10.6		≤ 0.1	0-0.09		up to 186,000	45-350				123-205
						Fall	2381	0-5.2		≤ 0.1			up to 12100					≈226
Paxson (MacLaren R.)	259.8	USGS	15291200	7/25/1975	17	Winter				≤ 0.1								
						Spring	2344	0-11.0		≤ 0.1	≈0.09		up to 10,400					100-182
						Summer	2396	0.5-10		≤ 0.1	0-0.34		up to 16,000	90-190				84-170
						Fall	680	0.5-3.5		≤ 0.1	≈0.07		up to 192					≈144
Vee Canyon[u]	223.1	USGS	15291500	7/30/1986	24	Winter	1000	≈0		≤ 0.1			≈19			2,965,500		
						Spring	13000	0-10		≤ 0.1	0.02-0.16		up to 175,000					91-250
						Summer	14437	4.0-13	11.5-12.0	≤ 0.1	0-0.25		up to 196,000					125-187
						Fall	4872	1-5.5		≤ 0.1	≈0.88		up to 2,070					≈174
Vee Canyon	223.1	R&M				Winter		≈0		≤ 0.1				0		6,898,000		
						Summer				≤ 0.1				320-720				
Mainstem Susitna at Watana Dam Site	184.2	APA and ADF&G		10/16/1985	1	Winter												
						Spring		3.7-9.0										
						Summer		1.9-14.4	9.9-11.6									
						Fall		0-4.0	11.5									
Watana Damsite	183	R&M				Winter		≈0		≤ 0.1				0				
						Summer				≤ 0.1								
Mainstem Susitna D/S of Devil's Canyon	150.1	APA and ADF&G		10/16/1985	1	Winter												
						Spring		5.5-8.6										
						Summer		2.6-15.1										
						Fall		0.5-4.3										
Mainstem Susitna U/S of Portage Creek	149.4	APA and ADF&G		10/9/1985	1	Winter												
						Spring												
						Summer			10.9-14.8					45-200	52-482			
						Fall			12.3-13.8					4.2-8.2	7.5-12			
Mainstem Susitna at LRX 53	140.1	APA and ADF&G		10/17/1985	1	Winter												
						Spring		5.5-8.5										
						Summer		2.8-15.0										
						Fall		0-6.7										
Gold Creek	136.6	USGS	15292000	9/23/1986	37	Winter	1884	0	10.9-16.2	0.03-0.09	0.15-0.16		2.9-18	0.1-0.7				260-279
						Spring	19931	0-13.0	11.6-14.7	≤ 0.031	0.05-0.69		up to 197,000	.01-50				70-286
						Summer	54810	4.5-14.1	8.5-12.7	0-0.184	0.02-0.25	350-1970	up to 250,000	23-290				87-227
						Fall	6160	0-6.5	11.1-13.3	0-0.061		≈1.3	up to 15,000	5.3-10				107-300
Gold Creek	136.6	R&M		9/30/1981		Winter		≈0		≤ 0.1				0		7,731,000	100-188	84-300

Station Name	Station Susitna River Mile*	Original Data Source	USGS Station Code	Most Recent Sample Date[t]	Years of Record	Season	Mean Instantaneous Discharge (cfs)	Water Quality Parameters										
								Conventional										
								Temp (°C)	DO (mg/L)	Orthophosphates (mg/L)	Nitrate Nitrogen (mg/L)	Bedload Discharge (ton/day)	Suspended Sediment Discharge (ton/day)	Turbidity (NTU)[w]	TSS (mg/L)	Suspended Sediment Load (tons/yr)	TDS (mg/L)	Conductivity (umhos/cm)
						Summer				≤ 0.1		up to 2180	up to 157,000[v]	728			55-140	75-227
Mainstem Susitna D/S of Gold Creek Bridge	135.8	APA and ADF&G		10/17/1985	1	Winter												
						Spring												
						Summer		2.8-14.9	10.3-13.7					22-220	53-592			
						Fall		0-4.8	12.3-12.5					3.6-7.9	3.7-10			
Mainstem Susitna at Curry Station	120.7	APA and ADF&G		10/17/1985	1	Winter												
						Spring		5.9-8.4										
						Summer		2.7-15.3	10.1-13.9					20-396	39-512			
						Fall		0-4.9	12-12.2					3.2-7	6.8-9			
Mainstem Susitna at Talkeetna Station	103	APA and ADF&G		10/12/1985	1	Winter												
						Spring		4.6-9.2						30-210	37-476			
						Summer		2.9-16.4	9.8-12.0					16-480	5.5-8.0			
						Fall		1.3-5.3	12-12.5					4-16				
Talkeetna[u] (Chulitna R.)	98.0	USGS	15292400	7/22/1986	28	Winter	1269	≈0		≤ 0.1	≈0		≤ 100					≈115
						Spring	11217	0-9.1		≤ 0.1	0.18-.025	up to 18300	up to 100,000					108-190
						Summer	21950	3.8-9.5		≤ 0.1	0.16-0.36	up to 13800	up to 262,000					101-144
						Fall	5533	1.6-8.0		≤ 0.1			up to 5,000	194-360				123-152
Talkeetna (Talkeetna R.)	97.0	USGS	15292700	5/18/2011	57	Winter	609	≈0	7.1-4.6	0-0.061	0.02-0.46			0.4-2.6				143-230
						Spring	6650	0-12	10.4-13.8	0-0.4	0.35-0.40			0.4-69				49-255
						Summer	10630	3.5-13.5	9.9-12.5	≤ 0.031	0.1-0.21	up to 1940 (R&M)		2-340				62-157
						Fall	3160	0.5-9.0	12.3-15.3	≤ 0.06	0.14-1.22			0.8-1.4				84-176
Mainstem Susitna above Parks Highway Bridge	86.2	APA and ADF&G		10/15/1985	1	Winter												
						Spring		4.1-8.9										
						Summer		3.6-12.8	10.5-12.3					80-400	178-751			
						Fall		0.8-5.6	11.7-12.4					19-36	60-93			
Sunshine	83.9	USGS	15292780	6/25/1986	15	Winter	4036	≈0	12.8-14.4	0.031-0.12		81		0.5-2.7				159-240
						Spring	37207	0-11	9.8-13.8	0.031-0.12		up to 13600	up to 500,000	0.16-0.2				50-242
						Summer	63740	5-14	9-13.4	0.031-0.061		up to 10000	up to 1,620,000	43-500				80-170
						Fall	25217	2.0-5.0	12.8-14.6	≤ 0.031		up to 1500	up to 25,000	≈23				112-138
Sunshine	83.9	R&M				Winter		≈0		≤ 0.1				0				
						Summer				≤ 0.1		up to 4520		up to 1056				
Skwentna (Skwentna R.)	28.0	USGS	15294300	9/11/1981	22	Winter	996	≈0		≤ 0.1			≈52					177-333
						Spring	8572	0-5		≤ 0.1			up to 40,300					≈206
						Summer	13182	5.5-12		≤ 0.1			up to 88,100	30-220				111-136
						Fall	9275	1.5-6		≤ 0.1			up to 10,500					≈177
Susitna (Yentna R.)	28.0	USGS	15294345	5/21/1986	5	Winter	2693	≈0	10.9-11.1	≤ 0.1		3.4-124	≈31					189-216

Station Name	Station Susitna River Mile*	Original Data Source	USGS Station Code	Most Recent Sample Date[t]	Years of Record	Season	Mean Instantaneous Discharge (cfs)	Water Quality Parameters										
								Conventional										
								Temp (°C)	DO (mg/L)	Orthophosphates (mg/L)	Nitrate Nitrogen (mg/L)	Bedload Discharge (ton/day)	Suspended Sediment Discharge (ton/day)	Turbidity (NTU)[w]	TSS (mg/L)	Suspended Sediment Load (tons/yr)	TDS (mg/L)	Conductivity (umhos/cm)
						Spring	26429	0-12	10.6-13.4	≤ 0.1		up to 157,000	up to 11,300					82-115
						Summer	47895	3.9-11.6	10.4-12.1	≤ 0.1		up to 13,300	up to 542,000					93-142
						Fall	16650	2.0-7.0		≤ 0.1		up to 8,220	up to 19,600					
Susitna	25.8	USGS	15294350	10/25/2003	48	Winter		≈0	9.9-12.7	≤ 0.1	0.16-0.23	≈15	29-171	1-3				180-225
						Spring		0-11.4	10.0-13.9	≤ 0.1	≈0.34	up to 15,000	up to 476,000	0.7-590				59-238
						Summer		2.5-14.8	9-12.3	≤ 0.1	0-0.23	up to 21,000	up to 1,330,000	up to 790				96-154
						Fall		0-5	10.5-13	≤ 0.1	0.16-0.28	up to 2000	up to 80,800	1.2-75				108-230

*for tributaries, River Mile is at confluence with Susitna and shaded in green

[t] some values may be older

[u] nearly all Data is older than 1970

[v] figure is from 1952

[w] Denali and Paxson Station Data only available in JTU

APPENDIX 4.4-1. Existing Water Quality Data (Conventional Parameters) for the Susitna River and Tributaries, Part 2 of 2.

Station Name	Station Susitna River Mile*	Original Data Source	USGS Station Code	Most Recent Sample Date[t]	Years of Record	Season	Mean Instantaneous Discharge (cfs)	Water Quality Parameters																
								Conventionals																
								Significant Ions (mg/L)							Total Hardness (mg/L)	pH	Total Alkalinity (mg/L)	Free CO_2 (mg/L)	TOC (mg/L)	COD	True Color (Pt-Co units)	Chlorophyll-a (ug/L)	Total Dissolved Gas (% Sat)	Total Coliform Bacteria (colonies/100mL)
								HCO_3^-	Cl^-	SO_4^{2-}	Ca (diss.)	Mg (diss.)	Na (diss.)	K (diss.)										
Denali	290.8	USGS	15291000	7/25/1986	29	Winter	209	≈137	≈21	≈36	≈41	≈8	≈18	≈6.3	≈140	≈7.6		≈5.5			≈0			
						Spring	2860	52-196	3-30	9.2-39	17-51	1.9-16	2.1-23	2.3-6.6	50-180	7.1-7.5		5.2-25			5-30			
						Summer	7507	51-83	1.5-9.0	13-31	18-24	1.7-6.4	2.2-7.5	1.3-36	52-84	7.4-7.9		1.5-4.5			0-10			
						Fall	2381	≈92	≈11	≈20	≈29	≈3.6	≈10	≈2.1	≈87	7.8		≈2.3			≈5			
Paxson (MacLaren R.)	259.8	USGS	15291200	7/25/1975	17	Winter																		
						Spring	2344	≈78	≈4.3	≈20	≈27	≈3.9	≈2.8	≈2.5	≈84	≈7.6		≈3.1			0			
						Summer	2396	34-54	0.4-3.5	13-22	11-20	2.2-4.3	0.8-2.1	1.4-2.6	36-62	6.8-7.8		1.1-9.6			0-20			
						Fall	680	≈59	≈4	≈22	≈18	≈5.4	≈3.5	≈1.6	≈67	≈7.6		≈2.4			≈5			
Vee Canyon[u]	223.1	USGS	15291500	7/30/1986	24	Winter	1000																	
						Spring	13000	48-54	3.5-7.4	7.5-12	14-17	1.8-2.4	2.2-48	2.8-7.3	42-54	7.4-7.6		2.2-3.1			30-40			
						Summer	14437	59-72	2.1-9.2	10-18	18-25	2.2-4.4	2.1-6.3	1.4-5.2	58-76	7.5-8.1		0.7-3.6		8-39	5-10			
						Fall	4872	≈67	≈8.5	≈16	≈27	≈1.1	≈5	≈0.3	≈70	≈7.2		≈6.8			≈10			
Vee Canyon	223.1	R&M				Winter		57-161	16-30	11-39	25-51	3.8-16.0	6.3-23.0	2.0-9.0										
						Summer		39-81	1.5-11	2-31	13-29	1.1-6.4	2.1-10.0	1.3-7.3										
Mainstem Susitna at Watana Dam Site	184.2	APA and ADF&G		10/16/1985	1	Winter																		
						Spring																		
						Summer										8-8.2							97.07-100.97	
						Fall										8.4							96.71-98.84	
Watana Damsite	183	R&M				Winter																		
						Summer																		
Mainstem Susitna D/S of Devil's Canyon	150.1	APA and ADF&G		10/16/1985	1	Winter																		
						Spring																	112.21-114.52	
						Summer																	108.83-118.32	
						Fall																	106.16-109	
Mainstem Susitna U/S of Portage Creek	149.4	APA and ADF&G		10/9/1985	1	Winter																		
						Spring																		
						Summer										6.8-8.2								
						Fall										7.2-8.3								
Mainstem Susitna at LRX 53	140.1	APA and ADF&G		10/17/1985	1	Winter																		
						Spring																		
						Summer																		
						Fall																		
Gold Creek	136.6	USGS	15292000	9/23/1986	37	Winter	1884	92-98	24-35	12-18	31-39	4.5-5.8	11-17	2.1-2.4	99-120	7.6-8.0	46-88	1.6-33	1.1-1.2	2-16	≈5			
						Spring	19931	28-97	1.8-33	4.7-27	9.9-33	0.3-7.4	2.4-17	1.0-3.8	30-110	7.0-8.0		1.3-24	1.8-10		5-50			
						Summer	54810	35-106	1.4-12	1-27	11-37	1.3-5.7	2.6-5.4	1.0-4.4	35-110	7.5-8.3	23-87	0.5-16	1.4-3.8	1.3-24	0-30			
						Fall	6160	45-107	5-20	12-38	16-37	2.2-8.3	4-13	1.1-5	49-120	7.2-8.3		1.2-10	≈4.2		0-12			
Gold Creek	136.6	R&M		9/30/1981		Winter		46-88	5.7-37	10-38	18-39	3.2-10	4.9-21.1	1.2-5										

Station Name	Station Susitna River Mile*	Original Data Source	USGS Station Code	Most Recent Sample Date[t]	Years of Record	Season	Mean Instantaneous Discharge (cfs)	Water Quality Parameters																
								Conventionals																
								Significant Ions (mg/L)							Total Hardness (mg/L)	pH	Total Alkalinity (mg/L)	Free CO_2 (mg/L)	TOC (mg/L)	COD	True Color (Pt-Co units)	Chlorophyll-a (ug/L)	Total Dissolved Gas (% Sat)	Total Coliform Bacteria (colonies/100mL)
								HCO_3^-	Cl^-	SO_4^{2-}	Ca (diss.)	Mg (diss.)	Na (diss.)	K (diss.)										
						Summer		23-87	1.2-15	1-31	10-37	1.2-7.8	1.8-10	0.9-4.4										
Mainstem Susitna D/S of Gold Creek Bridge	135.8	APA and ADF&G		10/17/1985	1	Winter																		
						Spring																		
						Summer										6.8-8.0							102.04-107.49	
						Fall										8.1-8.3							101.56-106.59	
Mainstem Susitna at Curry Station	120.7	APA and ADF&G		10/17/1985	1	Winter																		
						Spring																		
						Summer										6.8-8.0							93.27-96.92	
						Fall										7.7-8.2							91.76-101.62	
Mainstem Susitna at Talkeetna Station	103	APA and ADF&G		10/12/1985	1	Winter																		
						Spring																		
						Summer										7.4-8.0								
						Fall										7.8-8.3								
Talkeetna[u] (Chulitna R.)	98.0	USGS	15292400	7/22/1986	28	Winter	1269	≈52	≈1	≈11	≈19	≈1.9	≈0.5	≈0.4	≈56	≈7.1		≈6.6			≈0			
						Spring	11217	73-78	1.4-2.0	20-22	24-26	4.4-4.6	2.3-2.7	1.3-1.8	77-84	7.4-8.0		1.2-5.0			5-15			
						Summer	21950	46-59	0-2.5	10-14	14-18	2.5-4.1	1.2-1.7	0.7-2.2	46-59	7.2-8.1		0.6-5.5			5-10			
						Fall	5533																	
Talkeetna (Talkeetna R.)	97.0	USGS	15292700	5/18/2011	57	Winter	609	46-70	11-27	10-24	17-26	1.9-5.6	7.7-15	1.0-1.9	20-78	7.3-8.2		0.8-41	0.7-1.8		0-25			≈21
						Spring	6650	25-64	2.4-34	2.4-21	7-26	1-3.4	2.4-15	0.5-2.4	22-79	7.1-8.2		0.6-40	≈1.6		0-10			≈130
						Summer	10630	25-50	1.4-9.5	1-18	6.8-17	0.4-3.9	2.7-9.7	0.5-2.9	22-50.8	7.3-8.6		0.6-30	0.4-2.6		0-80			33-190
						Fall	3160	36-55	3.6-12	6-20	9.8-19	0.8-2.8	3.6-8.4	0.5-1.2	29.9-57.5	7.2-8.0		0.6-12.0	≈2.1		0-10			≈92
Mainstem Susitna above Parks Highway Bridge	86.2	APA and ADF&G		10/15/1985	1	Winter																		
						Spring																		
						Summer										7.4-8.5								
						Fall										7.8-8								
Sunshine	83.9	USGS	15292780	6/25/1986	15	Winter	4036		6.8-16	16-19	20-33	2.9-4.2	5.5-11	1.4-2	55-99.4	7.8-8.2		≈1.2	≈2					
						Spring	37207	31-86	2.5-21	5.7-18	11-31	1.4-4.5	1.9-11	1-2.1	33-96	7.2-8.3		3.9-91	0.4-7.4		0-100			
						Summer	63740	≈52	2.2-5.8	3-16	14-23	2-3.5	2.3-4.4	1.1-2.8	43.6-72	7.1-8.3		1.1-2.1	1.7-3.2		≈25			
						Fall	25217	≈52	5.1-6	12-15	17-18	2.7-3	4.1-4.4	≈1.2	37.8-45.7	7.4-8.3		≈3.3	≈2.7		≈8			
Sunshine	83.9	R&M				Winter		46-88	5.7-37	10-38	18-39	3.2-10	4.9-21.1	1.2-5										
						Summer		23-87	1.2-15	1-31	10-37	1.2-7.8	1.8-10	0.9-4.4										
Skwentna (Skwentna R.)	28.0	USGS	15294300	9/11/1981	22	Winter	996	≈77	≈12	≈24	≈28	≈4.3	≈7.7	≈1.7	≈88	≈7.1		≈9.8			≈10			
						Spring	8572	≈78	≈10	≈19	≈27	≈3.6	≈7.9	≈1.8	≈82	≈7.7		≈2.5			≈15			
						Summer	13182	≈52	≈6	≈20	≈17	≈5	≈4.4	≈0.9	≈63	≈7.4		≈3.3			≈20			
						Fall	9275	≈64	≈6	≈27	≈21	≈3.9	≈5	≈1.1	≈74	≈7.7		≈2			≈5			

Station Name	Station Susitna River Mile*	Original Data Source	USGS Station Code	Most Recent Sample Date[t]	Years of Record	Season	Mean Instantaneous Discharge (cfs)	Water Quality Parameters																
								Conventionals																
								Significant Ions (mg/L)							Total Hardness (mg/L)	pH	Total Alkalinity (mg/L)	Free CO_2 (mg/L)	TOC (mg/L)	COD	True Color (Pt-Co units)	Chlorophyll-a (ug/L)	Total Dissolved Gas (% Sat)	Total Coliform Bacteria (colonies/100mL)
								HCO_3^-	Cl^-	SO_4^{2-}	Ca (diss.)	Mg (diss.)	Na (diss.)	K (diss.)										
Susitna (Yentna R.)	28.0	USGS	15294345	5/21/1986	5	Winter	2693									7.1-7.9								
						Spring	26429									7.0-8.0								
						Summer	47895									7.4-8.3								
						Fall	16650																	
Susitna	25.8	USGS	15294350	10/25/2003	48	Winter		70-98	9.6-15	15-20	24-31	3.6-5.0	6.2-9.0	1.5-2.5	75-95	7.5-7.6	60-75	1.8-17	0.4-4		0-5	ND-1.2		≤ 20
						Spring		37-88	1.4-15	3.7-18	11-30	1.6-4.9	1.8-8.3	0.8-1.8	36-93.7	7.1-8.1		1.1-19						
						Summer		45-69	1.2-12	1-22	15-22	2-3.3	1-1.8	0.9-4.4	44-66	7.5-8.5	36-57	0.4-8.0	2.7-11		0-10			
						Fall		55-92	3.1-18	13-20	16-31	2.6-4.6	2.8-8.6	1.1-2.0	51.6-96	7.6-8.0		1.4-15			≈10			

APPENDIX 4.4-1. Existing Water Quality Data (Metals) for the Susitna River and Tributaries, Part 1 of 3.

Station Name	Station Susitna River Mile*	Original Data Source	USGS Station Code	Most Recent Sample Date[t]	Years of Record	Season	Mean Instantaneous Discharge (cfs)	Water Quality Parameters											
								Metals in Water, unfiltered (ug/L)											
								Al	Ba	Cd	Se	Cu	Fe	Pb	Mn	Hg	As	Ni	Zn
Denali	290.8	USGS	15291000	7/25/1986	29	Winter	209						≈60		≈10				
						Spring	2860						0-4000		≈20				
						Summer	7507						up to 3200		≈10				
						Fall	2381						≈610		≈60				
Paxson (MacLaren R.)	259.8	USGS	15291200	7/25/1975	17	Winter													
						Spring	2344						≈370						
						Summer	2396	≈10000	≤ 100	≤ 20	≈1	≈40	≈20000	≤ 200	0-10		≈18	≤ 50	≈90
						Fall	680												
Vee Canyon[u]	223.1	USGS	15291500	7/30/1986	24	Winter	1000												
						Spring	13000						660-5000						
						Summer	14437						up to 12000		up to 230				
						Fall	4872						up to 900						
Vee Canyon	223.1	R&M				Winter													
						Summer													
Mainstem Susitna at Watana Dam Site	184.2	APA and ADF&G		10/16/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Watana Damsite	183	R&M				Winter													
						Summer													
Mainstem Susitna D/S of Devil's Canyon	150.1	APA and ADF&G		10/16/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Mainstem Susitna U/S of Portage Creek	149.4	APA and ADF&G		10/9/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Mainstem Susitna at LRX 53	140.1	APA and ADF&G		10/17/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Gold Creek	136.6	USGS	15292000	9/23/1986	37	Winter	1884		≤ 100	≤ 1	≤ 1		≈120	≤ 1	≤ 20	≤ 0.1	1	≤ 1	≈10
						Spring	19931	≈14000	≤ 100	≤ 20	≤ 1	14-50	40-20000	≈5	10-370	≤ 0.1	2-5	≈2	10-80
						Summer	54810	≈13000	100-500	0-30	≤ 1	15-190	430-24000	≤ 200	10-390	2-13	2-12	≤ 50	20-120
						Fall	6160	≈500		≤ 20	≤ 1		≈800	≤ 200	≈20	≈0.2	≤ 1	≤ 50	≈30
Gold Creek	136.6	R&M		9/30/1981		Winter													
						Summer													
Mainstem Susitna D/S of Gold Creek Bridge	135.8	APA and ADF&G		10/17/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Mainstem Susitna at Curry Station	120.7	APA and ADF&G		10/17/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Mainstem Susitna at Talkeetna Station	103	APA and ADF&G		10/12/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Talkeetna[u] (Chulitna R.)	98.0	USGS	15292400	7/22/1986	28	Winter	1269						≈0		≈10				
						Spring	11217						0-810		10-30				
						Summer	21950						up to 4300		20-280				
						Fall	5533												

Station Name	Station Susitna River Mile*	Original Data Source	USGS Station Code	Most Recent Sample Date[t]	Years of Record	Season	Mean Instantaneous Discharge (cfs)	Water Quality Parameters											
								Metals in Water, unfiltered (ug/L)											
								Al	Ba	Cd	Se	Cu	Fe	Pb	Mn	Hg	As	Ni	Zn
Talkeetna (Talkeetna R.)	97.0	USGS	15292700	5/18/2011	57	Winter	609		0-22	≤ 1	≤ 1	1-10	≈80	≤ 10	3-10		≤ 1		≤ 20
						Spring	6650		0-100	≤ 1	0-1	20-40	60-2800	≤ 30	10-70		≤ 10		10-230
						Summer	10630	≈4600	0-200	1-5	≤ 1	20-100	70-17000	≤ 200	10-520		1-2	≤ 10	20-90
						Fall	3160		0-200	≤ 20	1-2	≤ 20	150-180	≤ 200	0-30		1-2		≤ 20
Mainstem Susitna above Parks Highway Bridge	86.2	APA and ADF&G		10/15/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Sunshine	83.9	USGS	15292780	6/25/1986	15	Winter	4036		100	0-1	1	5-20	110-1100	≤ 1	2-10	0.1	1-2	≈20	10-30
						Spring	37207	up to 22000	0-2000	≤ 20	≤ 1	5-200	160-37000	0-300	10-730	0.1-0.9	≤ 1	≤ 200	20-150
						Summer	63740	up to 15000	100-500	0-35	0-1	0-35	7600-32000	2-13	170-670	0.1-0.6	1-3	18-30	40-200
						Fall	25217	up to 2200	200	≤ 20	≤ 1	20	≈3700	≤ 200	100	≤ 0.1	3	≤ 50	30
Sunshine	83.9	R&M				Winter													
						Summer													
Skwentna (Skwentna R.)	28.0	USGS	15294300	9/11/1981	22	Winter	996								≈0				
						Spring	8572						≈550						
						Summer	13182								≈0				
						Fall	9275												
Susitna (Yentna R.)	28.0	USGS	15294345	5/21/1986	5	Winter	2693												
						Spring	26429												
						Summer	47895												
						Fall	16650												
Susitna	25.8	USGS	15294350	10/25/2003	48	Winter			100	≤ 20	≤ 1	up to 140	240-720	≤ 200	30-40	≤ 0.5	1-3	0-4	20-30
						Spring			100-200	≤ 20	≤ 1	20-60	230-16000	≤ 200	20-410	≤ 0.5	0-3	0-5	10-60
						Summer			up to 400	≤ 1	≤ 1	30-90	7900-42000	≤ 200	320-870	≤ 1	7-40	1-2	80-180
						Fall			≤ 100	≤ 20	≤ 1	20-30	260-5400	≤ 200	20-130	≤ 0.5	1-4		20-30

*for tributaries, River Mile is at confluence with Susitna and shaded in green

[t] some values may be older

[u] nearly all Data is older than 1970

[v] figure is from 1952

[w] Denali and Paxson Station Data only available in JTU

APPENDIX 4.4-1. Existing Water Quality Data (Metals) for the Susitna River and Tributaries, Part 2 of 3.

Station Name	Station Susitna River Mile*	Original Data Source	USGS Station Code	Most Recent Sample Date[t]	Years of Record	Season	Mean Instantaneous Discharge (cfs)	Water Quality Parameters											
								Metals in Water, filtered (ug/L)											
								Al	Ba	Cd	Se	Cu	Fe	Pb	Mn	Hg	As	Ni	Zn
Denali	290.8	USGS	15291000	7/25/1986	29	Winter	209												
						Spring	2860												
						Summer	7507												
						Fall	2381												
Paxson (MacLaren R.)	259.8	USGS	15291200	7/25/1975	17	Winter													
						Spring	2344												
						Summer	2396												
						Fall	680												
Vee Canyon[u]	223.1	USGS	15291500	7/30/1986	24	Winter	1000												
						Spring	13000												
						Summer	14437												
						Fall	4872												
Vee Canyon	223.1	R&M				Winter													
						Summer													
Mainstem Susitna at Watana Dam Site	184.2	APA and ADF&G		10/16/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Watana Damsite	183	R&M				Winter													
						Summer													
Mainstem Susitna D/S of Devil's Canyon	150.1	APA and ADF&G		10/16/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Mainstem Susitna U/S of Portage Creek	149.4	APA and ADF&G		10/9/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Mainstem Susitna at LRX 53	140.1	APA and ADF&G		10/17/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Gold Creek	136.6	USGS	15292000	9/23/1986	37	Winter	1884		≤ 100	≤ 1	≤ 1		≈10	≤ 1			1	≤ 1	≤ 10
						Spring	19931		≈60	≤ 3	≤ 1	≈5	20-100	0-1	0-40	≤ 0.1	2	≈3	≤ 40
						Summer	54810		0-44	0-20	≤ 1	2-5	50-320	0-5	2-180	≤ 0.2	1-2	0-3	6-20
						Fall	6160						≈40		≤ 10				
Gold Creek	136.6	R&M		9/30/1981		Winter													
						Summer													
Mainstem Susitna D/S of Gold Creek Bridge	135.8	APA and ADF&G		10/17/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Mainstem Susitna at Curry Station	120.7	APA and ADF&G		10/17/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Mainstem Susitna at Talkeetna Station	103	APA and ADF&G		10/12/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Talkeetna[u] (Chulitna R.)	98.0	USGS	15292400	7/22/1986	28	Winter	1269												
						Spring	11217												
						Summer	21950												
						Fall	5533												

Station Name	Station Susitna River Mile*	Original Data Source	USGS Station Code	Most Recent Sample Date[t]	Years of Record	Season	Mean Instantaneous Discharge (cfs)	Water Quality Parameters											
								Metals in Water, filtered (ug/L)											
								Al	Ba	Cd	Se	Cu	Fe	Pb	Mn	Hg	As	Ni	Zn
Talkeetna (Talkeetna R.)	97.0	USGS	15292700	5/18/2011	57	Winter	609	10-160	≤ 100	≤ 1	≤ 1	≤ 10	8-40	≤ 10	3-10		≤ 1	≤ 1	3-13
						Spring	6650	10-380	0-20	≤ 3	0-2	≤ 30	12-100	≤ 30	3-20		0-8	0-2	5-90
						Summer	10630	20-290	7-23	0-5	≤ 2	≤ 10	13-410	≤ 10	3-20		0-2	0-5	6-30
						Fall	3160	20-100	7-32	≤ 1	0-2	≤ 10	0-61	≤ 10	1-30		0	≤ 1	≈10
Mainstem Susitna above Parks Highway Bridge	86.2	APA and ADF&G		10/15/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Sunshine	83.9	USGS	15292780	6/25/1986	15	Winter	4036		25-100	≤ 1	≤ 1	1-10	17-40	≈3	2-10	≤ 1	1	≤ 1	10-30
						Spring	37207		19-41	≤ 1	0-1	≤ 1	12-180	≤ 1	3-20	≤ 0.1	1	≤ 1	20-31
						Summer	63740		0-70	0-24	0-1	2-10	10-330	≤ 1	7-12	≤ 0.1	1-3	0-2	14-65
						Fall	25217						≈60		≤ 10				
Sunshine	83.9	R&M				Winter													
						Summer													
Skwentna (Skwentna R.)	28.0	USGS	15294300	9/11/1981	22	Winter	996												
						Spring	8572												
						Summer	13182												
						Fall	9275												
Susitna (Yentna R.)	28.0	USGS	15294345	5/21/1986	5	Winter	2693												
						Spring	26429												
						Summer	47895												
						Fall	16650												
Susitna	25.8	USGS	15294350	10/25/2003	48	Winter			≈40	≤ 2	≈1	≤ 2	60-150	≤ 2	10-30	0-0.1	0-3	≈0	≤ 20
						Spring		10-50	20-80	≤ 3	≤ 1	≤ 20	20-370	2-11	10-20	0-0.3	0-3	0-5	12-33
						Summer		40-350	20-200	≤ 2	≤ 1	≤ 3	10-460	≤ 5	6-20	≤ 0.5	1-3	0-2	8-160
						Fall		40-150	25-38	≤ 1	≤ 1	≈3	40-230	≤ 5	10-21	0.1-3	1-4	≈1	6-18

APPENDIX 4.4-1. Existing Water Quality Data (Metals) for the Susitna River and Tributaries, Part 3 of 3.

Station Name	Station Susitna River Mile*	Original Data Source	USGS Station Code	Most Recent Sample Date[t]	Years of Record	Season	Mean Instantaneous Discharge (cfs)	Water Quality Parameters Metals in Suspended Sediment (ug/L)											
								Al	Ba	Cd	Se	Cu	Fe	Pb	Mn	Hg	As	Ni	Zn
Denali	290.8	USGS	15291000	7/25/1986	29	Winter	209												
						Spring	2860												
						Summer	7507												
						Fall	2381												
Paxson (MacLaren R.)	259.8	USGS	15291200	7/25/1975	17	Winter													
						Spring	2344												
						Summer	2396												
						Fall	680												
Vee Canyon[u]	223.1	USGS	15291500	7/30/1986	24	Winter	1000												
						Spring	13000												
						Summer	14437												
						Fall	4872												
Vee Canyon	223.1	R&M				Winter													
						Summer													
Mainstem Susitna at Watana Dam Site	184.2	APA and ADF&G		10/16/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Watana Damsite	183	R&M				Winter													
						Summer													
Mainstem Susitna D/S of Devil's Canyon	150.1	APA and ADF&G		10/16/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Mainstem Susitna U/S of Portage Creek	149.4	APA and ADF&G		10/9/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Mainstem Susitna at LRX 53	140.1	APA and ADF&G		10/17/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Gold Creek	136.6	USGS	15292000	9/23/1986	37	Winter	1884				0	≤ 10	≈110	0-4	7-10		0	0	10
						Spring	19931		≈40			1-9	30-120	0-4	7-8		0	0-1	≈10
						Summer	54810		70-400	0-10	≤ 1	15-190	4600-24000	0-47	70-390	0.1-0.4	3-6	8-29	20-110
						Fall	6160				≤ 1								
Gold Creek	136.6	R&M		9/30/1981		Winter													
						Summer													
Mainstem Susitna D/S of Gold Creek Bridge	135.8	APA and ADF&G		10/17/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Mainstem Susitna at Curry Station	120.7	APA and ADF&G		10/17/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Mainstem Susitna at Talkeetna Station	103	APA and ADF&G		10/12/1985	1	Winter													
						Spring													
						Summer													
						Fall													

Station Name	Station Susitna River Mile*	Original Data Source	USGS Station Code	Most Recent Sample Date[t]	Years of Record	Season	Mean Instantaneous Discharge (cfs)	Water Quality Parameters											
								Metals in Suspended Sediment (ug/L)											
								Al	Ba	Cd	Se	Cu	Fe	Pb	Mn	Hg	As	Ni	Zn
Talkeetna[u] (Chulitna R.)	98.0	USGS	15292400	7/22/1986	28	Winter	1269												
						Spring	11217												
						Summer	21950												
						Fall	5533												
Talkeetna (Talkeetna R.)	97.0	USGS	15292700	5/18/2011	57	Winter	609												
						Spring	6650		0-80		0		40-690	0-3	0-6		≤ 1		0-10
						Summer	10630		0-90	0	0		3100-6800		90-190		≤ 1		20-70
						Fall	3160										≈2		
Mainstem Susitna above Parks Highway Bridge	86.2	APA and ADF&G		10/15/1985	1	Winter													
						Spring													
						Summer													
						Fall													
Sunshine	83.9	USGS	15292780	6/25/1986	15	Winter	4036		0-80	0	0-1	≤ 20	120-1100		10-30	0	≈2	≈2	≈10
						Spring	37207		0-60		≤ 1	1	120-160	0	6-20	0	0-1	16	20-31
						Summer	63740		80-300	1-11	0	16-63	7400-32000	0-38	160-660	0.1-0.6	4-15	16-51	0-190
						Fall	25217												
Sunshine	83.9	R&M				Winter													
						Summer													
Skwentna (Skwentna R.)	28.0	USGS	15294300	9/11/1981	22	Winter	996												
						Spring	8572												
						Summer	13182												
						Fall	9275												
Susitna (Yentna R.)	28.0	USGS	15294345	5/21/1986	5	Winter	2693												
						Spring	26429												
						Summer	47895												
						Fall	16650												
Susitna	25.8	USGS	15294350	10/25/2003	48	Winter			0-100	≤ 10	≤ 1	140	300-400	≤ 99	0-30	≈1	0-0.1	1-4	0-30
						Spring			60-200	≤ 10	≤ 1	1-54	230-16000		0-400	≤ 0.1	0-6	4-21	0-50
						Summer			70-400	≤ 10	≤ 1	29-89	7800-38000	14-94	320-850	≤ 1	0.3-0.6	32-52	80-180
						Fall			≤ 100	≤ 10	≤ 1	20-54	≈300	9-97	0-130	0	1-4		6-18

APPENDIX 4.6-1
WILDLIFE HABITAT SCORES

Appendix 4.6-1. Wildlife habitat scores (summaries of rankings for seasonal food, cover, and reproduction [TES 1982]; higher scores indicate greater value[1]) for 116 species of birds and 30 species of mammals among cover types in the original Susitna Hydroelectric Project area.[2]

	Cover Type																				
Species	Black Spruce Woodland	White Spruce Woodland	Open Black Spruce Forest	Open White Spruce Forest	Open Birch Forest	Closed Birch Forest	Balsam Poplar Forest	Open Mixed Forest	Closed Mixed Forest	Wet Sedge–Grass Meadow	Sedge–Grass Tundra	Sedge–Shrub Tundra	Mat and Cushion Tundra	Tall Shrub	Birch Shrub	Willow Shrub	Mixed Low Shrub	Grassland	Rock	River	Lake
BIRDS																					
Greater White-fronted Goose	-	-	-	-	-	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	1
Snow Goose	-	-	-	-	-	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	3
Canada Goose	-	-	-	-	-	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	2
Trumpeter Swan	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	15
Tundra Swan	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	12
American Wigeon	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	9	15
Mallard	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	9	15
Northern Shoveler	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	6	15
Northern Pintail	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	6	15
Green-winged Teal	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	11	15
Greater Scaup	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	15
Lesser Scaup	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	15
Harlequin Duck	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-
Surf Scoter	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	15
White-winged Scoter	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	12

Species	Cover Type																				
	Black Spruce Woodland	White Spruce Woodland	Open Black Spruce Forest	Open White Spruce Forest	Open Birch Forest	Closed Birch Forest	Balsam Poplar Forest	Open Mixed Forest	Closed Mixed Forest	Wet Sedge–Grass Meadow	Sedge–Grass Tundra	Sedge–Shrub Tundra	Mat and Cushion Tundra	Tall Shrub	Birch Shrub	Willow Shrub	Mixed Low Shrub	Grassland	Rock	River	Lake
Black Scoter	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	15
Long-tailed Duck	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	15
Bufflehead	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	6	15
Common Goldeneye	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	6	15
Barrow's Goldeneye	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	6	15
Common Merganser	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	15	12
Red-breasted Merganser	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	10	15
Spruce Grouse	-	4	-	18	4	4	4	21	21	-	-	-	-	6	-	-	-	-	-	-	-
Willow Ptarmigan	4	-	4	-	-	-	-	-	-	-	6	5	-	6	21	21	21	-	-	-	-
Rock Ptarmigan	-	-	-	-	-	-	-	-	-	-	17	17	15	-	21	21	21	-	-	-	-
White-tailed Ptarmigan	-	-	-	-	-	-	-	-	-	-	2	2	15	-	6	-	-	-	17	-	-
Pacific Loon	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	15
Common Loon	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	15
Horned Grebe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
Red-necked Grebe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
Bald Eagle	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	6	6
Northern Harrier	-	-	-	-	-	-	-	-	-	15	15	15	2	-	9	9	9	9	-	-	-
Sharp-shinned Hawk	-	4	-	15	8	8	-	15	15	-	-	-	-	-	-	-	-	-	-	-	-
Northern Goshawk	-	3	-	6	19	19	12	19	19	-	-	-	-	-	-	-	-	-	-	-	-
Red-tailed Hawk	-	2	-	10	15	15	10	15	15	-	-	-	-	-	-	-	-	-	-	-	-

Species	Cover Type																				
	Black Spruce Woodland	White Spruce Woodland	Open Black Spruce Forest	Open White Spruce Forest	Open Birch Forest	Closed Birch Forest	Balsam Poplar Forest	Open Mixed Forest	Closed Mixed Forest	Wet Sedge–Grass Meadow	Sedge–Grass Tundra	Sedge–Shrub Tundra	Mat and Cushion Tundra	Tall Shrub	Birch Shrub	Willow Shrub	Mixed Low Shrub	Grassland	Rock	River	Lake
Golden Eagle	-	-	-	-	-	-	-	-	-	-	4	4	6	-	4	2	2	-	6	-	-
American Kestrel	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merlin	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gyrfalcon	-	-	-	-	-	-	-	-	-	-	6	5	6	-	3	3	3	-	-	-	-
Sandhill Crane	-	-	-	-	-	-	-	-	-	6	8	8	2	-	-	-	-	-	-	-	-
American Golden-Plover	-	-	-	-	-	-	-	-	-	-	15	15	15	-	-	-	-	-	-	-	-
Semipalmated Plover	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Spotted Sandpiper	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	2
Wandering Tattler	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
Greater Yellowlegs	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	2
Lesser Yellowlegs	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	2
Whimbrel	-	-	-	-	-	-	-	-	-	-	15	15	8	-	-	-	-	-	-	-	-
Least Sandpiper	-	-	-	-	-	-	-	-	-	-	15	15	10	-	-	-	-	-	-	-	-
Baird’s Sandpiper	-	-	-	-	-	-	-	-	-	-	15	15	15	-	4	-	-	-	-	-	-
Pectoral Sandpiper	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-
Long-billed Dowitcher	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-
Wilson’s Snipe	5	-	5	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-
Red-necked Phalarope	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	15
Bonaparte’s Gull	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	2	13
Mew Gull	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	14	13

Species	Cover Type																				
	Black Spruce Woodland	White Spruce Woodland	Open Black Spruce Forest	Open White Spruce Forest	Open Birch Forest	Closed Birch Forest	Balsam Poplar Forest	Open Mixed Forest	Closed Mixed Forest	Wet Sedge–Grass Meadow	Sedge–Grass Tundra	Sedge–Shrub Tundra	Mat and Cushion Tundra	Tall Shrub	Birch Shrub	Willow Shrub	Mixed Low Shrub	Grassland	Rock	River	Lake
Herring Gull	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	8	9
Arctic Tern	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	10	15
Long-tailed Jaeger	-	-	-	-	-	-	-	-	-	-	15	15	15	-	2	2	2	-	-	-	-
Great Horned Owl	-	-	-	13	21	21	8	21	21	-	-	-	-	-	-	-	-	-	-	-	-
Short-eared Owl	-	-	-	-	-	-	-	-	-	-	15	15	4	-	2	2	2	5	-	-	-
Boreal Owl	-	-	-	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Belted Kingfisher	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-
Downy Woodpecker	-	5	-	14	12	12	21	21	21	-	-	-	-	-	-	-	-	-	-	-	-
Hairy Woodpecker	-	5	-	14	12	12	21	21	21	-	-	-	-	-	-	-	-	-	-	-	-
American Three-toed Woodpecker	7	4	7	21	2	2		21	21	-	-	-	-	-	-	-	-	-	-	-	-
Northern Flicker	-	9	-	5	5	5	10	5	5	-	-	-	-	-	-	-	-	-	-	-	-
Olive-sided Flycatcher	10	15	10	-	-	-	-	5	5	-	-	-	-	-	-	-	-	-	-	-	-
Alder Flycatcher	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	10	10	15	-	-	-
Say’s Phoebe	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-
Northern Shrike	10	-	10	-	-	-	-	-	-	-	-	-	-	3	-	-	-	3	-	-	-
Gray Jay	14	7	14	21	6	6	10	21	21	-	-	-	-	-	-	-	-	-	-	-	-
Black-billed Magpie	4	15	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-
Common Raven	3	3	3	-	-	-	5	-	-	-	8	8	6	-	4	4	4	6	-	-	-
Horned Lark	-	-	-	-	-	-	-	-	-	-	11	11	15	-	5	-	-	-	-	-	-
Tree Swallow	-	15	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Species	Cover Type																				
	Black Spruce Woodland	White Spruce Woodland	Open Black Spruce Forest	Open White Spruce Forest	Open Birch Forest	Closed Birch Forest	Balsam Poplar Forest	Open Mixed Forest	Closed Mixed Forest	Wet Sedge–Grass Meadow	Sedge–Grass Tundra	Sedge–Shrub Tundra	Mat and Cushion Tundra	Tall Shrub	Birch Shrub	Willow Shrub	Mixed Low Shrub	Grassland	Rock	River	Lake
Violet-green Swallow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	6	6
Bank Swallow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	6	6
Cliff Swallow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-
Black-capped Chickadee	-	-	-	-	21	21	21	21	21	-	-	-	-	-	-	-	-	-	-	-	-
Boreal Chickadee	21	7	21	21	7	7	-	21	21	-	-	-	-	-	-	-	-	-	-	-	-
Brown Creeper	-	-	-	15	-	-	15	15	15	-	-	-	-	-	-	-	-	-	-	-	-
American Dipper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-
Golden-crowned Kinglet	-	-	-	15	-	-	-	10	10	-	-	-	-	-	-	-	-	-	-	-	-
Ruby-crowned Kinglet	15	15	15	15	4	4	4	15	15	-	-	-	-	-	-	-	-	-	-	-	-
Arctic Warbler	-	15	-	-	-	-	-	-	-	-	-	-	-	4	15	15	15	-	-	-	-
Northern Wheatear	-	-	-	-	-	-	-	-	-	-	4	4	15	-	-	-	-	-	15	-	-
Townsend’s Solitaire	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
Gray-cheeked Thrush	15	15	15	-	-	-	15	4	4	-	-	-	-	-	-	-	-	5	-	-	-
Swainson’s Thrush	10	15	10	15	15	15	15	15	15	-	-	-	-	-	-	-	-	-	-	-	-
Hermit Thrush	-	-	-	5	15	15	15	15	15	-	-	-	-	15	-	-	-	-	-	-	-
American Robin	15	15	15	5	10	10	10	10	10	-	4	4	4	10	2	3	3	-	-	-	-
Varied Thrush	5	4	5	15	15	15	15	15	15	-	-	-	-	15	-	-	-	-	-	-	-
American Pipit	-	-	-	-	-	-	-	-	-	-	8	8	15	-	4	-	-	-	-	-	-
Bohemian Waxwing	10	15	10	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lapland Longspur	-	-	-	-	-	-	-	-	-	-	15	15	12	-	5	5	5	-	4	-	-

Species	Cover Type																				
	Black Spruce Woodland	White Spruce Woodland	Open Black Spruce Forest	Open White Spruce Forest	Open Birch Forest	Closed Birch Forest	Balsam Poplar Forest	Open Mixed Forest	Closed Mixed Forest	Wet Sedge–Grass Meadow	Sedge–Grass Tundra	Sedge–Shrub Tundra	Mat and Cushion Tundra	Tall Shrub	Birch Shrub	Willow Shrub	Mixed Low Shrub	Grassland	Rock	River	Lake
Smith's Longspur	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Snow Bunting	-	-	-	-	-	-	-	-	-	-	4	4	15	-	-	-	-	-	15	-	-
Orange-crowned Warbler	10	15	10	-	10	10	-	10	10	-	-	-	-	-	5	10	10	5	-	-	-
Yellow Warbler	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-
Yellow-rumped Warbler	15	10	15	15	-	15	15	15	15	-	-	-	-	-	-	-	-	-	-	-	-
Blackpoll Warbler	15	15	15	-	15	15	15	10	10	-	-	-	-	-	4	4	4	-	-	-	-
Northern Waterthrush	5	10	5	-	5	5	15	5	5	12	-	-	-	5	-	4	4	15	-	6	2
Wilson's Warbler	-	15	-	-	15	15	15	15	15	-	-	-	-	15	15	12	15	10	-	-	-
American Tree Sparrow	15	15	15	-	-	-	-	-	-	-	5	5	3	4	15	15	15	4	-	4	6
Savannah Sparrow	5	10	5	-	-	-	-	-	-	-	15	15	10	2	15	15	15	15	-	-	-
Fox Sparrow	15	15	15	-	5	5	15	5	5	-	-	-	-	15	4	4	5	10	-	-	-
Lincoln's Sparrow	5	-	5	-	-	-	-	-	-	-	-	-	-	-	5	15	15	15	-	-	-
White-crowned Sparrow	15	15	15	-	-	-	10	-	-	-	-	-	-	4	15	15	15	10	-	-	-
Golden-crowned Sparrow	-	15	-	-	-	-	-	-	-	-	-	-	2	4	10	15	15	-	-	-	-
Dark-eyed Junco	15	15	15	15	15	15	15	12	12	-	-	-	-	10	-	-	-	-	-	-	-
Rusty Blackbird	15	15	15	-	-	-	-	-	-	12	-	-	-	15	-	-	-	15	-	3	2
Gray-crowned Rosy-Finch	-	-	-	-	-	-	-	-	-	-	4	4	14	-	-	-	-	-	15	-	-
Pine Grosbeak	-	4	-	21	10	10	6	19	19	-	-	-	-	-	-	-	-	-	-	-	-
White-winged Crossbill	4	2	4	12	4	4	4	8	8	-	-	-	-	-	-	-	-	-	-	-	-
Common Redpoll	12	17	12	7	19	19	17	19	19	-	10	10	7	11	15	15	15	5	-	-	-

Species	Cover Type																				
	Black Spruce Woodland	White Spruce Woodland	Open Black Spruce Forest	Open White Spruce Forest	Open Birch Forest	Closed Birch Forest	Balsam Poplar Forest	Open Mixed Forest	Closed Mixed Forest	Wet Sedge–Grass Meadow	Sedge–Grass Tundra	Sedge–Shrub Tundra	Mat and Cushion Tundra	Tall Shrub	Birch Shrub	Willow Shrub	Mixed Low Shrub	Grassland	Rock	River	Lake
Pine Siskin	-	2	-	12	4	4	-	8	8	-	-	-	-	6	-	-	-	-	-	-	-
MAMMALS																					
Cinereus shrew	7	7	7	7	14	14	21	21	21	14	7	7	-	21	7	14	14	21	-	-	-
Pygmy shrew	-	-	7	7	7	7	14	7	7	-	-	-	-	-	-	7	7	7	-	-	-
Dusky shrew	7	7	7	7	14	14	7	7	7	7	7	14	-	7	14	14	14	14	-	-	-
Tundra shrew	14	14	7	7	7	7	14	7	7	7	7	14	-	7	21	7	7	21	4	-	-
Wolf	13	16	16	18	7	12	8	15	11	7	10	8	6	11	11	10	11	2	2	8	9
Red fox	14	10	11	14	11	12	12	13	12	17	17	20	13	10	21	21	21	17	11	-	-
Lynx	14	21	7	6	14	17	17	21	15	4	5	6	2	13	6	20	9	3	7	-	-
River otter	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	20	20
Wolverine	12	15	14	15	7	7	7	11	7	7	10	15	18	16	13	13	14	7	18	7	-
Marten	16	21	17	21	12	12	7	16	21	7	3	-	-	12	-	8	3	-	-	-	-
Ermine	16	14	14	14	7	7	7	14	14	14	14	14	14	14	21	14	14	14	7	-	-
Least weasel	9	7	7	7	7	7	7	7	7	14	14	14	7	7	7	7	7	14	-	-	-
Mink	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	18	12
Black bear	10	10	12	12	6	6	6	17	17	9	6	7	5	11	8	8	9	7	7	4	4
Brown bear	8	8	8	8	7	7	5	8	7	9	8	7	10	11	10	10	10	7	9	2	2
Moose	13	16	14	17	7	9	6	12	10	8	10	7	4	15	10	12	12	7	-	12	14
Caribou	7	7	7	7	6	6	6	9	9	8	8	7	7	5	6	6	6	4	3	-	-

Species	Cover Type																				
	Black Spruce Woodland	White Spruce Woodland	Open Black Spruce Forest	Open White Spruce Forest	Open Birch Forest	Closed Birch Forest	Balsam Poplar Forest	Open Mixed Forest	Closed Mixed Forest	Wet Sedge–Grass Meadow	Sedge–Grass Tundra	Sedge–Shrub Tundra	Mat and Cushion Tundra	Tall Shrub	Birch Shrub	Willow Shrub	Mixed Low Shrub	Grassland	Rock	River	Lake
Hoary marmot	-	-	-	-	-	-	-	-	-	-	6	6	6	-	-	-	-	-	12	-	-
Arctic ground squirrel	-	-	-	-	-	-	-	-	-	-	12	21	21	-	8	12	12	-	12	-	-
Red squirrel	7	7	14	21	7	7	11	14	14	-	-	-	-	-	-	-	-	-	-	-	-
Beaver	-	-	-	-	-	-	-	-	-	14	-	-	-	-	-	-	-	-	-	21	21
Northern red-backed vole	14	14	21	14	7	7	14	14	14	-	7	7	-	14	14	14	14	6	4	-	-
Brown lemming	7	7	-	-	-	-	-	-	-	14	14	7	-	-	4	-	-	-	-	-	-
Singing vole	-	-	-	-	-	-	-	-	-	-	14	21	7	-	12	14	14	-	8		-
Root vole	-	-	7	-	-	-	-	-	-	21	14	-	-	7	-	14	14	21	-	-	-
Meadow vole	-	-	-	-	-	-	-	-	-	21	-	-	-	7	-	14	14	21	-	-	-
Muskrat	-	-	-	-	-	-	-	-	-	19	-	-	-	-	-	-	-	-	-	21	21
Porcupine	7	7	7	17	19	19	9	14	14	-	-	-	-	4	4	6	5	-	4	-	-
Collared pika	-	-	-	-	-	-	-	-	-	-	6	6	6	-	-	-	-	-	12	-	-
Snowshoe hare	7	7	9	9	9	9	14	7	7	-	-	-	-	21	4	21	21	-	-	-	-

[1] Totals of values ranging from 0 (not important) to 3 (most important) in each of 7 categories (food and cover in spring/early summer, late summer/fall, and winter; reproduction); the highest possible score for a habitat type is 21 and the lowest score is 1 (totals of zero were removed from the analysis).

[2] Within 16 km (10 mi) on each side of the Susitna River between Gold Creek and the Maclaren River.

APPENDIX 4.9-1
PHOTOGRAPHS

Susitna-Watana Hydroelectric Project Area and Southcentral Region, August 2011

Mt. McKinley, as seen from Talkeetna River Park (looking northwest)

Downtown Talkeetna

Downtown Talkeetna


Talkeetna Ranger Station

Cabin in Community of Gold Creek

Railroad bridge crossing Susitna River near Community of Gold Creek, looking northeast

Susitna River (Devils Canyon), looking northeast

Fog lakes, looking south

Susitna River, just upstream (east) of proposed dam site, looking downstream (west)

Susitna River, just upstream (east) of proposed dam site, looking upstream (east)

Susitna River, upstream (east) of proposed dam site, looking northeast

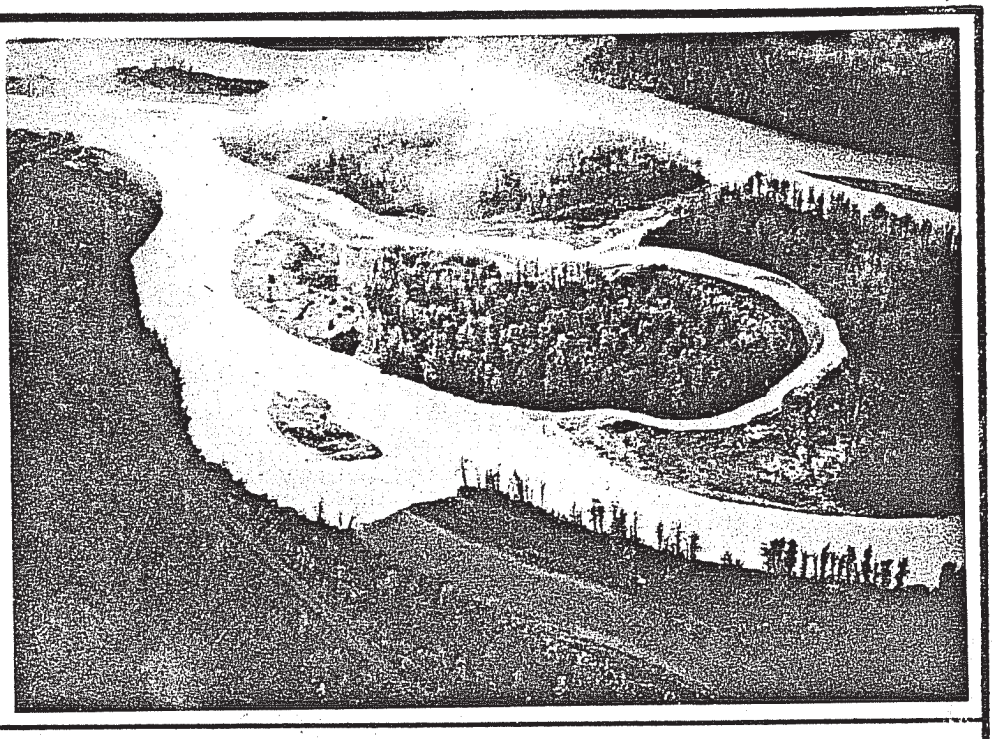
Susitna River, upstream (east) of proposed dam site, looking upstream (east)

APPENDIX 4.9-2
LANDSCAPE CHARACTER TYPE DESCRIPTIONS

LANDSCAPE CHARACTER TYPE

MID SUSITNA RIVER VALLEY

PHOTO E8.8.1



LANDFORMS

- Valley is 2 to 6 miles (3 to 10 km) wide with steep slopes.
- Flat terraced land adjacent to Indian River near confluence with Susitna.

WATERFORMS

- Moderately braided and silt laiden river up to 1/2 mile (0.8 km) wide.
- Wetland areas are common adjacent to the flat terraced areas, as are islands, sandbars and cobbles.
- Gold Creek tributary to Susitna here has high aesthetic value - flows through narrow forested canyon.

VEGETATION

- Dense mixed forest of spruce and deciduous trees.
- Tundra and brush species only on steeper valley slopes.
- Spruce/green is most prominent color - small amount of yellow/gold fall color by deciduous trees and willows.
- Tundra cover provides good red/orange tones in the fall.

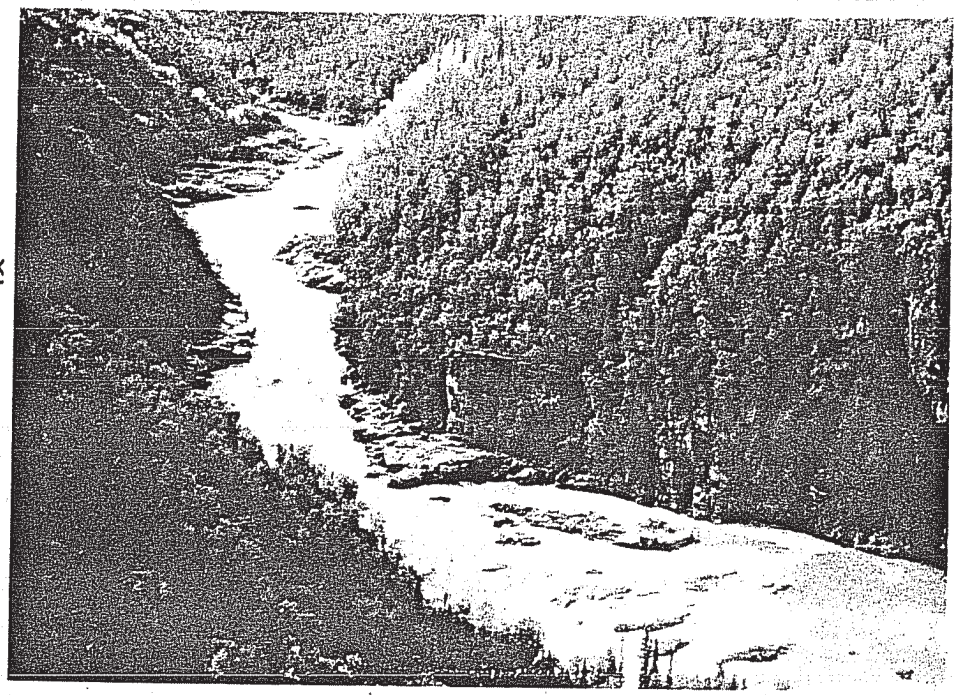
VIEWS

- Views are directed within the river channel, valley slopes and the commonly snow-capped Chulitna Mountains to the North.

LANDSCAPE CHARACTER TYPE

SUSITNA RIVER NEAR DEVIL CREEK

PHOTO E8.8.2



LANDFORMS

- Steep to vertical rock canyon walls - medium to dark brown colors for several miles - nearly 1000 feet (300 m) deep. Unstable environment.
- Deeply incised valley overall for over 20 miles (33 km).
- Giant rock shelves and angular boulders in river channel.
- The canyon is a significant Alaska natural feature.

WATERFORMS

- High volume and fixed channel river through a deep canyon.
- Contains an 11-mile (18-km) stretch of world class kayaking whitewater (Class VI).
- Portage, Cheechako and Devil creeks are all notable - steep to vertical canyoned tributaries.
- Devil Creek Falls are the most scenic falls in the basin.

1.*Devil Canyon Rapids
2.*Devil Creek Falls

VEGETATION

- Slopes are densely covered with a good mixture of spruce and deciduous trees - good fall color.
- Small pure stands of poplar species provide interesting tree patterns in the fall and winter.
- High color contrast with foamy gray water.

VIEWS

- Views are primarily restricted within the immediate canyon/valley.
- Views are dramatic in the vertical and near vertical rock canyon portions of the river.

LANDSCAPE CHARACTER TYPE

SUSITNA RIVER

PHOTO E8.8.3

LANDFORMS

- Broader valley - up to 4 miles (7 km) wide - in comparison with Devil Canyon area.
- Occasional dark colored rock outcrops or bluffs are found along the valley. Up river from Tsusena Creek on the northside is shear cliff of light colored rock, soil and cobble.
- The river bottom also has a low terrace before it steeply rises to the uplands.

WATERFORMS

- Mildly braided river with large islands of cobble and sand.
- Fog, Tsusena, Deadman, Watana, Kosina and Jay creeks are all significant and scenic tributaries to this portion of the Susitna. All have steep and narrow canyons near their confluences with the river.
- Tsusena, Deadman and Watana creeks all have notable falls.
- The tributaries' clear-water confluence with the silt-water river is of visual interest.

4.*Tsusena Creek Falls
6.*Deadman Creek Falls

VEGETATION

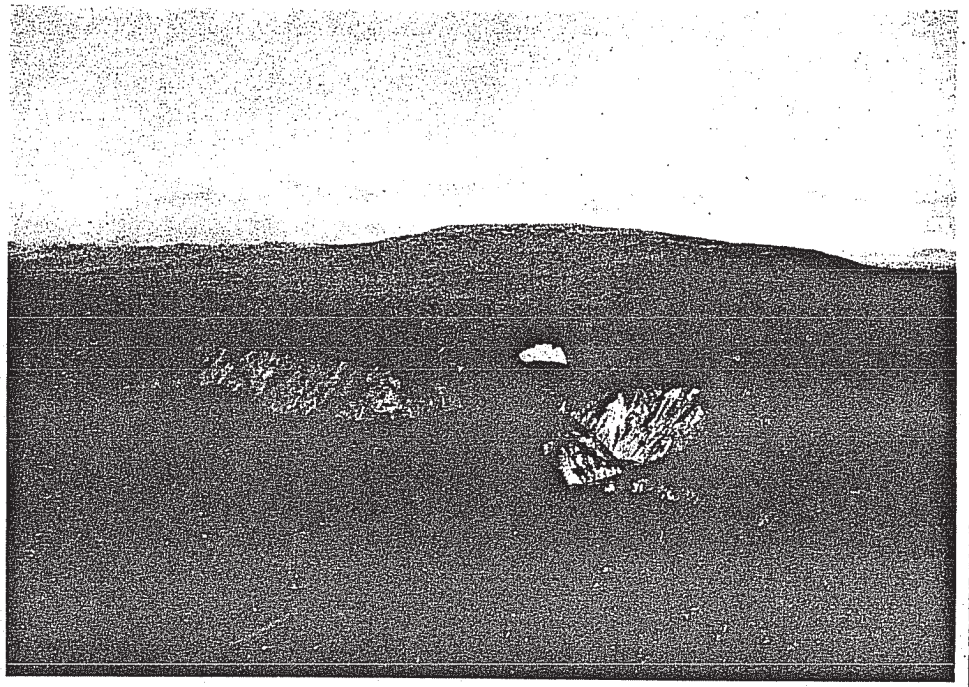
- Moderately dense to dense spruce-deciduous forest covers much of the river and tributary valleys. Good fall color.
- Willow and other shrub species are found along the river banks and terraces.

VIEWS

- The broader valley allows for more expanded views and although mostly river and valley oriented, views out of the valley are possible on the longer-straight portions of the river. High mountain tops can be seen.

LANDSCAPE CHARACTER TYPE

VEE CANYON
PHOTO E8.8.4



LANDFORMS

- Steep and meandering river valley.
- The 1/4 mile to 1 mile (0.4 to 1.6 km) wide valley rises up over 500 feet (150 m) from the river bottom.
- Vee Canyon displays a unique, very tight v-shaped rock feature in a double hairpin bend of the Susitna River. Colorful.
- Goose Creek, Oshetna River and other smaller tributary creeks have deep valleys themselves near their confluences with the river.

WATERFORMS

- The Susitna flows very fast here through a fixed channel.
- A well known stretch of rough whitewater occurs through Vee Canyon.
- Begins to meander several miles up river from Vee Canyon.
- Numerous islands and sandbars with gravel cobble edge.

13.*Vee Canyon

VEGETATION

- Tundra, brush and rock slopes dominate on the south side while moderately dense to sparse spruce forests cover the northside slopes and river bottom.

VIEWS

- The deep and narrow nature of the canyon/valley restricts views to the foreground area.
- Some of the higher points adjacent uplands can be seen from the more open areas of the river.
- Adjoining tributary canyons offer additional foreground views of interest.

LANDSCAPE CHARACTER TYPE

SUSITNA UPLAND WET TUNDRA BASIN

PHOTO E8.8.5

LANDFORMS

. Low, flat and rolling terrace above the banks of the Susitna River.

WATERFORMS

. The Susitna River here is mildly to heavily braided. Becomes more braided as it nears its glacial headwaters.
. River varies from 1/8 mile to over 1 mile (0.2 km to over 1.6 km) wide.
. Several hundred lakes ranging from very small to over 500 acres (200 ha) in size. Dense patterns.
. Oshetna, Tyone and Maclaren rivers and Clearwater, Butte, Windy and Valdez creeks are all significant tributaries.

VEGETATION

. Tundra (wet) is the dominant vegetation type.
. Sparse stands of spruce are scattered throughout the area.
. Dense willow and other shrub types are found along the river and many lake banks.
. The tundra foliage in the fall creates an extensive variety of colorful patterns over the landscape.

VIEWS

. The wide open character of the river basin allows scenic views of the Alaska Range and the Talkeetna Mountains.
. Susitna and West Fork glaciers - the source of the Susitna River - can be from 30 to 50 miles (50 to 80 km) distant.
. Views in the foreground landscape are not particularly scenic - except the fall tundra color.

LANDSCAPE CHARACTER TYPE

PORTAGE LOWLANDS

PHOTO E8.8.6

LANDFORMS

- The lower portion of Portage Creek forms a distinct winding fixed channel and steep-sloped valley.
- Large eroded sidewalls are common on the many hairpin turns in the river.
- Flat terraced areas along the upper creek are also common.

WATERFORMS

- Portage Creek is a very scenic, fast-flowing and clearwater tributary to the Susitna below Devil Canyon.
- A number of small streams cascade down into Portage Creek.

VEGETATION

- Moderately dense spruce-deciduous forest covers most of the valley up to an average elevation of 2500 feet (757 m).
- The well mixed forest provides scenic fall color.
- Bright green spring foliage of the deciduous trees also provide color.

VIEWS

- Views are generally restricted to the deep and forested valley.
- Overall, the combination of natural features provides a very aesthetically pleasing environment.
- Forest views are in marked contrast to many locations in the region.

LANDSCAPE CHARACTER TYPE

CHULITNA MOIST TUNDRA UPLANDS

PHOTO E8.8.7

LANDFORMS

- Wide variety of small and large scale topographic relief.
- Large, well defined and enclosed lake beds.
- Long, flat as well as rolling terraces above the Susitna River, with a variety of canyon sizes.
- Dark brown colored rock outcrops are common along upper terrace, canyon and lake edges.
- Several long shallow valleys.

WATERFORMS

- Dozens of irregular shaped lakes up to several hundred acres in size.
- Bog and wetland areas are common throughout the area.
- Many small streams flow through the canyons down to the Susitna.
- Indian River, Portage and Devil creeks are part of this area.

VEGETATION

- The upland area east Portage Creek is predominantely tundra.
- The upland area west of Portage Creek is covered with a moderately dense spruce forest.
- Willow and other shrub species are commonly found in dense cover near lake banks and wetland areas.
- Scattered and sparse stands of spruce are found east of Portage Creek and mixed woods in the creek valley.
- Tundra colors are gold and light brown during winter months - when not covered by snow. Medium to dark green in spring and summer. Bright red, burgundy and yellow tones in the fall.

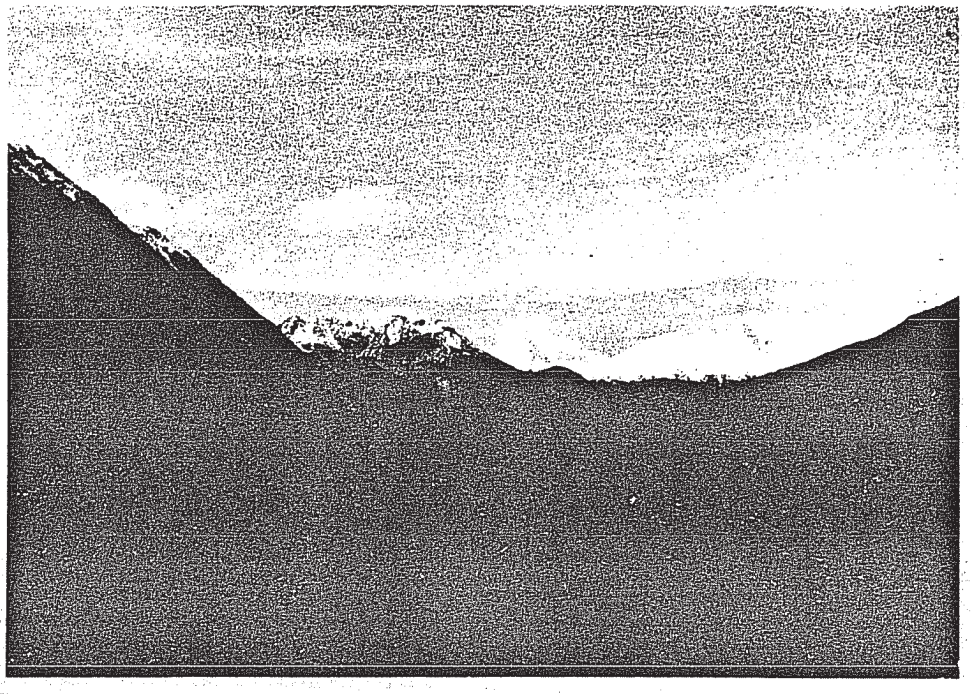
VIEWS

- Foreground and middleground views are scenic and common except in the denser forested areas.
- Vantage points are limitless.
- Views of the Chulitna and Talkeetna mountains occur often and views of the Alaska Range are possible.
- In late fall, the brilliant blue color of the lakes are in contrast to the snow covered landscape.
- Scenic views to adjacent drainages.

LANDSCAPE CHARACTER TYPE

CHULITNA MOUNTAINS

PHOTO E8.8.8



LANDFORMS

- Over 900 square miles (2340 square km) of rugged glacially carved mountains.
- Narrow and broad v-shaped valleys.
- Glaciers and permanent ice fields. Rock glaciers.
- Steeply rises up to over 6000 feet (1818 m) in elevation.
- Many extensive talus slopes.

11.*Caribou Pass
6.*Tsusena Butte Lake

WATERFORMS

- Cirque lakes of aqua-blue color.
- Five or six lakes of several hundred acres in size. Largest one is in Caribou Pass.
- Tsusena, Brushkana, Soule, Deadman and Honolulu creeks and the Jack, Middle and East Fork Chulitna rivers are all significant drainages.

VEGETATION

- Tundra and shrub species cover the valley floors and slopes creating an interesting edge as they meet the barren steeper rock slopes.
- Scattered stands of spruce and deciduous trees along Jack, Middle and East Fork Chulitna rivers.
- Tsusena Creek forms a unique green spruce-deciduous forest over 20 miles (33 km) through the Chulitnas.

VIEWS

- Views are scenic most everywhere.
- Impressive and awesome natural features.
- Mountain rock colors of light to dark gray (primarily talus slopes) and medium to dark brown (higher mountain tops) provide a variety of textures and patterns with the seasonal color changes of the tundra.

LANDSCAPE CHARACTER TYPE

WET UPLAND TUNDRA

PHOTO E8.8.9

LANDFORMS

- Flat to rolling upland area with several large surficial creeks.
- Gentle to moderately steep gradient slopes from Chulitna highlands to the creeks.
- Mild to moderately depressed lake beds with adjacent glaciated bluffs and hills.

WATERFORMS

- Big Lake and Deadman Lake are the largest examples of lakes in the upper basin. Big Lake is approximately 1080 acres (732 ha).
- Deadman Creek is a unique meandering watercourse.
- Brushkana and Butte creeks are other significant drainages of the area.
- Bogs and wetland areas are common and extensively occur in this upland.

10.*Big/Deadman Lakes

VEGETATION

- Wet tundra cover is prevalent with occasional stands of spruce.
- Willow and other shrub species are common near creek banks and lake shores and in wetland areas.

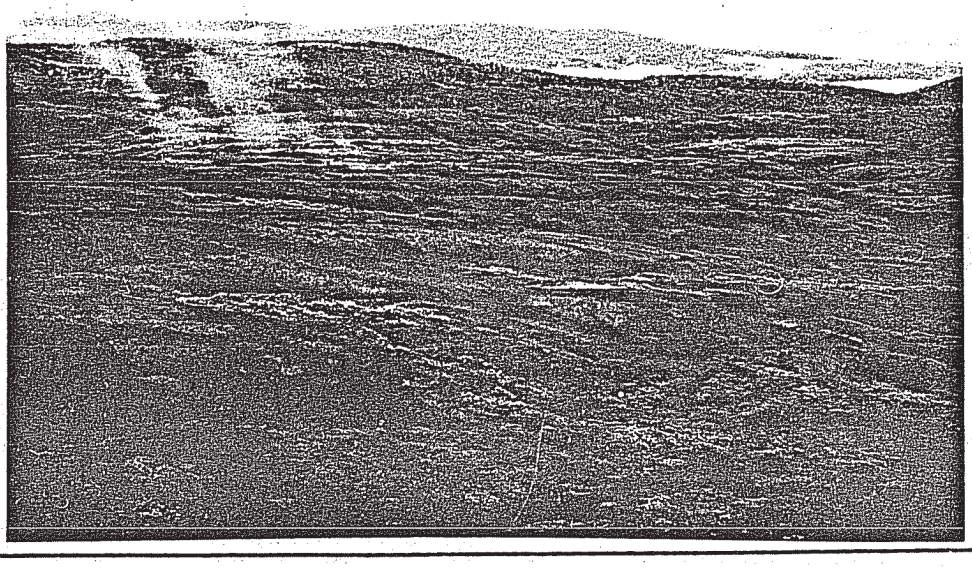
VIEWS

- Panoramic views of the Chulitna, Talkeetna and Clearwater mountains and the Alaska Range are possible.
- In the fall and early winter, ice forming on Deadman Creek creates very interesting patterns and textures.
- Fall color of the tundra, combined with all other natural features, is highly scenic.

LANDSCAPE CHARACTER TYPE

TALKEETNA UPLANDS

PHOTO E8.8.10



LANDFORMS

- Flat to rolling upland plateau.
- Slopes are primarily moderately steep to steep.
- Several knobs rise above 4000 ft (1212 m) with the average elevation of 3000 ft (900 m).
- Drainages in the area form deep and steep, sloped valleys and canyons.
- Rugged rocky hilltops and outcropping are common.

WATERFORMS

- Tens of lakes which are 20-50 acres (8-20 ha) in size. Simple and complex forms.
- Massive areas of muskeg bogs.
- Chunilna Creek is a very significant drainage in the area with many tributaries.
- Many of the lakes are topographically enclosed.

VEGETATION

- Moist and west tundra is dominant.
- Moderately dense spruce-deciduous tree cover is primarily restricted to drainages.
- Chunilna Creek valley is densely forested.

VIEWS

- Foreground and background views are scenic throughout most of the landscape.
- Panoramic views are possible from higher points.
- The Chulitna and Talkeetna mountains and the Alaska Range can be seen.
- Good views of the Susitna and Talkeetna river valleys are possible.

LANDSCAPE CHARACTER TYPE

TALKEETNA MOUNTAINS

PHOTO E8.8.11

LANDFORMS

- Rugged and steep sloped mountain range covering several thousand square miles.
- Elevations over 8000 ft (2420 m).
- Large glaciers, permanent ice fields and glacial features.
- Large moderately sloped terraces.
- Long, narrow and broad v-shaped valleys.
- Large talus slopes.

4.*Clear Valley

WATERFORMS

- Cirque lakes.
- Numerous lakes up to several hundred acres in size. Scattered to dense concentrations.
- Over ten rivers and creeks.

VEGETATION

- Primarily tundra and shrub species throughout the mountains below the steeper rocky slopes and peaks.
- Except for the drainages on the northeast area of the range, dense spruce-deciduous forests cover the river valleys.

VIEWS

- Views are scenic and limitless.
- Views are panoramic to semi-enclosed depending on viewer position.

LANDSCAPE CHARACTER TYPE

SUSITNA UPLAND TERRACE

PHOTO E8.8.12

LANDFORMS

- Terraced, flat and rolling terrain.
- Slopes have gentle gradients.
- Depressed lake basins.

WATERFORMS

- Large linear glaciated and irregular formed lakes. Stephan Lake is the second largest in the upper Susitna basin.
- Fog Lakes (5 adjacent lakes of several hundred acres in size each) create a pattern unique to the area.
- Fog Creek forms a narrow and deeply incised canyon leaving the Fog Lakes area and flowing into the Susitna.

3.*Stephan Lakes
8.*Fog Lakes

VEGETATION

- Densely forested with spruce and some deciduous trees, except for an area of approximately 10 square miles (26 square km) northeast of Fog Lakes, which is predominately tundra.
- Spruce-green is the dominant color for most of the year, white (snow) in the winter.

VIEWS

- Views are often restricted due to the forest cover and depressed lake beds. However, the higher mountains (Talkeetna and Chulitnas) still rise above the horizon.
- Open vantage points for panoramic views are present.

LANDSCAPE CHARACTER TYPE

SUSITNA UPLANDS

PHOTO E8.8.13

LANDFORMS

- Terraced, flat and rolling terrain.
- Elevation range is approximately 3000 - 5600 ft (900 - 1700 m).
- Slopes are primarily flat to moderately steep.
- Larger lake beds are depressed.
- Stream valleys are broad and fixed channel.
- Rock outcrops, cliffs and rocky hilltops are common in the area. Rock colors are light tan to dark brown.

WATERFORMS

- A number of small lakes are scattered throughout the area in dense patterns.
- The two largest lakes, Watana and Clarence, are narrow and linear in form. Both are several hundred acres in size.
- Large number of small creeks.
- Tributaries of the Susitna, Kosina, Tsisi, Gilbert and Goose creeks and the silt laiden Oshetna River are all scenic and significant to this area.

12.*Watana Lakes

VEGETATION

- Upland moist tundra and shrub species cover most all of the land except for the rock environments.
- Fall colors of this massive tundra area create a variety of patterns.
- Spruce are found within some of the drainages in sparse to moderately dense stands.

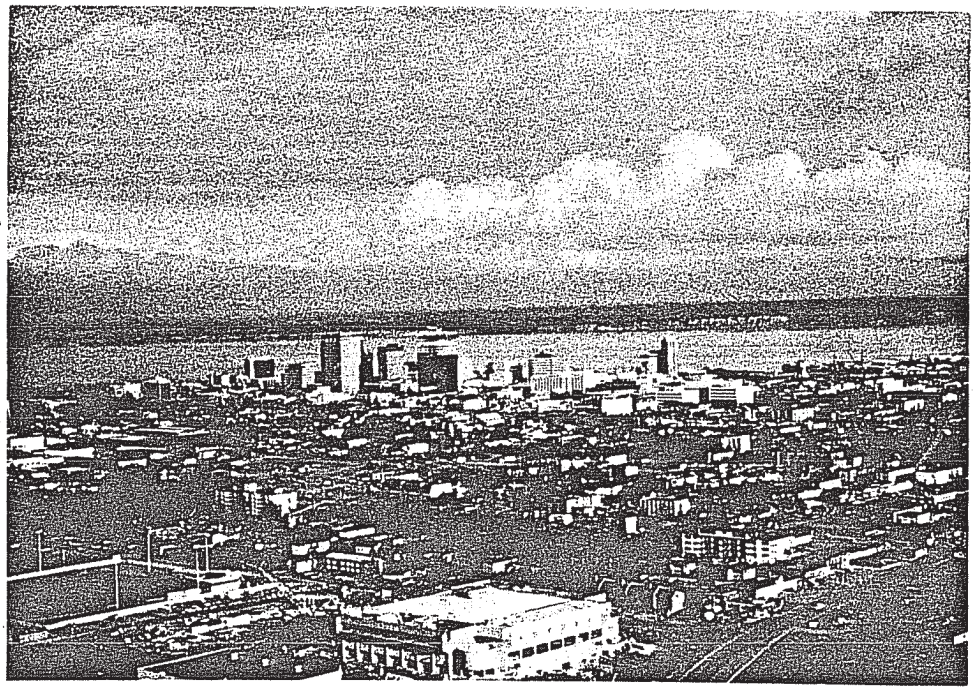
VIEWS

- Views are expansive.
- Many areas at the same elevation and higher in the upper basin can be viewed from this high upland.
- Views of the Talkeetnas are particularly scenic.

LANDSCAPE CHARACTER TYPE

ANCHORAGE, ALASKA

PHOTO E8.8.14



LANDFORMS

- Rolling and flat terraced lowlands of Knik and Turnagain arms (upper Cook Inlet).
- Rolling and moderately steep slopes of Chugach foothills.
- Large sunken areas caused by 1964 earthquake.
- Urbanized town landscape.

WATERFORMS

- Several small creeks traverse through the area and into Cook Inlet.
- Several large man-made lakes.
- Scattered natural lakes - low density.
- Dominated by the adjacent Cook Inlet and connecting arms.

VEGETATION

- Denser urban areas have sparse ornamental tree cover with some natural spruce and deciduous trees.
- Undeveloped areas, lakes and foothills are generally covered with moderately dense to dense forests of spruce-deciduous trees and willow.
- Natural drainages are usually forested and/or have dense shrub cover.

VIEWS

- Due to the flat to undulating terrain, views are open.
- The adjacent Chugach Mountains create a high quality aesthetic setting. Covered with snow in the winter, green in the summer and colorful in the fall.
- The Alaska Range, nearby Mount Susitna, Kenai Mountains and the Cook Inlet, with its unique mud flats, can be seen.

LANDSCAPE CHARACTER TYPE

SUSITNA RIVER LOWLANDS

PHOTO E8.8.15

LANDFORMS

- Very flat to gently rolling lowlands.
- Larger lake areas are enclosed by small hills.
- Mount Susitna, a flat topped remnant volcano, rises over 3000 ft (900 m) above the lowlands. Adjacent Little Mount Susitna and nearby Beluga Mountain also steeply rise above the landscape.

WATERFORMS

- Wet bog and wetlands cover a large percentage of the land.
- Hundreds of small lakes make dense patterns.
- Numerous topographically enclosed lakes several hundred acres in size.
- Heavily braided Susitna River varies from 1/2 mile to several miles (0.8 km to over 2 km) wide; many islands.
- Numerous meandering tributaries to Susitna.

VEGETATION

- Thin stands of black spruce cover many bog areas.
- Marsh grasses.
- Moderately dense to dense cover of spruce-deciduous trees around higher reliefed and larger lake areas - good fall color - also along Susitna River and tributaries.
- The dark green color of the spruce is most dominant.

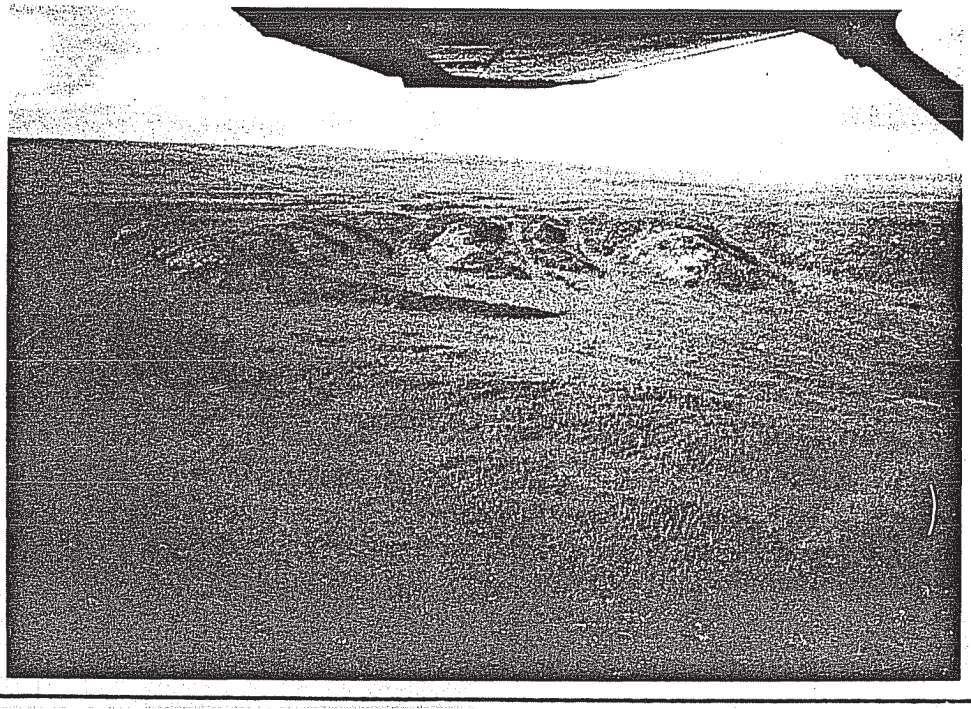
VIEWS

- Views of the immediate area are generally monotonous because of the expansive commonality and flat topography of the landscape.
- Views of the Alaska Range, Chugach and Talkeetna mountains and the Mount Susitna landmark are possible from open areas.
- Weather permitting, Mount McKinley dominates the scene.

LANDSCAPE CHARACTER TYPE

NENANA UPLANDS

PHOTO E8.8.16



LANDFORMS

- Relatively flat meandering river valley terraces several miles (over 2 km) in width with steep slopes rising up to the Alaska Range foothills.
- Exposed rock and soil cliffs and highly eroded banks are commonly found along the Nenana River.
- Rock outcrops are also common along rising terrace edges; light tan to dark brown in color.

WATERFORMS

- The moderately braided and large Nenana River is the most significant water form; silty glacial water.
- Several relatively small tributaries.
- Scattered small lakes.
- Bog areas and wetlands.
- Many islands, broad floodplain.

VEGETATION

- Variable patterns of sparse to dense spruce and mixed forest over most of the area.
- Scattered open spaces of tundra and bare ground. Soil colors are light.

VIEWS

- Views are oriented to the Alaska Range in the south and the higher reliefed foothills in the east.
- Views of the river are not particularly scenic in comparison to mountain views.
- Rock cliffs and outcrops do provide visual interest.
- Transmission lines (existing) are very visible.

LANDSCAPE CHARACTER TYPE

NENANA RIVER LOWLANDS

PHOTO E8.8.17

LANDFORMS

- Extremely flat terrain.
- Numerous small drainages and the Nenana and Teklanika rivers.
- Sand, gravel and cobbles.

WATERFORMS

- Braided channels and heavily meandering Nenana and Teklanika rivers create a distinct pattern on the land.
- Numerous smaller and also meandering tributaries.
- Adjacent to and tributaries of the larger and heavily braided Tanana River.
- Many scattered small lakes and expansive wetland areas.
- Many islands.

VEGETATION

- Expansive cover of thin to moderately dense spruce forests west of Nenana River.
- Linear bands of spruce along drainages east of Nenana River.
- Tundra and wetland-bog species cover most the the area.

VIEWS

- Views of the immediate area are monotonous because of the lack of relief and lack of distinctive features to view on ground.
- Views are across river and directed to the high and forested Tanana hills to the north and the Alaska Range to the south.
- Transmission lines (existing) are very visible.

LANDSCAPE CHARACTER TYPE

TANANA RIDGE

PHOTO E8.8.18

LANDFORMS

- Distinct rounded hills interrupted by small valleys.
- Slopes are moderately steep to steep.
- Rise several thousand feet above the lowlands.

WATERFORMS

- Bounded to the south and west by the heavily braided Tanana River (sixth longest in Alaska).
- Numerous creeks throughout the area.
- A few small scattered lakes.
- Goldstream Creek is a very distinctive meandering watercourse dividing Tanana Ridge from the higher hills to the north.

VEGETATION

- Distinct stands of pure deciduous trees occur here as well as pure stands of spruce and mixed forests.
- Forest cover is generally dense.
- Foliage color patterns have high aesthetic value in the spring and fall.
- The white trunks of the birch also provide interesting winter textures.

VIEWS

- The views are moderate in scenic quality. However, fall color is an exception.
- Views are limited due to the dense forest cover.
- Clear-cut right-of-ways of existing transmission lines and roads are distinctly visible from many areas.

APPENDIX 4.9-3
NOTABLE NATURAL FEATURES PHOTOGRAPHS

NATURAL FEATURES #1
DEVIL CANYON RAPIDS

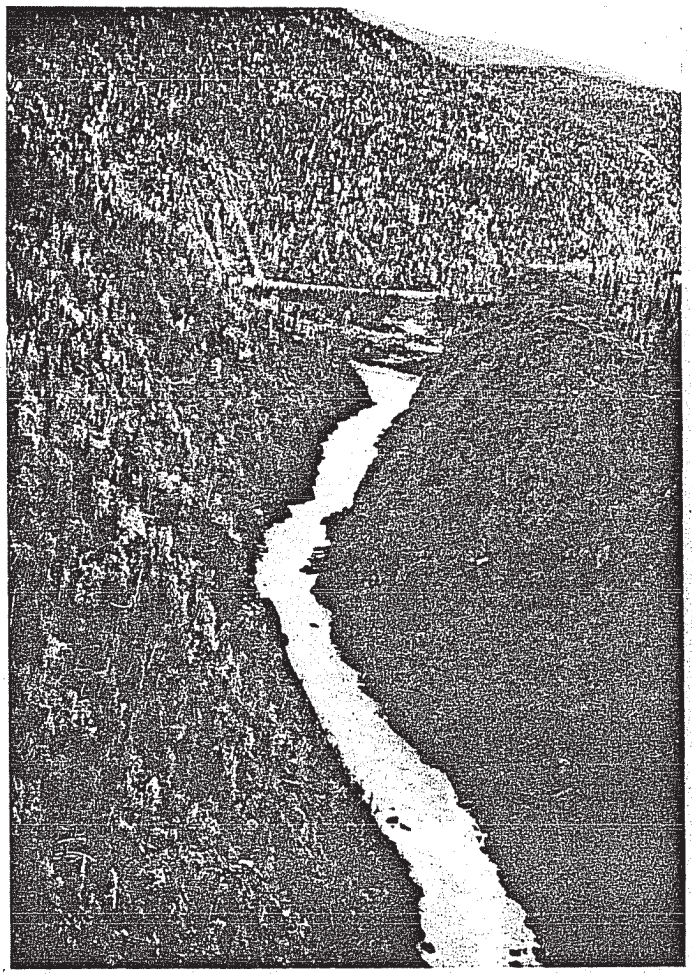


PHOTO E1.8.1: DEVIL CANYON RAPIDS LOOKING UPSTREAM TO DEVIL CANYON DAMSITE

NATURAL FEATURES # I
DEVIL CANYON RAPIDS

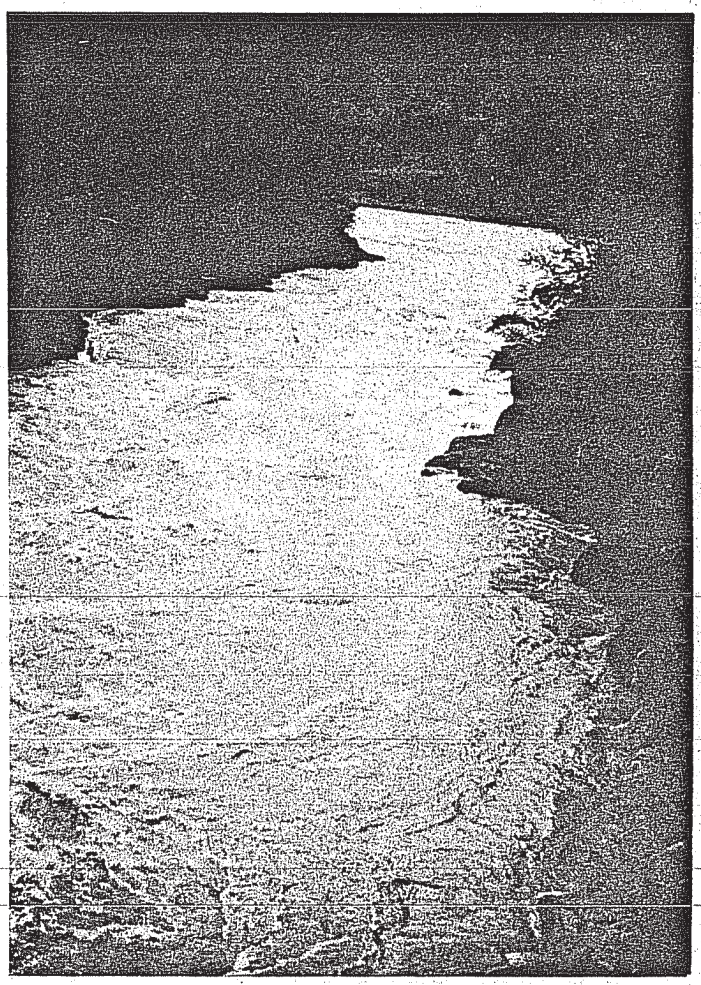


PHOTO E1.8.2: DEVIL CANYON RAPIDS

NATURAL FEATURES # 2
DEVIL CREEK FALLS

PHOTO E1.8.3: DEVIL CREEK FALLS #1

PHOTO E1.8.4: DEVIL CREEK FALLS #2

NATURAL FEATURES #3
STEPHAN LAKE

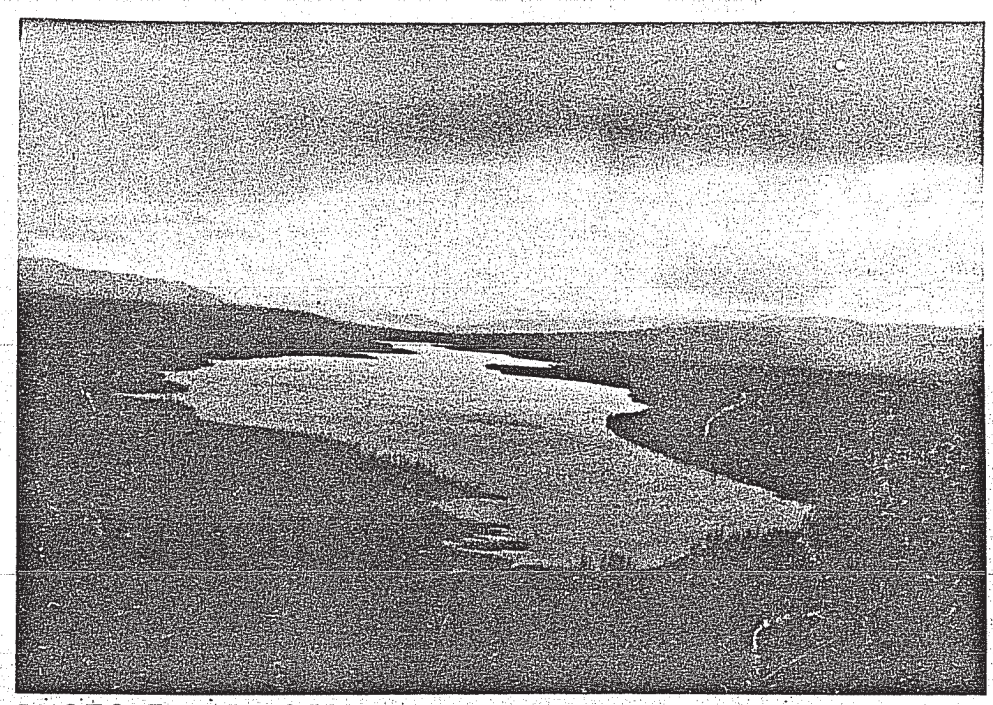


PHOTO E1.8.5: STEPHAN LAKE LOOKING SOUTH

NATURAL FEATURES #4
TSUSENA CREEK FALLS

PHOTO E1.8.6: TSUSENA CREEK FALLS

NATURAL FEATURES # 5
TSUSENA BUTTE LAKE

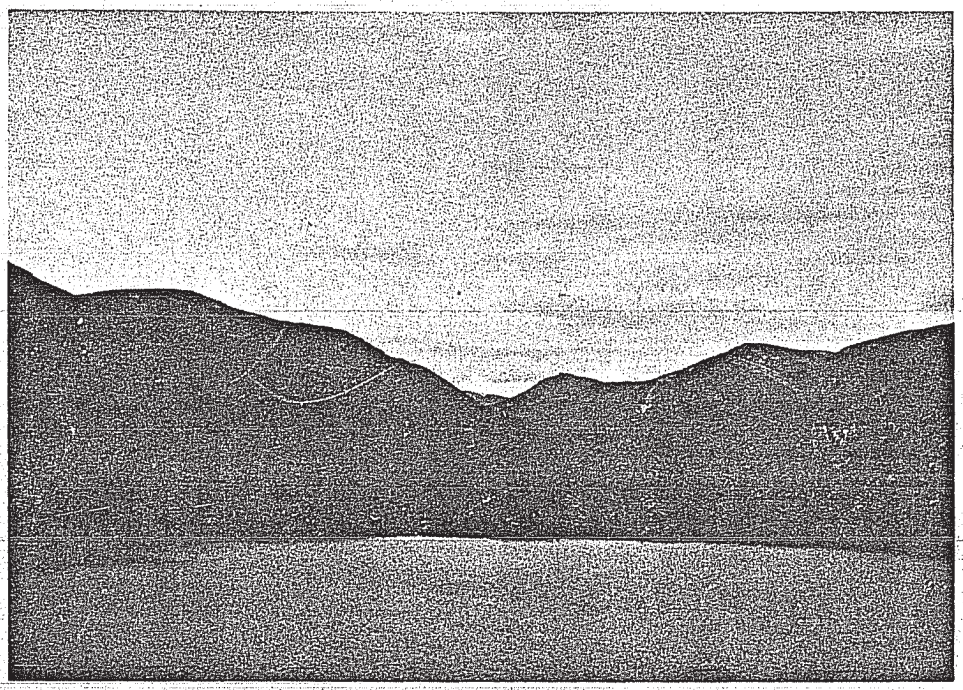


PHOTO E1.8.7: TSUSENA BUTTE LAKE LOOKING NORTH NORTHWEST

NATURAL FEATURES #6
DEADMAN CREEK FALLS

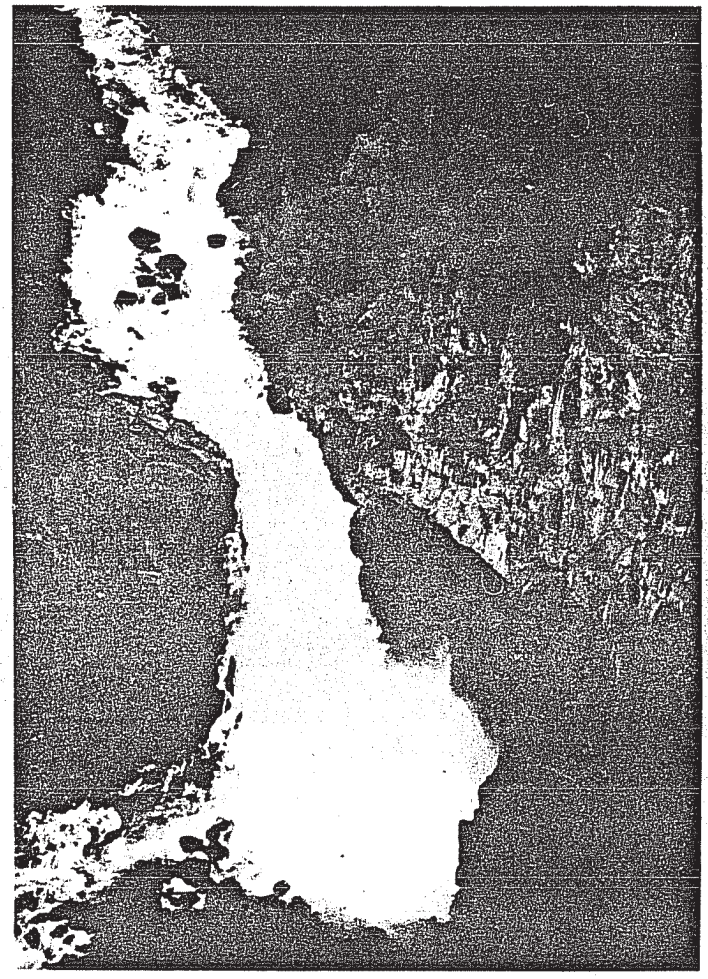


PHOTO E1.8.8: DEADMAN CREEK FALLS

NATURAL FEATURES # 7
FOG LAKES

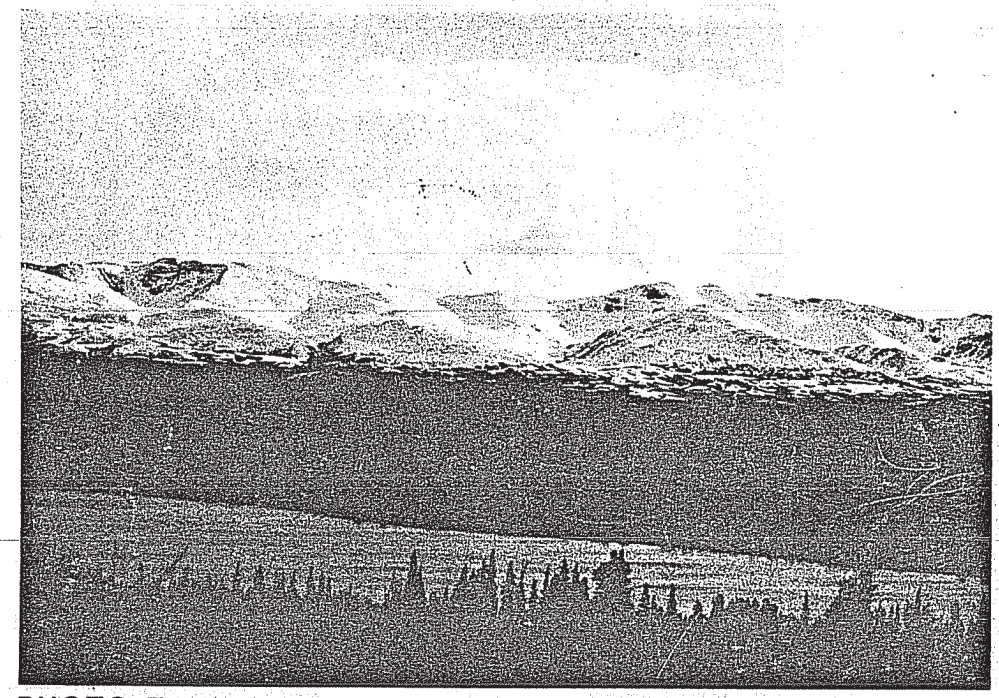


PHOTO E1.8.9: FOG LAKES

NATURAL FEATURES #8
BIG/DEADMAN LAKES

PHOTO E1.8.10: BIG/DEADMAN LAKE
(THE CONNECTING LAND BETWEEN THE 2 LAKES)

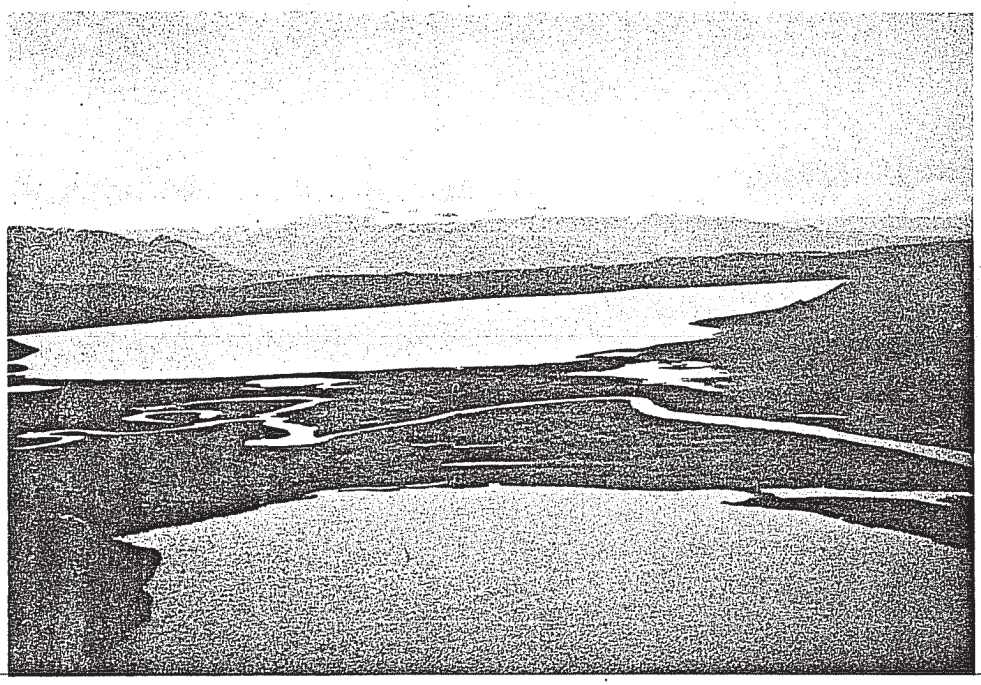


PHOTO E1.8.11: BIG/DEADMAN LAKE
(DEADMAN LAKE IS IN THE FOREGROUND AND BIG LAKE IN THE MIDDLEGROUND)

NATURAL FEATURES # 9
CARIBOU PASS

PHOTO E1.8.12: CARIBOU LAKES LOOKING SOUTH TOWARDS THE CONFLUENCE OF SOUTH CREEK AND JACK RIVER

NATURAL FEATURES #10
VEE CANYON

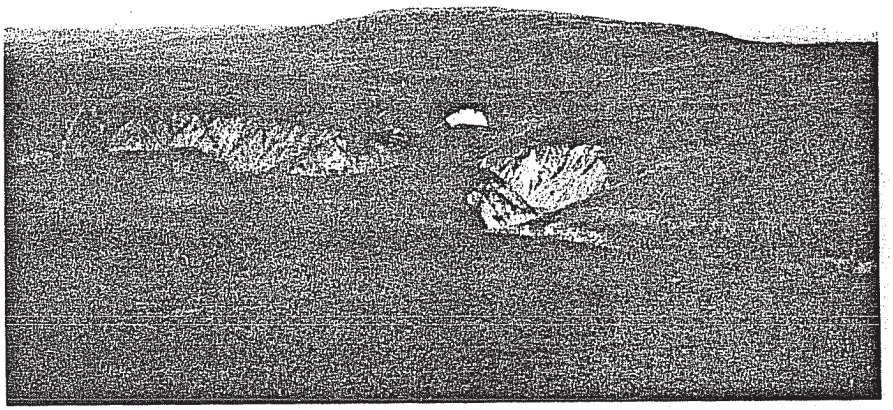


PHOTO E1.8.13: VEE CANYON AND VICINITY

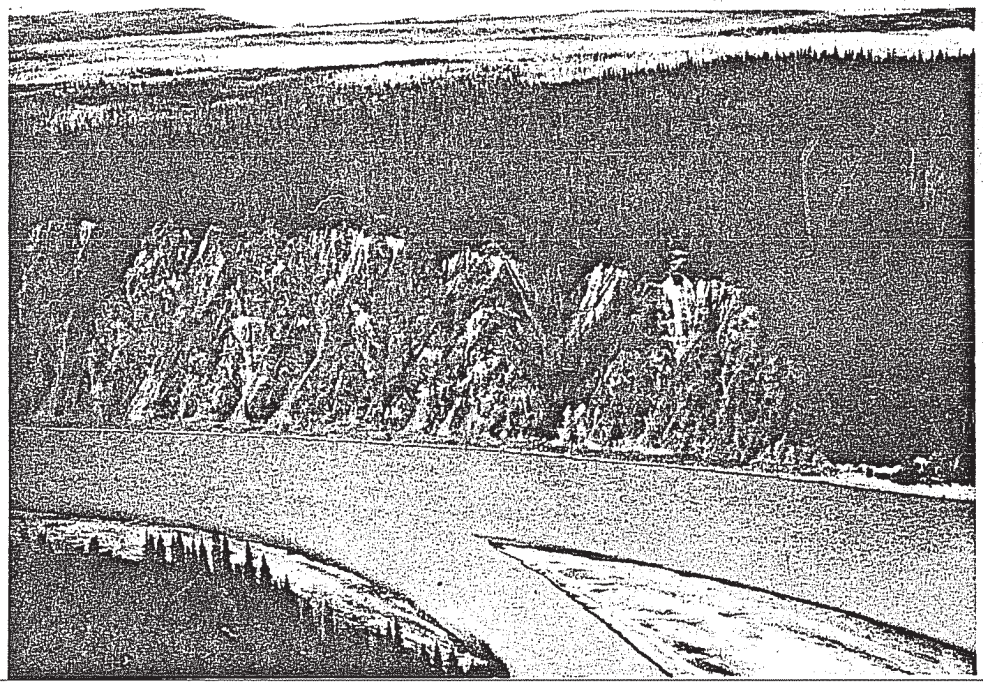


PHOTO E1.8.14: THE SOUTHERN WALLS OF VEE CANYON

APPENDIX 4.9-4

AESTHETIC VALUE AND VISUAL ABSORPTION CAPABILITY RATINGS

AESTHETIC VALUE AND ABSORPTION CAPABILITY RATINGS

LANDSCAPE CHARACTER TYPE	AESTHETIC VALUE	ABSORPTION CAPABILITY	COMMENTS
MID SUSITNA RIVER VALLEY	Moderate	Medium	. Common Alaskan landscape--nothing which makes it particularly distinctive. . Existing man-made elements (i.e., railroad parallel to river, railroad bridge, cabins and railroad related structures) have not had significant negative aesthetic impacts.
DEVIL CANYON	High	Low	. Distinctive Alaskan natural resource feature. . Dramatic but unstable environment because of steep slopes. . Man-made elements must be sensitive to the existing landscapes. A highly aesthetic and recreational resource.
SUSITNA RIVER	High	Medium	. Distinctive and impressive deep valley--large-scale. . Good variety of landform, vegetation and water edges. . Variety of scenic large- to small-scale features. . Able to absorb some man-made impacts on semiforested, less steep areas. Small-scale impacts.
RIVER CANYON	High	Low	. Distinctive river canyon. . Steep slopes make the area sensitive to development. . Due to the lack of substantial forest cover, the overall open character of the canyon requires highly compatible design solutions.
SUSITNA UPLAND WET TUNDRA BASIN	Moderate	Medium	. Impressive scale but landscape character is common in Alaska. . Distant scenic views to mountains along with a variety of land, water and vegetative edges in foreground gives the area moderate to high aesthetic value. . Flat and open character of land will not easily absorb man-made elements/ impacts. However, existing roads and small structures are not distractive.

AESTHETIC VALUE AND ABSORPTION CAPABILITY RATINGS

LANDSCAPE CHARACTER TYPE	AESTHETIC VALUE	ABSORPTION CAPABILITY	COMMENTS
PORTAGE LOWLANDS	High	Low	. Distinctive deep and winding tributary river canyon to the Susitna River. Variety of vegetation types and river bottom terrain. . Steep erodible slopes would be sensitive to any development.
CHULITNA MOIST TUNDRA UPLANDS	High	Moderate	. High aesthetic quality due to diversity of landforms, water and vegetation patterns. . The landform diversity and variety of forest edges and densities will allow for some visual integration and absorption of man-made elements.
CHULITNA MOUNTAINS	High	Low	. Highly distinctive area, rich in significant natural attractive features. . Complex glaciated landforms of all scales. . Man-made elements and impacts will be very visible on this predominantly treeless and steep sloped landscape. . Basically a wilderness area.
WET UPLAND TUNDRA	Moderate	Low	. There is a variety of water forms and their distinct edges with land and vegetation, along with highly scenic views. . Although the area is basically open, the rolling terrain would not be significantly impacted by man-made elements if they were properly sited and sensitively designed. Elements must be subordinate to the landscape.
TALKEETNA UPLANDS	Moderate	Low	. The overall aesthetic value of this area is good due primarily to variety of landforms, but is not as scenic (middle and foreground views) in comparison to many of the other character types. . The bisecting forested river valleys create a distinct and interesting pattern.

AESTHETIC VALUE AND ABSORPTION CAPABILITY RATINGS

LANDSCAPE CHARACTER TYPE	AESTHETIC VALUE	ABSORPTION CAPABILITY	COMMENTS
TALKEETNA UPLANDS (contd)	Moderate	Low	. Man-made features would be visible in most areas due to the flat to rolling open terrain. . Sensitive siting is mandatory with the landscape dominating the character of development if any.
TALKEETNA MOUNTAINS	High	Low	. Highly distinctive mountain range with a complex variety of land and water forms, and patterns. . As with the Chulitna Mountains, this area can be considered a wilderness area. . Medium- to large-scale man-made features will be highly visible in this treeless steep sloped mountain environment. . Recreation trails here and in the Chulitna Mountains should not be aesthetically disruptive.
SUSITNA UPLAND TERRACE	Moderate	Low	. This setting of large lakes, dense forest and scenic views to the mountains is basically of moderate aesthetic value. . Distinctive to the basin but not to Alaska. . Clearing of trees for most any type of development would be highly visible in this densely forested area. . Any major man-made impact (medium- to large-scale) must be carefully considered to emphasize site fitness.
SUSITNA UPLANDS	Moderate	Low	. This landscape character is common in Alaska with the exception of its large number of distinctive streams and rivers. The open landscape is significantly enhanced by the scenic views of adjacent and distant character types. . Other than recreational trails--if properly sited--most all other man-made features would be highly visible.

AESTHETIC VALUE AND ABSORPTION CAPABILITY RATINGS

LANDSCAPE CHARACTER TYPE	AESTHETIC VALUE	ABSORPTION CAPABILITY	COMMENTS
ANCHORAGE, ALASKA	Low	High	• Although the city is in a high quality aesthetic setting, the visual image of the city itself is not high in aesthetic value. • With the exception of the Chugach foothills, the large-scale urban environment should be able to absorb new man-made features. However, proper design, siting and alignment of features will be essential to lessen any potential aesthetic impact.
SUSITNA RIVER	Low	High	• The landscape is continuous and broad in scale with few significant landscape features. • Flat terrain and diverse vegetation patterns should be able to effectively absorb most man-made features. Aesthetic impacts will not be significant.
NENANA UPLANDS	Moderate	Medium	• Landscape has good variety of landforms and vegetation patterns and a large distinctive river. • Aesthetic value is not high in comparison to many other Alaskan character types. • This rich diversity and patterns of natural elements and generally open landscape will be able to absorb limited man-made features with sensitive planning and design.
NENANA RIVER LOWLANDS	Low	High	• This landscape has complex patterns of vegetation and water features but no topographic relief or significantly unique and attractive features to give it a higher aesthetic value. • Man-made features should be visually absorbed by this flat expansive landscape with a variety of vegetative patterns.
TANANA RIDGE	Moderate	Low	• Distinctive landscape relative to the general geographic area. The forested hills are at the edge of a large flatlands and visually significant.

AESTHETIC VALUE AND ABSORPTION CAPABILITY RATINGS

LANDSCAPE CHARACTER TYPE	AESTHETIC VALUE	ABSORPTION CAPABILITY	COMMENTS
TANANA RIDGE (contd)	Moderate	Moderate	• Again, this character has local high aesthetic value but not significant in comparison to other Alaskan landscapes. • The dense forest cover and steep slopes do not provide a condition allowing for visual absorption of medium- to large-scale man-made development. Sensitive siting will be essential to lessen aesthetic impacts.

APPENDIX 4.10-1
ANCSA 17(B) EASEMENT MAPS

EASEMENT AND NAVIGABILITY LEGEND

LINEAR EASEMENT		SYMBOL
ROADS	existing . . .	═══════
	proposed . . .	═ ═ ═ ═ ═
TRAILS	existing . . .	———————
	proposed . . .	— — — — —
STREAMSIDE. . . . . (25' both sides & bottom)		●—●—●—●—●

CORRDOR EASEMENTS	SYMBOL
BOUNDARY OF CORRIDOR . .	▰▰▰▰
ROAD	═ ═ ═ ═
RAILROAD	⊢+⊣⊢+⊣
PIPELINES OIL & GAS. . .	⊣ ⊢⊣ ⊢
PIPELINES MINERAL SLURRY	⊣M⊢
POWER TRANSMISSION . .	●— — — —●

SITE EASEMENTS

CAMPSITE.	⛺
WATER ACCESS FACILITY .	W
LANDING AREA.	T
NAVIGATION AID.	⊙
GAUGE STATION	◕
OTHER	□

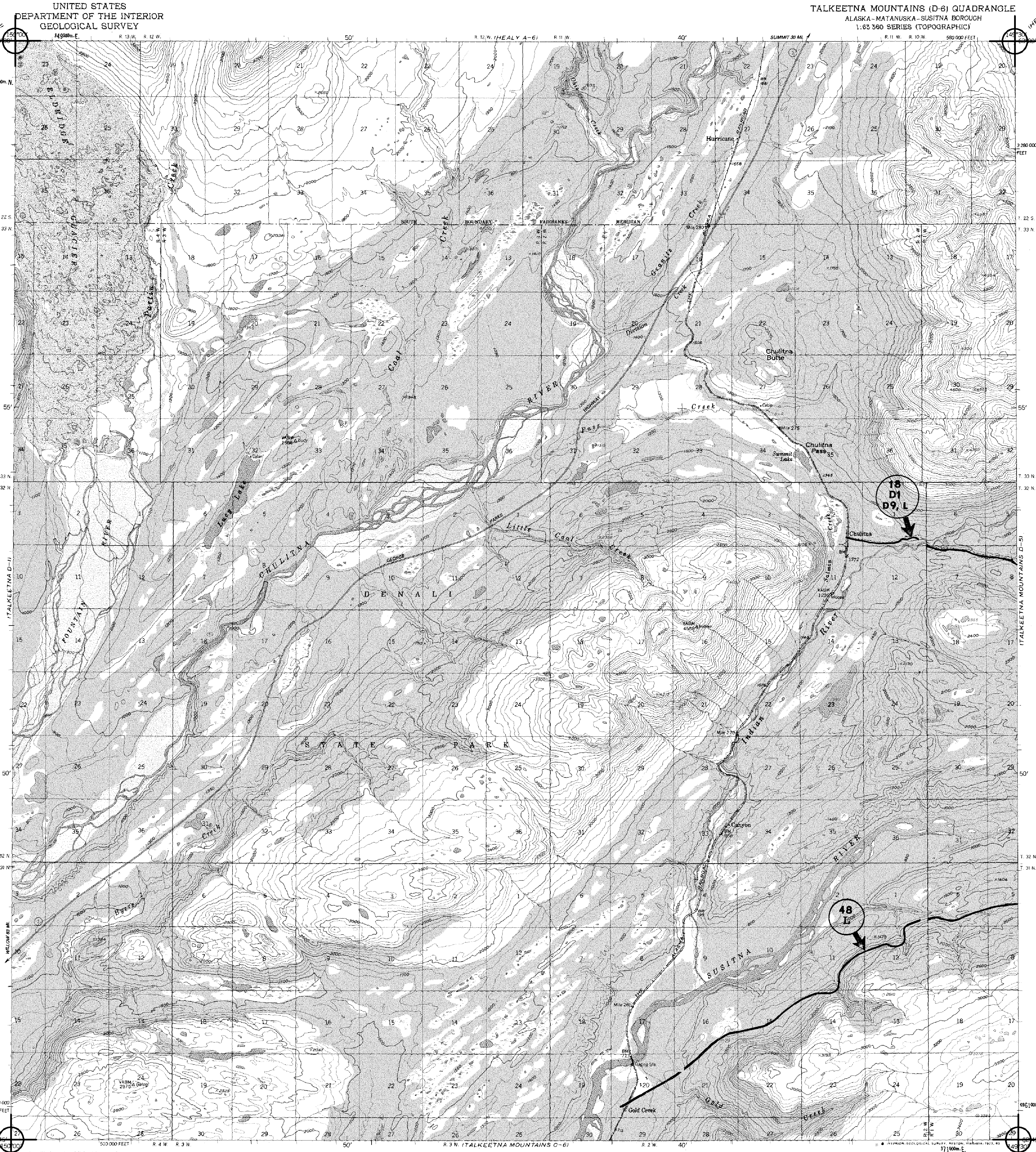
NAVIGABLE WATERS	—N—
CORE TOWNSHIP BOUNDARY. .	▬ ▬ ▬ ▬
EASEMENT NUMBER	3
SPONSOR CODE	D1

EASEMENT SPONSOR CODE

A Alaska Center for the Environment
B Department of Defense
C Department of Interior:
C1 Bureau of Outdoor Recreation
C2 National Park Service
C3 Bureau of Mines
C4 BLM State Office
C5 BLM District Office
C6 Fish and Wildlife
C7 Geological Survey
C8 Alaska Power Administration
D State of Alaska:
D1 Division of Lands
D2 Division of Parks
D3 Department of Highways
D4 Division of Planning and Research
D5 Division of Aviation
D6 Division of Public Works
D9 Department of Fish and Game
E Land Use Planning Commission
F RCA Alaska Communications
G U.S. Forest Service
H The Alaska Railroad
I Federal Aviation Administration
J U.S. Coast Guard
K Corps of Engineers
L General Public
M Village Corporation
N Regional Corporation

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

TALKEETNA MOUNTAINS (D-6) QUADRANGLE
ALASKA-MATANUSKA-SUSITNA BOROUGH
1:63 360 SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1949, field annotated 1951. Map not field checked

Universal Transverse Mercator projection, 1927 North American datum
10,000-foot grid based on Alaska coordinate system, zone 4
1000-meter Universal Transverse Mercator grid ticks, *zone 6, shown in blue*

Land lines represent unsurveyed and unmarked locations predetermined by the Bureau of Land Management
Folios S-2, Seward Meridian and F-10, Fairbanks Meridian

Swamps, as portrayed, indicate only the wetter areas, usually of low relief, as interpreted from aerial photographs

There may be private inholdings within the boundaries of the National or State reservations shown on this map

APPROXIMATE MEAN DECLINATION, 1951

SCALE 1:63360

CONTOUR INTERVAL 100 FEET
DOTTED LINES REPRESENT 50-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

FOR SALE BY U.S. GEOLOGICAL SURVEY
FAIRBANKS, ALASKA 99701, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

ROAD CLASSIFICATION
Trails

Talkeetna Mountains D–6

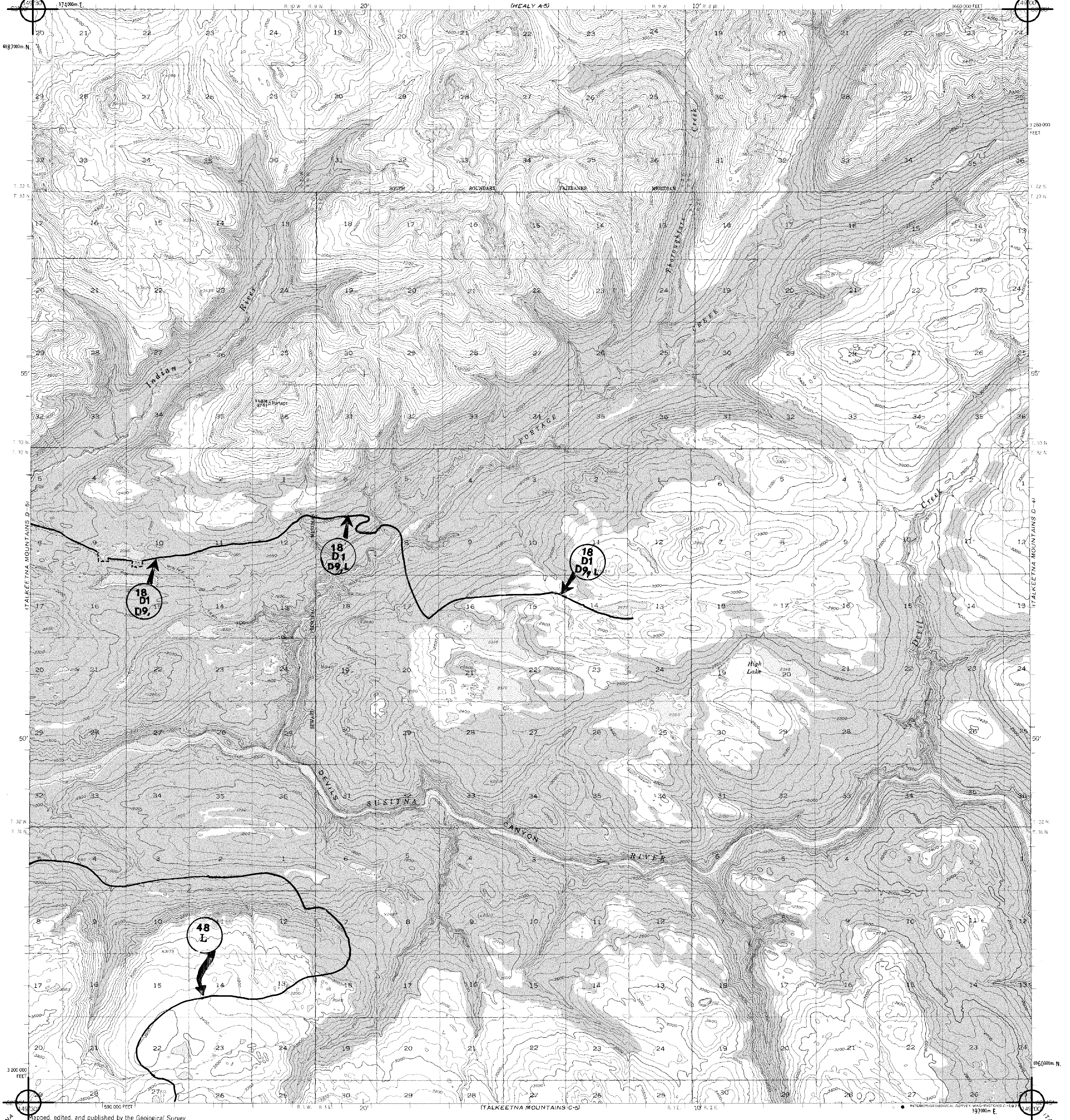
TALKEETNA MOUNTAINS (D-6), ALASKA
N6245-W14930/15X30

1951
MINOR REVISIONS 1966

Current To Date: 02-21-2007

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

TALKEETNA MOUNTAINS (D-5) QUADRANGLE
ALASKA
1:63 360 SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1949, field annotated 1950. Map not field checked

Universal Transverse Mercator projection, 1927 North American datum
10,000-foot grid based on Alaska coordinate system, zone 4
1000-meter Universal Transverse Mercator grid ticks, zone 6, shown in blue

Land lines represent unsurveyed and unmarked locations predetermined by the Bureau of Land Management
Folios F-10, Fairbanks Meridian and S-1, S-2, Seward Meridian

TRUE NORTH
MAGNETIC NORTH
28°
APPROXIMATE MEAN DECLINATION, 1950

SCALE 1:63360

1 ½ 0 1 2 3 4 MILES

3000 0 3000 6000 9000 12000 15000 18000 21000 FEET

1 .5 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DOTTED LINES REPRESENT 50-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

ALASKA
QUADRANGLE LOCATION

ROAD CLASSIFICATION
Trails ....

Talkeetna Mountains D-5

TALKEETNA MOUNTAINS (D-5), ALASKA
N6245-W14900/15X30

EDITION OF 1950
MINOR REVISIONS 1962

FOR SALE BY U. S. GEOLOGICAL SURVEY
FAIRBANKS, ALASKA 99701, DENVER, COLORADO 80225 OR WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

Current To Date: 02-21-2007

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

TALKEETNA MOUNTAINS (D-4) QUADRANGLE

ALASKA–MATANUSKA–SUSITNA BOROUGH

1:63 360 SERIES (TOPOGRAPHIC)

(HEALY A-5) (HEALY A-4) (HEALY A-3)

(TALKEETNA MTS C-5) (TALKEETNA MOUNTAINS C-4) (TALKEETNA MTS C-3)

(TALKEETNA MOUNTAINS D-5) (TALKEETNA MOUNTAINS D-3)

14 C5,D9

72 C5,D9

46 C5,D1

71 C5,D9

Mapped, edited, and published by the Geological Survey

Control by USGS

Topography by photogrammetric methods from aerial photographs taken 1949, field annotated 1951. Map not field checked

Universal Transverse Mercator projection, 1927 North American datum
10,000-foot grid based on Alaska coordinate system, zone 4
1000 meter Universal Transverse Mercator grid ticks,
zone 6, shown in blue

Land lines represent unsurveyed and unmarked locations predetermined by the Bureau of Land Management
Folios F-10, Fairbanks Meridian and S-1, Seward Meridian

APPROXIMATE MEAN DECLINATION, 1951

SCALE 1:63360

CONTOUR INTERVAL 100 FEET
DOTTED LINES REPRESENT 50-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

No roads or trails in this area

QUADRANGLE LOCATION

Talkeetna Mountains D–4

TALKEETNA MOUNTAINS (D-4), ALASKA
N6245—W14830/15X30

1951
MINOR REVISIONS 1959

FOR SALE BY U. S. GEOLOGICAL SURVEY
FAIRBANKS, ALASKA 99701, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

INTERIOR GEOLOGICAL SURVEY, RESTON, VIRGINIA 1975

Current To Date: 02–23–2007

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

TALKEETNA MOUNTAINS (D-3) QUADRANGLE

ALASKA—MATANUSKA–SUSITNA BOROUGH
1:63 360 SERIES (TOPOGRAPHIC)

(HEALY A-4) (HEALY A-3) (HEALY A-2)

148°30' 148°00' 425000m. E. 820 000 FEET 6986000m. N. 6959000m. N. 3 290 000 FEET 3 210 000 FEET

R. 5 W. R. 4 W. R. 3 W. R. 2 W. R. 5 E. R. 6 E. R. 7 E.

T. 33 N. T. 32 N. T. 31 N. T. 22 S.

(TALKEETNA MTS D-4) (TALKEETNA MOUNTAINS D-2)

(TALKEETNA MTS D-1) (TALKEETNA MTS D-2)

NORTH BOUNDARY SEWARD MERIDIAN

Deadman Creek

Big Lake

WABM 3467

Watana Creek

Fog Lakes

SUSITNA RIVER

22d D9

22e D9

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1949, field annotated 1951. Map not field checked

Universal Transverse Mercator projection, 1927 North American datum
10,000-foot grid based on Alaska coordinate system, zone 4
1000-metre Universal Transverse Mercator grid ticks,
zone 6, shown in blue

Land lines represent unsurveyed and unmarked locations predetermined by the Bureau of Land Management
Folios S-1, Seward Meridian and F-10, Fairbanks Meridian

APPROXIMATE MEAN DECLINATION, 1951

SCALE 1:63 360

CONTOUR INTERVAL 100 FEET
DOTTED LINES REPRESENT 50-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

FOR SALE BY U. S. GEOLOGICAL SURVEY
FAIRBANKS, ALASKA 99701, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

ROAD CLASSIFICATION

No roads or trails in this area

Talkeetna Mountains D–3

TALKEETNA MOUNTAINS (D-3), ALASKA
N6245–W14800/15X30

1951
MINOR REVISIONS 1965

• INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1975

Current To Date: 02–21–2007

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

TALKEETNA MOUNTAINS (C-4) QUADRANGLE

ALASKA—MATANUSKA—SUSITNA BOROUGH
1:63 360 SERIES (TOPOGRAPHIC)

46
C5, D1

46a
C4

26
D9, L

26a
C4

28
D9

27a
D9

38
D1, D9

TALKEETNA MOUNTAINS

TALKEETNA RIVER

Prairie

Daneka Lake

Lake

(TALKEETNA MOUNTAINS C-4)

(TALKEETNA MOUNTAINS D-4)

(TALKEETNA MOUNTAINS C-5)

(TALKEETNA MTS. C-5)

(TALKEETNA MTS. D-5)

(TALKEETNA MTS. B-5)

Mapped, edited, and published by the Geological Survey

Control by USGS and NOS/NOAA

Topography by photogrammetric methods from aerial photographs taken 1949, field annotated 1951. Map not field checked

Projection and 1,000-meter grid ticks shown in blue:
Universal Transverse Mercator, zone 6
10,000-foot grid ticks based on Alaska coordinate system, zone 4. 1927 North American Datum
To place on the predicted North American Datum 1983 move the projection lines 59 meters north and 118 meters east

Gray land lines represent unsurveyed and unmarked locations predetermined by the Bureau of Land Management Folio S-1, Seward Meridian

APPROXIMATE MEAN DECLINATION, 1951

SCALE 1:63360

CONTOUR INTERVAL 100 FEET
DOTTED LINES REPRESENT 50-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

FOR SALE BY U. S. GEOLOGICAL SURVEY
FAIRBANKS, ALASKA 99701, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

ROAD CLASSIFICATION

No roads or trails in this area

Talkeetna Mountains C-4

TALKEETNA MOUNTAINS (C-4), ALASKA
62148-E5-TF-063
1951

MINOR REVISION 1965

Current To Date: 02-21-2007

APPENDIX 4.13-1
CORPORATION AND TRIBE CONTACT INFORMATION

Regional Corporations

Cook Inlet Region, Inc.
2525 C St., Suite 500
Anchorage, AK 99503
907.274.8638

Ahtna, Inc.
PO Box 649
Glennallen, AK 99588
907.822.3476

Doyon, Ltd.
1 Doyon Place, Suite 300
Fairbanks, Alaska 99701
907.459.2000

Group Corporations

Alexander Creek, Inc.
8126 Wisteria St
Anchorage, AK 99502-4573
907.243.5323

Caswell Native Association
HC 89, Box 83
Willow, AK 99688
907.495.1263

Gold Creek-Susitna NCI
PO Box 847
Talkeetna, AK 99676
907.733.2329

Montana Creek Native Association
PO Box 100379
Anchorage, AK 99510
907.

Point Possession, Inc.
1321 Oxford Dr
Anchorage, AK 99503-6941
Phone: 563-1848

Urban Corporations

Kenai Natives Association, Inc.
15 Fidalgo Ave #102
Kenai, AK 99611-7795
Phone: (907) 283-4851

Village Corporations

Chickaloon-Moose Creek Native Association
P.O. Box 875046
Wasilla, AK 99674
907.745.7154 (Fax)

Eklutna, Inc.
16515 Centerfield Drive, Suite 201
Eagle River, AK 99577
907.696.2828

Knikatnu, Inc.
PO Box 872130
Wasilla, AK 99687
907.376.2845

Ninilchik Native Association, Inc.
701 West 41st, Suite 201
Anchorage, AK 99515
907.562.8654

Salamatof Native Association, Inc.
PO Box 2682
Kenai, AK 99611
907.283.7864

Seldovia Native Association, Inc.
PO Drawer L
Seldovia, AK 99663
907.234.7625

Tyonek Native Corporation
1689 C Street, Ste. 219
Anchorage, AK 99501
907.272.0707

Chitina Native Corporation
PO Box 3
Chitina, AK 99566
907.823.2223

Dot Lake Native Corporation
PO Box 2271
Dot Lake, AK 99737
907.882.2775

Mendas Cha-ag Native Corporation
457 Cindy Drive
Fairbanks, AK 99701
907.452.3094

Village Corporations (cont.)

Northway Natives
PO Box 401
Northway, AK 99764
907.778.2297

Tanacross, Inc.
22808 Green Garden Road
Chugiak, AK 99576
907.883.4130

Tetlin Native Corporation
PO Box 652
Tok, AK 99780

Toghotthele Corporation
PO Box 249
Nenana, AK 99760
907.832.5832

Federally-recognized Tribes

Knik Tribal Council
PO Box 871565
Wasilla, AK 99567
907.373.7991

Chickaloon Native Village
PO Box 1105
Chickaloon, AK 99674
907.747.0707

Eklutna Native Village
26339 Eklutna Village Rd.
Chugiak, AK 99567
907.688.6020

Kenaitze Indian Tribe
PO Box 988
Kenai, AK 99611
907.283-3633

Seldovia Village Tribe
Drawer L
Seldovia, AK 99663
907.234.7898

Ninilchik Traditional Council
PO Box 39070
Ninilchik, AK 99639
907.567.3313

Native Village of Tyonek
PO Box 82009
Tyonek, AK 99682
907.583.2271

Village of Salamatof
PO Box 2682
Kenai, AK 99611
907.283.7864

Cheesh-Na Tribal Council
PO Box 241
Chistochina, AK 99586
907.822.3503

Mentasta Traditional Council
PO Box 6019
Mentasta, AK 99780
907.291.2391

Native Village of Kluti-Kaah
PO Box 68
Copper Center, AK 99573
907.822.5541

Native Village of Gakona
PO Box 102
Gakona, AK 99585
907.822.5777

Gulkana Village
PO Box 254
Gakona, AK 99586
907.822.3746

Chitina Traditional Village Indian Council
PO Box 31
Chitina, AK 99566
907.845.2212

Native Village of Tazlina
PO Box 87
Glennallen, AK 99588
907.822.4375

Native Village of Cantwell
PO Box 94
Cantwell, AK 99729
907.768.2591

Village of Dot Lake
PO Box 2279
Dot Lake, AK 99737
907.882.2695

Tanacross Village Council
PO Box 76009
Tanacross, AK 99776
907.883.5024

Federally-recognized Tribes (cont.)

Healy Lake Village
PO Box 74090
Fairbanks, AK 99706
907.479.0638

Nenana Native Association
PO Box 369
Nenana, AK 99760
907.832.5461

Northway Village
PO Box 516
Northway, AK 99764
907.778.2311

Native Village of Tetlin
PO Box TTL
Tok, AK 99779
907.324.2130

APPENDIX 6-1
PRE-PAD CORRESPONDENCE AND MEETING NOTES

Meeting Minutes DRAFT
Railbelt Large Hydro Project Licensing
Planning Meeting with FERC
9:00 AM April 4, 2011
Held at FERC Offices
888 First Street, NE, Washington, DC

Purpose of Meeting: Discuss the Planning and Processes Associated with Licensing the Watana Hydroelectric Project

Attendees:

Present for FERC:	**Ann Miles**, Director Division of Hydropower Licensing
Present for FERC:	**Vince Yearick,** Deputy Director, Division of Hydropower Licensing
Present for FERC:	**Jennifer Hill**, Northwest Branch Lead
Present for FERC:	**David Turner**, Project Manager
Present for FERC:	**Brian Mosely**, Deputy Director
Present for AEA:	**Bryan Carey,** Project Manager
Present for AEA:	**Sara Fisher-Goad,** Director
Present for MWH:	**Brian Sadden,** Project Manager
Present for MWH:	**Howard Lee,** Planning and Licensing
Present for MWH:	**Kirby Gilbert,** Regulatory Specialist

Discussion Summary:

1. After introductions Bryan Carey briefed FERC staff on the nature of the project and current status. Discussion then began about difference between ALP and ILP. AEA expressed concern that the ALP does not have as much definition and they are worried about the timeline being stretched out under the ALP due to endless study requests. FERC indicated that they could approve use of the ALP even if 100% of the stakeholders did not agree. FERC indicated with ALP there are 2 options for Environmental Report: 1) Applicant Prepared EA; and 2) Third Party EIS. However, FERC pointed out the timelines on the ALP could slip easier than on an ILP – in general.

2. RE: the ILP, FERC acknowledged that it was designed more around relicensings and not so much for licenings – therefore, they understand the timelines need to be somewhat flexible where they can. AEA could modify the standard timeline to speed up the process….but in any event, when filed with FERC the License Application needs to be complete as to avoid delays at that stage. There will then be a Draft and Final EIS prepared, plus steps needed to comply with the ESA as appropriate. FERC encouraged AEA to get NMFS or USFWS involved early on in this Project as Section 18 fishway prescriptions have been important authorities on other new projects. Need

approval through Alaska's Coastal Zone Management Program including Water Quality Certificate/Waiver from the State before they can issue a License.

3. The need for one year to negotiate study plans under ILP means AEA cannot begin the "official, FERC-sanctioned field work" until after 2012 – It is a risk to start environmental studies ahead of agreement on methodologies. To get around this FERC explained we would need to file the PAD by July 2011 if we wanted to start studies a year earlier, in 2012, but then there would be little time to develop good project information and engage participants early and get some buy-in. FERC suggested if AEA wants to start environmental studies early they should put together a timeline and description of proposed methodologies and run it by the agencies. Run it by FERC also just to keep them informed – no official approval by FERC can be given though. Generally, studies that involve just collecting baseline resource information tend to be acceptable but one runs the risk of that the baseline study characterization efforts may not collect all the parameters or data types agencies want, unless they are consulted and feel informed of the project description and plan of development.

4. There was quite a lot of discussion surrounding the merits and factors to consider in picking one of the three FERC licensing processes potentially available to applicants. FERC staff were interested in the types of issues that were likely to be associated with the proposed project as those can make a difference in selecting a process. Bryan and Sara explained the strong state support for the project and it was noted that no endangered or threatened species appear to be affected; and no Federal lands other than scattered BLM tracks in the reservoir area (which are in the process of being transferred to the State under the AK Statehood Act provisions). Bryan and MWH staff described the significant amount of information gathered for both the 1983 application and 1985 draft amendment application. Ann Miles thought FERC may have prepared a draft environmental document at one point also. Bryan noted how during the previous licensing efforts no anadromous fish were ever found above the natural barrier at Devils Falls, but that in more recent times (2000s) about 100 juvenile Chinook salmon had been found in the project area. Bryan noted that Alaska Fish and Game was doing further work on salmon distribution and abundance this coming summer.

5. FERC Team for Watana:
    - Jennifer Hill is Northwest lead for FERC
    - Matt Cutlip – Portland Regional Office
    - David Turner – FERC PM in WA DC

6. Question was asked about FERC's early participation. Answer was yes – they could attend site visit this summer, and could attend early public meetings if it was desired by AEA. FERC confirmed that they can start to get involved with the project now, in

advance of PAD and NOI filing by AEA. They can attend meetings in person or by Webinar. One idea would be to have a meeting coincident with the NHA regional meeting planned in Girdwood August 30 and 31st of this year, or perhaps tag along with the engineering site visit this summer.

7. AEA asked FERC what triggers their jurisdiction over this project. Bryan noted that the BLM lands in the Project area are currently selected by the State for transfer and the river is not known to be navigable. It was ultimately suggested that in order to explore this further, AEA could file a Declaration of Intent request for jurisdictional determination asking the question in hypothetical terms, say in the event there were no Federal Lands involved in the proposed project boundary.

8. Discussion was held regarding the purpose of and benefits of AEA filing for a FERC Preliminary Permit and whether or they have Muni Preference under the Federal Power Act. Concern was expressed to FERC about the possibility that making the filing triggers designation or withdrawal of the lands in the proposed Project boundary as a Power Site Classification, and that this could cause problems with the ongoing State selection of BLM lands. Ann will explore this topic and get information back to AEA. FERC staff advised AEA to determine what entity would lead and serve as the ultimate licensee prior to filing any preliminary permit application or licensing documents. This was noted to be particularly important with respect to maintaining municipal preference with respect to any preliminary permit. Ann advised we watch the City of Quincy, Lock and Dam 21 case involving a city and a later attempt to switch the licensee to an LLC.

9. AEA questioned FERC regarding the State's ability to construct State roads in the project area in advance of FERC License issue – as a means of expediting start of project construction as quickly as possible once the FERC License is issued. After some discussion was held on this topic and AEA mentioned their current "Roads to Resources" Program which might be used for this purpose. The general thoughts were that if a roads project could be built on its own merits for purposes other than just future access to the Watana Hydro project, it might be possible.

10. Discussion was held regarding what part of the transmission line and system improvements need to be included in the project definition. The answer was that only the "Primary" transmission line to its point of interconnection with the regional transmission grid needs to be part of the licensed project. The licensed project does not include any work that might be done to strengthen the Railbelt grid. Because the transmission and road alignments are not fully yet fully defined, FERC indicated that AEA could study two different options in parallel in order to expedite the process but consistent studies would need to be accomplished on both routes.

11. Discussion was held regarding how FERC treats power economics in their analysis. AEA indicated that power costs from the project could be relatively high. FERC indicated they do not do a full market based economic analysis during their review and they can approve a project even if their analysis shows it is not economic.

12. FERC indicated that AEA will need to consult closely and early with the U.S. Army Corps of Engineers as a Section 404 Permit would likely be required. The Corps will have their own NEPA compliance requirements and FERC will work with them under the terms of the new MOU between FERC and the USACE.

13. FERC inquired as to when AEA would like to have a FERC License. Answer was "as soon as possible". It was mentioned that some Alaska legislators had some meetings with FERC that led them to believe they could get a license in just 3 years. FERC staff explained this must be a misunderstanding as this is not possible given all that needs to take place under ILP or ALP prior to license issuance. It was noted that the process could be sped up if AEA could do "unofficial" field studies starting in 2012 (if the agencies would concur) or if somehow only one field season was required to fill data gaps.

Kirby Gilbert, Regulatory Specialist, MWH

Meeting Minutes
Railbelt Large Hydro Project Licensing
Pre Aquatic and Terrestrial Gap Analysis Meeting
9:00 AM April 21, 2011
Held at AEA Offices
813 West Northern Lights Blvd; Anchorage, AK

Purpose of Meeting: Discuss the work efforts underway for the aquatic and terrestrial resources Gap Analysis tasks in support of early information gathering for the Watana Hydroelectric Project

Attendees:

Present for AEA:	**Bryan Carey**, Project Manager
Present for AEA:	**May Clark**
Present for CardnoEntrix:	**Jim Gill**
Present for ADNR:	**Kristina Plett**
Present for NPS:	**Cassie Thomas**
Present for USFWS:	**Mike Buntjer**
Present for USFWS:	**Phil Brna**
Present for USFWS:	**Betsy McCracken,** (BY PHONE)
Present for USFWS:	**Jennifer Spegon** (BY PHONE)
Present for BLM:	**Lee Koss** (BY PHONE)
Present for ADF&G	**Monte Miller**
Present for ADF&G	**Jason Mouw**
Present for NMFS	**Susan Walker**
Present for NMFS	**Eric Rothwell**
Present for Solstice Alaska Consulting, Inc.	**Robin Reich**
Present for Solstice Alaska Consulting, Inc.	**Colleen Bolling**
Present for MWH	**Kirby Gilbert**
Present as MWH subcontractor	**James Thrall**
Present as MWH Subcontractor Long View Associates	**Steve Padula**
Present as MWH Subcontractor Long View Associates	**Randall Filbert**
Present for HDR:	**James Brady**
Present for ABR:	**Brian Lawhead**

MWH

Discussion Summary:

1. After introductions Bryan Carey briefed agency staff on the status of the Watana Project early planning phases. The Gap Analysis concept originated from agency and AEA input and was discussed as a way to sort out what might be applicable and useful from the 1980s Susitna Hydroelectric study reports given today's knowledge and information sources on aquatic and terrestrial resources in the Susitna River basin.
2. Brain Lawhead of ABR described where they are at on reviewing the 1980s documents regarding terrestrial resources. Mammals such as moose, caribou, bear, wolves were studied extensively and there were some breeding surveys for raptors along with caribou movement and bear denning studies. Brian described what ABR had learned to date in the review and what they intended on doing but stressed that it is important to get agency input now, rather than learn about key information sources after they issued the report for review.
    - There was discussion about the geographic scope of the terrestrial gap analysis as several agency staff felt it was important to look at what terrestrial resources information was gathered or studied in downstream Susitna River reaches as changes in the river system, such as winter flow levels, could result in changes in habitat in those reaches also.
    - Several ADF&G staff noted they had looked through the 1980s Susitna documents on microfiche, some of which have been scanned by ARLIS and they have concluded that there are several documents (possibly not on the microfiche) that are held in file cabinets in their warehouse.
    - Jason Mouw requested that the gap analysis reports include a description of the process that was undertaken to identify the existing information used in the analyses.
    - Byran Carey mentioned that the index to the old documents was also available on an MS Access database which he would post onto the Sharepoint site.
    - It was noted that BLM probably did not have much new terrestrial resource information on the BLM scattered tracts in the Watana area since most of those lands have been selected by the State or Native Corporations. It was mentioned there could be some unpublished raptor breeding data and wetland functional assessment work completed in the downstream Susitna reaches (USFWS and Mat-Su Borough where mentioned).
    - Agency staff noted that it is important to review the assumptions in older studies and that we may have better techniques to do studies now than they did back then. Some studies may have answered a resource management question but not more of an ecological question. In addition, the agencies noted that it will be important to identify statistically appropriate approaches for any new studies.
    - Sue Walker mentioned that as federal budgets are getting cut back agencies may not have the manpower and funding to help identify Gaps or participate easily in these Watana planning efforts.

- Bryan Carey noted that a Preliminary Permit application should be filed with FERC within a month or two if that helps agencies devote efforts and AEA is considering finding ways to help fund or provide staff to help further agency participation.

3. James Brady of HDR described the aquatics Gap Analysis efforts and noted what had changed since the 1980s included the listing of Beluga whales, more invasive species such as Northern Pike. It was noted their efforts were also trying to identify ways to do "data rescue".
   - It was noted that old maps could be digitized into more modern formats. Additionally there are 1980s aerial imagery of the middle and lower river flown at low, medium, and high water levels.
   - Bryan Carey mentioned they are working with Mat-Su Borough on acquiring Lidar of the water penetrating variety and that work should be flown by end of this summer and should be available to all by wintertime through GINA (Geographic Information Network of Alaska).
   - It was noted that since the late 1990s there have been some studies using dendrochronology and other techniques to understand the paleo flood or flood chronology of the Talkeetna – Susitna River systems. Dr. Jesse Cherry of International Arctic Research Center has prepared a short proposal to look at climate change and variability on the Susitna River to try and better understand the adaptation of a new dam and hydropower plant to future conditions with respect to anticipated climate changes.
   - Bryan Carey discussed a new MWH technical memorandum on hydrologic trends and noted that annual flow volumes have remained similar to 1980s conditions but April and May peaks have increased. Bryan said he would email out the technical memorandum to the group.
   - It was noted that changes in run off patterns may lead to the need for updates to studies conducted in the 1980s on ice formation and break up in the river system.
   - There was some discussion about fisheries genetics reports for upper Cook Inlet sockeye fishery and other reports about tagging and fish spawning studies in recent years.
   - Jason Mouw noted that in evaluating the quality of existing information two key considerations are the repeatability of the study and the availability of the original data.
4. Bryan Carey discussed more about the Gap report review process and indicated that the reports should be available for agency reviews by May 16th or 17th with a 30-day review period. Toward the end of the review period a meeting would be convened to go over the reports and comments. Bryan mentioned that new RFPs went out for Gap analysis efforts regarding sedimentation, water quality, and cultural resources. Over the summer there may be the opportunity to get agency staff out to the site and FERC may have someone out in late August.
   - It was mentioned that recreation access points in the lower river should be evaluated and that the ice crossing use patterns were important to recreation use as even the Iditarod race crosses the lower river on ice and snow.

- There was discussion of understanding more of the basin hydrology in terms of relative flow contributions and Jason mentioned the need to capture the 5 years of gauge data from the Sunshine gauge in the lower river to help determine the various river system contributions (in conjunction with the upstream gauges). It was noted that Gold Creek gage data should be representative of the project site.
- Krissy Plett of ADNR mentioned the need to consider existing water rights reservations and mining claims in the downstream river when looking at any new changes to the river system flows. It was noted that the aquatic study group in particular will need some consistent naming conventions for the different river reaches.
- Agency staff asked to see a copy of the USGS work scope regarding the status of hydrologic information and Bryan Carey noted he would send the USGS work statement around.

Kirby Gilbert, Sr. Regulatory Specialist, MWH

AIDEA Alaska Industrial Development and Export Authority

ALASKA ENERGY AUTHORITY

May 24, 2011

Kim Cunningham
Senior Director, Land and Resources
Cook Inlet Region, Inc.
P.O. Box 93330
Anchorage, AK 99509-3330

RE: Watana Hydroelectric Project – Landing Rights

Dear Ms. Cunningham:

Alaska Energy Authority and our contractors request permission to land on Cook Inlet Region property near the possible Watana Hydroelectric project several times this summer. A landing would entitle the helicopter landing and several people getting out and walking around for half an hour to a couple of hours. Hunting, fishing, cutting of trees, and excavation would not occur.

Property which we believe to be Cook Inlet Region land for this purpose includes:

Seward Meridian T 31 N, Range 5 E, Sections 4, 5 and 34.
Seward Meridian T 32 N, Range 5 E, Section 28.
Seward Meridian T 32 N, Range 4 E, Section 25.
As shown in Attachment 1

It is anticipated that a trip would occur during the week of June 6. Additional trips will occur later in the summer/fall. Specific dates and landing locations for trips have not been determined. What permissions are required from Cook Inlet Region, Inc. for a landing or is it possible that a permit could be obtained by us for multiple landings over the summer/fall time period?

Please email me any questions or a land use permit.

Please contact me at (907) 771-3065 or email at bcarey@aidea.org for permit information or if you have any questions.

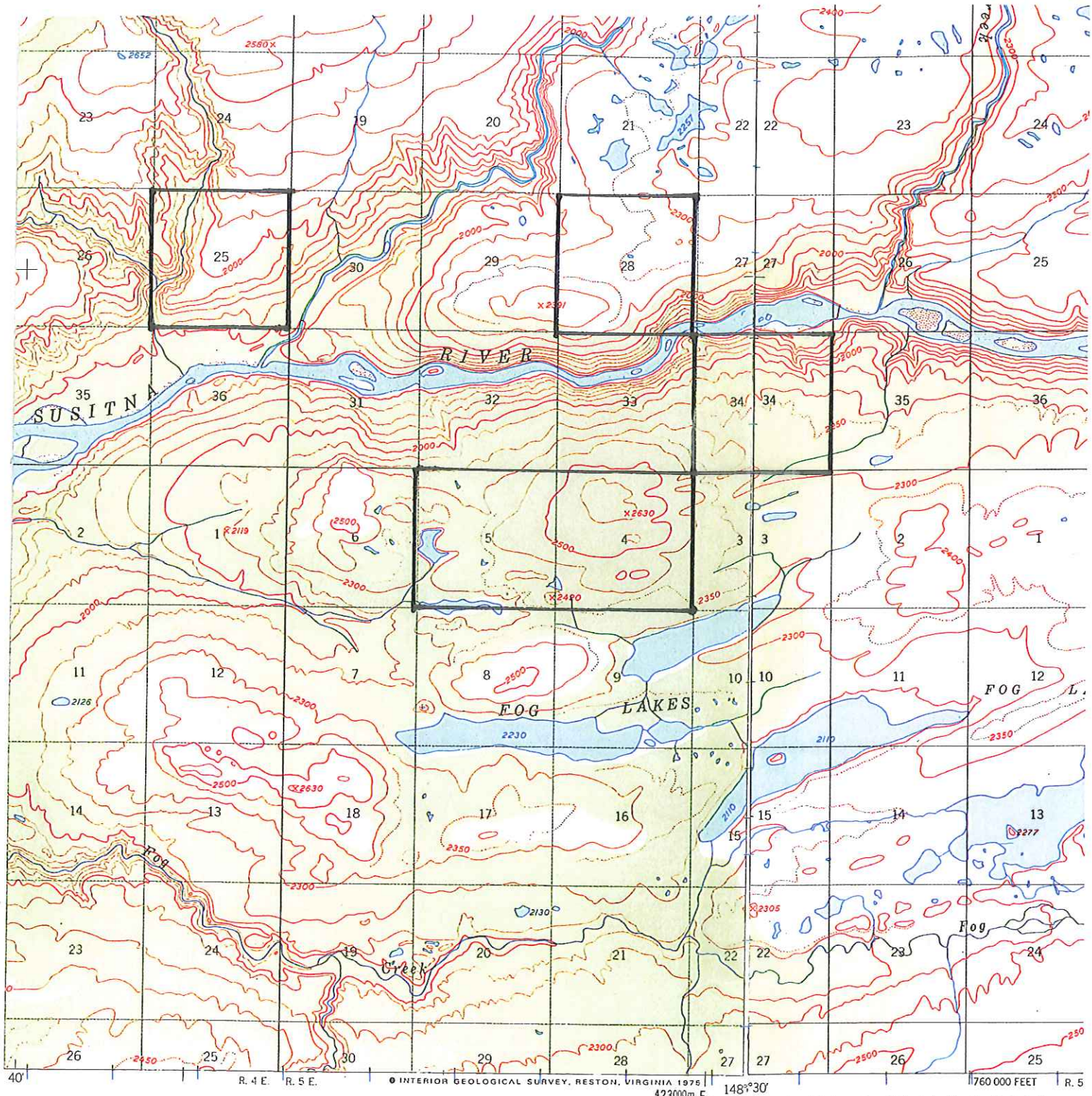
Sincerely,

ALASKA ENERGY AUTHORITY

Bryan Carey, P.E.
Project Manager

BC:mc
H:AEA Projects\Susitna Large Hydroelectric Project\Correspondence\CIRI Landing 052411.docx

Attachments: 1 Talkeetna Mountains D-3 & 4 Quadrangle



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1949, field annotated 1951. Map not field checked

Universal Transverse Mercator projection, 1927 North American d
10,000-foot grid based on Alaska coordinate system, zone 4
1000-metre Universal Transverse Mercator grid ticks,
zone 6, shown in blue

Land lines represent unsurveyed and unmarked locations predetermined by the Bureau of Land Management Folios S-1, Seward Meridian and F-10, Fairbanks Meridian

ROAD CLASSIFICATION

No roads or trails in this area

QUADRANGLE LOCATION

TALKEETNA MOUNTAINS (D-4), ALASKA

N6245—W14830/15X30

1951

MINOR REVISIONS 1965

Tyonek Native Corporation

Headquarters:
1689 C Street, #219
Anchorage, AK 99501-5131
Tel: (907) 272-0707
Fax: (907) 274-7125

Madison Branch:
229 Palmer Road
Madison, AL 35758
Tel: (256) 258-6200
Fax: (256) 258-6260

June 2, 2011

Bryan Carey, Project Manager
Alaska Energy Authority
813 W Northern Lights Boulevard
Anchorage, AK 99503

RE: Watana Hydroelectric Project – Quarry Site A Land Access

Dear Mr. Carey:

Tyonek Native Corporation ("TNC"), hereby grants to the Alaska Energy Authority, and its various agents, employees, contractors, and consultants (collectively known as "AEA"), permission to enter upon TNC's lands to conduct core drilling for the potential Watana dam. These lands are described in the maps previously provided by AEA. Temporary and Limited Access for these test drills is allowed, contingent upon the following conditions:

1, AEA shall not engage in hunting, fishing, or any other activity which interferes with the natural resource recreational and subsistence uses of the subject lands or the waters adjacent thereto.

2. AEA shall not disturb any archaeological or anthropological site, if archaeological or anthropological sites are discovered on TNC's lands during the course of the core drilling, activity will stop and the identity and location of such sites shall immediately be provided to TNC. Any fossils, artifacts, and articles of cultural or antiquity value, and any structures, or other remains of things religious, cultural or of archaeological interest or significance which are discovered on TNC lands in the course of the geological reconnaissance shall be left undisturbed, in-place and reported to TNC.

3. TNC accepts no responsibility whatsoever for any losses or damages (personal or property) which AEA suffers or incurs as a result of accessing TNC's Property and AEA agrees that it shall indemnify, defend, and forever hold TNC harmless from any and all liability whatsoever to any and all persons arising out of or flowing from or connected with, directly or indirectly, the activities of AEA, and shall provide a defense in any action brought as a result of the activities of AEA.

4. TNC agrees that it shall indemnify, defend, and forever hold AEA harmless from any and all liability whatsoever to any and all persons arising out of or flowing from or connected with, directly or indirectly, the activities of TNC and shall provide a defense in any action brought as a result of the direct activities of TNC.

5. AEA shall ensure that all TNC land remains in its original condition at the conclusion of the core drilling activities. AEA shall not disturb land or vegetation with any mechanized equipment. Access

across the land shall be on foot, or with helicopter. If requested to do so by TNC, AEA shall be responsible for reclaiming any areas it disturbs as a result of its activities associated with this Temporary and Limited Access Agreement.

6. AEA shall remove any and all trash and litter resulting from AEA or its consultant's operations upon the completion of said operations. AEA shall not bring hazardous materials to include petroleum products onto TNC lands.

7. The authorization granted by this letter shall be limited to the period commencing on June 1, 2011 and concluding on September 30, 2011.

8. Notwithstanding the provisions of paragraph 4 above, AEA, for itself and for all of its various agents, employees, contractors, and consultants agrees and acknowledges as follows: (a) that TNC's lands are wilderness or undeveloped lands, on which there are many dangerous conditions, just a few of which are frigid and turbulent waters, thin ice, bears, avalanche hazards, unrnaintained trails, unrnaintained roads, and individuals engaged in legal and illegal hunting activities; (b) that in spite of the risk of serious injury and death from these conditions and others, TNC has done and will do nothing to make the lands safe or to further warn AEA of these conditions, or any other dangerous condition; (c) that AEA, its agents, employees, contractors, and consultants will never institute any demand, claim, or lawsuit against TNC, their directors, officers, employees or agents for any loss, damage, or injury, including death, for any cause arising out of or flowing from the use of the lands, including the negligence of TNC, their directors, officers, employees or agents; and (d) that AEA will hold TNC, their directors, officers and employees harmless from all claims for injury, damage or death that may be made in regard to or flowing from the condition of the lands.

By dating, signing, and returning a copy of this letter to TNC, AEA agrees to be bound by the stipulations contained within this Temporary and Limited Access Agreement. This Temporary and Limited Access Agreement will become effective upon receipt of an executed copy at TNC's offices.

Sincerely,

for J. Steve Taylor, CEO
Chief Executive Officer
Tyonek Native Corporation

Date: 6/3/11

AGREED:

Bryan Carey, Project Manager
Alaska Energy Authority

Date: _____

Talkeetna Community Council, Inc.

A non-profit, community service organization

June 4, 2011

Representative Mark Neuman, Rex Shattuck and staff
Sarah Fisher-Goad, CEO - AEA
AEA Board Members

cc. Governor Sean Parnel
cci. Lieutenant Governor Mead Treadwell

Dear Representative Neuman, Rex Shattuck, and staff,

We appreciate you and your staff taking the time to respond to our concerns. The Talkeetna Community Council Inc., Susitna Dam Committee has organized a series of questions generated from the community regarding the proposed Susitna Large Hydro project. (Some of these were questions from the "public meeting" held in Talkeetna Feb. 28 by AEA - they were either unanswered, inadequately answered or are areas where future studies/data were promised by AEA)

The questions below are divided into eight categories. We foresee that several common categories can be combined into a series of meetings. These questions represent our initial concerns - there will be more!

Our most significant concern is that there has been an over riding lack of public process and fast tracking during this initial phase of the proposed project. The magnitude of both the state subsidy required to build the project and the threat of imminent impacts from it's operation warrant a thorough evaluation by Alaskan residents.

Sincerely,
Whitney Wolff
Talkeetna Community Council, Inc. - Susitna Dam Committee

1. VIABILITY / FEASIBILITY - FINANCIAL / ECONOMIC

* It has been noted that this hydro project has been rated at 50% efficiency: that a 600 mega watt rating only produces 300 mega watts in reality - explain why?
* What are the REALISTIC high and low estimates for energy production, especially for low, winter flow estimates, dry or cold years etc. How does this compare to railbelt demand? It is known that demand nearly doubles in winter when the dam would produce less - how does this factor into the viability of the project?
* AEA states that they will be doing an "interim report on electrical rates" - What is the projected rate needed to pay back the cost of the dam including the state subsidy?
* Where are the studies that compare each alternative form of energy at a "cost to build per kilowatt hour" estimate? How can the state decide that the best use of it's funds is the Susitna Large Hydro without the comparative data?
* How is the tremendous state subsidy factored into the actual cost of the project?
* Will financing for the dam include bonding and/or private parties?
* If Susitna was not feasible 30 years ago - why is it now? Dams are being torn down in the lower 48 - why are we going to subsidize the building of one?
* How much bearing do the studies from the 80's have on the new design?
* AEA says they are still looking at alternatives - why is SOLAR not one of the eight program areas of Alternative Energy and Energy Efficiency on their web site?
* Why is the large hydro alternative deemed "the only way to go from 24% renewable to 50% ? Why not explore a range of smaller projects, efficiency, and conservation?

2. FISH / WILDLIFE / HABITAT

*What effect will the flooded area behind the dam have on wildlife populations?
    * What will be the effect on migrating caribou, which cross the Susitna where the reservoir will be? The Nelchina herd has doubled in the last 30 years and there is a lack of studies on these migrating caribou and reservoir ice.
* How will winter releases of water affect juvenile salmon?
* How will warmer water out of the reservoir affect salmon?
* Opportunity for temperature changes to encourage invasive species such as pike?
* Several local guides have experience with the complex stock structure of the Susitna River. There are known Dolly Varden in a small creek above Watona and a small creek off of Jay Creek. The reservoir will wipe out the grayling.
*

3. HYDROLOGY ISSUES/ FLOW / WATER LEVELS

*What effect will the changed flow rate, with resultant temperature changes have on: freeze-up and break up cycles (will freeze up be later and consequently affect winter river travel to remote homesteads etc.?) sedimentation?

side-channel effects for salmon rearing?
salmon populations?
other fish populations?
downstream hydrologic effects

*Will it be possible to drive a boat up Devil's Canyon?

4. FAILURE - GEOLOGIC / SEISMIC

*What is the chance of catastrophic dam failure due to building by a major fault?

*At the initial public meeting in February, there was an error in the noted distance of the Denali fault from the Watona site - Why do the distances appear to be understated? What about the Talachulitna fault?

* What models have been developed to determine the effect of such a failure on downstream communities? (Talkeetna, gold Creek, Indian, Curry, Chase)

* Specific Seismic/Engineering issues:
  * the Denali fault has numerous discontinuous branches. where is the closest known branch to the proposed dam site? Each of these branches has a "best guess" of potential earthquake magnitude - what is the "best guess" magnitude for the Susitna dam site?
  * What magnitude of earthquake was used in the design risk-analysis for the dam?
  * Are there other dams of similar size, design, and construction that can be studied for comparison? Are any of these dams near fault lines? If so, how do the design differ?
  * Are there any other similar dams that have experienced failures or had compromising events? What were the resuts or consequences to the dam and the areas downstream?
  * Who did the risk analysis? Where can that be reviewed?

5. ARCHAEOLOGIC

6. HUMAN / ECONOMIC IMPACTS

*What will the economic impact be to the community of Talkeetna? ie. boom/bust cycles during construction, additional rail traffic negatively affecting local businesses, increased Park's Hwy traffic, potential threat to fishing and river boat guiding industries.

*How many jobs will be created and will there be a local hire preference?

*Wilderness is a precious commodity - both aesthetically and economically. Travelers come to the Susitna Valley to see wild rivers and a wilderness ecosystem - how will a "Hoover Dam" upstream negatively affect the tourism industry?

*What about the humanity of the downriver people?

7. CONSTRUCTION

*what type of dam?

*Where will the construction infrastructure (roads, camp, etc.) be located?
*Will new grid connections be built to supply energy to small communities?
*How many acres will be lost to the inundation (in the creating of the reservoir)?
*Where are the risk assessments for the different dam configurations ?
(embankment vs. roller compact)
*What is the carbon footprint of construction, the expected environmental imact?
*What if the state starts the consrtuction improvements of the Denali Hwy. and construction of access roads before the dam is permitted?

8. PUBLIC PROCESS

*What is the status of the Pre-Pad Questionnaire?
* Will there will local members of the FERC committee?
* What is the 67.5 million currently being spent on?
* What is the timeline for the public process? Three years to do studies?
* Why does the public have to wait for the federal licensing process to have a say in how state funds are being spent on this dam now?
* There seems to be little communication between AEA and the legislature - how are the specifics of the dam, including hazards, being conveyed to representatives?
* what is the plan, agenda, or configuration for the state's energy policy other than the self imposed 50% renewables by 2025? Who is heading up the creation of an energy policy? Are there specific energy experts working on the policy who are not from the industrial development camp (AIDEA) ?

Meeting Minutes
Watana Hydroelectric Project Licensing
Licensing Process Meeting
1:00 PM June 27, 2011
Held at AEA Offices
813 West Northern Lights Blvd; Anchorage, AK

Purpose of Meeting: Discuss the licensing process options for the Watana Hydroelectric Project

Attendees:

Present for AEA:	**Bryan Carey**, Project Manager
Present for AEA:	**Sara Fisher-Goad,** Executive Director
Present for CardnoEntrix:	**Jim Gill** Senior Consultant/Deputy Project Manager
Present for ADNR:	**Gary Prokosch**
Present for USFWS:	**Jennifer Spegon**
Present for USFWS:	**Mike Buntjer**
Present for USFWS:	**Betsy McCracken (via telephone)**
Present for ADF&G	**Monte Miller**
Present for ADF&G	**Jason Mouw**
Present for NMFS:	**Susan Walker**
Present for NMFS:	**Eric Rothwell**
Present for NMFS:	**Tom Meyer (via telephone)**
Present for USGS:	**David Meyer**
Present for Alaska Ratepayers:	**Rich Wilson**
Present for Alaska Ratepayers:	**Frank Mielke**
Present for Alaska Conservation Alliance:	**Kate McKeown**
Present for Alaska Conservation Alliance:	**Mike Coumbe**
Present for Alaska Center for the Environment:	**Kaarle Strailey**
Present for Hydropower Reform Coalition:	**Jan Konigsberg**
Present for MWH	**Kirby Gilbert**
Present as MWH Subcontractor Long View Associates	**Steve Padula**

MWH

Discussion Summary:

1. After introductions Bryan Carey briefed the group on the State goals and objectives for the Watana Hydroelectric Project. It was noted that this meeting date was originally set up to review the aquatic and terrestrial GAP reports but those reports were not quite ready so AEA thought it was good to use this meeting to go over licensing options as a way to get input from other parties on concerns and ideas of with regard to a licensing plan. Bryan Carey of AEA discussed the state's need for some certainty in licensing timelines and indicated that FERC's Integrated Licensing Process (ILP), with some possible modifications, was being considered at this time for the Watana Project. Steve Padula then provided a summary overview of the three FERC processes and identified the general commonalities and differences between them. It was indicated that the project team is thinking of the ILP with some flexibility. The meeting was then opened up as a round table discussion of past licensing experiences, concerns, anticipated needs, and interests of the represented stakeholder groups. The following points are an attempt to capture some of the main discussion items:

    - Monte Miller of ADF&G has experience with lot of FERC processes and noted that ILPs are front loaded with many activities and only one time has such a process been attempted in the state of Alaska.
    - Concerns by agencies that not every party might be able to sign off on all issues, and the resource agencies and other stakeholders in Alaska are more familiar with the ALP where all decision making is by consensus.
    - If NEPA is being run concurrent with the pre-filing process, there could be a problem with handling changes that arise and public perception that NEPA is being rushed, or done too early from what they are use to.
    - A strict following of the ILP process would allow for 2 years of field studies, but it would probably take almost 5 years from now to get a license application filed with FERC.
    - Alaska Ratepayers representatives asked how much of the 1980s information can be used in this new licensing process. The response discussion among participants was that is depends on the subject matter as some work, like that on sediment transport is probably very valuable but other areas, like socioeconomics is probably too dated to be of much use.
    - It was recommended that if the ILP process were to be modified to add in some flexibility AEA needs to really spell out the specifics of what those modifications might be. Modifications on the order of shifting timelines by only 30 days might not really help the overall process.
    - Question about how much of the $65 million in current budget allocation for this project would be used for environmental studies, or how long would this funding carry the process for AEA. The response discussion lead by AEA

was that funding would likely be sufficient for engineering and licensing studies in the range of about 3 or 4 years.

- Concern raised by Federal agencies particularly that many staff are very busy with numerous ongoing projects and finding manpower to work on the licensing of this project, regardless of licensing process, is going to be difficult. Bryan Carey noted that AEA is open to helping find suitable arrangements for finding some manpower funding.
- Similarly, state agencies representatives expressed their concerns regarding recent budget cuts and how that could affect their ability to participate in any licensing process of this magnitude.
- Concern that in an ILP, FERC's NEPA scoping is of limited duration and that would force all issues and study topics to be indentified during that short timeframe, and a large project such as this needs more flexibility and open ended timeframes.
- Discussion that the ILP process was developed by FERC only for relicensings and is thought to be not well suited, or suited at all, for a new project/original license.
- Concerns regarding the ILP and its fast pace. Additionally the ILP would entail a prescriptive process and the worry is there is lack of agency funding and staff resources to dedicate time and efforts on the project to meet an ILP schedule. The pace of the project under an ILP might be too fast to be able to really resolve issues and properly scope studies.
- Discussion that it could take up to 7 years of studies and consultation to complete a license application and that the strict ILP timeframes could not be met.
- Some of the biggest concerns with the ILP center on manpower supply issues and generally too short of timeframes for the various steps built into the ILP process.
- NMFS described that there can be as many as 60 projects going on within their purview at one time and it would be hard for NMFS to do justice for a project as large as Watana. If Watana is the priority some other projects might have to slip, and it takes time to staff up.
- Jan of HRC noted that there are issues of manpower resources for agencies in terms of doing the work necessary to review and participate in the study process itself, and then there is the issue of trust in the quality of the study work conducted by AEA contractors. It can come down to who gets to pick the study methods, study consultants, and perhaps a 3rd party may need to be brought in to review studies and results.
- Questions about number of issues resolved in the 1980s proceedings and what ones were unresolved. It was suggested that it would be better if the issues were resolved by the time the license application is filed.
- Concern by state agencies that under a dispute process with FERC only mandatory conditioning agencies can initiate a dispute filing and this does not give equal footing to state agencies in the process.

- Discussion about how AEA is going to work with other state agencies with respect to their requests for studies and if there are disputes among parties regarding study requests what the process would be to resolve disputes between AEA and state agency requests.
- Desire to see GAP analyses in order to inform parties about what studies might be needed and determining time and funding requirements for a licensing process.
- Questions about what level of interest or concern might precipitate the need to request a waiver from FERC in the ILP process; if just one agency has issues would that be enough for AEA to request a waiver.
- Mention and discussion that formal Interventions are only really possible at the time of the filing of a preliminary permit application or filing of a license application.
- A preliminary permit filing might be a helpful as a way to let the public be informed a licensing proceeding will be commencing.
- ADF&G would like at least a minimum of 30-days review on all work products – in general.
- 1980s data and studies might help licensing and associated studies proceed quickly or conversely could slow things down if there is extended debate regarding the adequacy of the earlier work to support the licensing of the current project.
- Hard to see if an ILP schedule would fit this project until parties can see what they are facing in terms of being able to go through previous studies, GAP analysis.
- General preference to meet after the GAP reports are issued, possible soon after so the consultants can brief the parties, and then provide some time for comments.
- Question if BLM lands are within the project area and if BLM has been contacted. It was noted that BLM did participate by telephone in the pre-GAP meeting.
- Discussion that ILP workgroups would probably be formed subsequent to filing of the NOI/PAD.

Action items to close the meeting were:

- Bryan Carey to send out an email to stakeholders on mailing list to solicit any further comments on licensing process decisions and concerns.
- AEA to get GAP aquatic and terrestrial reports out to agencies in July, and schedule a review meeting for August 18th, prior to the NHA regional meetings.

Kirby Gilbert, Sr. Regulatory Specialist, MWH

Kirby Gilbert

From: Bryan Carey [bcarey@aidea.org]
Sent: Thursday, June 30, 2011 3:18 PM
To: Kirby Gilbert
Subject: Fwd: licensing process
Attachments: HRC Science Guide.pdf; ATT00001.htm

Sent from Bryans mobile

Begin forwarded message:

> **From:** "Jan Konigsberg" <jan@hydroreform.org>
> **To:** "Bryan Carey" <bcarey@aidea.org>
> **Cc:** "Sara Fisher-Goad" <SFisherGoad@aidea.org>, "Kate McKeown" <kate@akvoice.org>, "Jason E B Mouw (DFG)" <jason.mouw@alaska.gov>, "eric Rothwell" <eric.rothwell@noaa.gov>, "Rich Wilson" <richwilsonak@gmail.com>, "Pat Lavin" <lavin@nwf.org>, "mike@akvoice.org" <mike@akvoice.org>, "kaarle@akcenter.org" <kaarle@akcenter.org>, "susan walker" <susan.walker@noaa.gov>, "phil_brna@fws.gov" <phil_brna@fws.gov>, "monte.miller@alaska.gov" <monte.miller@alaska.gov>, "Michael_Buntjer@fws.gov" <Michael_Buntjer@fws.gov>, "Lee_Koss@blm.gov" <Lee_Koss@blm.gov>, "gary.prokosch@alaska.gov" <gary.prokosch@alaska.gov>, "David F Meyer" <dfmeyer@usgs.gov>, "cassie_thomas@nps.gov" <cassie_thomas@nps.gov>, "Betsy McCracken" <Betsy_McCracken@fws.gov>, "Jennifer Spegon" <jennifer_spegon@fws.gov>
> **Subject: licensing process**
>
> Bryan,
>
> Thanks for convening the agencies and other stakeholders this past Monday to confer about the Watana licensing-process. Frank and open discussion is essential to mapping the topography that licensing will have to navigate. Once the gap-analysis of the previous Susitna licensing studies is in hand later this summer, we will be better able to identify and to discriminate among the areas of solid ground, shifting sands, and even uncharted territory, which will assist in formulating the questions the subsequent studies will be designed to answer. Jason Mouw commented that much has changed in the way watershed analysis is approached in the 25 years since the original suite of Susitna studies were conducted; methodologies for data collection and analysis have been refined or substantially changed . Apropos Jason's comment, I've attached the PDF of Hydropower Reform Coalition's "Scientific Approaches for Evaluating Hydroelectric Project Effects."
>
> So, I was concerned when you opined at Monday's meeting that the impact of the Watana project on salmon would likely be similar to that of Bradley Lake and Terror Lake hydropower projects, which you characterize -- if I heard you correctly -- as having "enhanced" the salmon populations in the waters affected by project operations. This certainly casts the proposed Susitna River hydropower project in a most favorable light, such that one might see the only significant question to be: "How much will Watana enhance (increase?) existing salmon populations?" At any rate, my understanding of the effects of Bradley and Terror on the salmon populations that existed before those dams were constructed does not jibe with yours. I'd be interested to know what data supports your contention.

Given, what we know about the effects of existing dams on native salmon populations, the rebuttal presumption for any proposed dam in salmon-bearing waters of the Northern Hemisphere ought to be that the project will have deleterious impacts on native salmon populations. Further, whatever fish populations have been "enhanced" in salmon-bearing waters as a result of dams are usually introduced, non-anadromous species. This is not to deny the possibility that a salmon population in the Susitna drainage may increase due to project operations. Yet, while we know with certainty the project can be engineered to produce energy, a hydropower project generally cannot be engineered to ensure no significant decline in salmon populations (in terms of both abundance and biodiversity), let alone engineer the project to produce more salmon.

Therefore, the more appropriate and important question is what harm to existing salmon populations might be expected if Watana were to be built and operated as proposed.

In any case, to suggest that the abundance of some, if not all, salmon species will increase if the Watana project is built seems to put the net before the fish (are even in the bay); in other words, this assertion is at odds with the purpose of the licensing process, which is to identify the crucial questions and to conduct studies to provide the data and analysis to inform the answers. Even if you intended your assertion about Watana enhancing salmon to be understood as somewhat speculative and tentative, this nuance will be lost on the wider audience of rate payers and decision makers, who will regard this conclusion as accurate and true, coming as it does with the state's imprimatur.

The integrity and efficiency of the licensing process depends upon negotiating the terrain without going around in circles and driving into dead ends due to faulty assumptions, misinformation, or undue political interference. We all have an obligation to maintain transparency and play fair, which is the virtue of sustaining a frank and open discussion throughout the licensing effort. We all understand this is easier said than done! So, it is with this admonition in mind that I raise my concern about your assertion regarding the potential beneficial impact of the proposed Watana project on existing salmon populations.

Again, I appreciate AEA's invitation to participate in the Watana licensing-process discussion.

Jan Konigsberg

Jan Konigsberg
Alaska Waters Program
Natural Heritage Institute
Hydropower Reform Coalition
7511 Labrador Circle, Anchorage, AK 99502
907.248.3014 (p)
907.677-3626 (f)
jan@hydroreform.org<mailto:jan@hydroreform.org>
www.n-h-i.org

www.hydroreform.org

~~~~~~~~~~~~~~~~~~~~ ><{{{(°>
~~~~~~~~~~~~~~~~~~~~

Alaska Ratepayers, Inc.

P. O. Box 210556
Anchorage, AK 99521
907-952-1502

Affordable and Predictable Electric Rates for Alaska

July 13, 2011

Mr. Bryan Carey
Watana Hydroelectric Project Manager
Alaska Energy Authority
813 W. Northern Lights Blvd.
Anchorage, AK 99503

RE: Response to Watana FERC Licensing Discussion, June 27, 2011
By Alaska Ratepayers, Inc.

Dear Mr. Carey:

Thank you for the opportunity for our ratepayer organization to provide comments on the approach taken to permitting and developing the proposed Watana Hydroelectric Project.

1. Alaska Ratepayers, Inc. appreciates the recognition by Governor Parnell, the Legislature and the Alaska Energy Authority that Watana is the best option for long term Rail Belt electric energy and are moving forward to secure a Federal Energy Regulatory Commission (FERC) license.

2. The Rail Belt needs affordable and predictable electricity right now. This project should not be delayed. Ratepayers currently face variable and increasing prices, rising from one of the lowest to one of the highest in the nation. This directly affects our living standards today and in the future. Is our economic well being given weight in the FERC process?

3. The Rail Belt needs secure electric energy sources. The Municipality of Anchorage has found it prudent to organize citizen drills others to prepare for periods of energy shortages. Clearly, the State and local governments, plus the general public are concerned about the potential for energy supply disruptions in the very near future. Is this taken into account during the FERC process?

4. Licensing a major hydro project is typically extremely lengthy and expensive, and can become an end to itself for agencies and stakeholders engaged in the process. This causes unnecessary delays in completion. Alaska Ratepayers, Inc. asks, what options are available to expedite the FERC process and what is AEA doing to consider those options? Two actions must be taken:

(a) Alaska Ratepayers, Inc. firmly agrees with AEA representatives in concluding the best approach to licensing of Watana is to use the default alternative, the Integrated Licensing Process (ILP); and

(b) Alaska Ratepayers, Inc. strongly supports authorizing a "Federal-State Joint Hydro Office," an independent coordinating/monitoring entity such as the Joint Pipeline Office (Trans Alaska Pipeline) to efficiently accomplish required procedures.

We believe these recommendations are in the best interest of two thirds of Alaska's population who will depend on Watana electricity.

Sincerely,

Alaska Ratepayers, Inc.

Richard G. Wilson
President

cc: Governor Sean Parnell
Sen. Lisa Murkowski
Sen. Mark Begich
Representative Don Young
Alaska Senate President Gary Stevens
Alaska House Speaker Mike Chenault
Honorable Dan Sullivan, Mayor, Municipality of Anchorage
Hugh Short, AEA Board Chair
Sara Fisher-Goad, AEA Executive Director
Alaska Ratepayers, Inc. Board of Directors and Members

Meeting Minutes
Railbelt Large Hydro Program
Railbelt Utilities Meeting
July 14, 2011
Held at AEA Offices
813 West Northern Lights Blvd; Anchorage, AK

Purpose of Meeting: Discuss Power Demand and Project Sizing

Attendees:

Present for AEA:	**Bryan Carey**
Present for AEA:	**Jim Gill**
Present for CEA	**Burke Wick**
Present for ERE:	**Tom Lovas**
Present for GVEA	**Henri Dale**
Present for HEA	**Bob Day**
Present for HEA	**Harvey Ambrose**
Present for HEA	**Jean Schroeder (phone)**
Present for HEA	**Jim Kingrey (phone)**
Present for MEA	**Jim Brooks**
Present for ML&P:	**Jeff Warner**
Present for ML&P:	**Doug Hall**
Present for MWH	**Howard Lee**

Discussion Summary:

Presentation and Discussion on Proposed Watana Project Operation (Preliminary draft of PAD Section

1. Bryan Carey briefly summarized status of funding and project engineering work – Governor Parnell signed SB 42 authorizing AEA to continue with Watana development.
2. An AEA public website is now being set up
3. AEA Introduced MWH and their role in Engineering Studies/Licensing
4. FERC PAD is being drafted for issuance this winter – this will kick off resource agency mtgs/consultation, a FERC site visit/public mtg, and start of Study Plan development
5. Howard and Tom reviewed the draft "Proposed Project Operation" document that discusses Base Case modeling – this will become a section of the PAD. Discussed each of the 10 Figures and facilitated discussions and answered questions.
6. Discussed the expected 250 MW Firm Power Output level w/600 MW installed capacity and the fact that this level of output is likely even if a higher plant capacity is installed

7. Discussed the range of considerations involved in preliminary design and the opportunity to consider the range of operating flexibility beneficial to the utilities, with particular regard to the expected operating lifetime (i.e. 100 years or more).
8. Noted that the focus of the PAD is on power plant and interconnection at Gold Creek, with transmission system upgrade issues deferred at this stage.

Action items to close the meeting were:

1. NHA Regional Meeting in Girdwood late August coupled with Public Meetings in Talkeetna and a FERC site visit
2. Some meeting participants suggested interest in having a series of Watana-specific utility meetings to enable continued input into project planning - sizing and system electrical load evaluations – perhaps tagged onto the regular Bradley Lk O&D meetings
3. MWH/Lovas to compile current and projected railbelt utility load data for use in future iterations of the Watana Operations Model

AIDEA
Alaska Industrial Development and Export Authority

ALASKA ENERGY AUTHORITY

July 22, 2011

Ms. Whitney Wolff
Susitna Dam Committee
Talkeetna Community Council, Inc.
P.O. Box 608
Talkeetna, Alaska 99676

Dear Ms. Wolff:

Thank you for providing us Talkeetna Community's questions regarding the proposed Susitna-Watana Hydroelectric Project. You raise a number of questions and these, in addition to many others, will be addressed in the upcoming permitting and licensing processes. Given we are at the very beginning of the project conceptual design and planning process we do not have complete answers to all of your questions but we have attached some preliminary responses to specific questions where possible. We welcome your continued inquiry and contributions as our studies progress.

Developing the Susitna-Watana Hydroelectric Project involves substantial public involvement opportunities. The Alaska Energy Authority (AEA) has initiated informal outreach efforts to agencies and the public. Meetings were conducted in spring of 2011 to explain why a project on the Susitna River was the preferred large hydro project for meeting the state's renewable energy goals. Our intent is to develop the project in a manner that provides answers to all questions raised in meetings or in other correspondence. AEA will launch a public website the week of July 25th that will provide easy access to project related information and notification of additional public meetings.

Studies for the project will be funded by the $65.7M appropriation. It is AEA's intent to conduct studies that provide state and federal agencies, and the public with clear and substantial information in three primary areas:

(1)Description of the environment affected by the proposed project and its reasonable alternatives;
(2)Project effects, both beneficial and adverse; and
(3)Protection, mitigation, and enhancement measures.

The scope of future environmental and engineering studies will be developed in consultation with all interested parties, including state and federal agencies responsible for fish and wildlife management. AEA has just recently initiated early consultation with some of the stakeholders to help us with environmental gap studies. Early efforts are focusing on determining what information from the original Susitna Project is relevant to the Susitna-Watana Project as currently conceived. Developing the Susitna-Watana Project will require updating many of those 1980's studies. Ultimately, many of the questions you raise will be answered through the updated studies.

We appreciate your detailed list of concerns and interest in factors that are important to consider in planning the Susitna-Watana Project. You have my commitment that your comments will be given due consideration throughout our upcoming development efforts.

If you have further questions or need additional information, please contact Bryan Carey, AEA Susitna-Watana Engineering Manager at (907) 771-3065.

Sincerely,

ALASKA ENERGY AUTHORITY

Sara Fisher-Goad

Sara Fisher-Goad
Executive Director

Attachment

July 22, 2011
TALKEETNA QUESTIONS AND AEA ANSWERS

1. CONSTRUCTION

(a) What type of dam?

In the 1980s an Earth Core Rockfill Dam (ECRD)[1] was proposed for the Watana site, and a concrete arch dam was proposed for Devil Canyon. Those types of dams were, at that time, the only types with a history of use for the dam heights considered. The use of RCC [2] was in its infancy in the 1980's. After deliberation, an ECRD was chosen for Watana.

Thirty years later, dam technology has progressed significantly. Around the world there are sufficient numbers of RCC dams and CFRD with heights comparable to the proposed Watana project to provide confidence in the technology associated with those types of structure.

Therefore, as an initial task in the planning studies, the engineers will draft three different project layouts, based on ECRD (same as the 1980's proposal), CFRD and RCC. The project layouts will differ significantly. The layout for the RCC dam will have specific cost saving benefits including shorter penstocks, reduced diversion tunnels, etc. The engineers will compare the three projects on the basis of capital cost, construction schedule, and operations and will make a recommendation on the dam type and layout.

[1] An ECRD comprises a central impervious core – of clay or silt – supported by upstream and downstream shells of rock drawn from the river gravels or rock quarry.

[2] An RCC dam is a concrete gravity dam – usually with a near vertical upstream face, and a downstream face of around 0.8 to 1 with a new concrete placement method. Instead of casting concrete in discrete blocks, a special concrete mix is continuously placed in thin layers of around one foot. After placement, the concrete is rolled by a roller, much as earthfill is rolled after placement. The control of the mix is important so that the rollers are able to compact the mix without sinking in to the surface. RCC dam construction is unusually fast compared with conventional concrete placement.

[3] A CFRD comprises a rockfill embankment with upstream and downstream slopes of around 1.4 to 1 compared to 2 to 1 for an ECRD. The slopes can be steep because the whole of the

embankment is unsaturated as a result of the fact that the concrete impervious membrane is placed on the upstream face.

(b) Where will the construction infrastructure (roads, camp, etc.) be located?

Temporary construction infrastructure will be required, much as outlined in the 1980s studies. There will be camps and workshops at the site, and a temporary bridge across the Susitna River will have to be constructed. A site access road will have to be constructed, used both for construction and permanent access, as well as an airstrip close to the site. Additionally, construction materials will have to be obtained from quarries and/or borrow areas close to the site.

In the 1980s studies, two construction access road routes were considered – the northern route and the western route, which only reached the railway at Gold Creek. An advantage for the western route was (and remains) the close proximity of a transmission route, lowering the cost of the transmission.

One more route will be included in the comparison that is presently being undertaken – a second western route south of the river rather than north of the river.

Alaska Department of Transportation (ADOT) is currently examining the three routes and will be providing a cost estimate for each so that AEA can use the price and other factors to make a decision on the favored route.

(c) Will new grid connections be built to supply energy to small communities?

New connections to small communities are not part of the design work at this time.

(d) How many acres will be lost to the inundation (in the creating of the reservoir)?

AEA will examine various dam heights and associated reservoir levels during the optimization studies to be performed during the project planning. AEA notes that the 1980s proposed project at Watana would have flooded approximately 20,000 acres at maximum reservoir level.

(e) Where are the risk assessments for the different dam configurations? (embankment vs. roller compact)

It is a normal part of project planning to create and maintain risk registers and hazard logs for the project to ensure that the design takes into account and

appropriately mitigates or allocates risks, both design, construction and operation. Risk registers will be created and maintained as the project progresses to guide the decision process. Early risk registers will be maintained as each type of project layout is developed, and appropriate adjustments to the layouts will be made to try to balance the risks during construction which often relate to diversion capacity and weather sensitivity. The Federal Emergency Management Agency (FEMA) publishes guidelines for dam safety which will be part of the design documentation.

(f) What is the carbon footprint of construction, the expected environmental impact?

At present the carbon footprint cannot be given. To assess such matters, design has to proceed far enough that realistic estimates can be made of construction equipment usage, i.e., construction planning must begin in earnest.

(g) What if the state starts the construction improvements of the Denali Highway and construction of access roads before the dam is permitted?

The State may have various road building and improvement programs that may continue independent from the planning and design of the project. Should the State elect to construct some infrastructure in the region of the project, typical regulatory and public notice and review processes for such a project would be followed.

2. PUBLIC PROCESS

(a) *What is the status of the Pre-Pad Questionnaire?*

The Pre-Pad Questionnaire is a tool being used in undertaking due diligence information gathering to identify relevant information sources regarding resources potentially affected by the project. It is anticipated a questionnaire may also be sent out to some agencies to supplement information sources identified in the Environmental Gap Reports.

(b) Will there will local members of the FERC committee?

AEA intends to create workgroups for common resource areas that will be open to participation by any interested party. The workgroups will be formed after a formal regulatory process has commenced. AEA will establish a project website where documents, meeting notices and other information will be made available. Additionally, hard copies of all formal filings will be placed in local public libraries.

Public notices will be placed in regional newspapers at the time of most major filings and prior to public meetings. In summary, members of the public can:

- Get placed on mailing lists and access licensing information through each stage of the process.

- Provide written comments to any interested party at any time documenting concerns with, comments on, or support for the project.
- Provide oral comments and ask questions of agency and regulatory staff and AEA at public scoping meetings, site visits, and in other meetings.

- Submit study requests and participate in work groups during study plan development.

(c) What is the $67.5 million currently being spent on?

The recently enacted appropriation for the project will be utilized to fund additional AEA staff, and the costs of environmental and engineering studies needed to support permitting and regulatory approval and Environmental Impact Statement preparation. Funds will also be used to hire consultants to conduct additional engineering and geotechnical studies, prepare the permit applications, and conduct all of the required resource agency and stakeholder consultation throughout the public process.

(d) What is the timeline for the public process? Three years to do studies?

The public process requires extensive planning, and consultation with Alaska Natives, members of the public, resource agencies and stakeholder groups with interests in the area. The process also involves holding many community meetings and opportunities for public comment are available throughout the process. AEA will publish a plan in the next few months that will outline opportunities for public involvement. In general, there will be numerous opportunities for the public to engage on this proposed project prior to decisions being made for approval to construct the project.

(e) Why does the public have to wait for the federal licensing process to have a say in how state funds are being spent on this dam now?

The federal licensing process does not determine how state funds are expended. Rather, it provides a framework for what information needs to be developed, and what consultation needs to take place, to approve a new project. The State legislative appropriation process included legislative hearings and other opportunities at which the public expressed views on the current expenditure of state funds on the project.

(f) There seems to be little communication between AEA and the legislature. how are the specifics of the dam, including hazards, being conveyed to representatives?

AEA has participated in many legislative committee and sub-committee meetings and met with most of the members of the legislature and answered their questions. AEA also agreed to provide the legislature with progress reports on the project. AEA will continue to communicate with the legislature and individual legislators.

(g) What is the plan, agenda, or configuration for the state's energy policy other than the self-imposed 50% renewables by 2025? Who is heading up the creation of an energy policy? Are there specific energy experts working on the policy who are not from the industrial development camp (AIDEA)?

In 2010, the legislature adopted and the Governor signed HB 306, "An Act declaring a state energy policy." This energy policy is very broad and outlines an effort to address energy needs of the state through a variety of measures and program including energy efficiency, renewable and alternative energy and oil and gas development. The legislature carries out this policy by creating and funding programs; for example, AEA's Renewable Energy Fund has been developed and funded to provide project proponents to apply for grants for renewable energy projects.

AEA, under the direction of the Governor's office and the State Legislature, developed a long-term energy strategy for the State of Alaska. Alaska is a large state, with diverse resources and energy needs. For this reason, it was necessary to consider a potential future pathway to meet the immediate and long-term energy needs of each individual community within the state separately before considering the bigger picture. This approach allowed residents of individual communities to get a sense for how development of projects in their community can influence long-term energy costs, and allowed calculation of the total investment needed statewide to develop all energy projects that have been identified as potentially economically viable.

As part of the planning process, many citizens with diverse backgrounds were engaged from around the state to find out how energy supply and cost impacts their lives, and to get input on what resources should be developed to meet future energy needs for electricity, heating, and transportation. This initial planning resulted in the 2009 publication, ***Alaska Energy – A First Step toward Energy Independence***. It contains information on all critical energy technologies, as well as a database of community energy resources compiled from a variety of sources, including conversations with Alaskans during community meetings. The full

document is available on AEA's web site at:

http://www.akenergyauthority.org/

Subsequently, additional work led to publication of a report entitled Alaska Energy Pathway, in 2010. The ***Alaska Energy Pathway*** addresses the 'big picture' by setting an overall policy direction for the state, including aggressive targets for energy efficiency and conservation as well as renewable energy development. The ***Alaska Energy Pathway*** also identifies critical priority areas for Alaska that are closely related to energy supply and demand, including economic development, climate change, energy security, and education and workforce development. Finally, it includes much more detailed information on an energy path forward for each community and region of the state. The full document is available on AEA's web site at:

http://www.akenergyauthority.org/alaska_energy.html

At the direction and funding by the legislature, AEA analyzed the options for a large hydroelectric project to serve the Railbelt region. In November 2010, AEA published its preliminary decision document to pursue a project on the Susitna River; the Watana site is determined to be the appropriate project to pursue.

AEA also lead the effort to develop the Railbelt Integrated Resource Plan (RIRP), which is a directional plan that identifies alternative resource paths that the region can take to meet the future electric needs of the Railbelt citizens, communities and businesses. This report was published in February 2010 and is also available on the AEA webpage. AEA is currently leading a similar effort in Southeast Alaska.

3. VIABILITY / FEASIBILITY- FINANCIAL / ECONOMIC

(a) It has been noted that this hydro project has been rated at 50% efficiency: that a 600 megawatt rating only produces 300 megawatts in reality – explain why?

This number is not efficiency; it is a "power factor". Generators greater than required for the year-around average power are normally installed in a hydro project. Thus, generators can produce more power when required or generators can be off-line for maintenance without affecting the total plant output. During high summer flows, the plant can be generating more than 500 MWs. Most Alaskan hydropower facilities run from 30%-50% of their nameplate capacity. This is similar to a car having the capacity to go 120 mph. Most of the time it is driven slower, yet it still has the ability to speed up as needed for various time periods.

The efficiency of modern hydroelectric plants (i.e. the proportion of energy converted into electrical energy) is 90% or above – this compares with, for example, a gas turbine with heat recovery which might reach 60% efficiency.

The question relates to the concept of firm power. In the hydro context, "Firm Power" is the maximum generation that may be generated continuously. Based on potential flow releases, the firm power available at the Watana site, with a Top Water Level of about 2000, is approximately 300 MW. During some months of the year, the available power will be higher and for one month it will be possible to generate 600 MW. If the dam were to be higher, there would be a proportionate increase in the firm power and in the peak power, as the capacity increases with available head. The challenge in optimizing a hydro project like this is to maximize the firm power while addressing requirements for flow release and minimum spills. The design work continuing throughout the feasibility, planning and the final permitting stages will be aiming at an optimized layout and installed capacity to match the needs of the utilities while protecting the environment.

(b) What are the REALISTIC high and low estimates for energy production, especially for low winter flow estimates, dry or cold years, etc. How does this compare to Railbelt demand? It is known that demand nearly doubles in winter when the dam would produce less - how does this factor into the viability of the project?

Potential operating parameters for the proposed project – using as a basis the scenarios developed during the 1980s studies – are currently being developed to serve as a starting point for discussions with Railbelt area utilities regarding project sizing and desired operating modes. Preliminary computer simulation model runs indicated that with a 600 MW installed capacity, minimum annual generation (in a "dry" year) would be about 1,800 GWh and maximum annual generation would be about 3,000 GWh; average annual generation (compiled from 56 years of flow records) would be about 2,500 GWh. Current annual net energy generation in Alaska is around 6,500 GWh.

The Railbelt Integrated Resource Plan (December 2009) provides information on current and projected future Railbelt utility electricity demands based on a different future population and load growth scenarios.

The project would require construction of the storage reservoir (i.e. Watana Dam and Reservoir) to ensure carry-over storage to enable the project to provide firm power during the winter months when demands are expected to be at their highest. This type of operation is intended to enhance the economic viability of the project.

(c) AEA states that they will be doing an "interim report on electrical rates." What is the projected rate needed to pay back the cost of the dam including the state subsidy?

How is the tremendous state subsidy factored into the actual cost of the project?

When the Pre-Application Document (PAD) is complete later, the proposed project will be described more specifically including the type of dam, project configuration, access routes, and operation. Once this is filed, project costs and the cost of energy can be estimated based upon various economic assumptions, including if the State provides no financial subsidy.

The form and amount of state financial subsidy, and "pay back" to the State is unknown. In the case of Bradley Lake Hydroelectric Project the Sate will receive payments after bond debt is paid off.

(d) Where are the studies that compare each alternative form of energy at a "cost to build per kilowatt hour" estimate? How can the state decide that the best use of its funds is the Susitna Large Hydro without the comparative data?

Comparison of the cost of energy with alternative energy supplies is a usual part of the permitting process, and will be done during project studies.

All alternative generation sources have a high initial cost per kilowatt-hr. A 100 kilowatt wind generator installed may cost nearly $1M yet, due to the lack of consistent winds, not produce energy for the majority of the year. Thus, wind-derived energy in Alaska tends to have a higher cost per kilowatt hour than hydro. The sun intensity in Alaska is a fraction of the Lower 48. Solar has the highest cost per kilowatt hour. The RIRP compared future loads and how they can be met. The RIRP reviewed other alternative generation as well as hydroelectric.

(e) Will financing for the dam include bonding and/or private parties?

At the moment no form of financing is "off the table." Based on experience of financing of large hydro, it is expected that a combination of straight forward State equity investment, and the sale of bonds will be determined to be the optimum form of funding.

For example, for Bradley Lake, the state paid 50% of the project costs. After the bonds are paid off by the utilities, the utilities are required to pay the State a payment for the following 20 years.

It should be remembered that, if other experience is to be taken as an example, the asset will continue to generate electricity for 100 years – well beyond the maturity of any bond.

(f) If Susitna was not feasible 30 years ago - why is it now? Dams are being torn down in the lower 48 - why are we going to subsidize the building of one?

The current proposed project differs significantly from the project proposed in the 1980's. The project in the 1980's included dams at both the Devil Canyon and Watana projects. The Devil Canyon Dam would have been a 646 foot high double curvature concrete arch dam with a nominal capacity of 680 MW. The Watana Dam would have been an 885 foot high embankment dam with a nominal capacity of 1,110 MW. The current proposed project does not include the Devil Canyon Dam and the height of Watana Dam is 700 feet instead of 885 feet.

The 1,790 MW Devils' Canyon/Watana 1980's projects were feasible 30 years ago. The projects, however, were determined to be not needed and difficult to finance with the State struggling under the economic downturn in 1985. Had the project been built 30 years ago, Southcentral Alaska would not be facing a risk of energy shortages in the next couple of years. Plus, because bond debt would have been paid by now, the power cost from the project would have been by 2011 the lowest in Alaska.

There are some smaller dams, mostly older ones with installed hydropower capacities of less than 50 MW, being removed in the Lower 48, for specific reasons. Most of the dam removals in the Lower 48 (with or without hydropower facilities) are being undertaken to remove major barriers to anadromous fish migration. The circumstances associated with these projects are unique and cannot be projected to apply to conditions, benefits and mitigation of all dams.

(g) How much bearing do the studies from the 80's have on the new design?

The studies carried out in the 1980s related to both the Devil Canyon and Watana projects. To the extent possible, the studies performed at that time will be used in design and permitting of the current project in order to be as cost-effective as possible and expeditious in project development. As a matter of prudence and economy, it is the intent of AEA that as many of the previous studies as possible will be used for the permitting and the design process, although it is acknowledged that some gaps will have to be filled, or some further studies will need to be done, because of new technology (roller compacted concrete for example) or because of changed site conditions.

The studies performed in the 1980s have tremendous application to the implementation of the current project. There are many aspects of the project footprint and conceptual design that have not changed, so almost all the previous work associated with the Watana site is valuable. Aspects of previous studies that can be used with very little enhancement include, but are not limited to, those pertaining to geology, seismicity, material properties, topography, hydrology, ice, construction infrastructure, water temperature, roads, transmission, and the basic design of an earth core rockfill dam option. These studies will all be used, although there will be some additional conceptual design work carried out because of the other dam types now being considered.

As far as environmental aspects are concerned, there are numerous previous studies - particularly with regard to physical and biological resources - that are very relevant to understanding the resource conditions and potential effects of project development and operation.

Most of the previous studies have been located in hard copy in the University of Alaska, AEA files and elsewhere, and many are being digitized, and will be available soon to all stakeholders through AEA and the Alaska Resources Library and Information Service (ARLIS).

(h) AEA says they are still looking at alternatives. Why is SOLAR not one of the eight program areas of Alternative Energy and Energy Efficiency on their web site?

AEA's Alternative Energy and Energy Efficiency (AEEE) program focus is on community-scale energy generation projects and on energy efficiency in community, commercial, and industrial facilities. Solar projects are generally most economically viable in off-grid settings (see Renewable Energy Atlas ftp://ftp.aidea.org/AEAPublications/2011_RenewableEnergyAtlasofAlaska.pdf. Given limited solar resource throughout the year, AEA is allocating its limited state resources to other AEEE programs. Solar projects are eligible for funding through the AEA-managed Renewable Energy Grant Fund.

(i) Why is the large hydro alternative deemed "the only way to go from 24% renewable to 50%?" Why not explore a range of smaller projects, efficiency, and conservation?

AEA recognizes that, given the diverse geography of the state and abundance of fossil and renewable energy resources, there is no single technology approach to meeting the goals of 15% energy efficiency improvement by 2020 or 50% renewable energy by 2025. Thus, statewide and regional energy plans have

stressed using local resources—biomass, coal, geothermal, hydro, natural gas—to meet local needs. AEA and its state, university, federal and regional partners are working together to coordinate energy efficiency programs through the statewide energy efficiency and conservation working group (currently more than 99% of the renewable http://www.akenergyefficiency.org/).

Regarding power generation resources on the Railbelt, the RIRP identified large-scale hydro, wind and geothermal projects as priorities for energy development. For the state to meet the 50% renewable goal means that six projects at the scale of Bradley Lake Hydroelectric (Alaska's largest) would need to be developed. AEA will continue to work with Railbelt utilities and industry to advance Mt. Spurr Geothermal, Fire Island Wind, Eva Creek Wind and other renewable projects; as well as Susitna-Watana Hydroelectric to contribute toward the 50% goal. At the same time, AEA, the University, industry and others will work toward developing other renewable technology suitable to the Railbelt, such as Cook Inlet tidal.

4. FISH / WILDLIFE / HABITAT

What effect will the flooded area behind the dam have on wildlife populations?

What will be the effect on migrating caribou, which cross the Susitna where the reservoir will be? The Nelchina herd has doubled in the last 30 years and there is a lack of studies on these migrating caribou and reservoir ice.

How will winter releases of water affect juvenile salmon?

How will warmer water out of the reservoir affect salmon?

Opportunity for temperature changes to encourage invasive species such as pike?

Several local guides have experience with the complex stock structure of the Susitna River. There are known Dolly Varden in a small creek above Watana and a small creek off of Jay Creek. The reservoir will wipe out the grayling.

These natural resource issues and others were studied extensively in the 1980s for the original Susitna Hydroelectric Project. As part of its current efforts, AEA is evaluating existing resource information (performing GAP studies), including the 1980s studies, to determine its relevance to the currently proposed Watana Project. After completing the PAD, study plans will be developed to fully evaluate the potential impacts of the project on each of these resource areas and provide final answers to these and other questions

Specifically, AEA anticipates that updated information on the Nelchina Caribou herd will be developed to inform the planning efforts for the new project. AEA, along with the state and federal agencies, anticipate engaging knowledgeable

individuals and groups in the project area to update any studies as needed over the next three years. We also note the availability of local knowledge with regard to resident fish.

5. HYDROLOGY ISSUES/ FLOW / WATER LEVELS

(a) What effect will the changed flow rate, with resultant temperature changes have on:

- *freeze-up and break up cycles (will freeze up be later and consequently)*
- *affect winter river travel to remote homesteads, etc.*
- *sedimentation*
- *side-channel effects for salmon rearing*
- *salmon populations, other fish populations*
- *downstream hydrologic effects*

The 1980s studies included substantial investigation of ice formation and breakup, salmon habitats and environmental effects to the aquatic environment. In examining hydrological and associated conditions, it should be noted that the contribution of the Susitna above Watana to the total flow of the basin in the lower river is of the order of 17% and thus effects on temperature or other flow and water level habitat factors in the lower river reaches will have to be evaluated in the context of other inflows and mixing. Thus, for example, a 20% change in flow at Watana makes about a 7% difference at Talkeetna and only about a 4% difference at the river mouth. These water resource considerations are being examined, and will continue to be examined to understand the effects of the smaller Watana project. There will be additional studies and analysis on many water quality parameters. AEA is planning on evaluating the potential for effects of project operations on ice formation with respect to current and anticipated human winter use and access patterns in and around the lower river area.

(b) Will it be possible to drive a boat up Devil's Canyon?

Summertime flows will still be within the historical flows. Thus, boaters will have similar choices and opportunities to access Devil Canyon as have existed in the past.

Boating uses on the lower Susitna River will be evaluated during the study process to better understand the relationship between flows and boating use, and to determine potential effects of the Project.

6. FAILURE- GEOLOGIC / SEISMIC

(a) What is the chance of catastrophic dam failure due to building by a major fault?

There are between 11,000 and 17,000 dams worldwide classed as "major" (the various definitions of "major" lead to the range). In a list of 55 major dam failures around the world since AD 575, excluding China which has a dam failure rate for modern dams twice that of the rest of the world, only two can be definitely linked to an earthquake (1999 in Taiwan during the 7.6 Chi Chi event, and 2011 in Japan during the Mag 8.7 earthquake and tsunami).

The Taiwanese failure was of the Shihkang gated structure, caused by the vertical offset of 15 m of a fault lying directly under the dam, during a magnitude 7.6 event. The recent dam failure during the March 2011 Tōhoku earthquake and tsunami was of the Fujinuma irrigation dam, an earthfill homogenous structure designed in the 1930s, with construction completed during the Second World War. On the day after the Tōhoku earthquake 252 Japanese dams were inspected and although some were damaged, no other breaches have occurred.

There are numerous examples of dams that have suffered major seismic events and survived, be it with damage. Among the most notable are the San Andreas dam, which survived the 1906 San Francisco earthquake despite the San Andreas fault passing under the embankment and spillway, the Crystal Springs concrete dam which is situated some 700 feet from the San Andreas fault; and Zippingpu dam in China which survived the Wenchuan, event of magnitude 7.9, with an epicenter just a few kilometers from the dam.

Engineers take great care in assessing the potential seismic events which might increase loads on dams, and design dams to resist those forces, even sometimes including extraordinary measures to address a fault movement (such as the special joint at Clyde Dam in New Zealand). As indicated – and as a result of the engineering care applied to the problem - seismic events, historically, are a small contributor to dam failure.

(b) At the initial public meeting in February, there was an error in the noted distance of the Denali fault from the Watana site. Why do the distances appear to be understated? What about the Talachulitna fault?

Fault distances from site to fault are measured in several ways, depending on how the measurement will be used. Typically, faults will not be vertical. Depending on the location of the site and the orientation of the fault (whether it dips towards the site or away from it) the closest distance to a fault may be

less than measured on the earth's surface. Calculations of ground motion due to earthquakes use both the distance measured on the surface and the distance to the fault plane below the ground surface. As described below, the further investigation and analysis to update the previous seismic studies will include a thorough examination of aerial photography, remote sensing data (including LIDAR) and field mapping to update and identify the extent and activity of geologic lineaments that may represent potential future earthquake sources.

(c) What models have been developed to determine the effect of such a failure on downstream communities? (Talkeetna, Gold Creek, Indian, Curry and Chase)?

The model incorporated into software called BOSS Dambreak, a derivative of the original Dambreak software, is the normal model used in the USA and around the world and accepted by almost all state, federal and international authorities. This software models particular types of hypothetical dam failure modes (V cracks, erosion, etc.) based on the type of dam under consideration and, using the topographical and physical characteristics of the river valley below the dam, predicts the time and extent of wave propagation downstream of the project. Adjustments to the dam design are sometimes made in accordance with the result. The BOSS Dambreak model will be completed prior to AEA submitting the license application.

(d) Specific Seismic/Engineering issues: the Denali fault has numerous discontinuous branches. Where is the closest known branch to the proposed dam site? Each of these branches has a "best guess" of potential earthquake magnitude. What is the "best guess" magnitude for the Susitna dam site?

Several reports on faults and earthquake sources have been prepared over the history of the Railbelt projects. These reports are in the process of being reviewed and updated and will include the earthquake sources that may cause significant ground motions at the site. Earthquakes occur because of the release of seismic energy and the amount of energy stored is related to the size of the source (fault length and depth – i.e. slip plane area). The magnitude of earthquakes that can be generated by a given fault is estimated from the extent of the fault (its length and area). This is also confirmed by examining regional historical earthquakes. A database of 421 worldwide earthquakes and associated faulting has been published and will be applied to this assessment.

(e) What magnitude of earthquake was used in the design risk-analysis for the dam?

The detailed design of the Watana dam remains years away following permitting. Preliminary information listed in the table below provides a compilation of earthquake sources prepared as part of an initial review of geologic and seismic information. It should be regarded as preliminary and will be refined during the current seismic update noted above. In particular, uncertainties distances and magnitudes will be assessed and included in evaluations. Also the possibility of other earthquake sources not listed below will be investigated.

Source	Distance - km	Magnitude
Denali Fault	72	7.9
Susitna Glacier Fault	65	7.2
Castle Mountain Fault	100	7.1
Megathrust Zone	150	9.2
Wadati-Benioff Zone	50	7.5
Susitna Seismic Zone	40	7.4
Random Unknown Local Fault		6.2

(f) Are there other dams of similar size, design, and construction that can be studied for comparison? Are any of these dams near fault lines? If so, how does the design differ?

Almost every major dam in the world is unique and engineered for the particular geology, hydrology, seismicity and topographical conditions at the site. Many are in highly-seismic areas such as California, Turkey, New Zealand and Japan.

Various types of dams incorporate features that analysis and experience has shown to be of benefit in resisting the loads associated with seismic activity. For an Earth Core Rockfill Dam (ECRD), a sloping core has been shown to be of great benefit in the seismic resistance of the structure. Concrete structures such as a Rolled Compacted Concrete (RCC) dams are often 'widened" at the lower parts of the cross section to limit stresses on the structure, while Concrete Face Rockfill Dams (CFRD), which are often regarded as particularly useful in areas of seismic activity, sometimes have enhanced fill used in the top few feet of the embankment, or are designed with higher freeboard (height of dam above maximum water level) than would otherwise be incorporated.

(g) Are there any other similar dams that have experienced failures or had compromising events? What were the results or consequences to the dam and the areas downstream?

[See earlier answer]

(h) Who did the risk analysis? Where can it be reviewed?

A full risk analysis will be performed as the study phase develops. All risk analysis done in the 1980's will be updated to incorporate improvements made to the discipline of risk management.

7. ARCHAEOLOGIC/ HUMAN / ECONOMIC IMPACTS

What will the economic impact be to the community of Talkeetna? i.e., boom/bust cycles during construction, additional rail traffic negatively affecting local businesses, increased Park's Highway traffic, potential threat to fishing and river boat guiding industries.

How many jobs will be created and will there be a local hire preference? Wilderness is a precious commodity, both aesthetically and economically. Travelers come to the Susitna Valley to see wild rivers and a wilderness ecosystem. How will a "Hoover Dam" upstream negatively affect the tourism industry?

What about the humanity of the downriver people?

These socioeconomic issues and others were studied extensively in the 1980s for the original Susitna Hydroelectric Project, but must be updated. The demographic and economic conditions have significantly changed in Alaska since that time. AEA is planning on performing additional studies in these areas to fully evaluate the potential impacts of the project on the factors you outline above and many related considerations.

Talkeetna Community Council, Inc.

A non-profit, community service organization

June 4, 2011

Representative Mark Neuman, Rex Shattuck and staff

cc. Sara Fisher-Goad, Executive Director - AEA
cc. AEA Board Members
cc. Governor Sean Parnell, Lieutenant Governor Mead Treadwell

Dear Representative Neuman, Rex Shattuck, and staff,

We appreciate you and your staff taking the time to respond to our concerns. The Talkeetna Community Council Inc., Susitna Dam Committee has organized a series of questions generated from the community regarding the proposed Susitna Large Hydro project. (Some of these questions were asked at the "public meeting" in Talkeetna on Feb. 28 hosted by AEA. They were either unanswered, inadequately answered or are areas where future studies/data were promised by AEA)

The questions below are divided into eight categories. We foresee that several common categories can be combined into a series of meetings with Rep. Neuman and Sara Fisher-Goad (plus additional specialized speakers if necessary). These questions represent our initial concerns - there will be more!

Our most significant concern is that there has been an overriding lack of public process and fast tracking during this initial phase of the proposed project. The magnitude of both the state subsidy required to build the project, and the threat of imminent impacts from it's operation warrant a thorough evaluation by Alaskan residents.

Sincerely,

Whitney Wolff
Talkeetna Community Council, Inc. - Susitna Dam Committee

Talkeetna Community Council, Inc.
P.O. Box 608, Talkeetna AK 99676

1. VIABILITY / FEASIBILITY - FINANCIAL / ECONOMIC

* It has been noted that this hydro project has been rated at 50% efficiency: that a 600 mega watt rating only produces 300 mega watts in reality - explain why?
* What are the REALISTIC high and low estimates for energy production, especially for low, winter flow estimates, dry or cold years etc. How does this compare to railbelt demand? It is known that demand nearly doubles in winter when the dam would produce less - how does this factor into the viability of the project?
* AEA states that they will be doing an "interim report on electrical rates" - What is the projected rate needed to pay back the cost of the dam including the state subsidy?
* Where are the studies that compare each alternative form of energy at a "cost to build per kilowatt hour" estimate? How can the state decide that the best use of it's funds is the Susitna Large Hydro without the comparative data?
* How is the tremendous state subsidy factored into the actual cost of the project?
* Will financing for the dam include bonding and/or private parties?
* If Susitna was not feasible 30 years ago - why is it now? Dams are being torn down in the lower 48 - why are we going to subsidize the building of one?
* How much bearing do the studies from the 80's have on the new design?
* AEA says they are still looking at alternatives - why is SOLAR not one of the eight program areas of Alternative Energy and Energy Efficiency on their web site?
* Why is the large hydro alternative deemed "the only way to go from 24% renewable to 50%? Why not explore a range of smaller projects, efficiency, and conservation?

2. FISH / WILDLIFE / HABITAT

*What effect will the flooded area behind the dam have on wildlife populations?
    * What will be the effect on migrating caribou, which cross the Susitna where the reservoir will be? The Nelchina herd has doubled in the last 30 years and there is a lack of studies on these migrating caribou and reservoir ice.
* How will winter releases of water affect juvenile salmon?
* How will warmer water out of the reservoir affect salmon?
* Opportunity for temperature changes to encourage invasive species such as pike?
* Several local guides have experience with the complex stock structure of the Susitna River. There are known Dolly Varden in a small creek above Watona and a small creek off of Jay Creek. The reservoir will wipe out the grayling.

3. HYDROLOGY ISSUES/ FLOW / WATER LEVELS

*What effect will the changed flow rate, with resultant temperature changes have on: freeze-up and break up cycles (will freeze up be later and consequently affect winter river travel to remote homesteads etc.?)
sedimentation?
side-channel effects for salmon rearing?
salmon populations?
other fish populations?
downstream hydrologic effects

*Will it be possible to drive a boat up Devil's Canyon?

4. FAILURE - GEOLOGIC / SEISMIC

* What is the chance of catastrophic dam failure due to building by a major fault?
* At the initial public meeting in February, there was an error in the noted distance of the Denali fault from the Watona site - Why do the distances appear to be understated? What about the Talachulitna fault?
* What models have been developed to determine the effect of such a failure on downstream communities? (Talkeetna, Gold Creek, Indian, Curry, Chase)

* Specific Seismic/Engineering issues:
* the Denali fault has numerous discontinuous branches. where is the closest known branch to the proposed dam site? Each of these branches has a "best guess" of potential earthquake magnitude - what is the "best guess" magnitude for the Susitna dam site?
* What magnitude of earthquake was used in the design risk-analysis for the dam?
* Are there other dams of similar size, design, and construction that can be studied for comparison? Are any of these dams near fault lines? If so, how do the design differ?
* Are there any other similar dams that have experienced failures or had compromising events? What were the resuts or consequences to the dam and the areas downstream?
* Who did the risk analysis? Where can that be reviewed?

5. ARCHAEOLOGIC

*319 historic and prehistoric sites have been documented in the project area and 140 sites will be impacted.

6. HUMAN / ECONOMIC IMPACTS

*What will the economic impact be to the community of Talkeetna? ie. boom/bust cycles during construction, additional rail traffic negatively affecting local businesses, increased Park's Hwy traffic, potential threat to fishing and river boat guiding industries.

*How many jobs will be created and will there be a local hire preference?

*Wilderness is a precious commodity - both aesthetically and economically. Travelers come to the Susitna Valley to see wild rivers and a wilderness ecosystem - how will a "Hoover Dam" upstream negatively affect the tourism industry?

*What about the humanity of the downriver people?

7. CONSTRUCTION

*what type of dam?
*Where will the construction infrastructure (roads, camp, etc.) be located?
*Will new grid connections be built to supply energy to small communities?
*How many acres will be lost to the inundation (in the creating of the reservoir)?
*Where are the risk assessments for the different dam configurations ? (embankment vs. roller compact)
*What is the carbon footprint of construction- the expected environmental impact?
*What if the state starts the construction improvements of the Denali Hwy. and construction of access roads before the dam is permitted?

8. PUBLIC PROCESS

*What is the status of the Pre-Pad Questionnaire?
* Will there will local members of the FERC committee?
* What is the $67.5 million currently being spent on?
* What is the timeline for the public process? Three years to do studies?
* Why does the public have to wait for the federal licensing process to have a say in how state funds are being spent on this dam now?
* There seems to be little communication between AEA and the legislature - how are the specifics of the dam, including hazards, being conveyed to representatives?
* what is the plan, agenda, or configuration for the state's energy policy other than the self imposed 50% renewables by 2025? Who is heading up the creation of an energy policy? Are there specific energy experts working on the policy who are not from the industrial development camp (AIDEA) ?

Kirby Gilbert

From: Bryan Carey [bcarey@aidea.org]
Sent: Monday, August 08, 2011 8:38 AM
To: Kirby Gilbert
Cc: Railbelt Hydro; Watana; Brian Sadden
Subject: FW: Proposed licensing process for Susitna-Watana Hydropower Project
Attachments: Susan_Walker.vcf

From: Susan Walker [mailto:susan.walker@noaa.gov]
Sent: Wednesday, August 03, 2011 3:35 PM
To: Sara Fisher-Goad; Bryan Carey
Cc: eric Rothwell; Michael_Buntjer@fws.gov; Cassie_Thomas@nps.gov; Tom GCAK Meyer; Betsy_McCracken@fws.gov; Jennifer_Spegon@fws.gov; Fran Mann; Ken.Lord@exchange.sol.doi.gov; Lee_Koss@blm.gov; Ann Rappoport (ann_rappopart@fws.gov); Jon Kurland
Subject: Proposed licensing process for Susitna-Watana Hydropower Project

Proposed licensing process for Susitna-Watana Hydropower Project

Hi Sara and Bryan,

We greatly appreciated the June 27, 2011, meeting at Alaska Energy Authority's Anchorage office that Bryan Carey organized to initiate interagency coordination on the State's proposed WatSu hydro project. Bryan requested comments from the agencies by this Friday, August 5th on AEA's proposed licensing process. We request an extension until September 9th. We will follow this email with a formal letter on August 5th, but want to give you a timely notice of our request.

The short timeframe and rigid nature of the study periods suggested in the project timeline appear inconsistent with the time required to design, conduct and review studies describing the dynamic hydrology, habitat and associated biology of the basin.

We are concerned that the strict timelines suggested are not sufficient to accommodate the necessary field studies, analyses, and licensing steps required for such a large new hydroelectric project and original license. We applaud AEA for contracting several Gap Analyses so that we can determine the adequacy and availability of information from the 1980s Susitna hydroelectric studies and proposals. We have yet to be provided with all of the gap analyses, which will greatly inform our recommendations on the licensing process and we received the first two reports on July 21.

Examples of additional information needs include determining current baselines for anadromous fish populations, and how/where/when adult and juvenile fish use habitat under different flow conditions. This cannot be determined in one, two, or even three study years. Information being developed by the USGS on synthetic hydrology from the 1980's gage locations will be useful, but additional flow data will certainly be needed to understand how flow timing and magnitude has changed since the 1980s. Basic hydrology questions

include determining how high peak flows from the Upper Susitna River recharge groundwater, maintain the floodplain, maintain baseflow, and maintain water quality. These examples suggest a need for greater time and flexibility in the study period than suggested.

The upcoming August 18 meeting for initial discussion of the gap analysis and the National Hydropower Association meeting and site visits with the Federal Energy Regulatory Commission scheduled for the week of August 29th will add to our ability to constructively comment on the most suitable licensing process for the WatSu project. These opportunities to discuss the project will allow for the development of a more realistic schedule for designing and conducting studies and proceeding effectively with project licensing. We request extension of the date for agency comments on the licensing process until Friday, September 9th to allow for distribution of the other gap analysis reports and to take advantage of the upcoming opportunities for agency collaboration.

Thank you for your consideration of our request. Please call me if you have any concerns you would like to discuss.

Susan Walker
Hydropower Coordinator for NMFS Alaska Region

907-586-7646

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

DIVISION OF SPORT FISH

SEAN PARNELL, GOVERNOR

Research & Technical Services
333 Raspberry Road
Anchorage, Alaska 99518-1565
Phone: (907) 267-2312
Fax: (907) 267-2422

August 5, 2011

Mr. Bryan Carey
Alaska Energy Authority
813 West Northern Lights Boulevard
Anchorage, AK. 99503

Re: Susitna / Watana Hydroelectric Project, Comments on choice of the FERC Integrated License Process

Dear Mr. Carey:

Thank you for the opportunity to comment on Alaska Energy Authority's (AEA) recommendations for licensing the proposed Watana hydroelectric project located on the Susitna River. We appreciate AEA contracting for a review and gap analysis of data and information collected during the previous Susitna River hydroelectric proposal.

In your email dated July 13, 2011, you requested comments on several topics. Our comments those topics are provided below.

AEA's Proposed License Process Modifications/Adjustments of Time:

AEA stated that the Federal Energy Regulatory Commission (FERC) Integrated Licensing Process (ILP) was being considered for this project. They discussed their preference for more certainty in licensing timelines and proposed making adjustments to the ILP default timelines to accommodate the project schedule and agency concerns.

As noted at the meeting, the ILP has many shortcomings for new project proposals, more so for a proposal of this size and nature. It was developed for relicensing projects where baseline information and project impacts are well studied. Stakeholder positions regarding issues surrounding an ILP project are usually well-known. This allows deadlines to be established with more certainty and agreements can be initiated much earlier. The ILP has shown potential to reduce challenges to timely license issuance for relicensing projects, but it does not ensure that this will happen and can lead to a longer process if resource data needs are not fully studied to meet National Environmental Protection Act (NEPA) requirements.

Under the ILP, (18 CFR 5.9(b)) study requests must be based on specific criteria and must contain an explanation for each study to include:

- A description of goals and objectives for each study proposal and the information to be obtained;

- An explanation of the relevant resource management goals of the resource agency with jurisdiction over the resource to be studied;
- A description of existing information concerning the subject of the study proposal, and describing the need for more information;
- Explanation of nexus between project operations and effects (direct, indirect and cumulative) on the resource to be studied, and how the study results would inform the development of license requirements;
- Explanation of how the study methodology is consistent with generally accepted practice in the scientific community, or as appropriate considers relevant tribal values and knowledge:
- Description of consideration of level of effort and cost and why the applicants proposed alternative studies would not be sufficient to meet stated information needs.

We are concerned that because this is a new project with dated baseline data and no information on AEA's proposed operation scenarios, it would be difficult to meet ILP timelines and the level of information needed for ILP study requests, notwithstanding the large size and scope of the proposed project. AEA stated that study working groups would not be formed until November 2011. If the Notice of Intent (NOI) and Preliminary Application Document (PAD) are filed with FERC in November 2011 and accepted by FERC shortly thereafter, there will not be adequate time to identify agency personnel to be assigned tasks, hold several discussion meetings, and to develop appropriate study plans in the short time period identified under the ILP. In addition, FERC will more than likely require an Environmental Impact Statement (EIS) for this project which increases the range, depth and scope of issues that will need to be addressed.

Instead, we believe it makes better sense to select the Alternative Licensing Process (ALP) and make adjustments to the project schedule to accommodate AEA's concerns. The ALP has been used regularly in Alaska and affords the flexibility necessary for new projects. There have been many successes in Alaska using this process. We believe the ALP, with agreed upon modifications, to be the best licensing process to obtain information and stakeholder support, to achieve a timely licensing process.

Early Studies

The selection of licensing process needs further discussion before having any detailed discussions on gap analysis or future studies.

Resources

Potential project affected resources need to be determined and addressed in workgroups. Workgroup staffing will need to include agency resource specialists for each respective discipline and will need a structured process to follow to make the most efficient use of everyone's time. Meetings on a Communication Protocol are needed to develop a process for consistent interaction between the applicant and agencies. This will help establish the "rules" of conduct and will further understanding of the process.

Other

We are concerned with the ILP's exclusion of non-mandatory conditioning agencies from the dispute resolution process[1]. This rule prevents ADF&G from presenting evidence to FERC or the Dispute Resolution Panel for resolution of any outstanding study requests. The most contentious study issues will likely involve fish and wildlife resources and their habitats for which ADF&G is the State's principal manager.

In order for this process to proceed at a timely pace, it is important that AEA provide detailed information and plans in a timely manner. For example, to date there have been several delays with issuance of data gap analysis reports. These reports are important for evaluating licensing processes and assessing planning and staffing needs. Based on our experience, incomplete work products and delays of project information, plans and other materials to stakeholders is a key factor determining the outcome of a timely licensing process.

We recommend the creation of, and keeping up-to-date, a Watana (Susitna River) Hydroelectric Project-dedicated webpage on AEA's website with a direct link to the site listed on AEA's home page. Because of the proposed project's size, scope, and public interest, information regarding the project should be relevant and easy to find.

By e-mail dated August 4, 2011, AEA extended the comment period to September 9, 2011. Following additional discussions and a scheduled meeting with FERC representatives on September 1, we may provide additional comments. Please call me at (907) 267-2312 if you have any questions.

Sincerely,

/S/ Monte Miller

Monte Miller, ADF&G/SF-RTS-Anchorage

[1] In 1999, the Alaska Department of Environmental Conservation (DEC) waived mandatory conditioning authority under the Clean Water Act, Section 401 certifications for all hydropower projects. This authority certifies project compliance with all applicable water quality standards.

ecc: Sara Fisher-Goad, AEA
C Swanton, ADF&G
B. Clark, ADF&G
J. Klein, ADF&G
J. Mouw, ADF&G
R. McLean, ADF&G
M. Daigneault, ADF&G
G. Prokosch, DNR
S. Walker, NMFS
E. Rothwell, NMFS
C. Thomas, NPS
L. Koss, BLM
J. Spegon, USFWS
M. Bunjer, USFWS
B. McCracken, USFWS
T. Meyer, NMFS
D. Meyer, USGS
R. Wilson, Alaska Ratepayers
F. Mielke, Alaska Ratepayers
K. McKeown, Alaska Conservation Alliance
M. Coumbe, Alaska Conservation Alliance
K. Strailey, Alaska Center for the Environment
J. Konigsberg, Hydropower Reform Coalition

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Anchorage Fish and Wildlife Field Office
605 West 4th Avenue, Room G-61
Anchorage, Alaska 99501-2249

AUG 5 2011

IN REPLY REFER TO:
AFWFO

Mr. Bryan Carey
Alaska Energy Authority
813 W Northern Lights Blvd
Anchorage, AK 99503

Re: Low Watana proposed licensing process
FERC Project No. 14241-0000

Dear Mr. Carey:

The U.S. Fish and Wildlife Service (Service) appreciates the opportunity to provide initial comments on the proposed Low Watana licensing process. We continue to be concerned that the strict process timelines suggested by the project sponsor may not accommodate the necessary review of historical information, development of field studies, field work, data analyses, interpretation, reporting and licensing steps required for such a large, new hydroelectric project. The Service applauds the Alaska Energy Authority for contracting several gap analyses so that we can determine the potential adequacy and availability of information from the 1980s Susitna hydroelectric studies and proposals. Although we have not yet seen all of the gap analyses, a preliminary review of the Aquatic Resources Gap Analysis suggests, for example, that information on current salmon spawning distribution and habitat utilization is needed to document biological baseline conditions.

The rigid nature of the suggested licensing process appears at odds with the time needed to comprehensively understand the dynamic hydrology, habitat and associated biology of the basin. For example, information being developed by the USGS on synthetic hydrology from the 1980s gage locations may be useful, but additional flow data will be needed to understand existing flow timing and magnitude, as well as flows predicted over project operations relative to climate change. Information on current seasonal fish species distribution and habitat utilization by life stage, and different flow regimes throughout the watershed are critical to understanding proposed project impacts and potential mitigation strategies. Questions related to the Susitna Basin hydrology and aquatic biota cannot be determined in one or two study years. Consequently, maximum flexibility will be needed in the licensing process for the Watana hydroelectric project in order to achieve successful project outcomes from the standpoints of energy supply, conservation of fish and wildlife, and economics.

Two upcoming events will help inform the licensing process for the Watana project. The first is the planned August 18 meeting for initial discussion of the gap analyses. The other is the Watana site visit (tentatively scheduled for Monday August 29), and associated National Hydropower Association meeting, and meetings with the Federal Energy Regulatory Commission scheduled for the week of August 29. These will provide additional opportunities to discuss the challenges associated with licensing and realistic project timelines.

Thank you for the opportunity to provide initial comments on this important project and for extending the timeframe for our initial comments on the licensing process. If you have any questions regarding these comments, please contact project biologist, Mike Buntjer at (907)271-3053, or by email at michael_buntjer@fws.gov

Sincerely,

Ann G. Rappoport
Field Supervisor

cc: S. Walker, NOAA, susan.walker@noaa.gov
E. Rothwell, NOAA, eric.rothwell@noaa.gov
T. Meyer, NOAA, tom.meyer@noaa.gov
L. Koss, BLM, lee_koss@blm.gov
C. Thomas, NPS, cassie_thomas@nps.gov
M. Miller, ADF&G, monte.miller@alaska.gov
M. Daigneault, ADF&G, michael.daigneault@alaska.gov
G. Prokosch, ADNR, gary.prokosch@alaska.gov
D. Meyer, USGS, dfmeyer@usgs.gov
K. Lord, DOI, Ken.Lord@exchange.sol.doi.gov
S. Fisher-Goad, SFisherGoad@aidea.org
B. Long, issues320@hotmail.com
C. Smith, TNC, corinne_smith@TNC.ORG
J. Konigsberg, HRC, jan@hydroreform.org
K. Strailey, ACE, kaarle@akcenter.org
M. Coumbe, ACA, mike@akvoice.org
P. Lavin, NWF, lavin@nwf.org
R. Wilson, Alaska Ratepayers, richwilsonak@gmail.com
K. Bose, FERC, Kimberly.Bose@ferc.gov

Meeting Summary
Susitna-Watana Hydroelectric Project Licensing
Aquatic, Terrestrial, and Water Quality Gap Analysis Meeting
1:00 pm - 4:00 pm, August 18, 2011
Held at 4th Floor Conference Room, CIRI Building
2525 C Street, Anchorage, AK

Purpose of Meeting: Present and discuss results of aquatic, terrestrial and water quality resources data gap analyses for the proposed Susitna-Watana Hydroelectric Project (Project) with stakeholders.

Attendees:

Present for AEA:	Bryan Carey, Project Manager
Present on behalf of AEA (CardnoEntrix)	Jim Gill
Present for ADNR, Division of Water	Gary Prokosch
Present for ADNR	Kim Sager
Present for NPS	Cassie Thomas
Present for USFWS	Mike Buntjer
Present for USFWS	Betsy McCracken
Present for USFWS	Jennifer Spegon (by phone)
Present for ADF&G	Monte Miller
Present for ADF&G	Jason Mouw
Present for ADF&G	Joe Klein
Present for ADF&G	Ron Benkert
Present for ADF&G	Mike Bethe
Present for NMFS	Susan Walker (by phone)
Present for NMFS	Eric Rothwell
Present for Solstice Alaska Consulting, Inc.	Robin Reich
Present for Solstice Alaska Consulting, Inc.	Colleen Bolling
Present for MWH	Kirby Gilbert
Present as MWH subcontractor	James Thrall
Present as MWH Subcontractor, Long View Associates	Steve Padula
Present as MWH Subcontractor, Long View Associates	Randall Filbert
Present as MWH Subcontractor, Long View Associates	Finlay Anderson (by phone)
Present for HDR	James Brady
Present for HDR	Mark Dalton
Present for ABR	Brian Lawhead
Present for URS	Paul Dworian
Present for LGL Alaska	Michael Link
Present for DOWL HKM	Kristen Hansen
Present for Attorney General's Office	Brian Bjorkquist
Present for Davis Wright Tremaine	Ted Wellan
Present for Coalition for Susitna Dam Alternatives	Becky Long

Present for Coalition for Susitna Dam Alternatives	Richard Leo
Present for Alaska Conservation Alliance	David Theriault
Present for Alaska Conservation Alliance	Kate McKeown
Present for the Alaska Ratepayers	Rich Wilson
Present for the Alaska Ratepayers	Kristina Woolston
Present for National Wildlife Federation	Pat Larin
Present for Northern Land Use Research	Richard Stern
Present for R2 Resource Consultants	Dudley Reiser
Present for R2 Resource Consultants	Betsy McGregor
Present for Natural Heritage Institute/Hydro Reform Coalition	Jan Konigsburg
Present for Cook Inlet Aquaculture Association	Gary Fandrei (by phone)

Summary:

Steve Padula facilitated the meeting and Kirby Gilbert took notes on a flip chart. Steve summarized the planned agenda and introduced the gap analysis presentations described below. Bryan Carey noted that identification of a data gap in these analyses did not necessarily mean that a study would be automatically conducted to address the gap in question. Rather, once the proposed project components and operations are better defined AEA and the resource agencies and other stakeholders would need to work together under the structure of FERC's Integrated Licensing Process (ILP) to identify important resource-related questions upon which the necessary studies would be based.

Steve and Kirby emphasized that AEA was interested in receiving feedback from the resource agencies and other stakeholders regarding the data gap analysis reports, which would help supply information for AEA's Pre-Application Document (PAD), slated to be filed by November 30, 2011. Steve reiterated that future studies would need to be based on well defined research questions aimed at assessing potential effects of the proposed Susitna-Watana Project, and that stakeholders would be integral to identifying these questions and helping to formulate study scopes.

Bryan Carey distributed the Alaska Power Authority's March 6, 1984 Issues List for the originally proposed Susitna Hydroelectric Project. Bryan noted that the issues identified for the historic project would not necessarily be the same as those associated with the currently proposed Project, but do serve as useful information in beginning to formulate study objectives or identify issue topics for the currently proposed project under the ILP. It was noted that PowerPoint presentations would be posted on the Project Website.

Aquatic Resources Data Gap Analysis:

James Brady (HDR) presented the results of the Aquatic Resources Data Gap Analysis, which included the following elements:

- Purpose/objective

- Approach
  - Navigation of 1980s literature
  - Identification of key documents
  - Assessment of contemporary literature
- Organization of the data gap analysis report
- Overview of the existing information and potential data gaps for the following topics:
  - Adult salmon
  - Resident and rearing anadromous fish
  - Macroinvertebrates and periphyton
  - Water quality (as it relates to aquatic biota)
  - Hydrology, geomorphology, and climate (as they relate to aquatic biota)
  - Instream flow
  - Marine mammals (i.e., Cook Inlet beluga whale)

Wildlife Resources Data Gap Analysis:

Brian Lawhead (ABR) presented the results of the Wildlife Data Gap Analysis, which included the following elements:

- Background
- Approach
  - Review of historical APA documents from scans of ARLIS documents and AEA microfiche
  - Review of recent resource literature
  - Resource agency contacts
  - Compilation of an annotated literature database
  - Synthesis of information and preparation of a data gap analysis report
- Description of the original Susitna Project
- Overview of the following items
  - Game management units and subunits in the Susitna River basin
  - Vegetation/land-cover mapping
  - National Wetlands Inventory wetlands mapping
- Potential information needs related to mammals, birds, and vegetation and wetlands

Water Quality Data Gap Analysis:

Paul Dworian (URS) presented the results of the Water Quality and Sediment Transport Data Gap Analysis, which included the following elements:

- Background
- Methodology
  - Significant studies prior to 1985, i.e., those with data readily available
  - Focus on collecting data from 1985 to present
  - Division of the Susitna River into segments to provide a framework for organizing and interpreting available data
- Water quality

  - Review of data sources and data quality
  - Comparison of data to water quality standards
  - Water quality data gaps
- Sediment transport
  - Hydrology, sediment transport, and deposition
  - Formation and changes to aquatic habitats
  - Sediment data gaps

Follow-up Discussions:

1. Eric Rothwell (NMFS) stated that it was not possible to adequately identify all resource data gaps without first defining relevant research questions. Eric stated that baseline conditions in the Susitna River basin have changed since studies were conducted in the 1980s, and that it would be necessary to decide which elements of the environment were likely to have changed and collect new baseline information as appropriate. Eric stated that to assess the proposed Project's effects on hydrology and sediment dynamics, particularly to construct and employ a sediment dynamics model, it would be necessary to have several years of flow data from a number of locations in the basin. Eric questioned whether flow data available from the US Geological Survey (USGS) would suffice for this purpose, noting that stream gaging had been conducted sporadically at different locations in the basin. Paul Dworian (URS) replied that existing flow data, coupled with quantitative analyses, could potentially be used to estimate some historic flows, thereby expanding the hydrologic dataset upon which other analysis tools would be based.

2. Mike Buntjer (USFWS) noted that Chinook salmon have a 6- to 8-year lifespan and stated that two years of field study, the minimum called for by the ILP, could be inadequate for gathering the information needed to assess potential Project effects on this species.

3. Monte Miller (ADG&G) stated that baseline data for understanding the distribution of salmon species in the basin, Chinook in particular, would require assessment of conditions under a range of flows. Monte noted that anadromous fish are likely to migrate farther upstream under low flows than under high flows, and failure to evaluate their distribution under low flow conditions could result in an inaccurate portrayal of salmon distribution over longer durations associated with varying hydrologic regimes.

4. Mike Bethe (ADF&G) stated that two years of data collection might be inadequate even for determining fish species presence/absence in the Susitna River and its tributaries upstream of Devil Canyon. Mike noted that he had observed both Chinook and sockeye salmon at the upstream end of the reach proposed for inundation, and he had seen salmon, but he could not identify the species, in the MacLaren River. These observations indicate that Devil Canyon might not be a barrier to the upstream migration of at least these two salmon species during some water years, and limiting

data collection to two years would not necessarily reveal the periodic upstream extent of salmon distribution. Mike stated that a substantial data collection effort would likely be required to identify areas of salmon overwintering/rearing in the Susitna River and its tributaries upstream of Devil Canyon, and these data could take more than 2 years to collect.

5. Mike Buntjer (USFWS) stated that construction and operation of the Susitna-Watana Project, depending on the Project's effect on flow regime, could create conditions that allow salmon and other fish species to migrate farther upstream than they do under existing conditions, resulting in a situation where fish might at times accumulate at the base of the dam.

6. Sue Walker (NMFS) concurred with statements made by USFWS and ADF&G regarding the need for more than two years of fisheries data to understand existing baseline conditions. Sue added that NMFS would need to allocate sufficient staff to satisfy the requirements of the Susitna-Watana Project ILP, a process that would take significant time and effort to complete.

7. Monte Miller (ADF&G) noted that review of existing information revealed that concentrations of metals at some locations in the basin exceed water quality criteria, and disturbance of rock sources during construction could liberate metals and potentially result in even higher concentrations.

8. Becky Long (Coalition for Susitna Dam Alternatives) asked whether current technologies would allow for a more accurate assessment of fish distribution in the Susitna River basin than those conducted in the past. James Brady (HDR) stated that modern technologies, e.g., dual-frequency identification sonar (DIDSON) among others, have allowed for more accurate assessments of sockeye distribution in recent years. James added, however, that application of modern technologies had not been applied to other salmon species in the basin.

9. Jason Mouw (ADF&G) stated that instream flow assessment would also be critical for assessing potential Project effects on wildlife species, citing as an example the effect of altered flow regimes on the availability of vegetative browse species for moose in the reaches downstream of the proposed Project. Jason added that changes in flow regime could also have impacts on recreational use of the river downstream of the proposed Project, including the ability of recreational users to access the river on both public and private lands.

10. Becky Long (Coalition for Susitna Dam Alternatives) also expressed concern about the potential effect of the proposed Project on recreational use in the middle and lower reaches of the Susitna River. Bryan Carey reiterated that AEA was currently in the process of developing a data gap analysis for recreation resources and that recreation issues would be evaluated during the ILP.

11. Cassie Thomas (NPS) stated that it would be necessary to know how the proposed Project's operation would affect ice formation and persistence on the Susitna River and its tributaries, both in the area to be inundated by the proposed reservoir and downstream of the Project, particularly in sloughs downstream of the Project. Cassie added that it would also be necessary to understand the proposed Project's effects on large woody debris recruitment and movement.

12. Monte Miller (ADF&G) added that the effects on ice dynamics could influence caribou migration, potentially resulting in injury to caribou if ice becomes less stable in a fluctuating reservoir or because the flow and temperature ranges change.

13. Mike Buntjer (USFWS) stated that few people have the expertise needed to conduct modeling of ice dynamics and that it would be important to identify a qualified expert.

14. Jan Konigsburg (Natural Heritage Institute) asked what criteria would be used by AEA to determine actual study needs under the ILP. Bryan Carey replied that AEA would base its evaluation of study needs on the potential for project effects after it had a firmer understanding of how the proposed Project would operate, which was expected to be soon.

15. Susan Walker (NMFS) asked if AEA intended to pursue settlement negotiations to come to agreement with stakeholders regarding mitigation for the proposed Project, adding that if so, AEA should expand the extent of its outreach in the near future to include all potentially interested resource agencies, native tribes, and nongovernmental organizations. Steve noted that AEA was in the process of expanding its outreach, beginning with meetings planned for August 29, 2011 in Talkeetna and September 1, 2011 in Anchorage. It was noted that site visits would also be conducted on August 29th.

16. Jan Konigsburg (Natural Heritage Institute) stated that site visits of the proposed Susitna-Watana Project area seemed premature, noting that site visits associated with the ILP typically occur following the filing of the PAD and Notice of Intent with FERC. Bryan Carey replied that the site visit had been scheduled to correspond with FERC's attendance of the National Hydropower Association's meetings in Girdwood. Bryan added that waiting until after the filing of the PAD (which is to be filed in November 2011) would result in a winter site visit, which would not be desirable in this part of Alaska.

17. Gary Prokosch (ADNR) asked when the USGS flow study for the basin would be completed. Bryan Carey replied that the USGS report was expected to be available in the winter of 2011/2012.

18. Monte Miller (ADF&G) noted that the AEA's data gap analyses were released later than expected and questioned whether the same would be true of the PAD/NOI. Monte stated that without a timely issuance of the PAD, it would be unlikely that fieldwork would be conducted in 2013. It was noted by Steve and Bryan that the PAD is also expected to inform plans for information gathering efforts in 2012, prior to the start of the formal field efforts in 2013 and that AEA was eager to begin receiving input from stakeholders regarding their ideas on study needs. Monte replied that stakeholders could only begin to really provide input on study needs after AEA released a description of the proposed Project's facilities and operations.

Kirby Gilbert, Sr. Regulatory Specialist, MWH & Randall Filbert, LVA

Meeting Summary
Susitna-Watana Hydroelectric Project Licensing
Meeting with Army Corps of Engineers
10:00 am - 12:00 pm, August 19, 2011
Held at MWH Offices
1835 Bragaw St., #350, Anchorage, AK

Purpose of Meeting: To discuss with representatives of the US Army Corps of Engineers (ACOE), North Branch, (a) the scope of the proposed Susitna-Watana Project (Project) and (b) information needs and scheduling for the filing of AEA's Section 404 permit application for the proposed Project.

Attendees:

Present for AEA	Bryan Carey, Project Manager
Present for the US Army Corps of Engineers	Victor Ross, Team Lead
Present for the US Army Corps of Engineers	Michiel Holley, Team Lead
Present for CardnoEntrix	Jim Gill
Present for MWH	Kirby Gilbert
Present as LVA	Steve Padula
Present as LVA	Randall Filbert

Issues Discussed with ACOE:

1. Kirby Gilbert (MWH) asked if the ACOE would ultimately adopt FERC's NEPA document prepared for the Project licensing. Victor Ross (ACOE) and Michael Holley (ACOE) replied that information collected to satisfy the needs of FERC's NEPA process would suffice for the 404 permit application, provided that relevant data meet ACOE standards. The ACOE offered the following clarifications and guidance:
    a. Current wetlands data will be needed, and data collection methods must be consistent with the ACOE's Alaska Regional supplement. AEA's contractors will need to consult the Alaska Regional Supplement to ensure that delineations are regionally correct.
    b. Wetland delineations should be conducted during the growing season.
    c. Wetland delineations take much time to complete, so it will be essential that AEA's study area is comprehensive–including all potential Project facilities, roads, and transmission routes and alternatives–so that AEA does not have to conduct additional data collection late in the licensing process.
    d. Wetland delineations must include a functional assessment so that the ACOE can assess both the quantity and quality of wetland habitat to be modified or lost due to construction of the proposed Project. Comparable wetland data must be developed for all alternatives.
    e. For the 404 application, AEA must provide the results of delineations and functional assessments of all wetlands that occur within the planned footprint for the Project, including the reservoir and all facilities. No delineations are

needed for wetlands along the Susitna River downstream of the Project, but any potential effects to downstream wetlands must be addressed, not only to satisfy NEPA but also to allow the ACOE to perform its assessment of cumulative impacts associated with the Project.

f. The ACOE will require AEA to provide in advance of fieldwork the name of the consultant hired to conduct wetland delineations and functional analyses. The ACOE will need to review proposed methods and then verify the delineations by evaluating representative transects during a site visit(s).
g. AEA will need to identify which streams will be impacted by the proposed Project, not only those reaches that will be inundated by the reservoir but also steams affected by all appurtenant facilities, road crossings, transmission lines, borrow sources, etc.
h. Steve Padula asked if ACOE approval of wetland assessments would satisfy other agencies' needs for QA/QC. Victor Ross replied that other agencies would likely need to conduct independent assessments of wetlands evaluations.

2. Victor Ross emphasized that the ACOE would require an analysis of why the proposed Project location was selected relative to others, why facilities need to be structured the way they are; for instance it maybe that an explanation of why fossil fuel is not more appropriate for satisfying power demand would be needed. The Project's "purpose and need" statement and alternatives analysis will be similar to what is needed for FERC's NEPA document.
    a. It will be necessary, per Section 404[b][1] of the Clean Water Act, to show that the proposed Project is the least environmentally damaging, practicable alternative for meeting the project's needs, i.e., has the least environmental impacts relative to cost. The "Least Environmentally Damaging Practicable Alternative" (LEDPA) is what the ACOE permits.
    b. Victor commented that EPA standards will likely curtail coal-fired energy production in the Alaska railbelt; this can be factored into the practicability assessment of the proposed Project along with the need for renewable energy sources if this is a driver for the Project.
    c. The proposed Project plan should explain how the Project would be developed to avoid impacts e.g., locating quarries in uplands rather than wetlands, using displaced rootwads as large woody debris for instream habitat, minimizing the use of culverts, placing culverts to minimize effects on wetlands, adhering to work "windows" that would prevent or minimize impacts, design road and transmission line corridors to minimize impacts, explain how equipment would be operated to minimize impacts, application of BMPs, etc.
3. It was noted that the State of Alaska waives Section 401 certifications in the context of FERC licensing and Victor was asked what the ACOE's experience is regarding obtaining a 401 certification as part of 404 permitting. Victor replied that the State of Alaska will make the determination as to whether or not the 401 certification will be waived for the Project. He noted that recent experience is that the State has waived a substantial number of 401 certifications for 404 permitting.

4. It was acknowledged that the Coastal Zone Management Act was currently not applicable in the state of Alaska.
5. Victor emphasized that AEA will need to identify potential impacts to tribal resources. The ACOE is required to engage in a government-to-government consultation with all tribes whose interests could be affected by the proposed Project. Although this process will be separate from the government-to-government process conducted by FERC, it would be most efficient to dovetail the FERC and ACOE processes by holding joint meetings. Kirby Gilbert noted that FERC's government-to-government consultation could begin as early as December 2011 and asked if the ACOE could be ready to engage by that time. Victor Ross replied that the ACOE could at least engage informally but could not undertake formal participation until the ACOE issues its public notice. Victor stated that he would consult his supervisor regarding how best to initiate the ACOE's participation in the FERC process.
    a. Government-to-government consultation is to occur with any interested Tribes out of all recognized "237" Alaska tribes, not with the tribal corporations. It does not matter if the tribes own property in the area to be affected; consultation is contingent upon tribal “interests.” AEA must identify tribes with potential interests both upstream and downstream of the proposed Project to determine which tribes’ interests may be affected. AEA should err on the side of being inclusive; tribes can decline government-to-government consultation, which can be documented, but it would be potentially problematic if AEA or the Corps or FERC overlooked a tribe with interests, which could result in them entering the process late and delaying licensing.
6. Victor Ross stated that an ACOE Project Manager would be assigned to the Susitna-Watana Project by late August 2011 and that a case number would be established. For this purpose, Victor requested that AEA submit a letter containing a brief description of the Project to the ACOE, including name of the applicant, latitude/longitude of proposed Project, estimated capacity in MW, estimated size of the reservoir, FERC docket number, and licensing start date.
    a. Victor stated that in addition to the letter it would be helpful if AEA/MWH could provide a short PowerPoint presentation containing the information identified above, which could be used to brief the ACOE branch chief.
7. Victor Ross stated that beginning with this meeting, AEA should document all interactions with the ACOE and provide the ACOE with summaries of all meetings and teleconferences. Summaries should identify all meeting/teleconference participants and their affiliations.
8. Victor mentioned that the ACOE would seek USFWS and NMFS input on the 404 application, informally before the filing of the application and request for formal comments requested after the application is filed.
9. Victor expressed interest that the ACOE should be involved throughout the FERC licensing process, with distinct items identified on meeting agendas as necessary.
10. AEA expressed interest in the ACOE attending the August, 29, 2011 tour of the proposed Project site. Victor Ross replied that the ACOE might have to participate at a later date, noting that the ACOE was required to pay for its seat and that the helicopter

used for the tour would need to be approved for use by the Department of Defense; the ACOE is required to file a risk assessment for any personnel who participate in flights.

11. Victor stated that it would be important to learn early in the process whether any of the cooperating agencies considered the proposed Project site to be an Aquatic Resource of National Importance (ARNI).
    a. Section 404 (b)(1) regulations are EPA's, they are only implemented by the ACOE.
    b. EPA, USFWS, and NMFS can elevate a site to the level of an ARNI.
    c. Sections 3(a), 3(b), and 3(c) call for the aforementioned agencies to submit a letter if they are going to elevate the location to an ARNI.
    d. EPA can veto a 404 permit issued by the ACOE. EPA may veto the permit if the proposed action is not considered by EPA to be the least environmentally damaging alternative. It will be critical to explain how impacts will be avoided, and if not, then minimized/mitigated.
    e. Up-front coordination with NMFS, EPA, and USFWS will be important to avoid potential delays.
    f. The ACOE will want to know if there is a possibility of its permit being vetoed before the permit application is filed by AEA; this can be accomplished via an ACOE-facilitated meeting of AEA with NMFS, USFWS, and ADF&G.

Kirby Gilbert, Sr. Regulatory Specialist, MWH and Randall Filbert, LVA.

Alaska Conservation Alliance
"A Strong Economy and Healthy Environment Go Hand in Hand"

August 26, 2011

Brian Carey
Alaska Energy Authority
813 W. No. Lights Blvd.
Anchorage, AK 99503

Dear Mr. Carey:

The Alaska Conservation Alliance respectfully submits this comment to the Alaska Energy Authority (AEA) regarding the Susitna-Watana hydroelectric project and the selection of the FERC licensing process to permit the project. The Susitna project, as currently proposed, would be the largest new hydroelectric facility built in the United States in decades and requires the largest public investment in Alaska state history. A project of this scale requires a licensing process with consistent and significant public involvement, transparency, and a comprehensive review of environmental impacts. The licensing process chosen by AEA should meet these requirements and build public confidence that the project will be done right rather than meet an arbitrary timeline.

AEA should view the licensing process as an opportunity to discover whether the Susitna-Watana hydroelectric project is the best option to provide electricity to the Railbelt. Transparency and public involvement beyond what is required by the selected licensing process and state statute should be considered. AEA's informal commitment to make public reports to the legislature on a quarterly basis, beyond the annual report required by state law, is a good start. The recent creation of the Susitna – Watana Hydroelectric Project website is also an encouraging sign that transparency and public involvement will be taken seriously as the project progresses. All project studies, reports, and important communications, particularly those between AEA and other government agencies, should be readily available on the website. Enhanced public involvement ensures Alaskans can meaningfully participate in the dialogue about the project.

A compressed or rigid licensing timeline does not make sense for the Susitna-Watana project. The proposed project is of an unprecedented scale in Alaska making it reasonable to anticipate that unexpected issues will arise. AEA's focus should be on making sure all potential impacts are identified and a plan to mitigate those impacts is in place before moving forward with construction. Fidelity to an arbitrary timeline will force AEA to make quick decisions to permit the project rather than ensure that Alaskans' interests are being adequately protected. The agency's focus should be on doing the project right, not doing the project fast.

The most critical part of the licensing process is thorough review of the Susitna-Watana project's environmental impacts. Studies must comprehensively review and evaluate the potential impacts to show Alaskans the project will not harm recreational or economic opportunities in the Susitna river valley. Environmental studies completed in the 1980s are likely too primitive or imprecise to meet this standard as scientific techniques have improved in the past thirty years. This is a different project from the 1980s and requires different studies.

AEA must remember throughout the period of the licensing process that the goal is inexpensive, reliable electricity. Alternatives to the Susitna-Watana project should be thoroughly evaluated during the licensing process to assess whether financial and economic assumptions made in the past are accurate. Other renewable energy sources may be more financially viable as the process moves forward and must be considered during this process.

Alaskans need reasonably priced and reliable electricity but the state must be careful to select a project with minimal impacts to other critical resources. Impacts to fisheries from above the proposed project site all the way to the Cook Inlet must be carefully examined. Wildlife and game impacts must also be carefully studied. Also, Alaskans must have ample and meaningful opportunity to participate in the process, ensuring the unprecedented public investment is fully vetted by the public.

Thank you for reviewing these comments.

Sincerely,

Mike Coumbe
Interim Director
Alaska Conservation Alliance

Cc: Sarah Fisher-Goad, Executive Director, AEA

Meeting Summary
Susitna-Watana Hydroelectric Project Licensing
Community Outreach Meeting
1:00 pm - 3:00 pm, August 29, 2011
Held at Don Sheldon Hangar
Talkeenta, AK

Purpose of Meeting: Provide open forum with FERC, AEA and Engineering contractors with community for dialog and question and answer forum in regards to schedule, plans, and information needs and concerns for the proposed Susitna-Watana Hydroelectric Project (Project).

Attendees:

Present for AEA	Bryan Carey, Project Manager
Present for AEA	Sara Fisher-Goad, Executive Director
Present for AEA	Sean Skaling, Renewable Energy Planner
Present for Alaska Attorney General's Office	Brian Bjorkquist
Present for MWH	Brian Sadden
Present for MWH	Kirby Gilbert
Present for Long View Associates; MWH Subcontractor	Steve Padula
Present for FERC	David Turner
Present for FERC	Kim Ognisty
Present for Alaska State Congress	Mark Neuman
Present for Alaska State Senate	Charlie Huggins
Present for GKRSE	Don Clarke
Present for Van Ness Feldman	John Clements
Present for Davis Wright Tremaine	Craig Gannett
Present for ADNR	Kim Sager
Present for ADNR	Gary Prokosh
Present for NPS	Cassie Thomas
Present for USFWS	Mike Buntjer
Present for USFWS	Ann Rappaport
Present for ADF&G	Monte Miller
Present for ADF&G	Ron Benkert
Present for NMFS	Susan Walker
Present for USFWS	Jennifer Spegon
Present for USFWS	Betsy McCracken
Present for NMFS	Eric Rothwell
Present for ADNR	Kristina Plett
Present for Coalition for Susitna Dam Alternatives	Becky Long
Present for Talkeetna Community Council	Whitney Wolff
Self	Ellen Wolf

Self	Roberta Sheldon
Self	Denis Ransy
Self	James Okonek
Self	Zac Mannix
Self	Vern Halter
Self	Leeroy Zeroth
Self	Don Zoerb
Self	Arlene Marquez
Self	Corinne Smith
Self	Joe Page
Self	Rick Shea
Self	Tom Waite
Self	Lisa Roderick
Self	Ed Cramer
Self	Peg Foster
Self	Ed Wick
Self	Peg Vos
Self	Grier Hopkins
Self	Mark Burcar
Self	Molly Wood
Self	Mike Wood
Self	Marc Gunderson
Self	Bruce Gunderson
Self	Tom Sisul
Self	Grete Perkins
Self	Billy Fitzgerald
Self	Scott Anderson
Self	Kelly Repnow
Self	Murray Nash
Self	Deborah Brooke
Self	Don Billington
Self	John Strasenburgh
Self	Mary McCrum
Self	Jenny Sonsa
Self	Dave Johnston
Self	Stephan Mahay
Self	Paul Roderick
Self	Albert Marquez
Self	Caitlin Palmer
Self	Janus Leo

Summary:

The meeting was arranged around the FERC site visit trips to the proposed project area and ran from approximately 1pm to 3:30pm. The meeting commenced shortly after the first group of participants returned from the site visit. Steve Padula (LVA) moderated the session and Kirby Gilbert (MWH) recorded comment topics on flip chart sheets. A panel in the front of the room consisting of AEA executive director and staff, FERC representatives, and lead engineering staff from MWH was arranged to answer questions and help facilitate discussion. There were no presentations as the participants preferred engaging in open dialog exchanges about a variety of topics and information sources and needs, captured in the following listings.

- There were questions regarding the status and intent of a Pre-PAD questionnaire. It was described that the Pre-PAD questionnaire would be potentially used as a follow up to the Gap analysis to attempt to identify other specific information sources for the PAD that were not addressed in the Gap analyses.
- How is AEA going about identifying stakeholders groups what groups will get to participate in what parts of the licensing processes? It was discussed that most meetings and events are open to all and notices of upcoming events will be posted on the Project website.
- How to get added to Mailing Lists; mentioned that listserv is open to all to get notices about Website updates.
- River and area above Devil Canyon was described as having fairly “untouched” natural resources.
- Questions about the type of Dam being planned – concrete faced rockfill, earthened and roller-compacted concrete where are briefly discussed.
- Questions about what the recent core samples and geologic field investigations have yielded to date.
- Noted that there is high silt concentration in the upper Susitna River leading to questions about sedimentation and what sedimentation studies have shown in regards to how the dam and reservoir would handle high sediment loads.
- Representatives of the Chase Community Council made note of information they could help provide and that they typically worked closed with the Talkeetna Community Council but would like to stay involved in the Project planning process.
- It was noted which Game Management units where in the area and their importance.
- Question about how many hydroelectric projects have been sited in ecosystems such as those found in the Upper Susitna River.
- Noted that the Susitna River system is already stressed and concern on what the effect of a hydro project might have on the river’s natural resources.
- Discussion about the FERC ILP process and 2 years of formal studies.
- Concern about the dam and earthquake risks along with accurately identifying the distance to the Denali fault. It was noted that an earthquake in November 2002 was along the Denali Fault.
- Questions about where the transmission lines from the Project would connect to the grid.

- Questions about whether the FERC licensing process addresses the new transmission lines or just the dam and hydropower plant.
- Questions about whether the Anchorage – Fairbanks transmission intertie would need upgrading and if those costs are included in the current cost estimate for the Project.
- Questions about the land ownership within the proposed reservoir area.
- It was noted that BLM had burnt cabins in remote areas and that type of policy seemed in contrast to the desires to enhance future recreation opportunities. Expressed desire to see more coordination among agencies in planning for the area.
- Concern that any new roads would change nature of hunting opportunities through easier access to unique fish and game resources.
- Question about what data gaps from earlier work would be filled, or not pursed under the licensing studies.
- Question as to whether the ILP had been previously used on a project of this size. David Turner of FERC mentioned several new projects that had used the ILP process and those varied in sizes.
- General question about what agencies make decisions that would move the Project ahead in the licensing process.
- Discussion regarding evaluations of alternative sources of energy and the need for comparative evaluations of energy resources including energy efficiency.
- It was noted that the region's glaciers are receding and by November the water runs fairly clear leading to questions regarding future water availability for the project.
- Questions about funding and sequence of funding from the State to advance the project.
- Concerns about the study periods under the ILP in terms of short review periods, the need for more staff resources at agencies, and planned timelines.
- Questions about project costs in regards to the availability of natural gas in Upper Cook inlet.
- Questions about the effect of winter flow releases in terms of potential effects on the fishery resources.
- It was noted that studies are paramount to the ILP process
- Questions about the ILP in terms of its flexibility and what stages would be flexible
- It was noted that all of the licensing and environmental work done in the 1980s was prior to the passage of the Electric Consumers Protection Act requiring equal consideration between development and non-developmental values.
- General question that if any data sets are found to be incomplete, how would that be handled in the licensing process and who bears the burden of indentifying adequacy of data.
- It was noted that studies focused on reconnaissance level information to determine presence or absence of specific resources could be very useful to inform any future studies and analyses.
- Question about the future availability of natural gas resources in the region.
- Desire to learn more and see more agency coordination on meeting goals for developing reliable, safe and clean energy resources.
- Questions about the amount of State subsidy needed to cover the project costs.
- It was noted that NOAA Fisheries is requesting authorization for 3.5 full time equivalent staff resources to help on this project and other proposed projects in Alaska.

- Concern about study timeframes for areas in and above the proposed dam site.
- It was noted that there is local support for energy efficiency and use of renewables.
- It was noted that this project should be looked at in light of the modern era where we have dam removals alongside evolving choices for new energy generation alternatives.
- Hydro alternatives should be evaluated against wind and solar alternative choices.
- Concern about seismic extreme events and the unpredictability of such events

The meeting concluded after it was noted that all parties can also use FERC's website as an information resource and file documents under the new project number: P-14241.

Kirby Gilbert, Sr. Regulatory Specialist, MWH

Meeting Summary
Susitna-Watana Hydroelectric Project Licensing
Project Overview and FERC Process Meeting
2:00 pm - 4:30 pm, September 1, 2011
Held at Dena'ina Center, Kahtnu Meeting Room 1
600 W. Seventh Ave., Anchorage, AK

Purpose of Meeting:

- AEA to present a brief overview of the Susitna-Watana Hydroelectric Project (Project), as currently conceived.
- FERC to address stakeholder questions and comments regarding use of the Integrated Licensing Process (ILP) for licensing the Project.

Attendees:

Present for AEA	Sara Fisher-Goad, Executive Director
Present for AEA	Bryan Carey, Project Manager
Present for USFWS	Mike Buntjer
Present for USFWS	Betsy McCracken
Present for USFWS	Jennifer Spegen
Present for NMFS	Susan Walker
Present for NMFS	Eric Rothwell
Present for ADF&G	Monte Miller
Present for ADF&G	Jason Mouw
Present for ADF&G	Joe Klein
Present for FERC	David Turner
Present for FERC	Kim Ognisty
Present for USEPA	Jennifer Curtis
Present for USEPA	Matthew LaCroix
Present for Attorney General's Office	Brian Bjorkquist
Present for the Nature Conservancy	Corrine Smith
Present for National Wildlife Federation	Pat Larin
Present for Hydropower Reform Coalition	Jan Konigsburg
Present for the Alaska Center for the Environment	Louisa Yanes
Present for the Alaska Conservation Alliance	Kate McKeown
Present for Alaska Power Association	Marilyn Leland
Present for Alaska Power Association	Crystal Enkvist
Present for CardnoEntrix	Jim Gill
Present for MWH	Kirby Gilbert
Present as MWH, Long View Associates	Steve Padula
Present as MWH, Long View Associates	Randall Filbert
Present for URS	Stephen Trimble
Present for DOWL HKM	Kristen Hansen
Present for the Alaska Ratepayers	Rich Wilson

Present for Van Ness Feldman	Chuck Sensiba
Present for Van Ness Feldman	Jonathan Simon
Present for Davis Wright Tremaine	Craig Gannett
Present for LGL Limited	Sean Burril
Present for Hanson Alaska	David McCourtney

Presentations:

Following an overview of the meeting's purpose by Sara Fisher-Goad (AEA), Steve Padula (facilitator) reviewed the meeting agenda and introduced the AEA and FERC presentations described below.

Susitna-Watana Project Overview

Bryan Carey (AEA) presented an overview of the proposed Project facilities and operation as conceived at the time of the meeting. Bryan highlighted the following points:

- Proposed Project location at river mile 184 on the Susitna River
- Project facilities overview
    - 700-foot-high dam located near Watana Creek
    - Installed capacity of 600 MWs
    - Annual average generation of 2,600 gigawatt hours (near 50 percent of current Railbelt usage)
    - Three possible types of dam construction
        - Earth embankment
        - Roller-compacted concrete
        - Concrete-faced rockfill
    - Reservoir would be 39 miles long and up to 2 miles wide
    - Devil Canyon rapids block most upstream passage of salmon
- A plot showing Susitna River maximum, minimum, and average seasonal discharges at Gold Creek (downstream of Devil Canyon)
- The portion of the mean annual flow in the basin that would be regulated, i.e., the watershed above the proposed dam site, accounts for 16 percent of the Susitna River's drainage area
- A summary of the total annual sediment contributions (percent load) of the Susitna, Chulitna, and Talkeetna rivers
- A map of salmon spawning distribution in the Susitna River basin
- Proposed Project timeline

FERC ILP Presentation

David Turner (FERC) presented an overview of the ILP summarized as follows:

- Number of hydroelectric projects using the FERC ILP since 2003
    - 54 relicenses
    - 17 original licenses

    - 9 original hydrokinetics licenses
- Comparison of the ILP, Traditional Licensing Process (TLP), and Alternative Licensing Process (ALP) with respect to the following aspects of project licensing:
    - Stakeholder consultation
    - FERC involvement
    - Deadlines
    - Study plan development
    - Study dispute resolution
    - License application document
    - Additional information requests
    - Timing of resource agency terms and conditions
- Flowchart showing the steps and typical schedule associated with the ILP
- Overview of FERC's online resources

Follow-on Discussion with Stakeholders

1. Jason Mouw (ADF&G) asked if agencies with 10(j) authority under the Federal Power Act (FPA), e.g., ADF&G, had the ability to dispute studies under the ILP. David Turner replied that only entities with mandatory conditioning authority, not entities with just 10(j) authority, have the ability to file a study dispute under the ILP. Entities with 10(j) authority must rely on using the study process and resolutions made as part of FERC's study plan determinations.
2. Eric Rothwell (NMFS) asked (1) whether any large projects in rivers containing anadromous fish species had received original licenses (not relicenses of existing projects) using the ILP and (2) whether more than two study years had been requested by stakeholders and granted by FERC for any licensing process where the ILP had been used. David Turner replied that no new large projects seeking an original license had yet filed a license application via the ILP; most applicants that have completed the ILP have done so as part of relicensing. David stated that, to his knowledge, requests for more than two years of study had not yet been made by stakeholders under existing ILPs. David added that stakeholders would need to make a case for any additional time needed to conduct studies under the ILP, after which FERC would make a determination as to whether or not additional study years were warranted.
3. Mike Buntjer (USFWS) noted that the mandatory conditioning agencies' opportunity to file a study dispute was associated with FERC's study plan determination, which would occur relatively early in the ILP. Mike asked how the ILP would accommodate information needs associated with questions or issues discovered later in the process. David Turner replied that in addition to agency consultation associated with the Proposed Study Plan (PSP) and Revised Study Plan (RSP), and the opportunity to file formal study disputes, FERC would make a determination related to the Initial Study Report (ISR) as to whether expansion of study scopes, e.g., to address unforeseen issues, was necessary. David added that this would likely be the time when the need for a possible additional year of study would be debated. Following its filing, stakeholders have 30 days to comment on the ISR, after which the applicant has 30

days to respond to comments. FERC then has 30 days to make its determination as to how to proceed.

4. Mike Buntjer (USFWS) noted that inadequate baseline data, resulting from too short a study period, could result in difficulty assessing the proposed Project's impacts during post-construction monitoring. To illustrate, Mike referred to the uncertainty regarding Chinook salmon distribution upstream of Devil Canyon. If after Project construction large numbers of Chinook congregate at the base of the dam, the extent of the impact on upstream migration could be difficult to assess if there is uncertainty as to how many fish were passing upstream in the absence of the Project. Mike noted that in the absence of reliable data the USFWS would likely interpret impacts conservatively, i.e., assume that fish at the base of the dam had been using habitat upstream of the Project before its construction. Bryan Carey stated that fish distribution and habitat use in the basin would be thoroughly addressed as part of the licensing process, relying as needed on technologies such as dual-frequency identification sonar (DIDSON). Mike Buntjer cautioned that regardless of the technology applied, if measurements were made during high-flow years, results would likely underestimate the extent to which Chinook are using the basin upstream of river mile 184. Jenny Spegen (USFWS) added that to properly assess impacts of the proposed Project, climate change, and its effects on glaciers and flows, would need to be taken into account when assessing the future trajectory of fish distribution in the Susitna River basin in the absence of the Project.
5. Rich Wilson (Alaska Ratepayers) stated that in the interest of making cheaper energy available to the Railbelt as soon as possible, all feasible steps should be taken to enable the ILP to be conducted within the standard timeframe defined by FERC. Rich stated that the large amount of information available from studies conducted in the 1980s for the original Susitna Project made the licensing of the currently proposed Susitna-Watana Project similar to the relicensing of an existing project. David Turner replied that it would be necessary for existing data to be fully vetted during the study planning process before it would be possible to assess the value and relevance of information collected during the 1980s.
6. Eric Rothwell (NMFS) asked why AEA was seeking agency feedback on licensing process given that AEA had already determined that the ILP would be used for the Susitna-Watana Project. Sara Fisher-Goad replied that AEA wanted to address any agency concerns early in the process in the hope that doing so would allow the licensing to stay on schedule. Sara emphasized that the ILP was necessary for the proposed Project to foster progress and cost effectiveness. Bryan Carey added that the ILP was chosen largely because of its rigorous schedule but also because it afforded some flexibility to increase consultation periods if necessary.
7. Jenny Spegen (USFWS) asked what FERC would do if AEA was unable to meet its obligations under the ILP timeline. David Turner replied that unlike a project relicensing, which is driven by a firm expiration date of an existing license, the process for the licensing of a new project was more flexible. David stated, however, that FERC's policy does not allow for projects to languish and in the event that progress is unjustifiably slow, FERC can opt to terminate an ILP. Jenny asked if an ILP had ever

been terminated, and David replied that FERC had terminated ILPs due to lack of progress on the part of the applicant.

8. Mike Buntjer (USFWS) asked if the ILP allowed for flexibility with regard to agency review deadlines. David Turner stated that it would be possible to extend a review deadline, but FERC would not grant extensions without a solid justification for deviating from the established ILP timeline. David added that it would be best to anticipate where extensions are likely to be needed and identify them as part of the applicant's process plan filed as part of AEA's Pre-Application Document (PAD). David added that one option for making review periods less onerous would be to stagger completion dates for any studies that did not need to be completed synchronously.
9. Sue Walker (NMFS) stated that NMFS did not think the ILP was the appropriate process for the licensing of a large, new project, such as the Susitna-Watana Project. Sue stated that data gap analyses showed that there had been significant changes to the area's resources since studies were conducted in the 1980s and that this, coupled with improvements in research methods and technology, made it essential that a comprehensive study program be undertaken in connection with the proposed Project. Sue stated for the record that the ILP was not appropriate for the Susitna-Watana Project and that NMFS would follow-up with a letter documenting its lack of approval for the ILP. Sue stated that piecemeal approvals by FERC of requests for study deadline extensions would be cumbersome and potentially ineffective and that a licensing process tailored to the unique characteristics of the proposed Project was necessary.
10. Sue Walker (NMFS) asked for clarification as to how long resource agencies had to formulate study requests following filing of the PAD. David Turner replied that the ILP provided for 120 days to provide PAD comments and study requests following the filing of the applicant's PAD/Notice of Intent (NOI) to file a license application.
11. Sue Walker (NMFS) stated that the August 29, 2011 site visit, although valuable, was conducted prematurely and that conducting it later would have allowed for more informed participation and would have ensured that all potentially interested parties were aware of it. David Turner noted that the site visit is called for by FERC protocol and is not required by the National Environmental Policy Act (NEPA). David added that AEA could consider conducting future site visits if they are shown to be necessary.
12. Sue Walker (NMFS) asked what criteria FERC would use to determine whether or not to issue a license to AEA for the proposed Susitna-Watana Project. David Turner stated that in making a determination as to whether to issue a license for a hydroelectric project, FERC must conclude that the project will be best adapted to a comprehensive plan for developing a waterway, i.e., FERC is required by the FPA to balance relevant developmental and environmental resource values when making its decision. Kim Ognisty (FERC) clarified that prior to the filing of the license application, the ILP is governed by NEPA, but post-filing activities are regulated by the FPA. David Turner added that FERC's NEPA analysis would include assessment of the proposed Project's facilities and operations, including roads, transmission system, and other appurtenant facilities. David stated that the alternatives to be assessed would likely include No

Action, AEA's Proposed Action, and AEA's proposal with FERC staff recommendations. David emphasized that the NEPA document would not include a detailed comparison of the proposed Project to other forms of energy production, e.g., fossil fuel-based generation. David noted that FERC was required as part of licensing to conduct Section 7 consultation for any ESA-listed species in the proposed Project vicinity and include conditions mandated by the Section 401 water quality certificate for the Project, unless the 401 process is waived by the State of Alaska. David noted that a Section 404 permit from the US Army Corps of Engineers would be required to construct the Project, but the 404 process is often conducted outside the FERC licensing process.

13. Sara Fisher-Goad asked Sue Walker (NMFS) why NMFS felt that the time allocated to identify studies within the ILP timeframe was inadequate. Sue Walker replied that the ILP was developed for the relicensing of existing projects in the contiguous United States, where the systems are well understood due to an ample body of existing research. Sue stated that resources in the Susitna River basin, notwithstanding studies done in the 1980s, are not sufficiently understood for the resource agencies to make informed decisions about how to condition a potential license. Sue stated that in the absence of adequate information upon which to evaluate the proposed Project, NMFS would be required to be conservative in the formulation of conditions, which could include fish passage facilities for the proposed Project. Sue added that use of the ILP could be more costly in the long-term than spending more time up front developing a better understanding of the system. Sue Walker added that NMFS was also challenged by having inadequate staff to handle the Project licensing.
14. Monte Miller (ADF&G) agreed with Sue Walker's (NMFS) statements regarding the inappropriateness of the ILP for licensing the Susitna-Watana Project and noted that ADF&G also lacked the staff needed for the licensing process. Monte added that if in the future AEA and other stakeholders were to enter into a relicensing settlement agreement, which is a likely outcome of the licensing process, the agreement could be subject to litigation if it were not based on sound science and a thorough understanding of the basin's resources. David Turner (FERC) suggested that resource agencies pool their resources, allocating responsibilities based on expertise and time available, rather than each agency trying to address all resource questions on its own. Monte Miller replied that such an approach did not account for the differing mandates of the participating agencies.
15. Jan Konigsburg (Hydropower Reform Coalition) asked who would be charged with requesting an extension of the study period under the ILP, if it were determined that more time was needed to address a given resource question. David Turner (FERC) replied that any stakeholder could make such a request but that it would be most effective if AEA and the stakeholders requested a waiver collectively. David Turner again emphasized the value of proposing a collaboratively determined, revised timeframe in AEA's process plan, although doing so would not guarantee that FERC would approve an extended schedule.
16. Sue Walker (NMFS) asked if FERC would be amenable to a process that maintained all ILP milestones but called for an overall extended schedule. David stated that such a

determination would be made by supervisory staff at FERC and that he could not confirm whether his agency would approve a wholesale modification of the ILP timeframe. Jenny Spegen (USFWS) asked if the ILP had previously been modified in this way, and David Turner replied that it had not been. Jenny Spegen asked if any ALPs had been conducted on a schedule as rigorous as that of the ILP, and David Turner replied that they had been. Sue Walker asked why AEA was resistant to using the ALP. Sara Fisher-Goad answered that AEA was not resistant to use of the ALP but had determined that the ILP would provide AEA with more certainty regarding scheduling; Sara added that the ILP is also FERC's default process for licensing.

17. Steve Padula (LVA) and Kirby Gilbert (MWH) explained that under the standard ILP timeframe there would be 255 days (≈ 8.5 months) between AEA's filing of the PAD/NOI and the filing of the Revised Study Plan with FERC. Steve emphasized that this would provide a lengthy period for collaborative study identification and development of appropriate study plans by AEA's contractors.
18. Jenny Spegen (USFWS) suggested that if the ALP were to be used for the Project licensing, it might be possible to develop study plans sooner, thereby allowing 2012 to be a full field season. David Turner (FERC) stated that the ILP allocated 255 days for study plan development to avoid the costly and inefficient redoing of studies that can result from making decisions too quickly. Bryan Carey (AEA) added that AEA did plan to conduct some studies, including preliminary fieldwork, in 2012 to provide baseline information and inform study plan development.
19. Sue Walker (NMFS) reiterated that NMFS was, and would continue to be, understaffed and asked whether AEA had determined if it could fund NMFS personnel for the licensing of the Project. Sara Fisher-Goad (AEA) replied that AEA wanted to work with the federal regulatory agencies to better understand their needs so that a plan could be presented to the Alaska legislature to determine whether such funds could be made available. Sara emphasized that to do this, it would be essential to have a clear statement from NMFS regarding how the funds would be used and why they are needed.
20. Rich Wilson (Alaska Ratepayers) stated that his organization was in favor of any measures needed to set a firm licensing schedule and then adhere to it. To that end, Rich advocated the provision of state funds to the federal agencies, provided that funding was aimed at making the Susitna-Watana Project operational by 2023.
21. Sue Walker (NMFS) and Monte Miller (ADF&G) expressed concern that AEA would be able to meet its commitments under the ILP schedule, noting that data-gap analysis reports had been up to four months late. Bryan Carey (AEA) stated that data-gap analyses had been late because full funding for the licensing was not formally made available until July 1, 2011, and that the scope of the gap analysis, including transfer of all 1980s data stored on microfiche, was larger than anticipated. Monte Miller stated that given the amount of existing information, it was understandable and predictable that the gap analyses took longer than expected and said that the same would almost certainly be true for the tasks and timeframes required by the ILP.

Kirby Gilbert, Sr. Regulatory Specialist, MWH and Randall Filbert, LVA

Meeting Summary
Susitna-Watana Hydroelectric Project Licensing
Meeting with USGS
1:00 pm – 3:00 pm, September 6, 2011
Held at USGS Offices
4210 University Dr, Anchorage, AK 99508

Purpose of Meeting: To discuss with representatives of the U.S. Geological Survey (USGS), the adequacy of existing gaging information, progress on USGS studies and converting monthly flows to daily records, and provide overview of MWH efforts and needs in operations modeling.

Attendees:

Present for AEA	Bryan Carey, Project Manager
Present for the USGS	Dave Meyer, Branch Chief for Hydrologic Data and Monitoring
Present for the USGS	Janet Curran, Hydrologist
Present for the USGS	Chad Smith, Hydrologist
Present for CardnoEntrix	Jim Gill
Present for MWH	Kirby Gilbert
Present for MWH	John /Haapala
Present as MWH, Subcontractor, Long View Associates	Steve Padula

Items Discussed with USGS:

- Kirby and Bryan introduced status of agency meetings and interests in hydrologic records.
- USGS provided an overview of the work they are undertaking that involves estimating missing daily values and long-term summary streamflow statistics for streamgages in the Susitna River Basin. There are generally two ways to get daily values which involve either statistical analysis and standard deviations or multiple regression analyses. Regression equations are being derived from overlapping streamflow records with the index streamgages being used to estimate daily hydrographs for continuous-record streamgages.
- The work will continue through next spring with anticipated results being 62 water years of estimated mean daily discharge records for the streamgages in the Susitna River Basin. Summary statistics will be generated that correspond to those commonly reported in the USGS Annual Water Data Reports, including annual monthly mean discharge, long-term monthly mean discharge, and annual and long-term seven-day low flow.
- It was noted there has been some observed differences in runoff patterns associated with the Pacific Decadal Oscillation (PDO)
- It was noted that once freeze up occurs it is difficult to get good readings; as once the river freezes over the river runs with mostly groundwater flows.
- It was noted that there is good correlation between the Cantwell and Gold Creek gages.

- Dave described that the existing records are good, but if a new gage was to be installed it might be interesting to do so more in the headwaters to see if that has been any effect of glaciers receding, however this is not needed to complete the current record.
- There can be rain on snow events in this basin, but it is rare, perhaps once every ten years.
- A DOT report on enlarging the Talkeetna Airport may have had some analysis of flooding potential that could be of use.
- John Haapala noted the highest priority for the engineers is to get a stage discharge relationship at the base of the dam so a tailwater rating curve could be developed.
- Bryan and Dave would work out some additional work scopes regarding new gages, setting up transects at the dam site, and getting some bed load and suspended sediment measurements.
- MWH gave a presentation on it work including an analysis of adequacy of streamflow data and operations and climate change analysis.

Kirby Gilbert, Sr. Regulatory Specialist, MWH

Meeting Summary
Susitna-Watana Hydroelectric Project Licensing
Meeting with Bureau of Land Management
9:30 am - 11:00 am, September 7, 2011
Held at BLM Offices
222 W. 7th, Anchorage, AK

Purpose of Meeting: To discuss with representatives of the Bureau of Land Management (BLM), (a) the scope of the proposed Susitna-Watana Project (Project) and (b) information needs and scheduling for obtaining rights-of-way or other use permits for the proposed Project.

Attendees:

Present for AEA	Bryan Carey, Project Manager
Present for CardnoEntrix	Jim Gill
Present for MWH	Kirby Gilbert
Present as MWH, Subcontractor, Long View Associates	Steve Padula
Present for BLM, Land Law Examiner	Becky Johnson
Present for BLM, Hydrologist	Lee Koss
Present for BLM, Glennallan Field Office	Elijah Waters
Present for BLM, Wildlife Program	Cara Staab
Present for BLM, Renewable Resources	Jolie Pollet
Present for BLM, Land Law	Renee Fencl
Present for BLM, Reality	Brenda Becker
Present for ADNR, Reality	Jerri Sansone
Present for ADNR	Wyn Menefee
Present for BLM, Archaeology	Robert (Bob) King

Topics and Information Discussed with BLM:

Kirby Gilbert (MWH) briefed the group on the current status of the Project and AEA's interest in engaging BLM and understanding the needs of BLM in permitting use of its lands for use by the Project. Open discussion the proceeded to cover a variety of topics captured as follows:

- Discussion about why the Project was stopped in 1980s
- BLM is more familiar with the Gas side of FERC
- There is a Caribou Calving area along the proposed North Road Route
- Question regarding what percentage the Project would contribute toward meeting the renewable energy goals by 2025
- Discussion about land ownership and records; it was noted by Renee that the online SDMS system is periodically updated, but Renee would ask to for an update in this region sooner so it could be accurate.
- Discussion about DNR selection on many of the lands, but most in the Project area have not been conveyed to the State. Further discussion about DNR selection process and it was determined the BLM and DNR should discuss land conveyance further in the future.
- Discussion about the Power Site Classification noting the lands are set aside for development of a hydropower project.

- The BLM lands in the Project area are managed under the guidance of the East Alaska Resource Plan for the Glennallen Resource Area.
- BLM has a vegetation map of the area that could help start the analysis of habitat types
- There is an Analysis Management Situation (AMS) for the area done in 2004 and that forms the backbone of the East Alaska Resource Management Plan for the area. Elijah could help get us copies if needed.
- Cara will work to provide an updated BLM sensitive species listing but it was noted that the Alaska Natural Heritage Program should be consulted.
- If studies on BLM lands involve land disturbance, AEA will need land use authorizations.
- The final road and transmission line would likely need a right-of-way permit on the Federal lands whereas the Federal lands within the reservoir would need a long term lease agreement authorization.

Kirby Gilbert, Sr. Regulatory Specialist, MWH

The Nature Conservancy
SAVING THE LAST GREAT PLACES ON EARTH

The Nature Conservancy in Alaska
715 L Street, Suite 100
Anchorage, Alaska 99501

tel [907] 276.3133
fax [907] 276.2584
nature.org

8 September 2011

Brian Carey, P.E.
Alaska Energy Authority
813 West Northern Lights Boulevard
Anchorage, Alaska 99503

Via email to: bcarey@aidea.org

Dear Mr. Carey:

I'm writing on behalf of The Nature Conservancy to comment on the data gaps that need to be filled for designing and licensing the Susitna Watana Hydroelectric Project.

The mission of The Nature Conservancy is to preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. For over 50 years, we have pursued this mission by using best available science and a pragmatic, non-confrontational approach to achieve conservation results. In Alaska, as elsewhere, we have conducted rigorous biodiversity assessments to identify and prioritize areas that – if managed to conserve key species – will ensure that Alaska's healthy ecosystems will be passed on to future generations.

The Nature Conservancy of Alaska completed an ecoregional assessment for the Cook Inlet Basin in 2003. The primary product of an ecoregional assessment is termed a *portfolio* of areas of biological significance. This portfolio may be considered a conservation blueprint – a vision for conservation success – to guide public land managers, land and water conservation organizations, private landowners, and others in conserving natural diversity within these ecoregions. The ultimate goal is to conserve the plants, animals and natural communities of an ecoregion over the long term. The portfolio serves as a blueprint for the Conservancy and other interested stakeholders in setting priorities and developing strategies for conservation.

In the portfolio for the Cook Inlet Basin, we identified the Upper Susitna Basin and the Susitna Flats as portfolio sites. Susitna Flats at the mouth of the river provides important habitat for nesting and migrating waterfowl and shorebirds, a migration corridor for salmon, and feeding for beluga whales. The Upper Susitna Basin was selected for its important bird habitat and productive stream systems for five species of salmon. The Susitna River stock of Chinook salmon is considered to be the fourth most abundant in Alaska. While the entire Susitna River was not selected for the portfolio, what occurs on the upper river has ramifications for the salmon systems downstream and the salmon themselves as they migrate.

The Nature Conservancy is a member of the steering committee of the Mat-Su Basin Salmon Habitat Partnership[1], one of the first four fish habitat partnerships in the country to be recognized by the National Fish Habitat Board (www.fishhabitat.org). The Partnership completed a Strategic Action Plan in 2008 to prioritize fish habitat conservation actions, including protection, enhancement, and restoration of key habitat, education and outreach, research, and mitigation. The plan identified three areas of natural resource information that are lacking in the Mat-Su Basin. Without this information, the impacts of land use decisions and development on salmon habitat and salmon populations in the Mat-Su Basin cannot be fully assessed. These three areas are:

1. Location of anadromous fish habitat for all species and life stages, and the documentation of that habitat in the Anadromous Waters Catalog maintained by the Alaska Department of Fish and Game
2. Comprehensive water quantity data that includes quantities, flows, and variability and the interaction between surface and groundwater
3. Comprehensive water quality data that provides a baseline to monitor changes in water quality of Mat-Su waterbodies

The Susitna River may be one of the most studied waterbodies within the Mat-Su Basin and southcentral Alaska. Yet even with the studies from the 1980s, we still do not know enough about the hydrology, water quality, fish and wildlife along the river to fully understand the potential impacts of the currently proposed Susitna Watana Hydroelectric Project. The data gap reports commissioned by AEA are clear that additional field studies need to be done for several reasons:

- the Susitna Basin has changed in the last 25-30 years;
- the current proposed project is different from the two-dam project studied in the 1980s;
- methods for collecting, analyzing, and compiling data have improved in the last 25 years;
- the lower reach of the river (from Talkeetna to Cook Inlet) was not sufficiently studied; this gap was identified in 1984 for additional studies at that time.

The proposed project will have impacts throughout the Susitna River. As noted in the *Susitna Hydroelectric Project Conceptual Alternatives Design Report, Final Draft*, "the fisheries resources have the highest potential to be impacted by the project" (p. 20). The dam will eliminate existing salmon habitat for spawning adults and rearing juvenile salmon and will forever block access for salmon to the upper river. The effects below the dam, all the way to Cook Inlet, may be just as great as water levels are changed seasonally and annually below the dam. The impacts of these changes on salmon habitat and migration must be understood to assess the project's impacts to fisheries.

Given our programmatic emphasis on salmon conservation, we have focused on reviewing the *Aquatic Resources Data Gap Analysis* and the *Water Quality and Sediment Transport Data Gap Analysis Report*. We found both of these reports to be thorough and detailed in their

[1] These comments are solely those of The Nature Conservancy, and have not been approved nor or meant to represent those of the Mat-Su Basin Salmon Habitat Partnership.

identification of data gaps for this project. We would particularly emphasize filling in the following data gaps for all reaches of the river, from Cook Inlet to the flooded area above the dam:

- **Habitat Change Analysis**: identification of salmon habitat by life stage throughout the river; comparison of current habitat to historic habitat identified in the 1980s; expected changes to habitat under flow regimes of the proposed project
- **Adult salmon habitat**: identification of spawning locations and habitat utilizations for all five salmon species throughout the river, including main stem, side sloughs, and side channels; abundance and distribution of Chinook salmon above Devils Canyon
- **Juvenile salmon habitat**: identification of rearing and over-wintering locations and habitat utilizations for all five salmon species throughout the river, including main stem, side sloughs, and side channels, and streams above Talkeetna; relationship between habitats used and various abiotic and biotic factors.
- **Water Quality**: baseline water quality parameters throughout the river; information on metals in river; hydrologic model to predict downstream effects of operational flow regimes.
- **Hydrology and Geomorphology**: statistically derived flow record for the last 60 years at gages other than Gold Creek and Talkeetna; ice studies for middle and lower river and understanding of how ice processes contribute to slough and side-channel formation; change analysis for unstable reaches of middle and lower river, sloughs, and side channels in last 30 years; estimates and measurements of sediment transport of Chulitna, Talkeetna, and Susitna Rivers; sediment and bed material input and transport from above the dam down to Talkeetna.
- **Instream Flow**: instream flow needs of salmon, all species and life stages, throughout the river; actual instream flow in upper, middle, and lower reaches.

In the process of filling the data gaps and proceeding with the licensing process, we hope that you will incorporate the following suggestions:

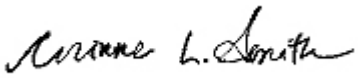
- The resource agencies, both state and federal, that are involved in the study plans and licensing process should have adequate staff, budget, and time to participate in this project. We hope that where AEA has influence over budgets and timelines, that these agencies will receive additional funding and time to properly fulfill their responsibilities to the fish and wildlife and people of Alaska and the nation.
- The licensing process used by AEA must allow sufficient time not only for agencies to participate but also for field studies to accurately document how salmon use the entire Susitna River, from Cook Inlet to above the proposed reservoir. This timeline should be driven by natural cycles, such as salmon lifecycles, and not hurried for human convenience.
- All data collected for this project should be stored in a geodatabase that links geographic location to tabular information. This geodatabase, developed with state funding, should be made available to the public as early as possible.

- Non-governmental organizations and community groups should be included on work groups that develop study methodology and objectives.
- The project website and email list could be used more proactively to disseminate information to the public and to seek input from the public.

Thank you for the opportunity to comment on the data gaps for the Susitna Watana Hydroelectric Project. The Cook Inlet Basin Ecoregional Assessment is available on CD; I would be happy to send you a copy if you don't already have one. The Mat-Su Salmon Partnership's Strategic Action Plan is available online (http://conserveonline.org/workspaces/MatSuSalmon). Please contact me if you have any questions.

Thank you for your consideration.

Sincerely,



Corinne Smith
Mat-Su Basin Program Director

ecc: Monte Miller, ADF&G
Eric Rothwell, NMFS
Ann Rappoport, USFWS
Kaarle Strailey, Alaska Center for the Environment
Jan Konigsberg, Hydropower Reform Coalition
Rick Leo, Coalition for Susitna Dam Alternatives
Pat Lavin, National Wildlife Federation
Erin Dovichin, The Nature Conservancy

September 9, 2011

To: Sara Fisher-Goad, Bryan Carey, Alaska Energy Authority

Fr: Jan Konigsberg, Natural Heritage Institute

Ref: Watana-Susitna River Dam Licensing Process

Regardless of the particular licensing process, it is the responsibility of the applicant to prepare an adequate license application. The major focus of licensing is the studies necessary to determine the environmental, social, cultural, and economic costs and benefits. If properly conceived and conducted, these studies will reveal many of the potential, probable biologic and ecologic impacts to the watershed from construction and operation of the hydropower dam.

The analysis of cumulative, direct and indirect impacts is crucial to formulating license terms and conditions affecting project design, construction, operation and maintenance. License conditions are usually intended to avoid and minimize impacts and to ensure compensatory mitigation measures for impacts that cannot be addressed by project design or operation. Studies are also necessary for FERC to prepare the NEPA analysis for which it is the lead agency under an ILP proceeding, as well as being essential for FERC compliance with the Federal Power Act requirement (Section 10) to develop a comprehensive plan for use and development of the river basin.

AEA's Aquatics, Water Quality and Terrestrial gap-analyses of the 1980s suite of studies all conclude the information gathered to prepare the original two-dam Susitna license application is no longer adequate to develop a license application for the proposed Watana dam mainly because:

1. baseline conditions have changed in the last 25-30 years ago;

2. characterizing, measuring, and analyzing baseline conditions is likely to be significantly different today due to improvement in data collection and scientific methodology;

3. the project itself is different; and

4. the lower reach of the Susitna River (from the three-river confluence at Talkeetna downstream to Cook Inlet) was not well studied.

This overarching judgment about the inadequacy of the 1980s data collection and analyses demonstrates the need for significant and extensive deliberation and consultation between interested parties about the information and studies required to file an adequate license application for the proposed Watana dam project.

At the August 1, 2011 meeting to discuss the licensing process with FERC staff, AEA stated its intention to use the Integrated Licensing Process (ILP), because it is the only licensing process that provides a (relative) degree of certainty in terms of a license end-date. While there is no disputing the need for timely license application, the State of Alaska's foremost concern ought to be determining the time frame necessary to ensure quality data-collection and analysis in order to design and construct an environmentally and economically viable project.

In particular this requires relying on the advice and expertise of the state and federal fish and wildlife agencies that have license-conditioning authority as provided by the Federal Power Act and other applicable law. The agencies have clearly expressed their conviction that the two years of study prescribed by the ILP is not enough time to develop the necessary information and analyses to develop an adequate license application. Given the inherent complexity of collecting data throughout the relatively pristine 220 miles or more of the salmon-bearing Susitna River drainage, which are likely to be affected by the project, a more realistic time frame to complete the studies would be the life cycle of Chinook salmon – at least 6 years. FERC staff did not disagree that the study period *may* need to extended, and stated that FERC has the authority to waive ILP timelines as it deems appropriate and when petitioned to do so. Nonetheless, AEA and FERC apparently would prefer to operate on the assumption that the prescribed ILP time frame is appropriate.

Once the NOI and PAD are filed, the ILP schedule provides for about five months before study requests are due at FERC. Some agencies have already signaled that this deadline is problematic, given the extent of concerns already identified in the gap analysis and whatever additional ones are identified during scoping and given the agencies' current workloads and budget constraints. The suggestion to establish a joint project office, like that for the Trans-Alaska Pipeline System, in which agencies share expertise with funding from AEA makes sense so long as the agencies continue to operate independently, pursuant to their respective authorities and further provided there is no quid pro quo with respect to problematic time frames.

Not only is it highly problematic for state and federal agencies to meet the prescribed ILP deadlines, but also these timelines may be even more problematic when it comes to participation by the general public, especially non-governmental organizations. AEA and FERC should not be surprised, therefore, when requests to waive and extend certain timelines expect are filed by the public and NGOs. To the extent that the state and federal agencies are perceived to be properly resourced as well as perceived to be exercising independent judgment, there is every reason to assume the public will have

trust in the licensing process. If, however, there is sufficient reason to question the integrity of the process, which, in turn, will require the public and NGOs to devote greater attention and time to review of data and analyses than otherwise, then there is an increased likelihood of their petitioning FERC for waivers to extend time frames. In this light, it would be wise that NGOs be invited to attend, if not participate, in various work groups, subject of course to relevant protocols

The integrity of the FERC licensing process and the state's duty to protect its public-trust resources in the affected region depends upon assigning equal, if not greater weight to study quality as to study duration. When both FERC and AEA emphasize the need for a speedy licensing process above all else (at least that is my perception), it is not unreasonable to suspect that the preconceived timeframe will be a primary filter AEA will employ in determining what studies to request FERC approve, and not unreasonable to suspect that FERC will also adjudge the studies through the lens of the ILP timeframe. Governor Parnell does little to allay this suspicion when he suggests the project might be licensed even faster than FERC prescribes, as he recently urged at the National Hydropower Association's regional conference in Girdwood August 30, 2011. This really is not a viable strategy and is instead likely to lead to immediate conflict and almost certainly will result in long-term and costly project delays.

The State of Alaska has an obligation to protect the public-trust resources that may be adversely affected by project construction and operation, the state's policy of achieving 50% of its electricity supply from renewable energy sources by 2025 not withstanding. In order to assess the potential cost if public-trust resources were to be damaged or destroyed in the affected area due to project construction and operation, the state has the responsibility to develop the information and analyses to assess benefit and cost *before* it determines whether the proposed project is in the public interest.

AEA has been remiss in clarifying that its support of the project is contingent upon its determination that its stewardship of the public-trust resources will not be significantly impaired by building the Watana dam – such determination to be based on rigorous and comprehensive studies as formulated by the fish and wildlife agencies. Not only has AEA thus far failed to effectively communicate this important caveat, AEA staff has already made unfounded and untested assertions about the project's environmental impact. To wit:

- At the June 27, 2011 licensing-process meeting, AEA staff opined that the impact of the Watana project on salmon would likely be similar to that of Bradley Lake and Terror Lake hydropower projects, which were characterized as having "enhanced" salmon populations in the waters affected by project operations. While there is no evidence that either project "enhanced" existing salmon population, this observation certainly casts the proposed Watana dam in a most favorable light, such that the only significant question worthy of investigation would be: "How much will Watana enhance (increase) existing salmon

populations?" Given, what we know about the effects of existing dams on native salmon (and resident fish) populations, the rebuttal presumption for any proposed dam in salmon-bearing waters of the Northern Hemisphere ought to be that the project will have deleterious impacts on native salmon populations. Therefore, the more appropriate and important question with which AEA should be concerned in the public's interest is: what harm to existing salmon populations might be expected if Watana were to be built and operated as proposed?

- During the National Hydropower Association's regional meeting August 29, 2011, AEA's power point presentation included a slide illustrating that the river above the dam site contributes about 14% of the Susitna's total discharge at the mouth of the river, 184 miles downstream. AEA staff then commented that, as 14% is such a small percentage of the total discharge, the impact of the project on the lower river promises to be insignificant. The conclusion of minor impact is wholly unwarranted and not supported by available information, particularly the gap analysis, which suggests that project effects may be detectable and significant past the river's mouth and into the inter-tidal area.

If AEA is to ensure the integrity of the licensing process, it must with hold judgment about project impacts and demonstrate its commitment to developing credible information and analysis by heeding the counsel of those agencies entrusted with the public-trust resources that are likely to be affected by the project. AEA must refrain from coming to conclusions about the benefits or cost of the project before the studies are completed.

When the State of Alaska submits the NOI and PAD, officially triggering the FERC licensing process, the Federal Energy Regulatory Commission will then be on track to license the largest hydropower dam to be constructed in the United States since the 1970s. In 1986 Congress passed the Electric Consumers Protection Act. This legislation amended the Federal Power Act, from which FERC derives its authority for hydro electric licensing, to require the Federal Energy Regulatory Commission to give "equal consideration to energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality."

After Congress amended the Federal Power Act, the Commission rejected the license application for a new large (144 MW) hydropower project on Kootenai River at the Kootenai Falls in Northwest Montana, and also rejected applications for dams on the Owens River in California because it determined the power benefits did not outweigh the diminution in value to other public benefits of maintaining the waterway in its undeveloped state. Consequently, the state could face a similarly high bar in front of the Commission with its proposal to industrialize the waterway by licensing,

constructing and operating the Watana dam. This speaks to the importance of maintaining a transparent and credible licensing process that emphasizes quality above speed and supports fish and wildlife agency need for information and analysis to develop the appropriate license terms and conditions.

I thank AEA for its willingness to solicit comment prior to the start of licensing, and I also appreciate the transparency in AEA's process during the past several months since the release of its preliminary decision document.

I'd also request that AEA host another meeting in the next few weeks to enable further discussion of the licensing process.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Anchorage Fish and Wildlife Field Office
605 West 4th Avenue, Room G-61
Anchorage, Alaska 99501-2249

IN REPLY REFER TO:
AFWFO

SEP 09 2011

Mr. Bryan Carey
Alaska Energy Authority
813 W Northern Lights Blvd
Anchorage, AK 99503

Re: Susitna-Watana proposed licensing process
FERC Project No. 14241-0000

Dear Mr. Carey:

The U.S. Fish and Wildlife Service (Service) appreciates the opportunity to provide comments on the proposed Susitna-Watana hydroelectric project (Susitna-Watana Hydro) licensing process. Since providing our initial comments on the licensing process, August 5, 2011, the Service has attended the August 18 Pre-PAD Gap Analysis meeting in Anchorage, the August 29 Susitna-Watana Hydro Site Visit and Public Information meeting in Talkeetna, the National Hydropower Association (NHA) meeting in Girdwood, August 30-31, and the Federal Energy Regulatory Commission (FERC) Process meeting in Anchorage, September 1. These meetings have all been helpful to understand the flexibility that may be accommodated in the proposed licensing process and to help both the Alaska Energy Authority (AEA) and resource agencies to develop a more informed decision about the licensing process. These meetings also provided resource agencies additional opportunities to discuss the challenges associated with licensing such a large and complex project, and realistic project timelines.

We understand that AEA continues to support use of the Integrated Licensing Process (ILP) for their evaluation and pursuit of the Susitna-Watana hydroelectric project. Consequently, we continue to be concerned that the strict process timelines prescribed by this process may not accommodate the necessary review of historical information, development of field studies, field work, data analyses, interpretation, reporting and licensing steps required for such a large, new hydroelectric project.

Biological, hydrological, and other studies are necessary to provide baseline conditions and to evaluate a full range of project alternatives, including mitigation that can be supported by the findings from statistically valid study objectives. The Service applauds the AEA for the transparency of the Susitna-Watana hydroelectric project planning process to date, including the

involvement of responsible agencies and others. Additionally, we applaud AEA for responding to previous agency comments and contracting several gap analyses so that we can determine the potential adequacy and suitability of information from the 1980s Susitna hydroelectric studies and proposals. However, a review of the Aquatic Resources Gap Analysis indicates that information on current salmon (and other species) spawning distribution and habitat utilization is needed to fully document biological baseline conditions. We recommend that biologists and others involved during the 1980s be brought together to meet with AEA and involved agencies to obtain input from those knowledgeable individuals about additional information that was perhaps not published, summarized or otherwise available, and the direction they recommend for further work on a Susitna-Watana hydroelectric project.

The Service recommends maximum flexibility in the licensing process for the Sustina-Watana project to achieve successful project outcomes from the standpoints of energy supply, conservation of fish and wildlife, and economics. Information on current seasonal fish species distribution and habitat utilization by life stage, and different flow regimes throughout the watershed are critical to understanding proposed project impacts and potential mitigation strategies. Several challenges associated with licensing and realistic project timelines were identified at these meetings, particularly for a large, new project such as the Sustina-Watana project. These included agency staffing and resource limitations, timely review and input at different stages in the licensing process (e.g., the development and review of study plans and requests), and adequate information to determine baseline conditions and evaluate potential project impacts. A meeting among resource agencies (and AEA) could identify specific areas where more time or flexibility is needed in the process. If this is not possible under the proposed licensing process, perhaps an Alternative Licensing Process could be implemented that would provide reasonable deadlines and predictability, but with flexibility where needed (and identified up front). For example, challenges meeting proposed timelines for the Susitna-Watana project have already materialized in the development of draft gap analyses reports. Those were originally scheduled for completion in April 2011, but were not completed and provided to resource agencies until August.

The rigid nature of the proposed appears at odds with the time needed to comprehensively understand the dynamic hydrology, habitat and associated biology of the basin. Among data gaps identified by the aquatic gap analysis, is that more information is needed to determine baseline conditions for all anadromous salmon species. Specifically, "information on current salmon spawning distribution and habitat utilization, particularly in the middle river and its tributaries is needed to document biological baseline conditions" (Draft Aquatic Resources Gap Analysis 2011). There is even less known about distribution and abundance of salmon, particularly Chinook salmon, in the upper river upstream of the proposed Watana dam site.

Questions related to the Susitna Basin hydrology and aquatic biota cannot be determined in one or two study years. What happens if outstanding questions about biological or hydrological baseline conditions remain at the end of 2-3 study years? Important questions which may not be answered after only a few years of study include: What proportion of the Chinook salmon population (juveniles and adults) currently exists upstream of the proposed dam site and under what flow conditions? At what flows is Devil's Canyon an impediment or a barrier to upstream fish passage for anadromous species? How will dam operations affect upstream fish passage for

anadromous species at Devil's Canyon? If large numbers of anadromous fish reach the base of the dam, what is the effect from the dam and to the species? What alternative flow regimes will be needed to conserve aquatic species while providing desired power objectives? More biological and hydrologic information is needed to determine baseline conditions, evaluate potential project impacts, and prescribe appropriate mitigation measures, including flows, than currently exists. Acquiring and analyzing this data will require more than the 2-3 study years allowed under the proposed licensing process. In addition, anadromous species such as Chinook salmon complete their life cycle over a 6 to 8-year period (Behnke 2002). Therefore, to document biological baseline conditions and evaluate habitats and biological responses under a variety of hydrologic conditions, with statistically valid study objectives, would likely require a minimum of 5-6 study years.

It is noteworthy that the proposed Susitna-Watana project would be the largest, new hydroelectric project developed in the United States in over 40 years; our knowledge and understanding of hydrological and biological sciences have significantly advanced since the previous Susitna hydro project was studied over 25 years ago; and we now understand that climate change has been affecting – and will continue to affect – Alaska's watersheds. This means that adaptive management to account for changes in precipitation, flow regimes, and timing is a further complication, and needs to be an essential part of a Susitna-Watana hydroelectric project.

Thank you for the opportunity to provide comments on this important project and for extending the timeframe for our comments on the licensing process. If you have any questions regarding these comments, please contact project biologist, Mike Buntjer at (907) 271-3053, or by email at michael_buntjer@fws.gov

Sincerely,

Acting For:

Ann G. Rappoport
Field Supervisor

cc: S. Walker, NOAA, susan.walker@noaa.gov
E. Rothwell, NOAA, eric.rothwell@noaa.gov
T. Meyer, NOAA, tom.meyer@noaa.gov
L. Koss, BLM, lee_koss@blm.gov
C. Thomas, NPS, cassie_thomas@nps.gov
M. Miller, ADF&G, monte.miller@alaska.gov
M. Daigneault, ADF&G, michael.daigneault@alaska.gov
G. Prokosch, ADNR, gary.prokosch@alaska.gov
D. Meyer, USGS, dfmeyer@usgs.gov
K. Lord, DOI, Ken.Lord@exchange.sol.doi.gov
S. Fisher-Goad, SFisherGoad@aidea.org

B. Long, issues320@hotmail.com
C. Smith, TNC, corinne_smith@TNC.ORG
J. Konigsberg, HRC, jan@hydroreform.org
K. Strailey, ACE, kaarle@akcenter.org
M. Coumbe, ACA, mike@akvoice.org
P. Lavin, NWF, lavin@nwf.org
R. Wilson, Alaska Ratepayers, richwilsonak@gmail.com
K. Bose, FERC, Kimberly.Bose@ferc.gov

References:

Benhke, R. 2002. Trout and salmon of North America. The Free Press, New York, NY.

Draft Aquatic Resources Data Gap Analysis. 2011. Prepared for the Alaska Energy Authority. Prepared by HDR Alaska, Inc., Anchorage, AK.

Document Content(s)

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

September 9, 2011

Sara Fisher-Goad
Executive Director
Alaska Energy Authority
813 West Northern Lights Blvd.
Anchorage, Alaska 99503

Re: Proposed Integrated Licensing Process for Susitna-Watana Hydroelectric Project, P-14241

Dear Ms. Fisher-Goad:

The Alaska Energy Authority (AEA) has invited the National Marine Fisheries Service (NMFS) to comment on the AEA's intention to use the Integrated Licensing Process (ILP) for the Susitna-Watana Hydroelectric Project licensing with the Federal Energy Regulatory Commission (FERC). AEA has also extended the invitation to comment to several other federal agencies that are integral to the licensing process. NMFS attended pre-license application meetings on August 2 and 18, 2011, and a site visit on August 29, 2011, during which AEA expressed its intention to use the ILP.

Statutory Authorities

NMFS has responsibilities related to FERC's hydropower licensing actions under the Federal Power Act (FPA), Endangered Species Act (ESA), Marine Mammal Protection Act (MMPA), Magnuson-Stevens Fishery Conservation and Management Act (MSA), and National Environmental Policy Act.

Federal Power Act

Section 18 of the FPA grants NMFS authority to issue mandatory fishway prescriptions for safe, timely, and effective fish passage. Under Section 10(j) of the FPA, NMFS is authorized to recommend license conditions necessary to adequately and equitably protect, mitigate damages to, and enhance, fish and wildlife (including related spawning grounds and habitat) affected by the development, operation, and management of hydropower projects. Section 10(a)(1) of the FPA requires FERC to condition hydropower licenses to best improve or develop a waterway or waterways for the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat) based on NMFS recommendations and plans for affected waterways.

Endangered Species Act and Marine Mammal Protection Act

Section 7(a)(2) of the ESA directs federal interagency cooperation "to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species" or result in the destruction or adverse modification of critical habitat. Marine mammal species that are not listed under the ESA are afforded protection by the MMPA which prohibits "take" of marine mammal species in U.S.

waters. FERC will likely need to consult with NMFS regarding the effects of the project on endangered Cook Inlet beluga whales and their critical habitat, and will likely need to obtain authorization for incidental takes of marine mammals under the MMPA.

Magnuson-Stevens Fishery Conservation and Management Act

Section 305(b)(2) of the MSA requires federal agencies to consult with NMFS on all actions that may adversely affect Essential Fish Habitat (EFH) identified under the MSA. If the proposed action may adversely affect EFH, FERC must prepare an EFH assessment including a description of the action, analysis of adverse effects, FERC's conclusion about the effects, and any proposed mitigation. NMFS is required to make EFH Conservation Recommendations for the proposed action which may include measures to avoid, minimize, mitigate or otherwise offset adverse effects. EFH for Pacific salmon in Alaska includes freshwater habitats used for spawning, rearing, and migration. FERC should include an EFH Assessment in the NEPA document developed during the licensing process. The level of detail in the EFH Assessment should be commensurate with the anticipated extent of adverse impacts on EFH. EFH regulations and guidance are available on our website: http://www.habitat.noaa.gov/pdf/efh_consultation_guidance_v1_1.pdf.

Comments on Use of the ILP

FERC developed the Integrated Licensing Process to give applicants another option for re-licensing hydroelectric projects. Although the ILP is considered the default process for original licensing or a new licensing for an existing project, it has not been used in the context of a large new controversial hydroelectric project with significant anadromous fish impacts. NMFS is aware of one attempt to use the ILP for a new project in New York (Messena Grasse, FERC Docket #P-12607) but the circumstances of that project are very dissimilar to Susitna-Watana, the ILP has not progressed beyond the study phase for that project, and the project appears to have been stalled and is not progressing under the strict ILP timelines. As AEA is aware, the ILP is schedule driven with strict limits on document review periods and study periods, and although time extensions can be granted they are not guaranteed. NMFS is concerned that the document review, comment, and study periods suggested under the ILP are unrealistic and insufficient for the scale of the Susitna-Watana project. Due to the scope of the project, the significant environmental data gaps, and the stringent ILP timelines, NMFS would likely need to request time extensions for its submissions at each step in the process, resulting in considerable uncertainty for all involved parties. A more efficient approach, providing increased certainty for AEA, would be to use a more flexible licensing process that allows the parties to cooperate and negotiate reasonable time frames for each step in licensing.

The study period limitations are of particular concern. NMFS, FERC, and other agencies must make informed analyses on project effects and determine mandatory conditions and make conservation recommendations. To do so, we must obtain adequate information on all aspects of the project. For NMFS, the information related to fish and wildlife effects will be obtained through studies. These studies will help NMFS and other agencies in our development of proposed license conditions that protect resources for which we have statutory responsibilities.

To this end, and pursuant to 18 CFR 5.9, studies are required to address any nexus between project operation and effects, including direct, indirect, and cumulative effects.

NMFS and other agencies must understand the effects this project will have on anadromous fish, marine mammals, and associated habitat. To understand effects, adequate baseline information gathered through the studies is necessary for anadromous species, including how, when, and where these species use habitat. Baseline conditions in the Susitna River basin must be understood in order to tie the studies to the project's cumulative effects in the basin.

Under the ILP, study plans must be filed within 45 days of the close of the 60-day comment period provided in the notice of commencement of proceeding and scoping. For a project of this size and complexity, this schedule is overly restrictive. The Susitna-Watana project is characterized by enormous geographic extent, ecosystem and physical complexity, and a high profile. Two years of studies would be insufficient to determine baseline conditions for hydrology, fish and wildlife habitat, anadromous species, and marine mammals.

AEA has been proactive in contacting NMFS and incorporating us in meetings as well as providing an Aquatic Resources Gap Analysis. The major conclusion from the gap analysis is that the 1980s studies are useful as historic baseline but insufficient and/or incomplete for analysis of the current project. Many of the assumptions for the 1980s studies are incorrect or inapplicable with our current understanding of the project. One example would be the assumption that anadromous fish do not migrate above Devil's Canyon, which has been found with even limited monitoring to be incorrect. This example points out that we do not know the full extent/range, number, timing, or population estimates for anadromous fish in the project area, particularly in the upper and middle river. AEA will need to address the information gaps under a variety of hydrologic conditions to understand the project effects and to enable NMFS and other agencies to provide informed input regarding the project. Two years would be insufficient to understand the natural variability in fish distribution and timing and the inherent relationship with hydrologic variability.

To understand current hydrologic conditions, several years of current environmental flow and habitat data must be collected from areas above the reservoir location and in the reach immediately downstream of the proposed dam, as well as in key downstream mainstem and off-channel slough habitats important for spawning and rearing salmon. Currently, the only operating USGS gauge on the Susitna River is at Gold Creek. The USGS is conducting a project that will estimate missing daily flow values and long-term summary streamflow statistics for stream gages in the Susitna River basin with incomplete records. Other time sensitive studies that also depend on water year include location, timing, extent, and life histories, and population size and population genetics of anadromous species. This information cannot be adequately obtained in two years, or even in three years. Chinook salmon, known to inhabit the river upstream of the proposed dam site, have a life cycle that includes a great deal of variability including a long freshwater juvenile residence, ocean residence ranging from one to six years, spring and summer adult spawning runs, and many months of freshwater residence as returning adults. Even three years of study would provide inadequate presence-absence information on a species with a life-span ranging from three to eight years. Information on this important

commercial and sport-harvested species is presently very limited and consists of only a few documented observations of individual adult and juvenile fish upstream of Devil's Canyon and Watana. Using the 1980s data would be insufficient; study methods and the geographic extent of the 1980s studies are not adequate for the current project proposal. As the gap analysis documents, science has progressed rapidly in the ensuing 25 to 30 years since these studies were conducted.

NMFS is also concerned that the August 29, 2011 site visit for the project was incomplete and did not comport with the ILP, insofar as the visit was noticed and took place in advance of an application for a preliminary permit or submission of a Preliminary Application Document (PAD). The site visit was informative and included flying the middle part of the Susitna River, landing at the proposed dam site, and flying a short portion of the proposed reservoir, but the downriver slough areas, Devil's Canyon, and the upper reservoir were not included. Once AEA completes the PAD, thereby clarifying the proposed project's boundaries and design, one or more additional site visits may be needed for reviewing agencies to understand the entire geographic extent and characteristics of the project, including effects to upstream and downstream fish habitats.

Since the ILP was initiated in 2003, FERC has monitored its use. Recently, FERC produced a summary of ILP user comments from applicants, government agencies, nongovernmental organizations, and other participants in roughly 30 FERC ILP proceedings. In its Integrated Licensing Process Effectiveness Evaluation Feedback 2010 publication (March 2011), FERC itemized a variety of shortcomings, helpful strategies, and issues associated with the ILP, particularly related to studies. Initially, the report notes that because ILP timing is short, it can be just as costly for applicants as other processes "because it can require significant support from consultants due to the magnitude of effort over a short period of time" (p. 5). In some instances, and through collaborative efforts, applicants conducted a season of baseline studies prior to submission of the PAD, "which was helpful in streamlining the entire process" (p. 7). In addition, the report notes that some applicants conducted studies two to three years in advance and thus accelerated the study phase. Because the ILP is deadline-driven process, FERC noted that it is affected by unpredictable factors. Careful review of the schedule and collaboration of study plan development was noted. Participants preferred to resolve study plan differences informally (p. 9) and with negotiation (p. 10). Of particular note, "most found it difficult to collect the study information needed in the two-year period and have adequate time to develop PM&E measures" (p. 12). FERC was told that "the number of years to conduct studies is a shared concern among many stakeholders" (p. 21). The take-home message from the FERC report is that AEA should collaborate with NMFS and other agencies regarding appropriate study periods. Possible strategies include issuance of a preliminary PAD, or delaying the PAD filing and conducting baseline studies for an agreed upon period, leaving the balance of the studies to be conducted under the two to three year ILP process.

NMFS recommends that AEA choose the Alternative License Process (ALP), or through collaboration with NMFS and the other agencies, agree to a blend the ALP with the ILP with respect to study time periods to ensure agreement between the AEA, resource agencies, other

stakeholders, and FERC on appropriate study development periods, comment periods, study periods, and study review periods.

We anticipate that FERC will decide which process will be used within 60 days of filing the Notice of Intent and PAD per 18 CFR 5.8 (b)(1). In our view, the ALP, accompanied by a well written communication protocol, would best fit the needs of the federal and state fish and wildlife agencies and result in a better project.

Please contact Susan Walker at (907) 586-7646 (susan.walker@noaa.gov), or Eric Rothwell at (907) 271-1937 (eric.rothwell@noaa.gov) with any questions regarding our recommendations.

Sincerely,

James W. Balsiger, Ph.D.
Administrator, Alaska Region

Cc email:
bcarey@aidea.org
Michael_Buntjer@fws.gov
Jennifer_Spegon@fws.gov
Betsy_McCracken@fws.gov
Ken.Lord@sol.doi.gov
Ann_Rappoport@fws.gov
Cassie_Thomas@nps.gov
Kirby.W.Gilbert@us.mwhglobal.com
Joe.klein@alaksa.gov
Monty.Miller@alaska.gov
Jason.Mouw@alaska.gov
gary.prokosch@alaska.gov
Eric.Rothwell@noaa.gov
Jan@hydroreform.org

FERC Susitna-Watana Hydroelectric Project, P-14241 sw 9-8-11

September 12, 2011

ERRATA:

Accession Number: 20110912-5022

Description: Natural Heritage Institute re Watana-Susitna River Dam Licensing Process under P-14241.

Page 2: Meeting was September 1, 2011, not August 1, 2011

Page 4: Meeting was August 30, 2011, not August 29, 2011.

AIDEA Alaska Industrial Development and Export Authority

ALASKA ENERGY AUTHORITY

September 16, 2011

Colonel Reinhard W. Koenig
Commander, Alaska District
U.S. Army Corps of Engineers
P.O. Box 6898
JBER, Alaska 99506-0898

Subject: Susitna-Watana Hydroelectric Project Licensing

Dear Colonel Koenig:

As you know the Alaska Energy Authority (AEA) is pursuing the planning for the Susitna-Watana Project located at mile 184 on the Susitna River. We are currently refining the project plan of development, reviewing existing information and preparing the Preliminary Application Document (PAD) which we intend to file with the Federal Energy Regulatory Commission (FERC) near the end of this year to initiate the formal licensing process. The Project would consist of an approximate 700 foot high dam creating reservoir about 39 miles in length, generating station with an installed capacity of approximately 600 megawatts and associated transmission lines, access road, airstrip, and operator facilities.

As we head towards the start of the formal licensing process, your agency's technical expertise will be essential in helping to identify key resource questions, regulatory requirements, review study designs, comment on study results and ultimately identify resource protection, mitigation and enhancement measures for inclusion as part of the overall project design. Our staff met with Victor Ross and Michiel Holley of your Regulatory Branch on August 19, 2012 and discussed the Corps permitting process under Section 404 of the Clean Water Act. We believe having the Corps as a cooperating agency with FERC may be an efficient way to ultimately have one NEPA document satisfy both agencies' needs.

As part of our planning efforts AEA has held several public and agency meetings and informally contacted a number of resource agency representatives, other interested organizations, and members of the public. We have shared information about the project and solicited input on which important resource questions should be addressed

during the licensing process. We appreciate the participation of the technical staff from your agency in these outreach efforts to date.

Several technical resource agency staff have commented on the burden that participating in the licensing process for the Susitna-Watana Project will cause for the various state and federal agencies. AEA and our licensing team recognize that government agencies have limited available personnel and other competing priorities. In order for us to understand the U.S. Army Corps of Engineers' specific needs to allow effective participation in the upcoming licensing process, we would like to set up a time to meet to discuss potential ways that AEA may be able to assist your agency's participation in this high priority Alaska project.

Please contact Shauna Howell at (907) 771-3028 so that we can arrange a convenient time to meet.

Sincerely,

ALASKA ENERGY AUTHORITY

Sara Fisher-Goad

Sara Fisher-Goad
Executive Director

cc: Victor Ross, Regulatory Branch
Michiel Holley, Regulatory Branch

AIDEA Alaska Industrial Development and Export Authority

ALASKA ENERGY AUTHORITY

September 16, 2011

Mr. Geoffrey Haskett
Regional Director
Alaska Regional Office
U.S. Fish & Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503

Subject: Susitna-Watana Hydroelectric Project Licensing

Dear Mr. Haskett:

As you know the Alaska Energy Authority (AEA) is pursuing the planning for the Susitna-Watana Project located at mile 184 on the Susitna River. We are currently refining the project plan of development, reviewing existing information and preparing the Preliminary Application Document (PAD) which we intend to file with the Federal Energy Regulatory Commission (FERC) near the end of this year to initiate the formal licensing process.

As we head towards the start of the formal licensing process, your agency's technical expertise will be essential in helping to identify key resource questions, review study designs, comment on study results and ultimately identify resource protection, mitigation and enhancement measures for inclusion as part of the overall project design.

As part of our planning efforts AEA has held several public and agency meetings and informally contacted a number of resource agency representatives, other interested organizations, and members of the public. We have shared information about the project and solicited input on which important resource questions should be addressed during the licensing process. We appreciate the participation of the technical staff from your agency in these outreach efforts to date.

Several technical resource agency staff have commented on the burden that participating in the licensing process for the Susitna-Watana Project will cause for the various state and federal agencies. AEA and our licensing team recognize that government agencies have limited available personnel and other competing priorities.

813 West Northern Lights Boulevard • Anchorage, Alaska 99503
www.aidea.org • 907/771-3000 • FAX 907/771-3044 • Toll Free (Alaska Only) 888/300-8534 • www.akenergyauthority.org

In order for us to understand U.S. Fish and Wildlife Service's specific needs to allow effective participation in the upcoming licensing process, we would like to set up a time to meet to discuss potential ways that AEA may be able to assist your agency's participation in this high priority Alaska project.

Please contact Shauna Howell at (907) 771-3028 so that we can arrange a convenient time to meet.

Sincerely,

ALASKA ENERGY AUTHORITY

Sara Fisher-Goad

Sara Fisher-Goad
Executive Director

cc: Kim Elton, Alaska Department of the Interior
Pat Pourchot, Alaska Department of the Interior

AIDEA Alaska Industrial Development and Export Authority

ALASKA ENERGY AUTHORITY

September 16, 2011

Ms. Cassie Thomas
National Park Service
240 West 5th Avenue
Anchorage, AK 99501

Subject: Susitna-Watana Hydroelectric Project Licensing

Dear Ms. Thomas:

As you know the Alaska Energy Authority (AEA) is pursuing the planning for the Susitna-Watana Project located at mile 184 on the Susitna River. We are currently refining the project plan of development, reviewing existing information and preparing the Preliminary Application Document (PAD) which we intend to file with the Federal Energy Regulatory Commission (FERC) near the end of this year to initiate the formal licensing process.

As we head towards the start of the formal licensing process, your agency's technical expertise will be essential in helping to identify key resource questions, review study designs, comment on study results and ultimately identify resource protection, mitigation and enhancement measures for inclusion as part of the overall project design.

As part of our planning efforts AEA has held several public and agency meetings and informally contacted a number of resource agency representatives, other interested organizations, and members of the public. We have shared information about the project and solicited input on which important resource questions should be addressed during the licensing process. We appreciate the participation of the technical staff from your agency in these outreach efforts to date.

Several technical resource agency staff have commented on the burden that participating in the licensing process for the Susitna-Watana Project will cause for the various state and federal agencies. While we understand the Park Service receives hydropower recreation assistance funding, AEA recognizes that government agencies have limited available personnel and other competing priorities. In order for us to understand the National Park Service's specific needs to allow effective participation in

813 West Northern Lights Boulevard • Anchorage, Alaska 99503
www.aidea.org • 907/771-3000 • FAX 907/771-3044 • Toll Free (Alaska Only) 888/300-8534 • www.akenergyauthority.org

the upcoming licensing process, we would like to set up a time to meet to discuss potential ways that AEA may be able to assist your agency's participation in this high priority Alaska project.

Please contact Shauna Howell at (907) 771-3028 so that we can arrange a convenient time to meet.

Sincerely,

ALASKA ENERGY AUTHORITY

Sara Fisher-Goad

Sara Fisher-Goad
Executive Director

cc: Kim Elton, Alaska Department of the Interior
Pat Pourchot, Alaska Department of the Interior

AIDEA Alaska Industrial Development and Export Authority

ALASKA ENERGY AUTHORITY

September 16, 2011

Mr. Jon Kurland
Assistant Regional Administrator for the Alaska Region
Habitat Conservation Division
NOAA Fisheries, National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

Subject: Susitna-Watana Hydroelectric Project Licensing

Dear Mr. Kurland:

As you know the Alaska Energy Authority (AEA) is pursuing the planning for the Susitna-Watana Project located at mile 184 on the Susitna River. We are currently refining the project plan of development, reviewing existing information and preparing the Preliminary Application Document (PAD) which we intend to file with the Federal Energy Regulatory Commission (FERC) near the end of this year to initiate the formal licensing process.

As we head towards the start of the formal licensing process, your agency's technical expertise will be essential in helping to identify key resource questions, review study designs, comment on study results and ultimately identify resource protection, mitigation and enhancement measures for inclusion as part of the overall project design.

As part of our planning efforts AEA has held several public and agency meetings and informally contacted a number of resource agency representatives, other interested organizations, and members of the public. We have shared information about the project and solicited input on which important resource questions should be addressed during the licensing process. We appreciate the participation of the technical staff from your agency in these outreach efforts to date.

Several technical resource agency staff have commented on the burden that participating in the licensing process for the Susitna-Watana Project will cause for the various state and federal agencies. AEA and our licensing team recognize that government agencies have limited available personnel and other competing priorities.

In order for us to understand NOAA's specific needs to allow effective participation in the upcoming licensing process, we would like to set up a time to meet to discuss potential ways that AEA may be able to assist your agency's participation in this high priority Alaska project.

Please contact Shauna Howell at (907) 771-3028 so that we can arrange a convenient time to meet.

Sincerely,

ALASKA ENERGY AUTHORITY

Sara Fisher-Goad

Sara Fisher-Goad
Executive Director

cc: Sue Walker, NMFS, Habitat Conservation Div.

AIDEA Alaska Industrial Development and Export Authority

ALASKA ENERGY AUTHORITY

September 16, 2011

Mr. Daniel S. Sullivan
Commissioner
Department of Natural Resources
State of Alaska
550 W. 7th Ave, Suite 1260
Anchorage, Alaska99501-3557

Subject: Susitna-Watana Hydroelectric Project Licensing

Dear Commissioner Sullivan:

As you know the Alaska Energy Authority (AEA) is pursuing the planning for the Susitna-Watana Project located at mile 184 on the Susitna River. We are currently refining the project plan of development, reviewing existing information and preparing the Preliminary Application Document (PAD) which we intend to file with the Federal Energy Regulatory Commission (FERC) near the end of this year to initiate the formal licensing process.

As we head towards the start of the formal licensing process, your agency's technical expertise will be essential in helping to identify key resource questions, review study designs, comment on study results and ultimately identify resource protection, mitigation and enhancement measures for inclusion as part of the overall project design.

As part of our planning efforts AEA has held several public and agency meetings and informally contacted a number of resource agency representatives, other interested organizations, and members of the public. We have shared information about the project and solicited input on which important resource questions should be addressed during the licensing process. We appreciate the participation of the technical staff from your agency in these outreach efforts to date.

Several technical resource agency staff have commented on the burden that participating in the licensing process for the Susitna-Watana Project will cause for the various state and federal agencies. AEA and our licensing team recognize that government agencies have limited available personnel and other competing priorities.

In order for us to understand the Department of Natural Resources' specific needs to allow effective participation in the upcoming licensing process, we would like to set up a time to meet to discuss potential ways that AEA may be able to assist your agency's participation in this high priority Alaska project.

Please contact Shauna Howell at (907) 771-3028 so that we can arrange a convenient time to meet.

Sincerely,

ALASKA ENERGY AUTHORITY

Sara Fisher-Goad

Sara Fisher-Goad
Executive Director

cc: Karen Rehfeld, Office of Management & Budget

AIDEA Alaska Industrial Development and Export Authority

ALASKA ENERGY AUTHORITY

September 16, 2011

Mr. Larry Hartig
Commissioner
Department of Environmental Conservation
State of Alaska
P.O. Box 111800
Juneau, Alaska 99811-1800

Subject: Susitna-Watana Hydroelectric Project Licensing

Dear Commissioner Hartig:

As you know the Alaska Energy Authority (AEA) is pursuing the planning for the Susitna-Watana Project located at mile 184 on the Susitna River. We are currently refining the project plan of development, reviewing existing information and preparing the Preliminary Application Document (PAD) which we intend to file with the Federal Energy Regulatory Commission (FERC) near the end of this year to initiate the formal licensing process.

As we head towards the start of the formal licensing process, your agency's technical expertise will be essential in helping to identify key resource questions, review study designs, comment on study results and ultimately identify resource protection, mitigation and enhancement measures for inclusion as part of the overall project design.

As part of our planning efforts AEA has held several public and agency meetings and informally contacted a number of resource agency representatives, other interested organizations, and members of the public. We have shared information about the project and solicited input on which important resource questions should be addressed during the licensing process. We appreciate the participation of the technical staff from your agency in these outreach efforts to date.

Several technical resource agency staff have commented on the burden that participating in the licensing process for the Susitna-Watana Project will cause for the various state and federal agencies. AEA and our licensing team recognize that government agencies have limited available personnel and other competing priorities.

813 West Northern Lights Boulevard • Anchorage, Alaska 99503
www.aidea.org • 907/771-3000 • FAX 907/771-3044 • Toll Free (Alaska Only) 888/300-8534 • www.akenergyauthority.org

In order for us to understand the Department of Environmental Conservation's specific needs to allow effective participation in the upcoming licensing process, we would like to set up a time to meet to discuss potential ways that AEA may be able to assist your agency's participation in this high priority Alaska project.

Please contact Shauna Howell at (907) 771-3028 so that we can arrange a convenient time to meet.

Sincerely,

ALASKA ENERGY AUTHORITY

Sara Fisher-Goad

Sara Fisher-Goad
Executive Director

cc: Bill Griffith, Division of Water
Karen Rehfeld, Office of Management & Budget

AIDEA Alaska Industrial Development and Export Authority

ALASKA ENERGY AUTHORITY

September 16, 2011

Mr. Bud C. Cribley
State Director
Alaska State Office
Bureau of Land Management
222 W. 7th Avenue, #13
Anchorage, Alaska 99513

Subject: Susitna-Watana Hydroelectric Project Licensing

Dear Mr. Cribley:

As you know the Alaska Energy Authority (AEA) is pursuing the planning for the Susitna-Watana Project located at mile 184 on the Susitna River. We are currently refining the project plan of development, reviewing existing information and preparing the Preliminary Application Document (PAD) which we intend to file with the Federal Energy Regulatory Commission (FERC) near the end of this year to initiate the formal licensing process.

As we head towards the start of the formal licensing process, your agency's technical expertise will be essential in helping to identify key resource questions, review study designs, comment on study results and ultimately identify resource protection, mitigation and enhancement measures for inclusion as part of the overall project design.

As part of our planning efforts AEA has held several public and agency meetings and informally contacted a number of resource agency representatives, other interested organizations, and members of the public. We have shared information about the project and solicited input on which important resource questions should be addressed during the licensing process. We also met with several from your staff on September 7, 2011 and appreciate all the participation of the technical staff from your agency in these outreach efforts to date.

Several technical resource agency staff have commented on the burden that participating in the licensing process for the Susitna-Watana Project will cause for the various state and federal agencies. AEA and our licensing team recognize that

813 West Northern Lights Boulevard • Anchorage, Alaska 99503
www.aidea.org • 907/771-3000 • FAX 907/771-3044 • Toll Free (Alaska Only) 888/300-8534 • www.akenergyauthority.org

government agencies have limited available personnel and other competing priorities. In order for us to understand BLM's specific needs to allow effective participation in the upcoming licensing process, we would like to set up a time to meet to discuss potential ways that AEA may be able to assist your agency's participation in this high priority Alaska project.

Please contact Shauna Howell at (907) 771-3028 so that we can arrange a convenient time to meet.

Sincerely,

ALASKA ENERGY AUTHORITY

Sara Fisher-Goad

Sara Fisher-Goad
Executive Director

cc: Julia Dougan, Associate State Director
Jim Fincher, Acting District Manager
Kim Elton, Alaska Department of the Interior
Pat Pourchot, Alaska Department of the Interior
Jolie Pollet, Anchorage District, Bureau of Land Management

NATIONAL WILDLIFE FEDERATION
Alaska Natural Resource Center
750 West Second Avenue, Suite 200
Anchorage AK 99501
907-339-3900
www.nwf.org

Bryan Carey
Alaska Energy Authority
Via email to bcarey@aidea.org

September 18, 2011

Re: Susitna Licensing Process

Dear Mr. Carey,

Thank you for the opportunity to submit comments regarding the Federal Energy Regulatory Commission (FERC) process for the proposed Susitna River dam.

National Wildlife Federation is the nation's largest conservation and education organization with over four million members and supporters, including over 5000 in Alaska. NWF has engaged in numerous energy issues in our state for several years, including serving on the public advisory committee for the Railbelt Integrated Resource Plan (RIRP) and providing input to the Alaska Energy Authority and legislators regarding state renewable energy and energy efficiency legislation and policy. We have also participated in several Regulatory Commission of Alaska dockets addressing these issues.

With more specific regard to the Susitna Dam, NWF has provided comments on AEA's preliminary decision to pursue the dam, attended AEA's July meeting to discuss gap analyses, attended the recent National Hydropower Association meeting in Girdwood at which the Susitna project was a featured topic, and attended the September 1 meeting hosted by AEA and FERC in Anchorage to discuss the FERC licensing process. We have also reviewed the notes AEA circulated after its June 27 meeting with agencies and stakeholders; notes prepared by attendees of the July 28 public meeting regarding this project in Talkeetna; and notes prepared by attendees of public meetings AEA held in March 2011 in Anchorage, Palmer, Talkeetna and Fairbanks.

Generally speaking, NWF shares the concerns already raised by severa; resource agencies regarding the need for adequate time and resources to allow a responsible evaluation of project impacts. We generally endorse the comments shared by the U.S. Fish and Wildlife Service in this regard and by The Nature Conservancy concerning the work needed to fill data gaps in the areas of aquatic resources and water quality. The comments below address other issues that have not received as much attention in the process to date.

Susitna Dam and Alaska's 50% Renewable Energy Goal

The Alaska Legislature has established a goal of generating 50% of the state's electricity from renewable energy sources by 2025. In November 2010, AEA issued a preliminary decision in favor of building the

proposed Susitna Dam. In that document, AEA stated that "[t]he only way to achieve this goal is for a new large hydroelectric project to be built in the Railbelt region." As explained in our April 2011 letter to AEA, however, this is not the case and in fact the RIRP excluded all variations of Susitna dam projects from its economically preferred generation mix.[1]

A publication titled "Susitna-Watana Hydroelectric Project, FERC Project No. 14241," distributed at the September 1, 2011 AEA/FERC meeting, now states that "[t]he only cost effective way to achieve the [50% goal] is for a new, large hydroelectric project to be built in the Railbelt region." While we appreciate the addition of the modifying clause *"cost effective,"* this still misrepresents the findings of the RIRP and suggests to the public that there is evidence that building the Susitna project is the least expensive or most economically viable route to achieve the 50% goal.

The RIRP estimated that the most cost-effective generation mix for the Railbelt resulted in a cumulative present value cost of $13.625 billion, a total capital investment of $9.087 billion, and average wholesale power cost of $17.26; this mix did not include the Susitna project. Even accounting for innovative financing mechanisms that may or may not prove to be available, including the Susitna-Watana project in the mix increases the cumulative present value cost to $15.040 billion, increases the capital investment over 67 percent to $15.057 billion, and increases the average wholesale power cost to $19.05.[2]

The RIRP did say that it is only if a large hydro project is built that the optimal generation mix and the optimal mix that would meet the 50% renewable goal are one and the same thing.[3] But that generation mix identified the proposed Lake Chakachamna project as the hydro development that would yield that result; as explained above, putting Susitna in the mix means that the 50% goal is achieved but at a high cost.

The Lake Chakachamna project appears to have fallen out of the discussion for now, at least in part because like Susitna it needed state support and financing to move forward and, unlike Susitna, none was forthcoming. Nonetheless, substituting the Susitna project for the Lake Chakachamna project is neither cost-effective nor necessary to meet the 50% renewable goal.

The RIRP found that removing Lake Chakachamna from the optimal generation mix resulted in a cumulative present value cost of $14.332 billion, capital investment of $7.719 billion and average wholesale power cost of $18.16, still noticeably more cost-effective than the Susitna option.[4] That generation resource mix yields a renewable energy percentage of 38.06% on the Railbelt, but as detailed in our April 2011 letter, that would still meet the statewide 50% renewable energy goal due to the prevalence of existing renewables, particularly in southeast but in other areas of the state as well.

In short, it is inaccurate to contend that building the Susitna project is the only cost-effective means of meeting the state's 50% renewable energy goal. AEA's own work has already documented more cost-effective ways of meeting that goal.

---

[1] See April 11, 2011 letter from Patrick Lavin to Sara Fisher-Goad, attached for convenience; RIRP at 1-35, 36 (available at . http://www.akenergyauthority.org/regionalintegratedresourceplan.html).

[2] RIRP at 1-17.

[3] RIRP at 1-13.

[4] RIRP at 1-17.

Finally, while NWF supports the state's 50% goal and finds AEA's efforts to seek ways of achieving it commendable, the legislature purposely established it as an unenforceable goal rather than a the mandatory type of renewable energy portfolio standard (RPS) that some 28 other states have enacted.[5] Even if constructing the Susitna project were the only way the state could possibly achieve the goal, which it is not, that would not mean that it must be constructed. AEA should not build the Susitna project in order to achieve the 50% goal if building the project is otherwise inadvisable for economic, environmental or other reasons.

State Water Quality Issues and Section 401 Certification

Existing information demonstrates numerous exceedances of state water quality standards in the Susitna River basin.[6] Almost every anadromous tributary studied exceeds temperature standards for salmon spawning, rearing and migration, and in many cases the mean recorded temperature exceeds those standards (not just the maximum). Rising temperatures have coincided with decreasing numbers of king salmon returning to the Susitna basin and bag limit restrictions and fishery closures in recent years. The lucrative Susitna River salmon fisheries appear to be under significant duress at this time, and maintaining and restoring these fisheries should be a top state objective whether or not a dam is built.

During the meetings AEA has said that some time ago the state of Alaska waived its right under section 401 of the Clean Water Act to certify that any proposed hydropower project will meet applicable state water quality standards. This appeared surprising to many, including one of the featured panelists at the NHA meeting in Girdwood, who noted that surely the state cares about its water quality and asked the crowd what mechanism is used instead of the 401 certification. There was, however, no such alternative mechanism identified.

Setting aside questions about the prudence of categorically waiving its right to condition hydroelectric projects to protect water quality via the section 401 certification, the state's position leads to the conclusion that FERC will need to stand in as a surrogate for the Alaska Department of Environmental Conservation as protector of the public's interest in preserving water quality. The Study Plan, in turn, will need to closely examine how the dam's design, construction and operation will impact water quality and whether the project will meet all applicable water quality standards.[7] Parameters like temperature and metals are already being exceeded and may prove challenging to meet; the Study Plan should also assess likely project compliance with all applicable water quality standards from Cook Inlet through the proposed reservoir.

Greenhouse Gas Emissions

AEA should model the likely GHG emissions associated with constructing and operating the Susitna project. Reduced GHG emissions is often mentioned as a beneficial aspect of hydroelectric power, and

[5] A list of states with a mandatory RPS can be found here: http://apps1.eere.energy.gov/states/maps/renewable_portfolio_states.cfm

[6] AEA Susitna Water Quality and Sediment Transport Data Gap Analysis Report, July 26, 2011 p.23 *et seq.*

[7] Alaska's water quality standards can be found at 18 AAC 70, and include criteria for a dozen water quality characteristics.

may be a benefit of the Susitna project. Studies indicate, however, that at least some types of hydroelectric projects have resulted in CO2-equivalent emissions greater than those associated with fossil-fuel burning generation sources producing comparable amounts of power. One cause of this dynamic is when reservoirs flood areas with substantial vegetation, then later release methane when the water passes through the turbines.[8] This would appear to be a risk for the Susitna project.

Study Plan Topics

We appreciate the gap analyses that AEA has already completed for aquatic, terrestrial and subsistence resources, and water quality and sediment transport. No one has articulated a proposed or agreed universe of study plan topics, however, and those identified to date strike us as an incomplete list of relevant topic areas in light of the fact that the FERC decision ultimately turns on a broad consideration of the "public interest."

Bearing this in mind we propose a thorough assessment of both project and opportunity costs (the latter being particularly relevant because all parties appear to agree that the project would require at least $2.25 billion in state subsidies). This opportunity cost assessment should include the cost of other power sources on the Railbelt, both renewable and non-renewable, which as recently as the February 2010 RIRP were found to be significantly more cost-effective than building the Susitna project.

The Study Plan should also include a literature review of impacts to fish, wildlife, vegetation, and hydrology experienced at other large dams, some of which have operated for decades and experienced a wealth of expected and unexpected impacts. It would seem imprudent to ignore the substantial national experience with the public costs and benefits associated with large dams when deciding whether to build the first such dam in over a generation.

We further recommend detailed modeling to estimate changes in the hydrologic cycle that can be anticipated due to the local impacts of global climate change. The likely impacts of the project's construction and operation in both current conditions, and expected conditions at least 50 years from now, are fundamental considerations bearing on the decision.

These study suggestions, plus many that others have already made following the gap analyses, are almost certainly do not reflect a comprehensive list of topic areas that bear on FERC's "public interest" determination. We request that AEA and FERC provide the process stakeholders with what you consider the appropriate scope of study plan topic areas for this project.

Integrated Licensing Plan

Our concerns with AEA's use of the ILP for this project reflect those that have been consistently raised by state and federal resource agencies from the beginning of the public discussion of this topic. In short, it appears that the standard ILP timeline for developing a Study Plan (6 months from submission of the Notice of Intent/Preliminary Application Document) and for completion of the studies themselves (1-2 years) are inadequate for the Susitna Dam project. Numerous agency representatives provided reasons for this, including the fact that developing baseline data for such a large and complex river basin area that the project would impact will take several years, not just one or two. Coming up with a robust

[8] *See, e.g.,* Graham-Rowe, *Hydroelectric power's dirty secret revealed* (New Scientist, Feb 24, 2005)

Study Plan at the outset was described as an onerous undertaking that could easily outstrip agency resources in the near term and in any event will be a real challenge on the ILP timeline.[9]

At the September 1 AEA/FERC meeting, FERC staff stated that the ILP was developed as a kind of middle ground between the traditional and alternative licensing processes that preceded it. All parties appear to agree that the ILP was developed primarily with dam re-licensing projects in mind simply because these are far more common than original licensing projects nationwide. Nonetheless, the ILP is FERC's default process for both types of projects.

Upon questioning, FERC staff acknowledged, however, that the ILP has never been used for an original large dam such as the proposed Susitna project. Thus, the use of the ILP for a project like this is unprecedented, and there are no examples or case studies that demonstrate how FERC or project applicants have effectively ensured an adequate review of a hydroelectric dam of this magnitude on the ILP timeline. Further, while FERC staff stated that parties can request adjustments to the ILP timelines, this must be done on a case-by-case basis, i.e., study-by-study, or timeline-by-timeline. Given the fundamental nature of the objections to the timeline, one can easily see that an ad hoc "waiver request" approach to solving the timeline problem will not work.

Understandably, this has led some agencies to inquire about AEA's interest in requesting the ALP, so that parties could potentially develop and agree to realistic, manageable timelines. It appears, however, that AEA is unwilling to do this due to concerns about, well, sticking to the timeline. The timeline calls for 1-2 years of study; the agencies appear to be thinking 5-6 years would be appropriate. So there is an impasse where AEA wants to use the ILP precisely because it is fast, and the reviewing agencies feel that the pace is unrealistic given the work necessary for a project of this size.

As an NGO interested in the integrity of the process, we simply urge AEA and the reviewing agencies to reach an agreement on this critical question. Based on the discussions to date, we are not persuaded that AEA's desire to build the project as quickly as possible is more important for Alaskans than the reviewing agencies' desire to adequately assess the likely project impacts. Neither AEA nor FERC have explained how this project can be adequately reviewed and licensed on the ILP timeline in light of the concerns the agencies have raised. At the end of the day, the public needs to be convinced that whatever process is adopted is reasonably designed to produce a well-informed decision. That does not presently appear to be the case.

Thank you once again for this opportunity to comment, and please don't hesitate to contact me with any questions or comments.

Patrick Lavin
339-3909
lavin@nwf.org

[9] An exhaustive walk through all of the ILP timelines has not been attempted at any meeting to date. Other timelines may well prove problematic but those related to the design and execution of the Study Plan appeared to be the most fundamentally troubling and unrealistic from the perspective of the participating agencies.

cc: S. Walker, NOAA, susan.walker@noaa.gov
E. Rothwell, NOAA, eric.rothwell@noaa.gov
T. Meyer, NOAA, tom.meyer@noaa.gov
L. Koss, BLM, lee_koss@blm.gov
C. Thomas, NPS, cassie_thomas@nps.gov
M. Miller, ADF&G, monte.miller@alaska.gov
M. Daigneault, ADF&G, michael.daigneault@alaska.gov
G. Prokosch, ADNR, gary.prokosch@alaska.gov
D. Meyer, USGS, dfmeyer@usgs.gov
K. Lord, DOI, Ken.Lord@exchange.sol.doi.gov
S. Fisher-Goad, SFisherGoad@aidea.org
B. Long, issues320@hotmail.com
C. Smith, TNC, Corinne_smith@tnc.org
J. Konigsberg, HRC, jan@hydroreform.org
R. Wilson, Alaska Ratepayers, richwilsonak@gmail.com
K. Bose, FERC, Kimberly.Bose@ferc.gov
B. McCracken, USFWS, Betsy_McCracken@fws.gov
A. Rappaport, USFWS, Ann_Rappaport@fws.gov
M. Buntjer, USFWS, Michael_Buntjer@fws.gov

NATIONAL WILDLIFE FEDERATION®
Alaska Natural Resource Center
750 West Second Avenue, Suite 200
Anchorage AK 99501
907-339-3900
www.nwf.org

Sara Fisher-Goad, Executive Director
Alaska Energy Authority
813 W. Northern Lights Blvd.
Anchorage, AK 99503

VIA ELECTRONIC MAIL

April 13, 2011

Re: Railbelt Large Hydro Evaluation
Preliminary Decision Document

Dear Ms. Fisher-Goad:

National Wildlife Federation is the country's largest nonprofit conservation and education organization with over four million members and supporters, including over 5000 in Alaska. One of our top priorities is to address global climate change by identifying and promoting solutions that reduce pollution while protecting and enhancing wildlife and habitat. In Alaska, NWF has participated and provided input on several AEA initiatives related to that goal, including the Railbelt Electrical Grid Authority (REGA) study, the Greater Railbelt Energy and Transmission Corporation concept and the development of the Railbelt Integrated Resource Plan (RIRP).

We appreciate the opportunity to provide input on AEA's preliminary decision document. We applaud the agency's efforts in recent years to examine opportunities to diversify the power generation portfolio and improve energy efficiency in the Railbelt area as a response to declining natural gas production in Cook Inlet.

For the reasons that follow, we find AEA's decision to select the proposed Susitna River Dam (Low Watana alternative) as the preferred project for the Railbelt to be premature and unwarranted by the investigations done to date. As detailed below, we urge AEA to more thoroughly evaluate alternative means of meeting current and future demand for electricity and space heat in the Railbelt region before selecting a project of this magnitude and cost. This evaluation must include the opportunity cost associated with the Susitna Dam, i.e., other ways that at least $4.5 billion, including a state subsidy of about $2.25 billion, could be employed to meet demand. The latter appears particularly important given several reports that increased oil and gas exploration is expected in Cook Inlet beginning this summer.

I. It is Not Necessary to Build a Large Hydro Project in Order to Achieve the State's 50% Renewable Energy Goal.

The Alaska Legislature has established a goal of generating 50% of the state's electricity from renewable energy sources by 2025. AEA states that "[t]he only way to achieve this goal is for a new large hydroelectric project to be built in the Railbelt region."[1] This is not the case.

Statewide electric generation totals about 6500 gigawatt-hours (2007 data), 5500 of those gigawatt-hours being generated on the Railbelt. Most of the 1000 gigawatt-hours generated off the Railbelt comes from renewable hydroelectric power, as does about ten percent of the Railbelt generation. Thus, approximately 1500 gigawatt-hours or about 24% of the state's current electric generation comes from renewable sources. Using the 6500 gigawatt-hour total generation figure, about 3250 gigawatt-hours from renewable sources would be needed by 2025 to achieve the state's 50% goal, or 1750 gigawatt-hours in addition to existing renewable generation.

This level of renewable energy generation could be added to the Railbelt system in a number of ways. The Susitna Dam project would generate about 2600 gigawatt-hours annually, so it alone would exceed the goal when added to existing renewable generation. But adding a combination of smaller scale renewable projects including wind, geothermal, tidal, biomass and landfill methane could also meet the goal, as outlined in the Railbelt Integrated Resource Plan.[2] This incremental approach would offer the advantages of reduced economic and environmental risk, greater ability to incorporate emerging technologies and projects as they become ready for development, and ultimately much greater system diversity compared to, say, a grid powered 90% by hydroelectric and gas.

For these reasons, AEA's presumption that a large hydroelectric project is necessary to reach the state's 50% renewable energy goal is not supported by the evidence. The apparent premise behind the preliminary decision document – that AEA must pursue *some* large hydro project in the Railbelt region – appears unwarranted and its selection of the Susitna Dam project (or any large hydro project) as a "preferred alternative" at this time is premature.

II. The 50% Goal Does Not and Should Not Dictate Construction of Otherwise Inadvisable Projects.

NWF supports the state's renewable energy goal and applauds AEA for seeking to achieve it as it considers energy efficiency programs as well as new generation options for the Railbelt. But it is a goal, not a mandate. Neither AEA nor anyone else pays any penalty if the goal is not achieved. But all Alaskans will pay a substantial penalty if AEA pursues and the legislature funds an overly expensive, risky, or otherwise inadvisable project based on a nonexistent duty to strictly comply with the 50% goal.

III. The Susitna Dam Project Is Economically Risky.

A. Project Cost

At $4.5 billion excluding significant upgrades to the transmission system that will be necessary to accommodate the hydroelectric power created, the Susitna Dam project would represent an enormous

[1] AEA, Railbelt Large Hydro Evaluation: Preliminary Decision Document (November 23, 2010) at 1.
[2] Black and Veatch, Alaska Railbelt Regional Integrated Resource Plan (February 2010) at 13-27.

financial undertaking. Indeed, the electric utilities will likely be able to finance only half of the project cost at best, leaving the state to provide at least a $2.25 billion subsidy and take on the role of project owner and applicant for licensing purposes. This would constitute the largest state subsidy/project investment in history, dwarfing by way of comparison the $500 million the state was willing to provide to entice potential gas line builders in the Alaska Gasline Inducement Act (AGIA), a larger project with the potential for significantly greater benefits for Alaskans.

After subsidizing one renewable energy project to this extent, the public and the state legislature will be understandably wary about spending more. Utility companies may well be unable to finance other desirable or even necessary projects, transmission grid improvements, etc., and Railbelt taxpayers will of course feel the brunt if the financing formulas fail or project performance falls short, with no hope of relief once the project is built.

Finally, even if all is successful – e.g., the project comes in on budget and on time, water flows and the power generation profile is precisely as anticipated and no unforeseen environmental harm occurs – the Susitna Dam is still a very expensive and only partial solution. After spending $5 billion or more, at best we will get 2600 gigawatt-hours of stably-priced power – and still need a natural gas solution for space heat at minimum and likely for at least some of the remaining electricity demand.

B. **Opportunity Cost**

Cook Inlet natural gas has supplied most of the space heat and electricity to the Railbelt for decades. As Dr. Mark Myers with the Division of Oil and Gas made abundantly clear to the Railbelt Integrated Resource Plan Advisory Group, the Inlet is nowhere near "running out of gas." There is plenty of gas still in Cook Inlet; the question is whether the current producers will continue to produce gas to serve Railbelt needs. If the answer were clearly yes, we almost certainly would not be seriously considering the Susitna Dam.

If the answer is no, then the next question is whether other producers, potentially including the state or its contractors, are willing to produce additional gas from Cook Inlet. And here is where AEA and the state have failed to thoroughly examine the options before embarking on a $5 billion hydroelectric alternative.

At least one and perhaps two jack up rigs are on their way to the Inlet this summer. Explorers may be more focused on oil than gas, but a lot of gas has been discovered in the search for oil. Smaller companies like Buccaneer may not need to take the same profit margin as the current major producers, Marathon and Conoco-Phillips. In short, conditions appear reasonably favorable that long-awaited additional exploration and development in the Cook Inlet basin – now undertaken by smaller companies filling the void created by large company inaction – is finally upon us.

More fundamentally, however, the state should no more be taken hostage by small oil and gas companies than large ones. If solving the Railbelt's energy challenge is a state priority, and the proposal to spend $5 billion to fix only half of it certainly suggests that it is, then the state should thoroughly examine its opportunities to lease, purchase, re-purchase, or otherwise acquire or make available lands likely to contain natural gas for development. The state could reprogram the Susitna Dam subsidy to support or undertake incremental Cook Inlet gas development, assuming the market fails to deliver that result. And as noted above, it could support a less risky, more diverse mix of renewable energy projects as well.

IV. The Susitna Dam Project is Environmentally Risky

Given the history of ecological problems caused by the construction and operation of large riverine dams elsewhere in the United States and worldwide, we were surprised to see AEA's discussion of this topic, which seems to dismiss the notion of any substantial foreseeable environmental impacts associated with the project.

Significant impacts associated with large dams around the world include fragmentation of the riverine ecosystem, isolating species on either side of the dam and restricting or preventing migrations and other species movements. Most dams reduce natural flooding, separating the river from its floodplain and replacing the natural system with a new reservoir. This reduction or elimination of natural flooding and associated wetlands has been described as perhaps the single most ecologically damaging impact of a dam.[3] Additionally, the creation of the reservoir itself of course inundates a great deal of riverine habitat, and this conversion of habitat type has led to the loss of plant and animal life adapted to the river valley. Because river and floodplain habitats are typically very high in species diversity, such diversity is usually lost when that habitat is inundated and floodplains disappear.[4]

In addition to these traditional concerns associated with large dams, there is also a new debate about whether these projects provide "clean" power in the sense of reducing greenhouse gas emissions, as many people intuitively assume is the case. At least when reservoirs inundate forested areas, however, scientists are claiming that they do not.[5]

Thus, while it is true that the proposed Susitna Dam would not physically block salmon migration (except for an unknown but presumably small number of king salmon that migrate upriver beyond the proposed dam site), numerous ecological issues and risks remain that do not appear in the preliminary decision document but that should give AEA serious pause.

CONCLUSION

NWF appreciates AEA's effort to seek energy solutions on the Railbelt and to consider the state's goal of producing 50% of our electricity with renewable energy by 2025 in doing so. We are not convinced, however, that a decision identifying the Susitna Dam project as a "preferred" project for the Railbelt is appropriate at this time. We look forward to continuing to participate in efforts to identify and pursue the most sensible and cost-effective solutions possible, while striving to strengthen and diversify the Railbelt energy portfolio.

---

[3] *Silenced Rivers: The Ecology and Politics of Large Dams* (Patrick McCully, Zed Books 1996).

[4] *See, e.g., Biodiversity Impacts of Large Dams* (Prepared for IUCN/UNEP/UNF by D.McAllister et. al 2001), available at http://intranet.iucn.org/webfiles/doc/archive/2001/IUCN850.PDF; *Silenced Rivers: The Ecology and Politics of Large Dams* (Patrick McCully, Zed Books 1996); *The Social and Environmental Impacts of Large Dams* (Edward Goldsmith, Wadebridge Ecological Centre 1984); R.T. Kingsford, *Ecological Impacts of Dams, Water Diversions and River Management on Floodplain Wetlands in Australia*, 25 Austral Ecology, p. 109-127 (2000) (finding reduced natural flooding causing reduced vegetation health, declining numbers of waterbirds and nesting, and declining native fish and invertebrate populations).

[5] *See, e.g.,* Graham-Rowe, *Hydroelectric power's dirty secret revealed* (New Scientist, Feb 24, 2005)(citing studies finding that inundated vegetation produces a build-up of dissolved methane, which is released into the atmosphere when water passes through the turbines. Methane is a potent greenhouse gas that can trap heat 21 times more effectively than carbon dioxide.)

We would welcome the opportunity to discuss this issue further at your convenience.

Yours truly,

Patrick Lavin
lavin@nwf.org
(907) 339-3909

Cc: Jim Strandberg, AEA
Bryan Carey, AEA
Rep. Bill Stoltze
Rep. Bill Thomas, Jr.
Senator Bert Stedman
Senator Lyman Hoffman
Regulatory Commission of Alaska

Document Content(s)

September 22, 2011

Subject: Susitna-Watana Hydroelectric Project (FERC No. 14241)
Pre-Application Document Recreation Resources Information Questionnaire

Dear Interested Party -

The Alaska Energy Authority (AEA) is beginning a Federal Energy Regulatory Commission (FERC) licensing process for the proposed Susitna-Watana Hydroelectric Project (Project), located at river mile 184 on the Susitna River, about half-way between Anchorage and Fairbanks. Engineering studies are underway to determine the most economically and environmentally suitable dam, powerhouse, transmission line, and access road/railway locations. MWH Americas, Inc. (MWH) is assisting the AEA in the licensing of the Project. The purpose of this letter is to:

1. Notify interested outdoor recreation providers and other interested individuals and groups of the upcoming licensing proceedings; and

2. Request your assistance in identifying existing and reasonably available recreation-related information relevant to the Project area and its vicinity.

A Susitna Hydroelectric Project was formerly proposed by the Alaska Power Authority (now AEA) in the early 1980s (FERC No. 7114) to be comprised of two major dams (the Watana Dam and Devil Canyon Dam) constructed in three stages, although it was never licensed or built. The currently proposed Susitna-Watana Project's dam is located at the same location as the former Susitna Project's Watana Dam site although is smaller and does not include a Devil's Canyon development. AEA, MWH, and many other agencies and consultants have or are reviewing information available in the earlier Susitna Project's licensing files, and will utilize the information that remains relevant in the new project licensing process. There are a series of similar information gathering efforts regarding important aquatic, terrestrial and cultural resources for the proposed Project area. For this questionnaire we appreciate if you can please help us identify recreation-related resources *other than* those related to the Susitna Project proposed in the early 1980s.

In 2008, the Alaska State Legislature authorized the AEA to again assess the feasibility of developing a hydroelectric project on the Susitna River. As currently envisioned by the AEA, the Susitna-Watana Hydroelectric Project would create a dam on the Susitna River, about 15 miles upstream of Devils Canyon and about 90 miles upstream of Talkeetna. The formal FERC licensing process will begin with the preparation and filing of a Pre-Application Document (PAD) and associated Notice of Intent (NOI) to file a License Application. The PAD is intended to provide FERC and stakeholders with existing and reasonably available information relevant to the Project site and will assist in identifying potential issues, determining information needs, developing study requests and plans, and preparing other documents required to analyze the License Application.

We would appreciate your taking a few minutes to complete the attached questionnaire and letting us know if you are aware of recent information relevant to this Project, or specific recreation or tourism-related resource issues that should be addressed during the licensing process. Your assistance at this time will help us produce a complete and more relevant PAD. To help ensure that information you may have is available for inclusion in the PAD, please fill out the attached PAD Information Questionnaire and return it by email if possible to kirby.gilbert@mwhglobal.com or bcarey@aidea.org within the next few weeks if possible. Alternatively, you can mail a filled-out hard copy of this questionnaire to: AEA; Attn: Bryan Carey; 813 W. Northern Lights Blvd; Anchorage, AK 99503. After the PAD is prepared, we hope you will be able to participate in follow-on meetings through 2012 and 2013.

Thank you for your interest in the Susitna-Watana Hydroelectric Project and for any information you are able to provide.

Sincerely,

Kirby Gilbert

Kirby Gilbert, MWH

Meeting Summary
Susitna-Watana Hydroelectric Project Licensing
Meeting with EPA
1:00 pm – 2:30 pm, September 29, 2011
Held at EPA Offices
Federal Building, 222 West 7th Avenue, Anchorage, AK 99513

Purpose of Meeting: To discuss with representatives of the EPA the Susitna Watana Project, how EPA would participate and what issues or regulatory processes are important.

Attendees:

Present for AEA	Bryan Carey, Project Manager
Present for the EPA	Matt LaCroix
Present for the EPA	Jennifer Curtis
Present for CardnoEntrix	Jim Gill
Present for MWH	Kirby Gilbert
Present as MWH, Subcontractor, Long View Associates	Steve Padula

Items Discussed with USGS:

- Kirby and Bryan introduced status of the project and discussed the previous agency meetings and interests.
- The EPA mostly gets involved in large projects like this through the Clean Water Act 404(b)(1) guidelines but they also perform NEPA reviews pursuant to Section 309 of the Clean Air Act.
- Matt and Jennifer expressed interest in getting added to the Project website listserv
- EPA will evaluate the environmental impact analysis for the project but looks to other Federal agencies for expertise on resource issues and specific recommendations.
- EPA co-administers the 404 permits with the Corps.
- For the 404(b)(1) analysis, restrictions on disposal of fill, Subpart A and B are key regulations. Matt described there are 4 restrictions on Fill.
- #1 restriction is the Corps can only authorize the Least Environmentally Practicable Damaging Alternative (LEPDA).
- There was a lot of discussion about alternatives and what was a Practicable alternative. Matt described that Practicable considers existing technology, logistics, and costs. It was recommended to AEA to cover a broad array of alternatives.
- If AEA is to eliminate alternatives in licensing, do not assume anything, be sure and describe the obvious.
- An alternative can be not “practicable” if one cannot build it. When looking at road choices, the route with standard grades and turning radius, etc. can be chosen based upon industry standards which are “practicable” verses a road that cannot achieve or meet the standards without re-engineering the countryside.
- #2 restriction is about compliance with other regulations like Endangered Species Act, or State Water Quality Standards.

- #3 restriction is essentially a prohibition of the Corps to authorize projects with significant degradation to water quality. NMFS, USFWS and EPA give input on significance.
- #4 restriction is about avoidance and other mitigation including water management and discharge controls.

Kirby Gilbert, Sr. Regulatory Specialist, MWH

Meeting Summary
Susitna-Watana Hydroelectric Project Licensing
Meeting with Alaska Department of Environmental Conservation
9:30am – 11:00am, September 30, 2011
Held at ADEC Offices
555 Cordova, Anchorage, AK 99501

Purpose of Meeting: To discuss with representatives of the ADEC the Susitna Watana Project, how ADEC would participate and what issues or regulatory processes are important.

Attendees:

Present for AEA	Bryan Carey, Project Manager
Present for the ADEC	William Ashton
Present for CardnoEntrix	Jim Gill
Present for MWH	Kirby Gilbert
Present as MWH, Subcontractor, Long View Associates	Steve Padula

Items Discussed with ADEC:

- Kirby and Bryan introduced status of the project and discussed the previous agency meetings and interests.
- The ADEC has been waiving issuance of 401 water quality certifications for hydro projects in Alaska for some time, but they might reconsider for a project of this magnitude. They would likely prepare a 401 for the licensing and another for the construction through the Corps 404 permit process.
- Bradley and Terror Lake Projects may have been the last 401 certifications they issued for hydro projects.
- Normally they participate with the Corps and the Public Notice under the 404 permit application process serves as formal notice and acceptance of 401 application, but given the size of this project William anticipates they will need supplemental information.
- The stormwater program is a different part of ADEC that will have rules to comply with regarding construction. A construction/stormwater permit under the General Permit requirements will likely be needed.
- The 401 certification for the project would likely address temperature, dissolved oxygen, and possibly turbidity.
- The Corps administers wetland mitigation and the Mat-Su Borough has a mitigation bank.
- If dissolved oxygen is high in Devils Canyon and there is future desire to try and have the project output help the management of DO, then it is possible to get a variance to the standards.
- There currently is no Coastal Zone Management Program for the State, but it use to reside within ADNR.
- William reports to Sharon Morgan who reports to the Deputy Director.

Kirby Gilbert, Sr. Regulatory Specialist, MWH

MWH

Meeting Summary
Susitna-Watana Hydroelectric Project Licensing
Meeting with Cassie Thomas, NPS
1:00 pm – 2:30 pm, September 30, 2011
Held at MWH Offices
1835 Bragaw; Suite 350, Anchorage, AK 99508

Purpose of Meeting: To discuss sources of social sciences information and other information sources and needs with Cassie Thomas of the National Park Service.

Attendees:

Present for AEA	Bryan Carey, Project Manager
Present for AEA (Cardno Entrix)	Jim Gill
Present for MWH	Kirby Gilbert
Present for Long View Associates	Steve Padula

Items Discussed:

- For recreation information it would be good to contact –
  - Air taxi operators
  - Mahay's Riverboat Service in Talkeetna
  - Fairbanks Paddler
- Recreation boaters range from whitewater boaters to hunters on float trips
- The Alaska Outdoors Bulletin Board is a good source of information
- ADF&G would have information on hunting success verses effort
- The Alaska Railroad could provide user numbers for the Whistle Stop train service
- It is important to check with ADNR on mental health and University trust lands and recreation management/use for the State lands in the area
- Look into 17(b) easements under ANILCA
- Kevin Keeler of BLM can help with Iditarod National Trail information
- Alaska Trails is a good website to check
- Look into potential Pack Rafting use of the Susitna and tributaries
- For visual resources establishing key vantage points/viewing areas will be important
- Should also consider Night Sky policies and effects

Kirby Gilbert, Sr. Regulatory Specialist, MWH

MWH

Meeting Summary
Susitna-Watana Hydroelectric Project Licensing
Meeting with Alaska SHPO
1:30 pm – 2:30 pm, October 13, 2011
Held at Office of History & Archaeology
555 West 7th Avenue, Anchorage, AK 99501

Purpose of Meeting: To discuss with representatives of the State Office of History and Archaeology the Susitna Watana Project, how the office would participate and what issues or regulatory processes are important.

Attendees:

Present for AEA	Bryan Carey, Project Manager
Present for the AEA	Betsy McGregor, Env. Manager
Present for MWH	Kirby Gilbert
Present of Office of History & Archaeology	Dave McMahan
Present of Office of History & Archaeology	Shina duVall
Present of Office of History & Archaeology	Richard VanderHoek

Items Discussed with Staff of Office of History & Archaeology:

- Kirby and Bryan introduced status of the project and discussed the previous agency meetings and interests.
- Typically FERC takes the lead on Section 106 consultation and compliance
- An Area of Potential Effect (APE) will need to be defined for studies based on potential direct and indirect effects to historic properties.
- Discussion of funding agreements between AEA and ADNR through an RSA
- SHPOs office helps with permitting of projects on State lands
- It will be important to make determinations of eligibility of sites in consultation with FERC.
- Ethnographic studies will probably be need to identify traditional cultural properties, if any, as that was not something required in the 1980s studies
- A programmatic agreement will probably be necessary to allow the project to proceed in compliance with Section 106 as not all the adverse effects can be predicted
- If AEA sends the SHPO office a letter introducing the project, they can assign a file number for the new project.
- Paleontological resources do not receive protection under Section 106 of NHPA, rather there is a statute under Paleontological Protection Act (PURPA)
- The University of Alaska, Fairbanks provides curation services for the State
- There are new techniques to evaluate the geography/soils to determine areas which might require further surveys. Loess areas can have some deep deposits worth investigating.

- Previous sites studied in the 1980s do not have good mapping, all was done by hand on USGS maps. There also was not determination of eligibility for identified sites.

Kirby Gilbert, Sr. Regulatory Specialist, MWH

Meeting Summary
Susitna-Watana Hydroelectric Project Licensing
Aquatic Resource Issues Agency Meeting
10 a.m. - 4 p.m., October 24, 2011
Held at 4th Floor Conference Room, CIRI Building
2525 C Street, Anchorage, AK

Purpose of Meeting:

Present and discuss results of hydrologic analysis to date, discuss fish and aquatic/water quality/sediment transport initial issue and study concept identification with resource agency representatives

Attendees:

AEA:	Bryan Carey, engineering manager
AEA:	Betsy McGregor, env. manager
AEA:	Emily Ford, public affairs
CardnoEntrix	Jim Gill, assistant to AEA
MWH	Kirby Gilbert
MWH	John Haapala
Long View Associates	Steve Padula
Long View Associates	Randall Filbert
Long View Associates	Finlay Anderson (by phone)
3PPI	Sally Morsell
	John Morsell
CardnoEntrix	Woody Trihey
CardnoEntrix	Lynn Noel
CardnoEntrix	Jean Baldrige
CardnoEntrix	Steve Nevares
USGS	Dave Meyer
Ahtna, Inc.	Kathryn Martin
FERC	Kim Nguyen
FERC	David Turner (by phone)
FERC	Matt Cutlip (by phone)
EPA	Matthew LaCroix
EPA	Jennifer Curtis
ADNR, Division of Water	Gary Prokosch
ADEC	William Ashton
BLM, Glennallen Resource Area	Tim Sundlov
BLM	Mike Sondergaard
BLM	Elijah Waters
NPS	Cassie Thomas
USFWS	Mike Buntjer
USFWS	Betsy McCracken

MWH

USFWS	Jennifer Spegon
NMFS	Eric Rothwell
NMFS	Sue Walker
NOAA General Counsel	Thomas Meyer (by phone)
ADF&G	Monte Miller
ADF&G	Jason Mouw
ADF&G	Joe Klein
ADF&G	Ron Benkert
ADF&G	Mike Bethe
ADF&G	Joe Giefer
ADF&G	Jack Erickson
ADF&G	Ed Weiss
ADF&G	Sarah Hazell
ADF&G	Mark Fink
USDA –Rural Development	Eric Marchegiani
Senator Joe Thomas Office	Grier Hopkins
Aquaacoustics	Don Degan
Aquaacoustics	A M Mueller
Northwest Hydraulics	Malcolm Leythan
Alaska Restoration and Research Institute	Jeff Davis
HDR	James Brady
HDR	Robin Beebee
ABR	Terry Schick
URS	Paul Dworian
LGL Alaska	Michael Link
DOWL HKM	Kristen Hansen
Coalition for Susitna Dam Alternatives	Becky Long (by phone)
Van Ness Feldman	Mike Swiger (by phone)
Alaska Conservation Alliance	Kate McKeown
Alaska Ratepayers	Scott Crowther
R2 Resource Consultants	Dudley Reiser (by phone)

Presentations:

- David Meyer (US Geological Survey, Alaska Science Center): Hydrologic Monitoring in the Susitna Basin.
- John Haapala (MWH): Susitna-Watana Hydroelectric Project, Hydrology and Operation Modeling.
- John Haapala (MWH): Susitna-Watana Hydroelectric Project, Operations and Climate Change.

Questions/Discussion Related to Presentations

USGS - Hydrologic Monitoring in the Susitna Basin

USGS provided clarification regarding the following stakeholders questions/comments:

- Low- and high-flow statistics for the Susitna River and its tributaries.
- Establishing relationships between existing flow data and data collected in the future as part of licensing.
- Ability to assess Project-induced flow changes based on the existing USGS record.

MWH - Hydrology and Operation Modeling

MWH addressed the following stakeholder questions and comments regarding potential Project operations:

- Potential frequency of spill events at the proposed Watana Dam.
    - Spillway flows would be infrequent, i.e., at 50-year flood frequency.
    - Low-level outlet flows, when the reservoir is full and the powerhouse is already operating at capacity, would occur in most years.
- Basis of firm power reliability estimates.
    - For the base case run, firm power was defined as the power that can be supplied with 98 percent reliability during November through April.
- Relative benefits of HEC-ResSim and HEC-Ras[1].
    - HEC-RAS includes detailed hydraulic flow routing but does not include reservoir operations; HEC-ResSim includes simplified hydrologic flow routing that has been shown to produce accurate results and also includes reservoir operations.
- Effects of a lack of flow routing on modeled comparisons of natural and "with-project" flows.
    - Lack of flow routing results in failure to account for attenuation.
- Year-to-year deviations from estimated long-term average power output.
- Project generating capacity relative to inflows/reservoir storage.
    - The ratio of the average annual inflow volume to active storage is about 0.4 (40 percent).
    - The ratio of average generation to the generation that would be produced if the plant were to operate at maximum capacity all of the time is about 0.5 (50 percent). This is a typical value for hydroelectric plants that have storage reservoirs.
- Project generation versus Railbelt energy demand.

[1] HEC-ResSim and HEC-Ras have been designed and developed by the Hydrologic Engineering Center of the U.S. Army Corps of Engineers to perform Reservoir System Simulation. It is intended to meet the needs of real-time reservoir regulators for a decision support tool, as well as the needs of modelers doing reservoir studies.

    - The Project could provide up to 50 percent of annual Railbelt electrical demand.
- Source of modeled environmental flow releases.
    - Environmental flows from Scenario E-VI from Exhibit E of the 1985 Susitna Project FERC license application were used as a convenient starting point for operations modeling to present representative routing downstream and reservoir capabilities. These do not represent proposed flows for the current project.
- Inclusion of flushing flows in the operation model.
    - Flushing flows were not included.
- Estimated reservoir capacity.
    - The active storage capacity between elevation (El) 1850 feet and El 2000 feet is 2.4 million acre-feet.

MWH - Operations and Climate Change

MWH and USGS addressed the following stakeholder questions and comments regarding potential Project operations and climate change estimates:

- Potential effects of shrinking glaciers on future Project operations.
    - Glacial melting resulting from atmospheric warming may initially increase the volume of water available for power generation, although this effect is not evident in the recorded stream flow record. However, over the longer term the contribution of glacially produced water could decline. It is uncertain, and not possible to identify the inflection point between the two scenarios. In the distant future, declining flows from glacier wasting could be counterbalanced by projected increases in precipitation.
- Inclusion in operations modeling of El Niño, La Niña, and Pacific Decadal Oscillation (PDO).
    - These phenomena are incorporated into operations modeling to the extent that they have affected historic recorded flows. Additional summary information on long-term weather cycles is expected to be provided in a technical memorandum.
- Likelihood of increased precipitation in Alaska as the result of climate change.
    - In general, Alaska is expected to receive more precipitation in the future, particularly in the southern/eastern part of the state.

Study Workgroup Concepts and ILP Planning Efforts for Studies

The AEA team discussed the following study workgroup concepts and Integrated Licensing Process (ILP) planning efforts for studies:

- Work Group structure, function, core membership, and public attendance.
- Resource areas for which Work Groups would likely be formed: Aquatic; Water Quality; Terrestrial; Recreation, Socioeconomics, Aesthetics; and Cultural.
- The need to schedule Work Group meeting dates in a staggered fashion to ensure that core members responsible for multiple resources can attend all necessary meetings.

- Overview of the ILP schedule.
- Posting of materials on the AEA website http://susitna-watanahydro.org/.
- The need for 2011 Work Group meetings to allow AEA to develop requests for proposals (RFPs) for 2012 field studies.
    - It was agreed that initial meetings would be held in early December 2011.
- Agency staff stressed the need for AEA to send meeting materials to Work Group members in advance of meetings, preferably at least two weeks before meetings.

Discussion of Fish and Aquatic/Water Quality/Sediment Transport/Ice Dynamics Initial Issues and Study Concepts:

The AEA team discussed Project-related issues and potential studies and addressed stakeholder questions pertaining to aquatic resources, water quality, sediment transport, and ice dynamics as follows:

- Comments on potential issues and study needs provided by stakeholders by the end of November 2011 would be useful to help complete the PAD.
- Woody Trihey, who lead many of the aquatic studies in the 1980s, discussed the potential effects of the Project's existence and operation on (1) flow and resulting changes in fluvial geomorphology, riparian vegetation, groundwater, and ice dynamics in the reservoir and the Susitna River, downstream of the proposed dam site, including the mouths of tributaries draining into the Susitna River and side sloughs and (2) Project effects on water quality in and downstream of the proposed reservoir.
    - Impacts of the Project on the river would vary as a function of distance downstream of the dam, flow and sediment inputs from tributaries, alluvial versus bedrock conditions, elevation, etc.
- Trihey made a point that based on prior experience there are tremendous logistical and safety-related concerns and limitations associated with conducting fieldwork in the remote, dynamic, and potentially harsh conditions occurring in the Susitna River basin.
- Stakeholders asked the following questions and received responses from Trihey based on outcomes of 1980s work:
    - How would the Project likely affect turbidity in the middle Susitna River?
        - Turbidity during winter in the potentially ice-free reach immediately below the dam could actually increase as glacial flour suspended in the reservoir is released from the generating units.
    - How would the Project affect ice formation downstream of the Project?
        - Because of the release of warmer water during the normal freeze-up period, frazil ice would not be generated for a considerable distance downstream of the dam. Ice formation would be reduced or lacking in the reach between the dam and Devil Canyon.
    - How would the Project affect groundwater upwelling in side sloughs?
        - Under current conditions winter ice cover maintains upwelling in side sloughs. A reduction of winter ice in the future could reduce hydrostatic pressure, thereby potentially reducing localized upwelling.

  - How would a reduction in ice cover affect riparian vegetation?
    - A reduction in ice-induced effects on channel geomorphology would likely result in encroachment of riparian vegetation, including large shrubs and trees.
  - What effect might the Project have on reservoir ice formation?
    - The surface layer of ice on the reservoir would likely be unstable as the result of fluctuations in water surface elevation, potentially making it difficult for animals to cross the reservoir in winter.
  - What size sediment would pass downstream of the dam?
    - Only sediment particles less than about 8-10 µm would pass downstream of the dam.
  - Would the Project affect fish passage conditions in the Devil Canyon Reach?
    - The Project will reduce spring flows, thereby increasing the likelihood that Chinook will more easily pass through the Devil Canyon reach.
  - Would the Project influence the relative abundance of various habitat types downstream of the Project?
    - The river may be in a state of dynamic equilibrium, and it will be important to study the potential effects of the Project on the relative abundance of different habitat types in the Middle River.
  - How would temperature changes in the river downstream of the dam affect fish and other aquatic biota in the mainstem?
    - If more Chinook can access the reach between Devil Canyon and the dam, warmer water temperatures could increase juvenile survival and growth rates. Invertebrate production could also be increased.
  - Do both juvenile coho and chinook salmon use turbid water for rearing in the Susitna River?
    - Based on existing information, juvenile coho prefer clear water, whereas juvenile Chinook were found at the turbid water – clear water interface; it was assumed that Chinook used the turbid water for cover and the clear water area for foraging.
- Stakeholders stated that existing ice dynamics should be assessed as part of early studies conducted in 2012.
- Stakeholders emphasized the importance of thoroughly studying the Project's potential effects on turbidity.
- Stakeholders asked when LiDAR[2] data for the Susitna River would be available.
  - LiDAR data, with imagery, are expected to be available in spring 2012.
- AEA agreed to coordinate with the Alaska Department of Fish and Game to acquire a summary of recently collected salmon distribution/life history data for the Susitna River.

[2] **LiDAR** (**Light Detection And Ranging**) uses ultraviolet, visible or near-infrared light to image objects, using a narrow laser beam to map physical features with very-high resolution.

- Stakeholders asked about operational flows.
    - Answer was that given that flows would likely be base flows [3]. .

Kirby Gilbert, Sr. Regulatory Specialist, MWH & Randall Filbert, LVA

Action Items:

- AEA will post to its website the provisional recommended environmental base flows from the 1985 Susitna FERC Application Scenario E-VI from Exhibit E that were incorporated into the hydraulic and operational flow modeling presented by Haapala as a convenient starting point. Note that these do not represent proposed flows for the current project.
- AEA will coordinate with ADF&G to identify ongoing ADF&G studies within the Project Area and will post the list of studies to its website.
- To the best of its ability, AEA will post to its website meeting agendas, presentations and handouts prior to scheduled work group meetings.
- AEA will post to its website the ILP schedule.

[3] Subsequent to the meeting it has been decided that some load following ability would be beneficial to the project. Effects of magnitude, frequency, and timing will be assessed in 2012.

Meeting Summary
Susitna-Watana Hydroelectric Project Licensing
Terrestrial Resources Initial Issue Identification and Study Concepts
1:00-3:00 pm; October 25, 2011
CIRI Building – 4th Floor Conference Room
2525 C Street Anchorage, AK

Purpose of Meeting:

- Presentation by MWH on tentative Project footprint/transmission corridors.
- Discuss study Work Group concepts and Integrated Licensing Process (ILP) Planning efforts for studies.
- Initial issues and study concepts identification for Wildlife Species Surveys, Vegetation Mapping, and Wetlands.
- Discussion of possible 2012 studies versus the formal study program to be planned with agencies in 2012 and conducted in 2013 and 2014.

Attendees:

AEA	Bryan Carey, Engineering Manager
AEA	Betsy McGregor, Environmental Manager
AEA	Emily Ford, Public Outreach Liaison
CardnoEntrix	Jim Gill
Attorney General's Office	Brian Bjorkquist
MWH	Kirby Gilbert
Long View Associates	Steve Padula
Long View Associates	Randall Filbert
3PPI	Sally Morsell
CardnoEntrix	Woody Trihey
CardnoEntrix	Lynn Noel
CardnoEntrix	Jean Baldrige
CardnoEntrix	Steve Nevares
Ahtna, Inc.	Kathyrn Martin
ADF&G	Joe Klein
ADF&G	Todd Rinaldi
ADF&G	Tim Peltier
ADF&G	Jason Mouw
ADF&G	Ed Weiss
ADF&G	Mike Petrula
ADF&G	Joe Giefer
ADG&G	Ron Benkem
USFWS	Mike Buntjer
USFWS	Betsy McCracken
USFWS	Jennifer Spegon
USEPA	Jennifer Curtis

BLM	Tim Sundlov
BLM	Elijah Waters
NPS	Cassie Thomas
ADNR	Jusdi McDonald
ADNR – Office of History & Archaeology	Richard VanderHoek
Alaska Conservation Alliance	Kate McKeown
Senator Joe Thomas Office	Grier Hopkins
Dowl HKM	Kristen Hansen
ABR	Brian Lawhead
URS	Paul Dworian
HDR Alaska	Anne Leggett
NLUR	Pete Bowers
USDA –Rural Development	Eric Marchegiani
URS	Stephen Trimble
Van Ness Feldman	Matt Love

Presentations:

- Kirby Gilbert (MWH): Tentative Project Footprint/Transmission Corridors.

Questions/Discussion Related to MWH Presentation

MWH addressed the following stakeholder questions and comments regarding the tentative Project footprint/transmission corridors:

- When will maps showing the proposed transmission line corridors and road access routes be available?
    - Maps showing the proposed transmission line corridors and road access routes will be included in the PAD and will likely be posted on the AEA website in the near future.
- Will there be a need for an access road to the east end of the reservoir?
    - Currently there appears to be no need for an access road leading to the east end of the reservoir, although potential recreational needs will be considered when developing a recreation plan for the Project.
- Will the borrow pit on the south side of the dam site be accessible following construction of the Project, and if so, will there be an access road across the dam?
    - Permanent access routes are not fully known, but Project personnel will be able to cross the dam with work vehicles.
- AEA will need to consider soil type and permafrost conditions when planning road alignments.
    - AEA and ADOT have hired geotechnical consultants to evaluate soil conditions. Results of analyses will be presented to stakeholders in the future.
- Where will the Project airstrip be located?
    - The precise location of a future airstrip is not finalized, but we have a tentative location near the dam on the north side of the river. Environmental studies will

help determine locations or layouts for some facilities in order to help minimize environmental impacts.

- How many workers will be housed near the dam site when the Project is under construction?
    - More information regarding the size and scheduling of construction crews will be available in the future and depends on the dam type. The number of people on site would be low in winter and at times would be high during summer. The Project would be operated remotely from Anchorage, so the permanent onsite staff would be much smaller than that envisioned in the 1980s.
- Will material for construction of roads be derived from the area to be inundated by the reservoir?
    - No, the likely scenario would be to develop multiple, small borrow pits along the road corridor to provide construction materials.
- How long will the river be diverted while the dam is being constructed?
    - AEA is still determining what type of dam construction would be used, which would influence the duration of construction and, therefore, the period of diversion. The PAD will provide a description of the type of dam to be built and timeframes associated with construction and river diversion. Construction would be conducted year-round to reduce the duration of diversion.

Study Workgroup Concepts and ILP Planning Efforts for Studies

The AEA team discussed the following study workgroup concepts and ILP planning efforts for studies:

- Work Group structure, function, core membership, and public attendance.
- Resource areas for which Work Groups would likely be formed: Aquatic; Water Quality; Terrestrial; Recreation, Land Use, Aesthetics; and Cultural.
- The need to schedule Work Group meeting dates in a staggered fashion to ensure that core members responsible for multiple resources can attend all necessary meetings.
- Overview of the ILP schedule.
- Posting of materials on the AEA website.
- The need for 2011 Work Group meetings to allow AEA to develop requests for proposals (RFPs) for 2012 field studies.
    - It was agreed that initial meetings would be held the week of December 5, 2011.
- Stakeholders stressed the need for AEA to send meeting materials to Work Group members in advance of meetings, preferably at least two weeks before meetings.

Discussion of Initial Issues and Study Concepts Identification for Wildlife Species Surveys, Vegetation Mapping, and Wetlands:

The AEA team discussed Project-related issues and potential studies and addressed agency staff questions pertaining to Wildlife Species Surveys, Vegetation Mapping, and Wetlands:

- It was noted that ice dynamics should be identified as a specific study need and that work on this subject should begin in 2012.

- Meeting participants asked the following questions and received responses from the AEA team:
    - Would the reservoir bottom near the shoreline be steep or more gently sloped, a factor that would influence habitat suitability for waterfowl?
        - Slopes in the vicinity of the Watana Creek inflow would be relatively gentle, whereas the shoreline around most of the remainder of the reservoir generally would be steep.
    - Would timber growing in the area to be inundated be removed before the reservoir is filled?
        - Timber maybe removed prior to the filling of the reservoir to reduce the potential for impacts associated with the decomposition of submerged organic matter. (The issue of removal vs no removal will be studied).
    - Geology and soils mapping will be important for assessing the potential distribution of bat roosting sites and hibernacula. When will such mapping be conducted?
        - Contractors are available to conduct mapping to supplement, as needed, work done during the 1980s. The rock in the region of the proposed reservoir is granitic, i.e., not a material likely to provide caves for bats.
- It was noted that Alaska Department of Fish and Game files could provide valuable information based on recently conducted wildlife surveys.

Other Studies-Related Questions and Comments

- Stakeholders recommended that baseline data be collected through informal surveys of key providers and user groups on recreation use in and downstream of the Project vicinity prior to there being any significant disturbance associated with conducting field studies. Collection of baseline recreation information should begin with interviews of lodge and air taxi operators. Preliminary activities in 2012 would not need to involve statistical surveys.
- Stakeholders noted that AEA should plan to conduct assessments of visual characteristics in the Project vicinity and be prepared to assess the Project's impacts on aesthetics as part of licensing studies.
- Stakeholders stated that AEA should begin planning soon for cultural resources investigations.
    - Cultural resource issues will be discussed at the meetings to be held during the week of December 5, 2011. Following initial identification of issues, AEA will reach out to native groups before conducting any studies.
- AEA should consider measures to prevent trespassing on native-owned properties during the conducting of studies or construction activities, and to prevent work crews from trespassing during non-work periods.

Randall Filbert, LVA & Kirby Gilbert, Sr. Regulatory Specialist, MWH

Action Items:

- AEA will post to its website meeting agendas, presentations and handouts prior to scheduled work group meetings.
- AEA will post to its website the ILP schedule.

SUSITNA-WATANA
HYDROELECTRIC PROJECT

Meeting Summary
Water Resources Agency Workshop
on 2012 Studies and Issues
9 a.m. – Noon, December 7, 2011
Held at AEA Project Offices Conference Room,
411 W 4th Avenue, Suite 1, Anchorage, AK

Purpose of Meeting:

Present and discuss 2012 Study Plans.

Attendees:

AEA	Betsy McGregor, Env. Manager
AEA	Emily Ford, Public Affairs
AEA	Wayne Dyok, Project Manager
AEA	Audrey Alstrom
AEA	Doug Ott
Cardno-Entrix	Jim Gill, Assistant to AEA
MWH	Kirby Gilbert
Long View Associates	Steve Padula
Cardno-Entrix	Woody Trihey
Cardno-Entrix	Lynn Noel
Cardno-Entrix	Craig Addley
Cardno-Entrix	Mitchel Katzel
Cardno-Entrix	Steve Nevares
Van Ness Feldman	Jonathan Simon
Tetra Tech	Robert Plotnikoff
Tetra Tech	Bill Fullerton
Long View / NES	John Morsell
Coalition for Susitna Dam Alternatives	Becky Long
DNR; Div. of Geological & Geophysical Surveys	Rod Combellick
USFWS	Betsy McCracken
USGS, ASC	David Meyer
URS	Paul Dorian
USFWS	Mike Buntjer
USFWS	Bill Rice
ADWR	Gary Prokosch
ABR / GWS	Dave Brailey
CIRI	Dara Glass
DOWL HKM	Kacy Hillman

USBLM	Mike Sondergaard
HDR	Robin Beebee
USEPA	Matthew LaCroix
NHI HRC	Jan Konigsberg
ADEC	William Ashton
ADF&G	Joe Klein
ADF&G	Ron Benkert
NWF	Pat Lavin
USFWS	Jennie Spegon
State of Alaska, AG's Office	Brian Bjorkquist
HDR	James Brady
NMFS	Eric Rothwell
USDOI	Michael Baffrey
Knikatnu, Inc.	Tom Harris
NMFS	Sue Walker
E-Terra	Lars Gleitsmann
(*None listed*)	Scott Crowther
AEA	Bryan Carey
FERC	Paul Makowski (by phone)
MWH	John Haapala (by phone)
R2	Stuart Beck (by phone)
GW Scientific	Mike Lilly (by phone)
ARRI	Jeff Davis (by phone)
3PPI	Sally Morsell (by phone)
NHC	Dave McLean (by phone)
NHC	Gary Van Der Linne (by phone)
EPA	Jennifer Curtis (by phone)

Presentations:

- Kirby Gilbert (MWH): HEC ResSim Description for Susitna-Watana Hydroelectric Project.
- Craig Addley (Cardno-Entrix): Review of Existing Water Temperature Data and Models
- Mitchel Katzel (Cardno-Entrix): Determine Bed and Suspended Load by Size Fraction at Tsusena, Gold and Sunshine Gages
- Mitchel Katzel (Cardno-Entrix): Geomorphic Assessment of Middle River Reach using Aerial Photography
- Woody Trihey (Cardno-Entrix): Document the Formation of River Ice Downstream of Watana Dam Site

Questions/Discussion Related to Presentations

MWH – Hec ResSim cross sections

- Hec ResSim is an operations model that includes downstream flow routing coupled with reservoir operations.
- Output will provide hourly flow rates and water elevations at specified transects.
- MWH is starting model development using 1980s cross sections – there are 68 within the Middle Reach below Devils Canyon and 23 between Devils Canyon and the Watana dam site.
- 2012 study plan is to perform additional cross-section surveys initially trying to find 1980s cross-section locations and updating those measurements by establishing vertical and horizontal control points, getting the bed profiles and obtaining roughness values using photography.
- Discussion about what other data might be collected at the same time the transects are being established and measured. Perhaps some site geological conditions such as rock types could be documented.
- Concurrent flow measurements should be taken at each transect during the surveys.
- Need for a current GIS map with locations on aerial photography of all the 1980s transects.
- Discussion about extending cross-section measurements to bankfull to bankfull, or control points above the bank, or 100-yr floodplain. It was noted this model is not being used for flood routing and LiDAR may help establish top of bank in flood conditions.
- There may be a future need for 100-year flood routing to understand sediment transport conditions, and perhaps that can be added to the study later.
- Need to include cross sections in the Lower River Reaches below Talkeetna. Previous transects from 1980s only covered sloughs in Lower River Reach.
- Each transect will have a staff gauge installed and the model will predict surface water elevations. This will be useful in the planning process. The HECResSim model presumes the cross sections are static and it is therefore not appropriate to use in analysis of geomorphology or channel evolution processes. Other analyses will address those issues.
- Wayne Dyok of AEA explained how RFPs will be issued for 2012 studies and contractors will be selected for the long-term. During March and April it is anticipated the contractors will brief the agencies and stakeholders to finish off the 2012 study plans. A detailed schedule will be provided by beginning of the year and more about how the 2012 studies will be integrated into the formal study plans.
- There was further discussion that while the initial transect effort will focus on the Middle Reach, the Lower River Reach will also receive attention.

Cardno-Entrix – Water Temperature Data and Models

- It was noted that Cook Inlet Keepers has collected thermal data for tributaries and that Talkeetna has a good meteorological station.
- ADF&G would like more detail and maps of data collection sites to be able to fully comment. ADF&G would like to see the details of the study plan such as type of equipment, sampling protocols, calibration methods – all in the study plans.
- It was noted that the PAD will have very brief discussion of the 2012 studies but the versions of the study plans developed by the contractors would have more detail.
- Temperature recorders are to be placed in the main channel in order to be representative of the longitudinal profile of the river, and not the off channel habitats. Thermal refugia will be picked up by fish habitat and instream flow studies.
- There is not a good understanding of groundwater input and how that affects temperature Localized influence of temperature on habitat is important in localized areas. However, it will be good to get basic temperature model running first. The current effort is designed to evaluate longitudinal changes and understanding how far temperature changes continue through the system. Stream Network Temperature Model (SNTEMP) provides layered time-series model for riverine temperatures.

Cardno-Entrix – Bed and Suspended Load

- The sediment data will be compared to the flood frequency curve, which is available at the Gold Creek gage; the two-year flood stage is somewhere around 50,000 cfs.
- Discussion that Gold Creek gage has 56 years of record but Sunshine station has less than 10 years of record.
- The 1985 sediment load presented represented the total sediment load, including wash load, suspended sediment and bedload. The total sediment load of the Susitna River above the three rivers confluence represents approximately 10% of the total sediment load in the Susitna River at the Sunshine gage.
- Cross section surveys are desired to determine if the channel is in equilibrium.
- Need to make sure study sites are well located and characterized so the results can be appropriately extrapolated to the entire river. It was also suggested that multiple indirect studies be implemented to validate results.
- It's important to understand the sediment load from Middle Reach as a proportion of total load through the river system.
- It was noted that the largest riparian changes in the mainstem Susitna River have been observed below the Talkeetna River and that significant sediment inputs likely occur from lateral channel migration and erosion.
- Discussion of rating curves at Gold Creek.
- It was inquired if there would be sites at the Chulitna and Talkeetna rivers to evaluate changes at the deltas of the confluences. This issue is at a finer resolution than this study and other studies will be conducted to predict the changes at the tributary deltas.
- It was asked if passive acoustic methods be employed like hydrophones to extend the sampling. Hydrophones will not likely be used because they would only indicate data on the initiation of bed movement and the number of days bedload is actively moving,

but would not provide any information on particle size distributionThe difficulty of sampling during high flows was noted due to inclement weather precluding helicopter access and unsafe boating conditions due to the high flows and high debris loads.
\

Cardno-Entrix – Geomorphic Assessment

- The study area focuses on the Middle Reach because that is the portion of the river where the geomorphic assessment was conducted in the 1980s using aerial photography at various flows. Lower river 1980s photography is available at the tributary confluences. If the Project arrests sediment movement in the Middle Reach that could lead to significant changes on the Lower River. Due to the width of the river in the lower reach, use of aerial photography may not be adequate to assess potential geomorphic changes.
- The use of aerial photography between the 1980s and today was suggested to evaluate changes in side channels, get some intermediary points to evaluate the rates of change, and to possibly identify the event(s) that caused the channel to change.
- Geomorphic parameters (e.g. width-to-depth ratio, entrenchment) will not be measured in 2012. The 2012 study will be used to characterize the stability of the river, the flow-dependent influence on channel types, channel form and pattern.
- Micro habitats are important and will also be addressed in instream flow studies.
- There was mention of two previous studies that addressed instream flow and habitats including:
    - APA Doc. # 2945: "Response of Aquatic Habitat Surface Areas to Mainstem Discharge in the Talkeetna-to-Devils Canyon Segment of the Susitna River" and;
    - APA Doc. # 3060: "Instream Flow Relationships Report, Volume 1, Final Report December 1985 by Harza-Ebasco/Trihey & Associates.

Cardno-Entrix – Ice Formation

- The ice formation process in the Susitna River was described. Based on 1980s studies, approximately 80% of the slush ice in the lower river was transported from the upper and middle river reaches.
- With future Project operations ice could form 4-7 feet higher than current ice cover in the river below the dam.
- What would be the effects of changed ice processes on the Lower River?
- Would the sediment transport regime change with changes in ice flows?
- What would the influence of the lower hydrostatic pressure be on groundwater upwelling?

Kirby Gilbert, Sr. Regulatory Specialist, MWH and Lynn Noel, Cardno-Entrix

Action Items:

- AEA will verify that the documents referenced during Trihey's presentation are electronically available through ARLIS.
- AEA will provide a map of the 91 HECResSim transects established in the 1980s.

The notes are designed to provide a summary of conversation and the meeting was not recorded. If you feel there is an error or a correction needs to be made, contact Emily Ford.

SUSITNA-WATANA
HYDROELECTRIC PROJECT

Meeting Summary
Fisheries Resources Agency Workshop
on 2012 Studies and Issues
1- 4 p.m., December 7, 2011
Held at AEA Project Offices Conference Room,
411 W 4th Avenue, Suite 1, Anchorage, AK

Purpose of Meeting:

Present and discuss 2012 Study Plans.

Attendees:

AEA	Betsy McGregor, Env. Manager
AEA	Emily Ford, Public Affairs
AEA	Wayne Dyok, Project Manager
AEA	Audrey Alstrom
AEA	Doug Ott
Cardno-Entrix	Jim Gill
MWH	Kirby Gilbert
Long View Associates	Steve Padula
Cardno-Entrix	Woody Trihey
Cardno-Entrix	Lynn Noel
Cardno-Entrix	Craig Addley
Cardno-Entrix	Mitchel Katzel
Cardno-Entrix	Steve Nevares
Aquacoustics	Don Degan
Aquacoustics	A. M. Mueller
MSB Fish & Wildlife Commission	Larry Engel
ADNR, Water	Kim Sager
LGL Alaska	Michael Link
LGL Alaska	Sean Burril
ADF&G	Jack Erickson
ADF&G	Lowell Fair
Cramer Fish Science	Dani Evenson
USBLM, Glennallen	Tim Sundlov
Coalition for Susitna Dam Alternatives	Becky Long
DOWL HKM	Kacy Hillman
USFWS	Jennie Spegon
ADF&G	Joe Giefer
NMFS – PRD	Mandy Migura
CIRI	Dara Glass

USBLM	Elijah Waters
HDR	James Brady
E-Terra	Lars G. Leitsmann
Van Ness Feldman	Jonathan Simon
Mat-Su Mayor	Larry DeVilbiss
Hydropower Reform Coalition	Jan Konigsberg
ADF&G	Joe Klein
Tetra Tech	Rob Plotnikoff
Knikatnu, Inc.	Tom Harris
Tetra Tech, Alaska	Christy Miller
NLUR	Peter Bowers
NMFS	Sue Walker
ADF&G	Mark Willette (by phone)
USFWS	Betsy McCracken
Mat-Su Borough	Larry DeVilbiss (by phone)
State of Alaska, AG's Office	Brian Bjorkquist (by phone)
HDR	Michael Barclay (by phone)
R2 Resource Consultants	Dudley Reiser (by phone)
EPA	Jennifer Curtis (by phone)

Presentations:

- Craig Addley (Cardno-Entrix): Fish Distribution and Relative Abundance Studies
  - Synthesis of Existing Fish Data
  - Susitna River Run Apportionment
  - Chinook Salmon Presence Above Devils Canyon
  - Middle River Habitat Utilization
- Craig Addley (Cardno-Entrix): 2012 Instream Flow Study

Questions/Discussion Related to Presentations

Cardno-Entrix – Fisheries Distribution and Abundance Studies

- Question about the availability of more recent fishery studies including results of radio-tagging studies. ADF&G said their reports are on ADF&G website.
- There may be a need to retrieve more existing ADF&G data to identify key gaps.
- ADF&G described the recent radio telemetry and mark-recapture studies for sockeye salmon (2006-2010) and coho and chum salmon (2009-2012). For the sockeye fish tagging and mark-recapture project, ADF&G installed fish wheels and weirs in lakes and up the Yentna system. They also collected genetic samples beginning in 2009. There are preliminary distribution data for chum and coho from 2010 work, but 2011 efforts will yield more data soon. ADF&G will have apportionment data for the Three Rivers confluence area.

- Sockeye, coho and chum abundance, run apportionment and spawning distribution were determined from the ADF&G studies. However, the resolution of the data may not be adequate to determine habitat or channel type use within the middle Susitna River and no habitat data was collected at potential spawning sites.
- There was some comfort with information on sockeye, chum, and coho but there was a general desire for more information on Chinook and pink salmon.
- ADF&G has been collecting genetic samples of Chinook salmon in the Susitna River and its major tributaries, including Chulitna, Portage, Talkeetna, Montana, Willow, Deshka and Alexander. However, preliminary results indicate that the genetic markers are not separated enough to determine the tributary of origin.
- The chinook salmon populations are at low-levels and perhaps the information from the 1980s is not comparable to today. Understanding the apportionment of the Chinook run and the extent of Chinook abundance above Devils Canyon is important.
- With climate change there may be a shift in run timing, about 2-weeks earlier than in the 1980s.
- Need to understand Chinook distribution/migration routes within the mainstem channel types, in addition to where they ultimately end up.
- Concern that enough Chinook may not be caught to understand distribution.
- While setting up a sonar station could take a whole year to find a good site, it may be worthwhile for the long run.
- Project operations could affect flows and number of fish passing through Devils Canyon.
- Juveniles may be a bigger data gap than adults in terms of known distribution and abundance.
- Resident fisheries are important and the Project will be looked at closely for effects on resident fish populations.
- Would like to see more data presented from 1980s, perhaps in the PAD.
- Cook Inlet beluga whales require studies addressing critical habitat and potential changes to prey species, specifically eulachon and salmon, from Project operations.

Cardno-Entrix – 2012 Instream Flow Study

- Discussion about upwelling and downwelling areas and using temperature as a tracer. Open water areas in the winter do not necessarily indicate upwelling.
- Suggest collecting surface and intragravel temperature data and pressure data with piezometers.

Kirby Gilbert, Sr. Regulatory Specialist, and Lynn Noel, Cardno-Entrix

The notes are designed to provide a summary of conversation and the meeting was not recorded. If you feel there is an error or a correction needs to be made, contact Emily Ford.

SUSITNA-WATANA
HYDROELECTRIC PROJECT

Meeting Summary
Terrestrial Resources Agency Workshop
on 2012 Studies and Issues
9 a.m. – Noon, December 8, 2011
Held at AEA Project Offices Conference Room,
411 W 4th Avenue, Suite 1, Anchorage, AK

Purpose of Meeting:

Present and discuss 2012 Study Plans.

Attendees:

AEA	Betsy McGregor, Env. Manager
AEA	Emily Ford, Public Affairs
AEA	Wayne Dyok, Project Manager
AEA	Doug Ott
Cardno-Entrix	Jim Gill, Assistant to AEA
MWH	Kirby Gilbert
Long View Associates	Steve Padula
Cardno-Entrix	Woody Trihey
Cardno-Entrix	Lynn Noel
Cardno-Entrix	Steve Nevares
USFWS	Jennie Spegon
Coalition for Susitna Dam Alternatives	Becky Long
HDR	Nancy Tankersley
ABR, Inc.	Brian Lawhead
Long View / NES	John Morsell
ADF&G	Mark Burch
ADNR, Office of History & Archaeology	Richard VanderHoek
DOWL HKM	Kacy Hillman
Oasis Environmental	Susan Ives
Oasis Environmental	Josh Brekken
CIRI	Dara Glass
ADF&G	Joe Giefer
USEPA	Matthew LaCroix
ABR, Inc.	Terry Schick
Tetra Tech	Bill Fullerton
AEA	Audrey Alstrom
Knikatnu, Inc.	Tom Harris
E-Terra	Lars Geistmann

MWH

ADF&G	Ron Benkert
USFWS	Mike Buntjer
DOWL	Jessica Christianson
USBLM, Glennallen	Elijah Waters
USFWS	Betsy McCracken
HDR Alaska	Anne Leggett
Van Ness Feldman	Jonathan Simon
Natural Heritage Institute	Jan Konigsberg
Tetra Tech	Rob Plotnikoff
USDOI	Michael Baffrey
USBLM, Glennallen	John Jangala
ABR	Bob Burgess (by phone)
3PPI	Sally Morsell (by phone)
FERC	David Turner (by phone)
3PPI	Cheryl Moody (by phone)

Presentations:

- Lynn Noel (Cardno-Entrix): Wildlife Studies
  - Wildlife Habitat Use and Movement
  - Past and Current Big Game and Furbearer Harvest Study
  - Eagle and Raptor Nest Study

- Lynn Noel (Cardno-Entrix): Botanical Studies
  - Vegetation and Wildlife Habitat Mapping Study
  - Riparian Study
  - Wetland Mapping

Questions/Discussion Related to Presentations

Cardno-Entrix –Wildlife Studies

- Question about how the study area is defined. The project footprint provides a basic analysis area of direct impacts including the three alternative access corridors, transmission corridor and dam and reservoir areas. Beyond the Project footprint, the study areas will vary with the resource being studied.
- Wayne Dyok indicated that the study area can go as far as Cook Inlet if warranted. Woody Trihey mentioned the 2012 studies may help determine and define the extent of downstream effects.
- Existing data may not be refined enough to fully assess impacts.
- Need to comply with Bald and Golden Eagle Protection Acts.
- It will be good to avoid raptor disturbance during study periods.
- Important to look for patterns of changes in moose and caribou distribution.

- Questions about when preferred access corridor will be determined. Currently three main routes being studied and carried through to study efforts. The environmental study process will help to define or potentially limit the final proposed corridor.
- Question about where and how the river will be diverted at the dam site during construction – it will be a short diversion tunnel on the north bank.
- Important to consult early with ADF&G Habitat Division on potential stream crossing locations of the proposed access road. The Denali Corridor does not cross any anadromous fish bearing streams, while both the Gold Creek and Chulitna corridors do.
- Question about need for blasting – it is likely there will be some at or near proposed Dam site.
- Question whether an airstrip is part of Project plan. The airstrip is planned and will need to be established early on.
- Question about the access road, if it will be open to the public and if it will be paved. Long term access and road surface have not been determined at this time; there will be no public access during construction.
- Questions about consideration of a railroad spur. It has been eliminated as an alternative based on cost versus benefit.
- For caribou, ADF&G may need to collar more animals to determine distribution, migration patterns, stream crossing sites and assess potential Project impacts. Some animals may be collared with GPS collars to obtain more specific movement data than can be determined from VHF collars.
- Question about predator surveys. There may be adequate existing information on bears. Wolves would be difficult to survey and telemetry would not likely be appropriate because it is a predator control area and the population and movements are very dynamic.

Cardno-Entrix – Botanical Studies

- Question about how much data is available downstream of proposed dam site. This is still being compiled. There is data within the active floodplain from the proposed dam site to the Talkeetna River confluence, approximately 30 discrete locations within the riparian corridor of the Middle and Lower Susitna River reaches, and several isolated sites below the Deshka River.
- Has the permafrost extent been or will it be studied? It was studied in the 1980s and there will be additional studies.
- It was mentioned that Talkeetna area has doubled its frost-free period in recent years. However, further discussion brought out a need to be cautionary as the location of the met station is near pavement and subject to effects of increased plane tarmac traffic patterns where planes can idle for long periods of time.
- It is important to collect functional information on wetlands and engage the Corps of Engineers on the methodology. The Corps will be engaged and will be consulted to approve of the functional assessment prior to its use.
- There may be different requirements for surveys on BLM lands.

- Local climate effects of reservoir may be important to consider in impact assessment.
- Mention of the potential need for compensatory mitigation and whether that might be important.

Kirby Gilbert, Sr. Regulatory Specialist, MWH and Steve Nevares, Cardno-Entrix

The notes are designed to provide a summary of conversation and the meeting was not recorded. If you feel there is an error or a correction needs to be made, contact Emily Ford.

SUSITNA-WATANA
HYDROELECTRIC PROJECT

Meeting Summary
Social Resources Agency Workshop
on 2012 Studies and Issues
1 - 4 p.m., December 8, 2011
Held at AEA Project Offices Conference Room, 411 W 4th Avenue, Suite 1, Anchorage, AK

Purpose of Meeting:

Present and discuss 2012 Study Plans.

Attendees:

MWH	Kirby Gilbert
CRC	Michael Yarborough
ABMC, Co.	Chuck Akers
Cultural Assessment	Ron Stanek
HDR Alaska	Laurie Cummings
NLUR	Peter Bowers
Hydropower Reform Coalition	Jan Konigsberg
BLM, Glennallen	John Jangala
Cardno-Entrix	Jim Gill
Long View Associates	Steve Padula
ADNR, OHA	Richard VanderHoek
NLUR	Richard Stern
Van Ness Feldman	Jonathan Simon
DOWL HKM	MaryEllen Tuttell
AEA	Betsy McGregor, Env Manager
AEA	Wayne Dyok, Project Manager
CIRI	Dara Glass
Ninilchik Natives Association	Gary Oskolkoff
Knikatnu, Inc.	Tom Harris
ADF&G	Joe Giefer
MSB	Fran Seager-Boss
DOWL HKM	Kacy Hillman
USDOI	Michael Baffrey
HDR Alaska	Tracie Krauthoefer
(*Not provided*)	Evan Oval

URS Alaska	Jon Issac
ADF&G	Davin Holen
BIA, Archaeology	Ricky Hoff
FERC	Ken Wilcox (by phone)
BLM Glennallen	Brenda Becker (by phone)
BIA	Mark Cutland (by phone)
Senator Joe Thomas office	Grier Hopkins (by phone)
FERC	Frank Winchell (by phone)
MWH	Steve Bedross (by phone)

Presentations:

- Kirby Gilbert (MWH): Recreation, Land Use and Management, Aesthetics, Socioeconomics and Transportation.
- Richard Stern (NLUR): Subsistence
- Pete Bowers (NLUR): Cultural Resources

Questions/Discussion Related to Presentations

Kirby Gilbert, MWH – Recreation, Land Use, Aesthetics, Socioeconomics and Transportation

- Some concern that construction workers would potentially change the quality of the recreation experience in the area due mainly to numbers.
- While it is important to quantify the recreation use patterns and potential changes it is also important to get at the changes in the quality of the experience in terms of what recreationists are seeking.
- Important to not "over survey" people as they can get survey fatigue.
- The question was raised if there could be a decrease in recreation opportunities due to loss of sand bars.
- Important to look at the relevant land use plans.
- Need to consider including hunting and fishing uses and commercial operation use areas.
- Current recreation questionnaire went out to commercial operators; about 20 were sent out, but only a few received back.
- Talkeetna is a hub for recreation in the vicinity and there is a desire that it not be underestimated.
- Question was raised about what happens if you inundate BLM land? Discussion about AEA seeking to obtain approvals, such as use and occupancy permits for the reservoir and right-of-way or access permits for roads and transmission lines.
- BLM indicated that the State may take ownership of the lands in the reservoir.

- There is an ongoing settlement process related to Alaska Native Claims Settlement Act (ANSCA) land claims. The 12a lands are held in trust by CIRI. Therefore research will be needed and it will not be easy due to the ongoing litigation.
- May need to dig into the history on the status of land claims and land trades.
- CIRI cautioned that identifying land ownership and obtaining access agreements may be difficult and time consuming. There are both selected and unselected CIRI lands within the Project area. For all of the lands, CIRI holds the right to the subsurface estate while the village corporations have surface rights.
- CIRI will try to help AEA in working through the ownership issues. Might have to learn more about any disputed claims.
- Knikatnu has 950 acres of 12a lands to be submerged and 580 acres of 12b lands. Tyonek has 3,340 acres of 12a lands which would be submerged and another 950 acres which have been selected but not yet deeded. Chickaloon, Seldovia, Salamantoff, Ninilchik,and Tyonek have not finished selecting CIRI lands.
- Ninilichik puts high value on their lands and does not like to sell or use it for backing up loans.
- It was stated that cooperation was needed with every Village Corporation, along with CIRI, and that no one should access CIRI lands without permits.
- Ahtna may have lands to the north.
- A centralized process for gaining access permits was suggested
- While doing reconnaissance to identify potential key view points and viewing areas would be appropriate in 2012, the actual photography work should probably be performed in 2013. It would be better to have photographic documentation built into ILP studies as part of the formal FERC study process.
- The State regulations require an assessment of public health impacts. Health and Social Services coordinates this and then it gets wrapped into the EIS.

Richard Stern, NLUR - Subsistence

- Subsistence program manager from ADF&G, Davin Holen was present at the meeting. He discussed the State's experience with FERC pipeline office. The State and FERC established 7 criteria for subsistence studies including detailed harvest and locations information, harvest maps, spatial and temporal patterns, demographics, associated economics and description of subsistence versus local and traditional uses and that the data be collected within the previous three years.
- It was expressed that downstream communities could be affected. Many communities exist along the river, but some of these may be below the threshold of minimum community/population size.
- There was discussion about the study area and how to define the communities in the study area. For instance, the effects, if any, in Alexander Creek are uncertain.

It was expressed that if there is a nexus of biological resources which move from one area of the Project into another area then studies may be warranted. Talkeetna is not within the State's subsistence area, but the community members do exhibit a subsistence lifestyle.

- NPS also suggested we include consideration of Alaska National Interest Lands Conservation Act (ANILCA) Section 810 analysis of subsistence impacts procedures.

Pete Bowers, NLUR - Cultural Resources

- Need to have a plan in place in case a discovery is made.
- Areas within the proposed impoundment zone should be prioritized for 2012 studies.
- FERC staff indicated that AEA should talk with tribes now and identify data gaps.
- CIRI indicated that there are important distinctions among regional corporations, village corporations and tribal councils.
- FERC indicated that it will identify who the relevant groups are and what they call themselves. "Tribes" is used as an all-encompassing term relative to Section 106 Consultation and it includes the ANSCA Corporations and tribes, both federally recognized and those that are not federally recognized.
- Suggestion offered that it might be better to use term "Alaska Native Groups" instead of "Tribes".
- A Programmatic Agreement (PA) will need to be prepared. It was suggested that this be initiated soon, but FERC indicated that the PA is typically completed after the studies and the National Environmental Policy Act (NEPA) analysis have been completed..
- An associated historic properties management plan will be developed.
- Final PA is typically issued with final NEPA document.
- A question was asked if FERC will take care of the initiation of consultation letters. This will happen after the Notice Of Intent, which formally begins the Section 106 process. Additional parties include Alaska Native groups, BLM, the Applicant, plus anyone else who would have a site affected by the Project.
- FERC asked if the list of Alaska Native Groups is current as shown in the preliminary permit. David Turner may contact AEA to complete the list.
- Tom Harris of Knikatnu discussed federally recognized tribal consultation in terms of districts. Some districts have been formed while other applications are underway. He mentioned Tyonek as a land owner as well as an original member of a Tribal Conservation District.
- The Alaska State Historic Preservation Office (SHPO) representative noted that efforts on the Programmatic Agreement and any archeological permits will need to be coordinated.

- Discussion about reviewing the data gap analysis prior to having archaeologist going to the field.
- Data needs to be brought up to current standards, GIS format. Questions about if FERC could be innovative due to large study area.

Jim Gill, Cardno Entrix and Kirby Gilbert, Sr. Regulatory Specialist, MWH

Action Items:

- AEA will post the draft subsistence and redacted cultural resource gap analyses.

The notes are designed to provide a summary of conversation and the meeting was not recorded. If you feel there is an error or a correction needs to be made, contact Emily Ford.

APPENDIX 6-2
SUSITNA-WATANA PROJECT CONTACT LIST

DISTRIBUTION LIST

Advisory Council on Historic Preservation
1100 Pennsylvania Ave., NW
Old Post Office Building
Suite 803
Washington, D.C. 20004

Ken Johns
President/CEO
Ahtna, Inc.
PO Box 649
Glennallen, Alaska 99588

Kathryn Martin
Ahtna, Inc.
PO Box 649
Glennallen, Alaska 99588

Toby Smith
Executive Director
Alaska Center for the Environment
807 G Street, Suite 100
Anchorage, AK 99501

Kaarle Strailey
Alaska Center for the Environment
807 G Street, Suite 100
Anchorage, AK 99501

Louisa Yanes
Energy Organizer
Alaska Center for the Environment
807 G Street, Suite 100
Anchorage, AK 99501

Mike Coumbe
Executive Director
Alaska Conservation Alliance
P.O. Box 100660
Anchorage, AK 99510

Kate McKeown
Alaska Conservation Alliance
P.O. Box 100660
Anchorage, AK 99510

David Theriault
Alaska Conservation Alliance
P.O. Box 100660
Anchorage, AK 99510

Julie Jessum
Alaska Conservation Foundation
441 West 5th Street, Suite 402
Anchorage, AK 99501-2340

Susan K. Bell
Commissioner
Alaska Department of Commerce,
Community and Economic Development
P.O. Box 110800
Juneau, AK 99811-0800

Dan Easton
Director
Alaska Department of Environmental Conservation
410 Willoughby Avenue Ste 303
Juneau, AK 99811

Larry Hartig
Office of the Commissioner
Alaska Department of Environmental Conservation
P.O. Box 111800
410 Willoughby Avenue, Suite 303
Juneau, AK 99811-1800

Bill Griffith
Division of Water
Alaska Department of Environmental Conservation
555 Cordova Street
Anchorage, AK 99501-2617

Brenda Krauss
Division of Water
Alaska Department of Environmental Conservation
P.O. Box 111800
410 Willoughby Avenue, Suite 303
Juneau, AK 99811-1800

DISTRIBUTION LIST

William Ashton
Storm Water & Wetlands Manager
Alaska Department of Environmental Conservation
555 Cordova St.
Anchorage, AK 99501

Alaska Department of Fish & Game
P.O. Box 115526
1255 West 8th Street
Juneau, AK 99811-5526

Joseph "Joe" Buckwalter
Habitat Biologist
Alaska Department of Fish & Game
333 Raspberry Road
Anchorage, AK 99518

Shawn Johnson
Fishery Biologist
Hydropower Coordinator
Alaska Department of Fish & Game
P.O. Box 110024
Juneau, AK 99811-0024

Jason Mouw
Alaska Department of Fish & Game
333 Raspberry Road
Anchorage, AK 99518

Joe Hitselberger
Alaska Department of Fish & Game
P.O. Box 240020
Douglas, AK 99824-0020

Kate Kanouse
Habitat Biologist
Alaska Department of Fish & Game
P.O. Box 240020
Douglas, AK 99824

Monte Miller
Hydroelectric Project Coordinator
Alaska Department of Fish & Game
333 Raspberry Road
Anchorage, AK 99518

Jackie Timothy
Southeast Regional Supervisor
Alaska Department of Fish & Game
802 West 3rd Street
Douglas, AK 99811

Joe Klein
Alaska Department of Fish & Game
333 Rasberry Rd.
Anchorage, AK 99518-1599

Mike Bethe
Alaska Department of Fish & Game
1800 Glenn Hwy., Suite 6
Palmer, AK 99645-6736

Joe Giefer
Alaska Department of Fish & Game
333 Rasberry Rd.
Anchorage, AK 99518-1565

Jack Erickson
Alaska Department of Fish & Game
333 Rasberry Rd.
Anchorage, AK 99518-1599

Ed Weiss
Alaska Department of Fish & Game
333 Rasberry Rd.
Anchorage, AK 99518-1599

Sarah Hazell
Alaska Department of Fish & Game
333 Rasberry Rd.
Anchorage, AK 99518-1599

Mark Fink
Alaska Department of Fish & Game
333 Rasberry Rd.
Anchorage, AK 99518-1565

Ron Benkert
Alaska Department of Fish & Game
1800 Glenn Hwy., Suite 6
Palmer, AK 99645-6736

Todd Rinaldi
Alaska Department of Fish & Game
333 Rasberry Rd.
Anchorage, AK 99518-1599

Tim Peltier
Alaska Department of Fish & Game
1800 Glenn Hwy., Suite 2
Palmer, AK 99645-6736

Mike Petrula
Alaska Department of Fish & Game
333 Rasberry Rd.
Anchorage, AK 99518-1599

Mark Burch
Alaska Department of Fish & Game
333 Rasberry Rd.
Anchorage, AK 99518-1599

Davin Holen
Alaska Department of Fish & Game
333 Rasberry Rd.
Anchorage, AK 99518-1599

Ron Stanek
Alaska Department of Fish & Game
333 Rasberry Rd.
Anchorage, AK 99518-1599

Lowell Fair
Alaska Department of Fish & Game
333 Rasberry Rd.
Anchorage, AK 99518-1599

Anne Johnson
Natural Resource Manager
Alaska Department of Natural Resources
GIS RSA
550 West 7th Avenue, Suite 650
Anchorage, AK 99501-3579

Daniel S. Sullivan, Commissioner
Alaska Department of Natural Resources
P.O. Box 111000
400 Willoughby Avenue, Suite 500
Juneau, AK 99811-1000

Joseph R. Balash
Deputy Commissioner
Alaska Department of Natural Resources
550 West 7th Avenue, Suite 1400
Anchorage, AK 99501-3561

Tom Crafford, Director
Office of Project Management and Permitting
Alaska Department of Natural Resources
550 West 7th Avenue, Suite 1430
Anchorage, AK 99501

Wyn Menefee, Director
Division of Mining, Land, and Water
Alaska Department of Natural Resources
550 West 7th Avenue, Suite 1070
Anchorage, AK 99501-3579

Kristina "Krissy" Plett
Natural Resource Manager
Division of Mining, Land, and Water
Alaska Department of Natural Resources
550 W 7th Ave Ste 1020
Anchorage, AK 99501-3579

Gary Prokosch
Natural Resource Manager
Division of Mining, Land, and Water
Alaska Department of Natural Resources
550 West 7th Avenue, Suite 1020
Anchorage, AK 99501-3579

Candice Snow, Permits
Resource Assessment and Development
Division of Mining, Land, and Water
Alaska Department of Natural Resources
550 West 7th Avenue, Suite 900c
Anchorage, AK 99501-3579

Alaska Department of Natural Resources
Water Resources
Division of Mining, Land, and Water
550 West 7th Avenue, Suite 900A
Anchorage, AK 99501-3577

DISTRIBUTION LIST

Ben Ellis, Director
Division of Parks and Outdoor Recreation
Alaska Department of Natural Resources
550 West 7th Avenue, Suite 1380
Anchorage, AK 99501-3561

Judith Bittner
State Historic Preservation Officer
Alaska Department of Natural Resources
550 West 7th Avenue, Suite 1310
Anchorage, AK 99501-3565

Kim Sager
Alaska Department of Natural Resources
550 W. 7th Ave., Suite 1020
Anchorage, AK 99501-3579

Jusdi McDonald
Alaska Department of Natural Resources
550 W. 7th Ave., Suite 900c
Anchorage, AK 99501-3577

Shina duVall
Office of History & Archaeology
Alaska Department of Natural Resources
550 W. 7th Ave., Suite 1310
Anchorage, AK 99501-3565

Dave McMahan, Deputy SHPO
Alaska Department of Natural Resources
550 W. 7th Ave., Suite 1310
Anchorage, AK 99501-3565

Richard VanderHoek
Office of History & Archaeology
Alaska Department of Natural Resources
550 W. 7th Ave., Suite 1310
Anchorage, AK 99501-3565

Rod Combellick
Division of Geological & Geophysical Surveys
Alaska Department of Natural Resources
3354 College Rd.
Fairbanks, AK 99709

Ethan Birkholz, Chief of Planning
Alaska Department of Transportation &
Public Facilities;
2301 Peger Rd.
MS-2550
Fairbanks, AK 99709

Ben White, Acting State Environmental Manager
Alaska Department of Transportation &
Public Facilities;
P.O. Box 112500
3132 Channel Drive
Juneau, AK 99811-2500

Mark Huber
Alaska Fly Fishers
200 West 34th Avenue, # 1233
Anchorage, AK 99503

Emily Ford,
Public Outreach Liaison
Alaska Energy Authority
813 West Northern Lights Blvd.
Anchorage, AK 99503

Betsy McGregor
Alaska Energy Authority
813 West Northern Lights Blvd.
Anchorage, AK 99503

Bryan Carey
Alaska Energy Authority
813 West Northern Lights Blvd.
Anchorage, AK 99503

Marilyn Leland,
Executive Vice President
Alaska Power Association
703 West Tudor Rd., Suite 200
Anchorage, AK 99503-6650

Marilyn Leland,
Executive Vice President
Alaska Power Association
302C Assembly Bldg.
411 Fourth St.
Juneau, AK 99801

Crystal Enkvist
Alaska Power Association
703 West Tudor Rd., Suite 200
Anchorage, AK 99503-6650

Alaska Public Interest Research Group
P.O. Box 101093
Anchorage, AK 99510

Alexander Creek Inc.
8126 Wisteria Street
Anchorage, AK 99502-4573

Patsy Gunn
Alaska Railbelt Energy Authority
3601 C Street, Suite 1400
Anchorage, AK 99503

Thomas O'Keefe,
Pacific Northwest Director
American Whitewater;
3537 NE 87th Street
Seattle, WA 98115

American Rivers;
1104 14th Street NW, Suite 1400
Washington, D.C., 20005

American Rivers;
Northwest Region
P.O. Box 387
Seattle, WA 98111-0387

Jeff Warner, Power Dispatcher
Anchorage Municipal Light & Power
1200 East 1st Ave.
Anchorage, AK 99501

Caswell Native Association
HC 89, Box 83
Willow, AK 99688

Cheesh-Na Tribal Council
P.O. Box 241
Chistochina, AK 99586
Chickaloon-Moose Creek Native Association
P.O. Box 875046
Wasilla, AK 99674

Chickaloon Native Village
P.O. Box 1105
Chickaloon, AK 99674

Chitina Native Corporation
P.O. Box 3
Chitina, AK 99566

Chitina Traditional Village Indian Council
P.O. Box 31
Chitina, AK 99566

Burke Wick
Chugach Electric Association, Inc.
5601 Electron Drive
P.O. Box 196300
Anchorage, AK 99519-6330

Becky Long
Coalition for Susitna Dam Alternatives
P.O. Box 320
Talkeetna, AK 99676

Richard Leo
Coalition for Susitna Dam Alternatives
P.O. Box 320
Talkeetna, AK 99676

Gary Fandrei,
Executive Director
Cook Inlet Aquaculture Association
40610 Kalifornsky Beach Rd.
Kenai, AK 99611

Cook Inlet Region, Inc.
2525 C Street, Suite 500
Anchorage, AK 99503

Margaret Brown
President and CEO
Cook Inlet Region Corporation
P.O. Box 933330
Anchorage, AK 99509-3330

Jim Jager,
Director, Corporate Communications
Cook Inlet Region Corporation
P.O. Box 933330
Anchorage, AK 99509-3330

Ethan Schutt
Sr. Vice President
Cook Inlet Region Corporation
P.O. Box 933330
Anchorage, AK 99509-3330

Dara Glass
Land Administrator
Cook Inlet Region Corporation
P.O. Box 933330
Anchorage, AK 99509-3330

James Mery, Sr. Vice President
Lands and Natural Resources
Doyon, LTD
1 Doyon Place, Suite 300
Fairbanks, AK 99701-2941

Eklutna , Inc.
16515 Centerfield Dr., Suite 201
Eagle River, AK 99577

Eklutna Native Village
26339 Eklutna Village Road
Chugiak, AK 99567

Tom Lovas, Owner
Energy & Resource Economics
5840 Azalea Drive
Anchorage, AK 99516

Fairbanks Northstar Borough
P.O. Box 71267-1267
Fairbanks, AK 99701

Federal Emergency Management Agency;
Region X
130-228th Street SW
Bothell, WA 98021-8627

Kimberly Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, D.C. 20426

Edward Perez
Regional Engineer
Federal Energy Regulatory Commission
805 SW Broadway
Fox Tower, Suite 550
Portland, OR 97205

Kim Nguyen
Federal Energy Regulatory Commission
888 First Street, NE
Washington, D.C. 20426

David Turner
Federal Energy Regulatory Commission
888 First Street, NE
Washington, D.C. 20426

Matt Cutlip
Federal Energy Regulatory Commission
805 SW Broadway
Suite 550
Portland, OR 97205

Kim Ognisty
Federal Energy Regulatory Commission
888 First Street, NE
Washington, D.C. 20426

Gold Creek-Susitna NIC
P.O. Box 847
Talkeetna, AK 99676

Henri Dale
Golden Valley Electric Association
758 Illinois Street
P.O. Box 71249
Fairbanks, AK 99707-1249

Gulkana Village
P.O. Box 254
Gakona, AK 99586

Healy Lake Village
P.O. Box 74090
Fairbanks, AK 99706

Bob Day
Homer Electric Association
3977 Lake Street
Homer, AK 99603

Harvey Ambrose
Dir. of Power Prod. & Transmission
Homer Electric Association
3977 Lake Street
Homer, AK 99603

Jean Schroeder
Homer Electric Association
3977 Lake Street
Homer, AK 99603

Jim Kingrey
Homer Electric Association
3977 Lake Street
Homer, AK 99603

Jan Konigsberg,
Director, Alaska Waters Coalition
Hydropower Reform Coalition;
7511 Labrador Circle, Suite 100
Anchorage, AK 99502

Kenai Natives Association, Inc.
15 Fidalgo Ave., #102
Kenai, AK 99611-7795

Kenaitze Indian Tribe
P.O. Box 988
Kenai, AK 99611

Knik Tribal Council
P.O. Box 871565
Wasilla, AK 99567

Tom Harris
Knikatnu Inc.
Box 872130
Wasilla, AK 99687

Raymond Theodore
President
Knikatnu Native Corporation
P.O. Box 872130
Wasilla, AK 99687-7476

Jim Brooks
Matanuska Electric Association
P.O. Box 2929
Palmer, AK 99645

Mayor Larry DeVilbiss
Matanuska-Susitna Borough
350 E. Dahlia Ave.
Palmer, AK 99645

Shannon Post,
Director LiDAR
Matanuska-Susitna Borough;
350 E. Dahlia Ave.
Palmer, AK 99645

Fran Seager-Boss
Archeologist
Matanuska-Susitna Borough
350 E. Dahlia Ave.
Palmer, AK 99645

Larry Engel
Matanuska-Susitna Borough;
350 E. Dahlia Ave.
Palmer, AK 99645

Mendas Cha-ag Native Corporation
457 Cindy Drive
Fairbanks, AK 99701

Mentasta Traditional Council
P.O. Box 6019
Mentasta, AK 99780

Montana Creek Native Association
P.O. Box 100379
Anchorage, AK 99510

Municipality of Anchorage
632 West 6th Avenue
Anchorage, AK 99501

Thomas Meyer,
Attorney Advisor
National Oceanic and Atmospheric Administration
P.O. Box 21109
709 West 9th Street, Room 909A
Juneau, AK 99802-7414

National Oceanic and Atmospheric Administration
P.O. Box 21668
709 West 9th Street, Rom 420
Juneau, AK 99802-1668

Eric Rothwell, Hydrologist
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
222 West 7th Avenue, Box 43
Anchorage, AK 99513

Kate Savage, Energy Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
P.O. Box 21668
709 West 9th Street
Juneau, AK 99802

Susan Walker,
Hydroelectric Project Coordinator
National Marine Fisheries Service
P.O. Box 21668
709 West 9th St.
Juneau, AK 99802

Patrick Lavin,
Conservation Policy Advocate
National Wildlife Federation
National Oceanic and Atmospheric Administration
750 W 2nd Ave, Suite 200
Anchorage, AK 99501-2168

Native Village of Cantwell
P.O. Box 94
Cantwell, AK 99729

Native Village of Gakona
P.O. Box 102
Gakona, AK 99585

Native Village of Kluti-Kaah
P.O. Box 68
Copper Center, AK 99573

Native Village of Tazlina
P.O. Box 87
Glennallen, AK 99588

Native Village of Tetlin
P.O. Box TTL
Tok, AK 99779

Native Village of Tyonek
P.O. Box 82009
Tyonek, AK 99682

Nenana Native Association
P.O. Box 369
Nenana, AK 99764

Ninilchik Native Association, Inc.
701 West 41st, Suite 201
Anchorage, AK 99515

Ninilchik Traditional Council
P.O. Box 39070
Ninilchik, AK 99639

Northway Natives
P.O. Box 401
Northway, AK 99746

Northway Village
P.O. Box 516
Northway, AK 99764

Point Possession, Inc.
1321 Oxford Drive
Anchorage, AK 99503-6941

Corinne Smith
The Nature Conservancy
715 L Street, Suite 100
Anchorage, AK 99501

Regulatory Commission of Alaska
1016 West 6th Avenue, Suite 400
Anchorage, AK 99501

Salamatof Native Association, Inc.
P.O. Box 2682
Kenai, AK 99611

Seldovia Native Association, Inc.
P.O. Drawer L
Seldovia, AK 99663

Seldovia Village Tribe
Drawer L
Seldovia, AK 99663

John J. Burns
Attorney General
State of Alaska
P.O. Box 110300
Juneau, AK 99811-0300

Brian Bjorkquist
Attorney General's Office
State of Alaska
1031 W. 4th Ave., #200
Anchorage, AK 99501

Governor Sean Parnell
State of Alaska
P.O. Box 110001
Juneau, AK 99811-0001

Senator Charlie Huggins
State of Alaska;
State Capitol, Room 423
Juneau, AK 99801

The Office of Senator Joe Thomas
ATTN: Grier Hopkins
State of Alaska;
1292 Sadler Way, Suite 314
Fairbanks, AK 99701

Representative Mark Neuman
State of Alaska;
State Capitol, Room 513
Juneau, AK 99801

Tanacross, Inc.
22808 Green Garden Road
Chugiak, AK 99576

Tanacross Village Council
P.O. Box 76009
Tanacross, AK 99776

Tetlin Native Corporation
P.O. Box 657
Tok, AK 99780

Randall Hagenstein
Alaska State Director
The Nature Conservancy in Alaska
715 L Street, Suite 100
Anchorage, AK 99501

Toghotthele Corporation
P.O. Box 249
Nenana, AK 99760

Tim Bristol, Director
Trout Unlimited;
419 6th Street, Suite 200
Juneau, AK 99801

Trish Rolfe, Executive Director
Trustees for Alaska
106 West 4th Street, Suite 201
Anchorage, AK 99501

Tyonek Native Corporation
1689 C Street, Suite 219
Anchorage, AK 99501

Steve Taylor
Chief Financial Officer
Tyonek Native Corporation
1689 C Street, Suite 219
Anchorage, AK 99501

Heidi Firstencel
Field Office Manager
U.S. Army Corps of Engineers;
P.O. Box 898
Anchorage, AK 99506-0898

Michiel Holley
Regulatory Branch, Team Lead
U.S. Army Corps of Engineers, AK District
P.O. Box 6898
JBER, AK 99506-0898

Victor Ross
Regulatory Branch, Team Lead
U.S. Army Corps of Engineers, AK District
P.O. Box 6898
JBER, AK 99506-0898

Shannon Morgan
Chief, Regulatory Branch
U.S. Army Corps of Engineers, AK District
P.O. Box 6898
JBER, AK 99506-0898

Robert N. Jones,
State Conservationist
U.S. Department of Agriculture;
Natural Resources Conservation Service
800 W Evergreen Avenue, Suite 100
Palmer, AK 99645-6539

Michael Baffrey
Office of the Secretary
U.S. Department of Interior
1689 C Street, Suite 100
Anchorage, AK 99501

Lee Koss
Division of Resources Hydrologist
U.S. Department of Interior;
Bureau of Land Management
222 W 7th Ave #13
Anchorage, AK 99507

Gary Reimer, District Manager
U.S. Department of Interior;
Bureau of Land Management
4700 BLM Road
Anchorage, AK 99507

Tim Sundlov, Fish Biologist
U.S. Department of Interior;
Bureau of Land Management
P.O. Box 147
Mile Post 186.5 Glenn Hwy.
Glennallen, AK 99588

Mike Sondergaard, Hydrologist
U.S. Department of Interior;
Bureau of Land Management
P.O. Box 147
Mile Post 186.5 Glenn Hwy.
Glennallen, AK 99588

Elijah Waters, Acting Field Manager
U.S. Department of Interior;
Bureau of Land Management
P.O. Box 147
Mile Post 186.5 Glenn Hwy.
Glennallen, AK 99588

John Jangala
U.S. Department of Interior;
Bureau of Land Management
P.O. Box 147
Mile Post 186.5 Glenn Hwy.
Glennallen, AK 99588

Pamela Bergmann,
Regional Environmental Officer
U.S. Department of Interior;
Environmental Policy and Compliance
1689 C Street, Room 119
Anchorage, AK 99501-5126

Michael Buntjer
Conservation Planning Assistance Brand Chief
U.S. Department of Interior;
Fish and Wildlife Service
605 West 4th Street, Room G-61
Anchorage, AK 99501

Richard Enriquez
U.S. Department of Interior;
Fish and Wildlife Service
3000 Vintage Boulevard, Suite 201
Juneau, AK 99801

Ann Rappoport, Field Supervisor
U.S. Department of Interior;
Fish and Wildlife Service
605 West 4th Street, Room G-61
Anchorage, AK 99501

Betsy McCracken, Biologist
U.S. Department of Interior;
Fish and Wildlife Service
605 West 4th Street, Room G-61
Anchorage, AK 99501

Bill Rice, Hydrologist
U.S. Department of Interior;
Fish and Wildlife Service
605 West 4th Avenue
Rm. G-61
Anchorage, AK 99501

U.S. Department of Interior;
National Park Service;
Alaska Regional Office
240 West 5th Avenue
Anchorage, AK 99501

Paul Anderson, Superintendent
U.S. Department of Interior;
National Park Service;
P.O. Box 9
Denali National Park and Preserve
Denali Park, AK 99755

Lisa Holzapfel,
Program Manager
U.S. Department of Interior;
National Park Service;
240 West 5th Avenue
Anchorage, AK 99501

Center Director
U.S Department of Interior;
U.S. Geological Survey
4210 University Drive
Anchorage, AK 99508

David Meyer, Hydrology
U.S Department of Interior;
U.S. Geological Survey
4210 University Drive
Anchorage, AK 99508

U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101

Jennifer Curtis
U.S. Environmental Protection Agency
222 W 7th Ave. #19
Anchorage, AK 99513

Matthew LaCroix
Office of Ecosystems, Tribal & Public Affairs
Aquatic Resources Unit
U.S. Environmental Protection Agency
222 W 7th Ave. #19
Anchorage, AK 99513

Honorable Don Young
U.S. House of Representatives
2314 Rayburn House Office Building
Washington, D.C. 20515-0201

Honorable Lisa Murkowski
U.S. Senate
709 Hart Senate Office Building
Washington, D.C. 20515-0202

DISTRIBUTION LIST

Honorable Mark Begich
U.S. Senate
111 Russell Senate Office Building
Washington, D.C. 20510-0201

Village of Dot Lake
P.O. Box 2279
Dot Lake, AK 99737

Village of Salamatof
P.O. Box 2682
Kenai, AK 99611

Brad Evans, General Manager
Chugach Electric Association, Inc.
5601 Electron Drive
P.O. Box 196300
Anchorage, AK 99519-6330

Jim Posey, General Manager
Anchorage Municipal Light & Power
1200 East 1st Ave.
Anchorage, AK 99501

Brian Newton, General Manager
Golden Valley Electric Association
758 Illinois Street
P.O. Box 71249
Fairbanks, AK 99707-1249

Brad Janorschke, General Manager
Homer Electric Association
3977 Lake Street
Homer, AK 99603

Joe Griffith, General Manager
Matanuska Electric Association
P.O. Box 2929
Palmer, AK 99645

John Foutz, General Manager
City of Seward, Electric Utilities
P.O. Box 167
Seward, AK 99664

Z.J. Loussac Public Library
3600 Denali Street
Anchorage, AK 99503

Wasilla Meta-Rose Public Library
391 N Main St
Wasilla AK 99654

Talkeetna Public Library
23151 S Talkeetna Spur Rd
Talkeetna, AK 99676

Noel Wien Public Library
1215 Cowles Street
Fairbanks, AK 99701

Dot Lake Native Corporation
P.O. Box 2271
Dot Lake, AK 99737